Texas City Wings

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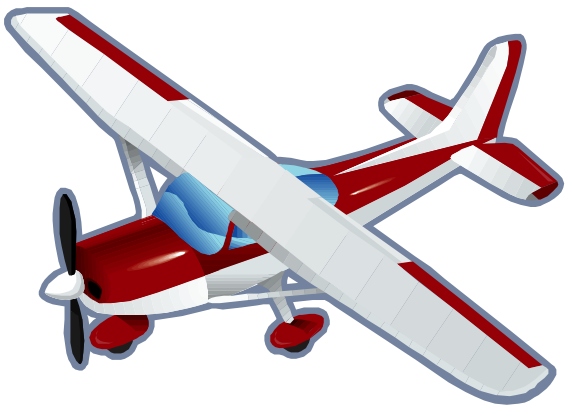
Improving Poorly Controlled Dangerous Takeoffs

From TRAC News, Tampa Radio-Control Aircraft Club, Tampa, Florida

by Jim Devine

How often have you seen an airplane that is taking off veer toward the pilot stations? Usually the pilot gives the engine more gas and, using the ailerons, yanks the airplane back to the right. Occasionally, the airplane continues to the left, clears the safety barriers, and heads for the people in the pits and the cars just beyond.



If you have poorly controlled, potentially dangerous takeoffs, try practicing control of your aircraft on the runway. First, check the wheels and make sure they have a little toe-in. Also, the wheels should not continue to spin when given a flick. To create friction and avoid free-wheeling, slip a 3/16-inch long piece of fuel line on the axle and push the retainer collar in tight. With proper adjustment, the wheels will turn only if you push them with your finger. This braking action allows for a high idle speed without the airplane moving, which reduces the chance of the engine dying when the idle is too low. This also helps stop an airplane that might otherwise roll off the end of a runway during landing.

Choose a day when the wind is light and the runway isn't being used. Practice taxiing back and forth the length of the runway, using the rudder for control. Stay within a few feet of the yellow center line. When you have mastered taxiing at slow speed, click the throttle up another notch or two and keep practicing. With enough practice and a slow, smooth application of power, you can approach takeoff speed while moving down the center of the runway. You also can practice aborting the flight by shutting off fuel when you're about to lose directional control of the airplane.

With this improved directional control and practice at aborting a poorly controlled airplane, your takeoffs will be much safer and a pleasure to watch.

Texas City Radio Club Meeting Minutes January—

Kevin Furman – Secretary

These are the minutes for the Texas City Radio Control Club meeting for January 21st , 2010. The meeting at the Nessler Recreation Center was called to order at 7:30pm by President Randy Brown. A quorum was met with 26 members in attendance and 1 visitor.

Secretary's Report – Kevin Furman: At December's meeting no club business was discussed as it was the club Christmas party.

Treasurer's Report – Ray Saenz: Ray stated that the beginning balance in December was $xxxx.xx and ending balance was $xxxx.xx.

Ray opened a new account for the new club house on January 7th. Starting balance was $xxxxx.xx the current balance as of January 21st is $xxxxx.xx

President's Report – Randy Brown: Randy introduced the new board for 2010.

Randy stated that all members will receive a 10% discount card for RC Hobby Shop with payment of 2010 membership dues.

Randy stated that Butch McEachern will remain the safety officer, Harvey Cappel will remain the chief instructor and Mike Grassmuck will be the new field marshall.

Randy announced that name tags are available for $8.00 and a sign up sheet for name tags was passed around.

Vice President's Report – James Grassmuck:

No Updates

Safety Officer's Report – Butch McEachern: Butch stated that there were no incidents for the month.

Pilot Instruction – Harvey Cappel: No one in training.

Field Marshalls Report – Mike Grassmuck:

Mike is looking for volunteers for the mowing schedule as well as volunteers to do general field maintenance

Events Section

Randy stated the following events have been scheduled and have been sanctioned:

Helicopter Event is scheduled for April 17/18th

Annual Big Bird Event is scheduled for June 19th

Both Events will be CD'ed by Kevin Furman/Randy Brown

It was brought up by the membership that events need to be approved by the membership before being finalized. Harvey Cappel made a motion that the club continue with both scheduled events. The motion was seconded and passed.

Club 40 Races and Fun Fly Events need to be scheduled and will be discussed at the next board meeting.

OLD Business –

Harvey Cappel gave an update on the new club house.

NEW Business –

Randy stated that the AMA rules have change starting January 1st 2010 and that each member should read them and ensure that they are compliant with these new rules.

The combination to the main gate will stay the same until all construction of the new clubhouse has been completed.

Sonny Shepherd brought memory foam to show the membership for show and tell.

Meeting was adjourned at 8:37pm.

Next scheduled members meeting – February 18, 2010.

On the Safe Side—Distraction Action

By Don Nix, Insider Safety Column Editor

Once upon a midnight dreary, as I pondered weak and weary….

Actually, it was last night, considerably before midnight, not dreary at all, while I was pondering what to write for this column. Then I began to recall some incidents where distraction at the flying field had caused crashes. Here are two in which I was personally involved.

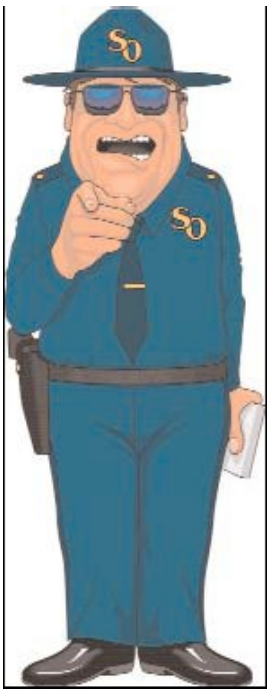
As I've mentioned in past columns, when I lived in Southern California most of my flying was done at Mile Square Park in Orange County. Mile Square was the busiest RC park I ever saw, and quite possibly the busiest in the US. I say "was," because it was closed to model flying some years ago.

The runway was an abandoned WW II military airfield, the RC part 2,000-feet long. There were 12 pilot stations, and on good weather weekends it was not unusual to have 50 or 60 fliers at the field and all 12 stations "hot" at the same time. One particular distraction incident remains clear in my memory although it took place more than 20 years ago.

A good friend of mine did a lot of teaching. When newbies came to fly for the first time, they were usually directed to George to get them on the buddy box and start learning. One Saturday, George called me over just before starting a beginner's engine.

"Don, before I get this fellow on the buddy box, you take his transmitter. After takeoff, I'll trim mine, then turn it over to you to get his box trimmed out so he won't have to struggle with it." I agreed, and after George made a couple of circuits said, "Okay, Don, you take it and trim his box."

I had control of the model for perhaps a hundred yards when we heard someone scream, "HEADS UP!" followed by the unmistakable sound of a model under full power and, even without seeing it, could hear it was coming toward us.



Naturally, we ducked and a split second later the airplane crashed hard on the pavement three or four yards from our feet. As soon as we realized we had not been hit, our attention turned back to the model we were test flying. This happened to be at a moment when almost all the other stations had models in the air at the same time. The sky looked and sounded more like a swarm of large bees than a model flying field.

Scanning the air for our model, George yelled, "I've got it!" quickly followed by, "No, that wasn't it; I think it's that one!" The sun was at the point where most of the airplanes in the air appeared to be almost silhouetted against the sky and were hard to distinguish from each another in the flock on the far side of the circuit.

George repeated the phrase two or three times over the next 15 seconds, until it was obvious that none of the models were ours and that it was apparently gone into Never-Never Land out of sight somewhere beyond the trees in the distance. There was nothing to do but hand the owner's transmitter back to him, tell him we had no idea where his model had gone, followed with a heart-felt apology. Understandably, the fellow was somewhat bewildered and heartbroken, having no idea such a bizarre thing could happen. However, this story does have a happy ending.

About a half-hour later, while the owner was packing up his gear to leave, a van bearing the logo of a gas station/auto repair shop came driving up. The driver got out, picked "our" model, totally unblemished, out of the back and asked, "Does this belong to someone here?"

After we got control of our astonishment, he explained: He and another mechanic were working on a car when one of them looked up in time to see the model, propeller stopped, rolling up quietly into an

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empty service bay. One exclaimed, "Where the (bleep) did that come from?" By then, several had gathered around, and one commented that a lot of such models were flown at Mile Square Park, a couple miles distant, so they decided to give it a try. Obviously, the plane, perfectly trimmed by George, had flown the distance, run out of fuel and glided to a stop, just yards from a busy street.

I realize the above sounds totally unbelievable, but I was there.

There is also a good lesson hidden in that incident. The last time I looked, a couple of lines in the AMA rule book clearly state that each model should have the owner's name, address, and phone number somewhere on or in it. This is a rule that is rarely taken seriously.

The second incident of distraction disaster took place back in the 1990s after I had moved back to Texas and was living in a small town near Austin. A friend from out of state was visiting, expressed curiosity about RC flying, and I, anxious to show off, said, "Hey, I have permission to fly models at our little local airport. C'mon … I'll show you how these things work!"

I took my favorite, a big 1.20-powered aerobatic model. As I was putting the wings on, getting fueled up and ready to go, I was being a smart guy, explaining how everything worked. My friend stroked my ego with admiring comments. I started the engine, taxied to the takeoff spot, shoved the throttle full forward, broke ground and started a great climb-out. What happened next wasn't pretty.

Almost immediately, the model became uncontrollable, trying to roll from side to side. Within another two or three seconds it rolled on its back, diving straight into the pavement. I was stunned. We went over, picked up the wreckage and took it back to my van. I took the wings off, commenting lamely that the only thing I could think of was radio interference, which I had never experienced at that field.

I unbolted the wing, lifted it off and reached to disconnect the aileron servo leads from the receiver and found I didn't have to. In my eagerness to impress my friend and basking in the glow of his comments, I had never connected them.

Having been a full-scale pilot for decades and thousands of flying hours in addition to years of flying RC, I truly believe this was the single, solitary time in either that I never checked for full movement of all the controls before takeoff.

We should never, ever be complacent about safety, no matter what the level of our experience—novice or expert.

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Better Performance with Less Noise

By Brian Dorff

With the ongoing debate about the noise our little engines produce, much is being done to preserve our way of life while respecting the rights of others. At first, noise reduction sounds bad for pilots. We think that reduced noise means reduced power, and conventional wisdom supports this. It is not until you fully understand how engines and propellers operate that you will realize the gains that benefit not only our neighbors but our airplanes as well!

There are four contributors to the noise made by models (in no specific order): muffler type, engine speed (rpm), tip speed of the propeller, and vibration.

Muffler

The mufflers provided with today's engines are quite good for the rpm range in which they are designed to run. Mufflers that come with internal baffles should keep the baffles in. Removing them does nothing to boost power, it increases noise, and makes the engine idle poorly because of lack of back pressure. Pitts-style mufflers shouldn't have more exit area than the stock muffler does, and if it does, one of the ports may have to be partially or completely blocked. Again, this will help idle.

Engine speed

A large contributor of noise

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made by airplanes is an over-revving engine. Most modelers try to make their engines run as fast as possible, trying to obtain the rpm at which the manufacturer claims the largest brake-horsepower (BHP) number. What they don't realize is the peak efficiency for the engine occurs at peak torque, which is usually about 65%-75% of the peak BHP rpm.

Example 1: A manufacturer of a .46 engine claims 1.5 BHP at 16,000 rpm. After break-in you find that you can turn a 10 x 5 propeller at 15,500 rpm—very close to the peak BHP, but the airplane's performance is mediocre, it is loud, and consumes way too much fuel.

Now you find the engine's peak torque is about 70% of the peak BHP rpm (.70 x 16,000 rpm = 11,200 rpm). You switch to an 11 x 7 propeller and find that the rpm is 11,500. You are much closer to peak torque now, and the airplane flies better and is quieter because the frequency of the engine firing has reduced dramatically. The fuel also lasts longer, and the engine will last longer as well since it is not working as hard. A slower engine also helps in achieving the next goal …

Propeller Tip Speed

The tip speed of the propeller is critical in quieting the airplane. The point where things get noisy is 560-feet per second or about 380 mph. Going more than 400 mph is a big no-no. Even in an airplane that is built for speed, you should be able to choose a quiet propeller.

Example 2: Same setup as the last example, the 10 x 5 propeller is at 15,500 rpm and the 11 x 7 propeller is at 11,500 rpm. The formula for tip speed in miles per hour is: (Diameter in inches)(3.1416)(rpm)/1056. The number 1056 is a constant that converts inches per minute to miles per hour. A 10 x 5 has a tip-speed of 461 mph (a no-no). (10)(3.416)(15500)/1056 = 461.

We want our tip speeds no faster than 400 mph and it should be less than 380 mph if you want to keep your flying site. The 11 x 7 at 11,500 rpm has a tip-speed of 376 mph. (11)(3.1416)(11500)/ 1056 = 376. The tip speed is now down to a moderate level. But how do these propellers compare in performance? You can calculate airspeed by using the propeller pitch and the rpm of the propeller. The pitch of a propeller is the second number in the propeller designation. This is the distance in inches that the propeller will travel through the air in one revolution.

Multiplying the pitch by the rpm and dividing by 1056 will give the calculated speed of the model. 5 x 15,500/1056 = 73 mph; 7 x 11,500/1056 = 76 mph.

So your airplane will actually be traveling slightly faster with the 11 x 7 than with the 10 x 5, while turning 4,000 rpm slower. This reduces engine noise, propeller noise, fuel consumption, wear and tear on the engine, etc., without compromising performance.

Propeller Loading Factor (PLF)

How do you know what to expect switching propellers? Being able to compare propellers before you run them is the key to optimizing your airplane's performance and getting rid of the noise. Say you are happy with the rpm that your engine is turning with the 11 x 7 propeller, but you want to try other propellers to see what you like best for flight performance.

Right now you are at the middle of the road, slightly fast and passable vertical performance, but what if you want more vertical? First we solve the PLF of our existing propeller, and then we compare it to others. PLF=D x D x P (D=diameter, P=pitch)

The 11 x 7s PLF would be 11 x 11 x 7= 847 PFL (compared with the 10 x 5s or l0 x l0 x 5=500 PLF). Now let's see what else is out there. To increase vertical you should either increase diameter, decrease pitch, or both.

To keep a PLF close to the same you will have to do both. If you are trying to raise the rpm, decrease pitch—and if you are trying to slow the motor, increase diameter. I would try the 12 x 6 first and then the 13 x 5. They have close PLFs. This is for comparison only. Switching propeller brands or not balancing a propeller, among other things, can vary your results.

Vibration

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How does the vibration of your model relate to the sound it makes in the air? Well, sound is vibration. Imagine your beautiful model—a nice wooden structure covered in drum-tight plastic covering. Think of it as a percussion instrument. The piston is traveling up and down like a drumstick pounding away at your model. And your model echoes every stroke it makes. The same thing happens with an out-of-balance propeller. Noise. It's everywhere! Your new mission: get rid of all vibration.

Start at the Propeller

It moves 300+ mph at the tip—balance it! It will remove noise because all that vibration won't exist in your airframe. Our neighbors will thank you and your receiver crystal, your servo pots, fuel tank, and NiCds will thank you as well. You will be rewarded with much greater reliability and a longer airframe life span. Also consider a high-quality spinner. They are better balanced and look nicer.

Back to the other cause of vibration—the engine. It is not possible to balance an engine dynamically at all speeds, so some vibration will forever be present, especially with four-strokes. The only thing that you can do about it is to isolate the vibration from the aircraft, making less noise in the process. Iso-mounts vary in type and price; from rubber grommets between the firewall and the mount, to specialized mounts for specific engines and airplanes that cost $100 or more. A popular one is made by Dubro and is for any 40-90-size 2c or 4c engine. It sells for $20-$30. Well worth the investment!

While it may not be feasible to make every one of these criteria work on your aircraft, it is important to keep these points in mind when getting your airplane ready to fly. If we all do a little, we can make a big difference. Remember, a 3 dBA difference in sound and the intensity doubles. If you can make your airplane even 3 dBA quieter, you have made a huge cut in the noise that everyone around us has to hear. (Although the sound energy is halved for every 3 dBA drop, it takes a 10 dBA drop for the human ear to perceive the sound being half as loud. A 10 dBA drop results in one-tenth the original sound energy.)