

SPORT

October 2013

Aerobatics

OFFICIAL MAGAZINE

INTERNATIONAL AEROBATIC CLUB

- Remembering
Paul
- Fly It
- Hand
Signals



EAA Oshkosh
AirVenture 2013
Photo Essay



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—Mike Heuer

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Photo by Mike Siford from the 2013 EAA AirVenture air show.

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REGGIE PAULK
COMMENTARY / EDITOR'S LOG

More about flying a Pitts

And the special photography from 2013 AirVenture

IS A PITTS REALLY THAT difficult to fly? My experience with biplanes is that they're not at all difficult to fly—landing them is another matter entirely. I once ground looped a big Stearman PT-17 when I turned a little too tightly as I lined up on the runway. That was before I had finally 'got it' as far as the feel of a tailwheel airplane goes. Once in

kosh? I know I do. In years past, long before I was able to make the journey to Oshkosh, I would jealously flip through the pages of every aviation magazine I could get my hands on as I looked through the photos of that year's show. I would always promise myself to make the trip, "someday." This summer marks my sixth trip to Wisconsin to participate in the fun. As an aside, this year's sequester made a huge dent in the types of airplanes we're use to seeing at AirVenture. There were literally *no* active military airplanes present; the constant sound of powerful jets just a distant memory from years past. Let's hope it's not a harbinger of things to come.

You'll notice the 2012 winner of the Kathy Jaffee Volunteer award, Gary Debaun, has contributed an article on hand signals this month. Gary has contributed greatly as a volunteer, but he has also been helping fill the pages of *Sport Aerobatics* and *In the Loop* with regular contributions of his Meet-a-Member pieces. I'd also like to send a special congratulations to all of our non-flying award winners—thank you for the tremendous contributions you make to our wonderful sport.

You should be receiving this issue as the WAC is ongoing—make sure to check out the progress of our team at www.unlimitedaerobaticusa.com/wac-2013 **IAC**

I'd also like to send a special congratulations to all of our non-flying award winners.

the air, that Stearman was a docile bird that required large control inputs to maneuver through the sky. Budd Davisson thinks of the Pitts as the perfect basic trainer. That statement may be polarizing, but is nonetheless worth considering. When compared to a tricycle gear airplane, the Pitts will indeed be more challenging. But there's no doubt a newly minted Pitts pilot would require almost no training to move over to a Cessna. This month, we continue down the path of flying the Pitts with another perspective on a very popular biplane.

Do you like photos from Osh-



Notice of Special Membership Meeting

The International Aerobatic Club will hold a special meeting of its members at 9:00 AM Central Standard Time (CST) on Wednesday, November 13, 2013. The location of the meeting will be the EAA Air Academy Lodge, Oshkosh, Wisconsin. The sole purpose of this meeting is to decide by vote whether to adopt the restated Articles of Incorporation and By-Laws, dated March 2013, as proposed by the Board of Directors. Your vote will be recorded if you returned the proxy card you received with your election ballot to IAC headquarters by October 18.

—Jim Ward, IAC Secretary



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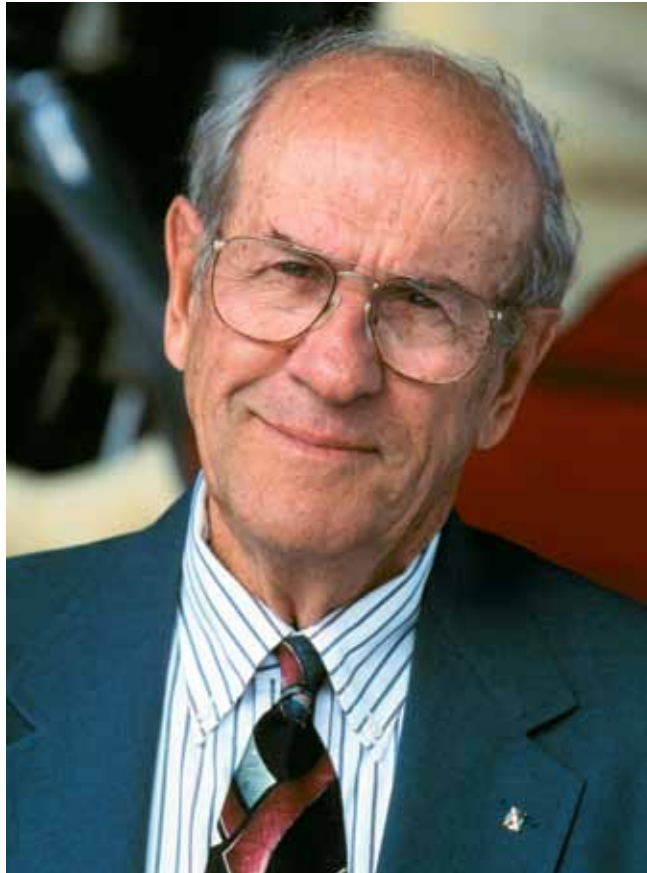
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IAC 1

Remembering Paul Poberezny

BY MIKE HEUER, IAC 4



I am sure many of you received the news already about the passing of Paul Poberezny on August 22 in Oshkosh. He was 91 years old, and I doubt if there are more than a few people in the world who have lived a fuller and fulfilling life. His personality, work, inspiration, and force of will and drive affected hundreds of thousands of people around the world—and that included me in a very big way.

His biography is well-known. Founder and first president of EAA, he started the organization in his basement in Hales Corners, Wisconsin, and it was in that town he built the EAA's first headquarters and museum. He built an entire movement from scratch, and we now see the culmination of his work every year in Osh-

kosh—but year-round throughout the world.

For aerobatics and IAC, he was also incredibly special and important. Always the visionary, thinking ahead in the 1960s, he was very concerned about the use of homebuilt aircraft for aerobatics and gathered around him the experts of the day, to keep it safe and to fend off unwelcome regulation. He called that group the “Precision Flying Division” and later the “Aerobatic Division” of EAA.

IAC members should remember that in 1965, the FAA had threatened a rulemaking that would have outlawed aerobatics in homebuilt aircraft. Paul needed help to oppose this move on the government's part, but he also needed to demonstrate that EAA was lead-



Audrey and Paul Poberezny talk with Bill Thomas at Fond du Lac, 1976. Thomas was a member of the U.S. Aerobatic Team.



Paul in the cockpit of the Acro Sport as Tom Poberezny looks on. Photo was taken at the IAC Championship in Fond du Lac, 1976.

ing the way in homebuilt aircraft and the types of flying they were being used for. Ultimately, the FAA withdrew its proposals, and the sport aviation movement remained unfettered by regulations that would have shut off aircraft development and ultimately the aerobatic sport we have come to know in the IAC. Imagine an IAC without the Pitts, the Laser (which grew out of the Stephens Akro and eventually spawned designs like the Edge and the Extra series), and other types. Freedom to build, develop, and fly have been the keystones of our success—and that freedom is something Paul fought for over his decades of leadership.

Eventually, the committees that Paul formed morphed into the IAC, which was founded in 1970 with my father, Bob Heuer, as its first president. Bob and his friends and colleagues took the bull by the horns, with Paul's constant support and advice, and built the foundation of what has become the largest aerobatic organization in the world with hundreds of competitions held in these past 43 years. Using EAA as a model, the IAC became a "grassroots" organization with a strong chapter structure and activities planned and organized by those local groups. They were and are the heart and soul of IAC—just as with EAA.

Paul was awarded IAC membership No. 1, with Bob Heuer No. 2, and Don Taylor No. 3. Again, with Paul's support and guidance, the first IAC Championships were held in Fond du Lac, Wisconsin, in 1970 and ran for three decades. EAA provided much of the equipment and logistical support we needed for Fond du Lac. Paul and his wife, Audrey, were frequent visitors to the com-



The original Red Devils team watch an EAA show in Waukesha 1970. Right to left: Gene Soucy, Marion Cole, Bob Heuer, and Paul Poberezny.

petition—and also the U.S. Nationals in its early years in Sherman-Denison, Texas. They also attended many of the regional competitions we held that first year, and son Tom went on to become a member of the U.S. Aerobatic Team in 1972 and National Aerobatic Champion in 1973. Aerobatics was clearly in the Poberezny blood.

I personally worked for Paul for four years before my own career headed toward the airlines. I was in the office next to his and talked to him most every day for all of those years. He was a hard taskmaster but always had a way of helping you rise to the occasion. Many of the lessons I learned at EAA I later applied in my work in aerobatics—sometimes it was the small things like answering every letter and phone call that came in, without exception, and without delay. And never forgetting the members and valuing all of the volunteers who are the lifeblood of the organization.

IAC

OSHKOSH 2013

AIRVENTURE

PHOTO ESSAY





J.J. HUMPHREYS



DEKEVIN THORNTON



DEKEVIN THORNTON



JONATHAN HENDRICKSON



DEKEVIN THORNTON



DEKEVIN THORNTON



JIM WARD

Tim Just and Doug Sowder.



NANCY CARTER

Andrew Davidsmeyer and Mike Lents.



NANCY CARTER

Mirco Pecorari and *Miss Maggie*.



JIM WARD

Jean Taylor speaks with enthusiasts.



NANCY CARTER



DEKEVIN THORNTON



DEKEVIN THORNTON



DEKEVIN THORNTON

Matt Chapman



J.J. HUMPHREYS

David Martin with aerobatic fans.



JIM WARD

Trish Diemer-Steineke, IAC Manager.



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NANCY CARTER



DEKEVIN THORNTON

FLY IT LIKE *an Airplane*

And other good advice

BY PAUL UHLIG
IAC 429981

In 2002 when I bought my Pitts S-2A, I had the privilege of flying with its previous owner, Ron Chadwick. Ron is a former F-100 pilot and US Airways captain. I had just finished Budd Davisson's course on flying and landing the Pitts Special—one of my most treasured and rewarding aviation experiences—and my mind was filled with the nuances of how to maneuver this beautiful airplane into a position where a landing was possible. Ron listened patiently as I talked about what I was learning. He smiled and said, "It is an airplane. Fly it like an airplane."

Budd's thorough teaching was the foundation, and Ron's simple reminder unlocked many things for me. For 11 years I have enjoyed learning with and about this remarkable airplane. I recently completed a delivery flight, taking my airplane to its new owners in Michigan. While these thoughts are still fresh in my mind, I wanted to write down a few things I have learned about flying and landing a Pitts Special. In this article I will assume that the reader knows how to fly an airplane. I will concentrate on the things I didn't know about flying an airplane that flying and landing the Pitts has taught me.



Approach for Landing

The things I didn't know about approach for landing had to do with nuances of managing altitude and airspeed, managing things happening very fast, managing very significant rates of descent, and most of all, managing how to see the runway during the approach and landing. I will talk about each of these.

Regarding attitude and airspeed, I had not realized how much I was not seeing the attitude of my airplane on approach before I started flying the Pitts. There is *one* pitch attitude that will give you precisely the airspeed and energy management you want on a power-off approach. Figure it out by looking out the windscreen and paying careful attention. That view doesn't change whether you are wings-level or turning. Nail that altitude on every approach and you will nail your

energy management every time. Budd taught me that, but I kept learning it over and over, seeing more and more.

Regarding things happening very fast, you will just get used to it. It takes a while, but soon you will be ahead of the airplane all the way down. Time and experience take care of this one.

Regarding managing very significant rates of descent, keep Ron's advice in mind that the

Pitts is an airplane, so fly it like one. Don't be afraid to use power to control the rate of descent on approach, especially early in the approach. In my experience adding power late, dragging the airplane in low and slow, is a very bad thing to do. You will regret it. If you find yourself running out of energy late in the approach, take Budd's advice, "Straighten out your left arm and add five minutes to your logbook."

But, earlier in the approach, it is helpful to use power to be sure you are comfortably positioned as you come to your final descent point, so you have plenty of energy and altitude and are ready to thread the needle to the runway in a smoothly controlled slip. Keep in mind what Budd says, "There is no such thing as too high in a Pitts Special." The last part of the approach is usually

flown power off and slipping, but the rest of the approach can be fine-tuned with power to keep the entire experience comfortable and almost sedate. Power can be a wonderful thing. Fly the Pitts like the airplane it is, using everything including power to get to that perfect point where you are ready and comfortable to take it down to the runway. Remember, too, that you will be using left rudder all the way down once the power comes out. Practice so you can fly the entire approach power off, but don't be afraid to use power when it helps you.

Regarding managing how to see the runway, that is the thing that I had no idea how to do from flying other airplanes, including many hours in Cubs and Citabrias. I had no prior experience flying airplanes that had simply no forward visibility in level flight, approach, or landing attitudes. Budd said, "If you fly an ordinary approach in this airplane, not only can't you see the runway, you can't see the airport." He was so right.

The special abilities for landing the Pitts are mostly in how to maintain a view of the runway. Here is what the Pitts has taught me: The secret to flying the Pitts is figuring out how to see during the approach and landing. Approach and landing are very different phases in a Pitts and require different ways of seeing the runway. I will talk first about seeing the runway during the approach. In a later section I'll talk about the transition to touchdown. Your options for maintaining a view of the runway during the approach are by some combination of *angling, turning, slipping, crabbing, or lowering the nose*. It is really as simple as that. Use some combination of these to move the nose out of your line of sight to the runway.

Something I learned right away as I began flying approaches into different airports with varying wind

and traffic situations is that you need to be able to use all of these methods, and use them left or right with equal comfort. Whichever way you learned in training for seeing during the approach is certainly a good way, yet the chances of being able to use that one way for every approach, at every airport, with varying winds and traffic conditions, is not very likely.

*They are part of the
magic of the airplane.
You will come to love them.*

At one airport you will use a left pattern, at another a right pattern, today there is a left-to-right crosswind, tomorrow it is right-to-left, and here the tower expects a straight-in final with no turns or offset allowed. In the real world you will want to be proficient in all of these methods. So let's talk about turning, slipping, angled approaches, crabbing, and nose down.

Regarding turning, slipping, and angled approaches, you will quickly learn to become comfortable with them so I won't write about them here. Early on you will realize that you have amazing control of the airplane in turns and slips. They are part of the magic of the airplane. You will come to love them. As long as you are turning and angled you can see the runway. Your target is the place where you intend to touch down. Your purpose is to keep that target in view. Remember also that you have another primary purpose, which is being sure that you see any other traffic. Turning, angled approaches help you do that. Never forget to roll level and "belly check" for other traffic before your final turning descent toward the runway.

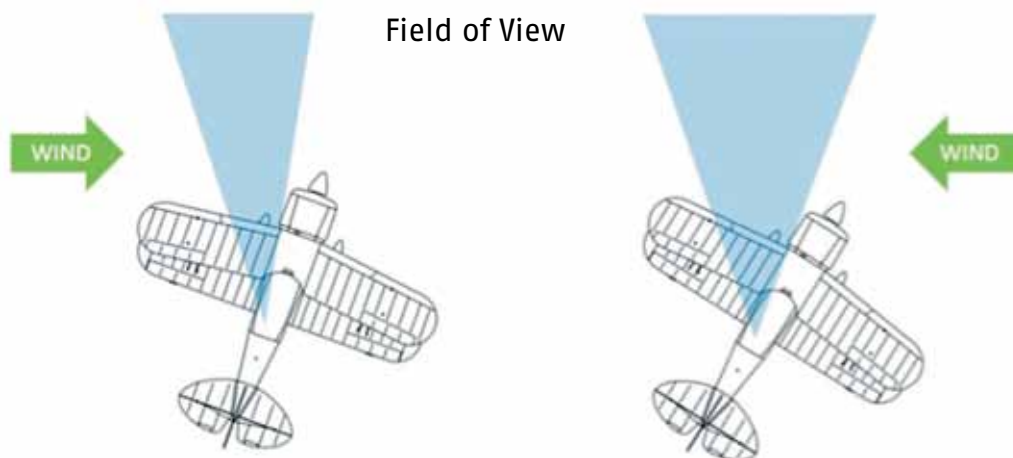
Regarding crabbing, a key lesson is that crosswinds and drift correction can be your friends for being able to see the runway. I had flown the Pitts a lot before I realized this. The first clue was that on certain days I could see the runway beautifully, and on other days I struggled to see even though I thought I was doing the same things as always. I finally figured out that the difference was because of crosswinds and drift.

Here is what was happening: On certain days I had a crosswind that was helping me see, and on other days I had a crosswind that made seeing difficult. Understanding how the crosswinds and drift corrections were affecting my view of the runway during my usual turning, slipping approaches was a critical piece of insight for me.

Let's visualize what this means. Imagine you are making a turning, slipping approach using a left-hand pattern. First, consider a wind straight down the runway. Visualize the approach: Your nose is offset to the right and your left wing is low as you turn and slip toward the runway. So far, so good.

Imagine now, however, that you are making the same turning, slipping approach to the left because that is what you always do, yet this time you have a strong left-to-right crosswind. In order to fly your usual approach path, the nose of the airplane, although still pointed to the right of the runway, will be pointed less to the right than usual. It will be harder for you to see the runway. Things will feel tighter.

Now consider the same approach but this time with a right-to-left crosswind. To fly your usual approach path, the nose of the airplane will be pointed even more to the right than usual, into the crosswind, as you turn and slip to the runway. Correcting for the crosswind opens up your view of the runway. Easier!



Effects of left and right crosswinds—identical left hand turning, slipping approach paths.

To complete this mental exercise, imagine you are flying down the centerline of the runway with a strong crosswind from either direction. By pointing the nose into the crosswind to correct for drift, you will be able to see the runway with little slip or possibly no slip needed at all. In fact, if the crosswind is strong enough you could fly the entire approach down the centerline of the runway, maintaining a perfect view of the runway until the time comes to round out and land.

What this means, is that if you are making a turning, slipping approach for landing and have an opposite-sided crosswind, you are going to have a very comfortable approach. You will have a great view of the runway all the way down, no sweat. However, if you are making the same turning, slipping approach but have a same-sided crosswind, things are going to feel tighter. You can fly it like that, of course, and it will usually work out. But another option is to change your usual pattern and fly a straight-in final, pointing your nose into the crosswind and adding a slip in the same direction if you need an even better view of the runway. Your friends may wonder why you are slipping the “wrong” way, but you will be easily sliding down final, comfortably watching the runway all the way in. As a Pitts pilot you know that the crosswind correction that matters starts when you round out

just above the runway, not on the approach itself.

You can use this same kind of straight-in approach using any crosswind to your advantage and enough of a slip to see the runway when you want to make a straight-in approach, say at a towered field. Point your nose into whatever crosswind happens to exist, add enough of a slip in the same direction so you can see, and use power as needed to set your descent profile as you fly comfortably down to the runway. You can also fly your approach either slightly offset from the centerline, or at an angle to the runway as well.

About landing at towered fields, don’t hesitate to tell the tower when you need something different than what they have instructed, if that is necessary for you to feel comfortable. If they want you to land out of a right turn and you are much more comfortable turning left or if you need an offset or an angle, tell them.

Regarding lowering the nose, there is a school of thought that this is a pretty good way to fly all of your approaches. You stay aligned with the runway all the way in. Lowering the nose to see pushes your speed up significantly. The Pitts bleeds off speed quickly in the transition over the runway, but you will still float a lot farther than with a precisely flown turning, slipping approach. Like any other airplane, touching down and rolling out where you want

in the Pitts means being precisely on speed and stable when you get to the runway. If the nose is down, you will really be scooting along. I prefer a turning, slipping approach because it is a really good way of managing energy. Lowering the nose to see during approach can be very helpful sometimes if you have plenty of runway, but don’t try this for the first time on a short runway.

So that is your bag of tricks for seeing the runway on your approach. Practice all of these tips, left and right, and you will never be out of options for seeing the runway. Remember, however, that each Pitts landing is an event that requires your complete attention. Remember also that you can avoid many challenges by picking your battles. If there is traffic in the pattern or on the runway, or something throws you out of your usual routine, always consider leaving the pattern and coming back when things are quieter and more comfortable. A few minutes can make all the difference. Most fields aren’t that busy all the time. As Budd says, “If there is a traffic conflict, always remember that *you* are the movable peg.” Great advice.

Transition to the Runway

Now comes one of the most interesting parts of flying a Pitts: The transition from the approach to the runway. In most airplanes this would be called the flare. In

a Pitts Special it is something much different.

In the space of about 30 feet vertically, several hundred feet horizontally, and in a matter of only a few seconds, you will transition from the approach to touchdown. During this time you must arrest your rapid descent, align with the runway, level the wings, recognize and respond to any crosswind and drift, and establish a three-point attitude at an acceptable height above the runway surface. You will then hold this attitude, maintaining your alignment with the runway and correcting for any drift until you settle into the landing. You will do this at 90 mph with no forward visibility. As you first begin flying the Pitts, the transition phase will feel really low and fast, and it is. A lot is happening very close to the ground. The reason low is necessary, like most things in landing the Pitts, is so you can keep sight of the runway.

The secret to managing the transition from approach to landing is how to keep the runway in sight. If your view of the runway is interrupted as you transition, the references you need to maintain orientation are no longer available, and your ability to confidently guide and control the airplane will be on hold until you can see the runway again. You will be settling blindly, not knowing where you are, whether you are drifting, and where you are pointed. For all you know you may be settling over the runway lights, drifting sideways, and pointed sideways. You will not be happy. If you lose your view of the runway for only a brief moment, things may work out, but everything is happening very fast. So basically the rule is that if you lose sight of the runway during the transition, you should go around.

How do you keep your view of the runway during the transition? The answer lies in understanding

your field of view from the cockpit when you are aligned with the runway. As you transition from approach to touchdown, you must eventually align the airplane with the runway. As you do this, your approach view of the runway—which was by direct vision out the side or over the nose—will go away. What you can see as you transition now depends on a combined view, looking forward and downward on either side of the fuselage between the upper and lower wings. Your view is basically great out to the sides, but very limited forward and downward where you need to see, blocked ahead by the nose and down by the fuselage.

If you begin your transition too high, even a wide runway will be completely hidden by the nose ahead and by the fuselage below as you align with the runway. At a lower altitude your perspective changes and the runway will begin to appear in one or both fields of

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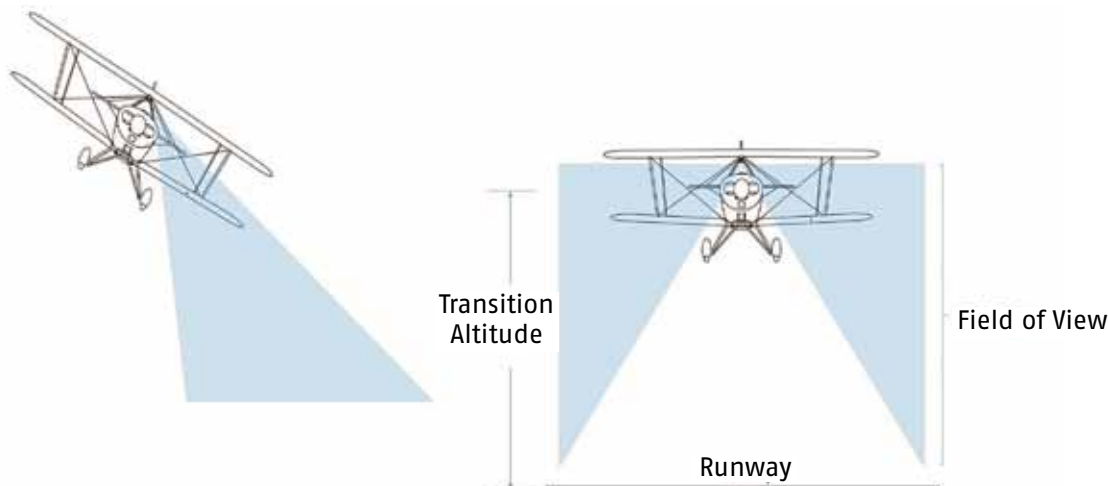
Budd is one of the best instructors I've ever flown with. He has more knowledge to share about the Pitts, and flying in general, than anyone. -Mike Melvill

...I had to dead stick my Pitts in and an old timer said "Nice save. Someone taught you well." Yes they did! Thanks, Budd. -Craig H.

My insurance company covered me, a low-time, low-tailwheel-time pilot in a single-hole Pitts largely because I went to Budd for my training. -Tom P

... the engine failed at low altitude and the accident investigators said that my fundamentals saved me. Thanks my friend. -Maynard H.

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view on either side of the fuselage. You need to be low enough when you begin your transition so the runway stays in view as you roll level, and you should fly the transition to keep at least one edge of the runway in sight at all times. As you descend, the runway will eventually fill your field of view on both sides. Once this happens you are able to easily sense and adjust your position over the runway, monitor your attitude and altitude, and detect and correct any drift. The wider the runway, the higher you can begin your transition and maintain your view. Sitting up as high as possible in the cockpit is also very important for maximizing your view down and around the fuselage.

What this means practically is that you must hold your approach view of the runway until you are low enough to begin the transition and still see the runway. You will also want to sit up as high as possible in the cockpit during your approach. The wider the runway, the higher you can begin the transition. The narrower the runway, the lower you must be. It might seem that a wider runway would be helpful in a Pitts because of the rollout, and to an extent it is, but the greater benefit is how a wider runway makes it easier to see the runway during the transition. With a wide runway the transition in

the Pitts is low but relatively comfortable. If the runway is narrow, the transition must happen even closer to the ground.

If you have a chance to watch Pitts landings from the ground, or other tailwheel airplanes with no forward visibility in an approach attitude, study what the pilot is doing to be able to see. You will recognize the exact moment when the pilot transitions from an approach view to a landing view. The best pilots will make the transition smoothly with continuous control. Other pilots will transition early and settle without vision for a while. You can see them begin to control the airplane again as their view of the runway returns.

For me the ideal Pitts runway is 75-100 feet wide. It is comparatively easy to fly into a runway that is 100 feet wide in a Pitts. Seventy-five feet is also a good width. Sixty feet starts to get "interesting," and on a runway shorter than that I have never tried.

It is important to note that a runway can be too wide. A runway that is 150 feet wide, which is quite common at major airports, is comfortable regarding transition altitude but makes landing challenging in a different way. A 150-foot runway is too wide to judge your altitude and orientation if you are in the middle of the runway. The edges are too far away. It

is like a glassy water landing in a seaplane. You can correct for this by landing somewhat to the side of the runway so you can keep one edge easily in view. A helpful trick Budd teaches is landing on half of a wide runway, using the centerline as a second edge.

Touchdown and Rollout

There are several things about touchdown and rollout that are unique to the Pitts. It is important to emphasize that in the Pitts you will learn to be really good at sensing and correcting any drift, because you only have a few seconds to get it done after the transition. Only when you have rolled level, are aligned with the runway, and can see the runway will you be able to fully assess what you are dealing with. Often you will enter the transition from a turn or slip in one direction and then roll quickly into a wing-low crosswind correction in the other direction for touchdown. Visualizing what you will need to do for crosswind correction after the transition is very helpful as part of your mental preparation for landing.

The very last part of the landing just before touchdown is interesting. If you want to make a smooth three-point landing, just fly the Pitts into a position a little above the runway, place it in a three-point attitude, and hold it there correct-

ing for drift and direction. The airplane will settle gently and touch down smoothly. For some reason it has always been hard for me to be patient about this. I often end up easing the stick back slightly, holding the airplane off the runway as it settles. I guess it is a deeply ingrained habit. That works fine, too, but if you do, what happens is that you will touch down slightly tail first—bump, bump.

If all goes well after you touch down and begin rolling forward, you will add in full back stick and ailerons into any drift, guiding the airplane as it slows by responsively applying and immediately releasing rudder and brakes until the landing is finished. If all does not go well, you must be spring-loaded to add full power and fly out of any worry. It is rare that this is needed, but you must be ready to do this on every landing. The Pitts will begin flying again immediately when you add full power. It is one of the nicest things about the airplane. You can fly out of just about anything if you start soon enough, so don't hesitate. If you bounce a landing, it is usually best to go around. If you do land again from a bounce, be absolutely certain there is no drift. Most of this is normal if you fly airplanes, except that it all happens really fast in a Pitts.

During touchdown and rollout, keep in mind Budd's admonition that "it is as important to get off the rudder as it is to get on it." The moment you see or feel an effect from a rudder or brake input, you must be backing out of that input so that you do not over control. The inputs needed can go from minor to major. Always they must be instinctive and made nearly instantaneously, and getting off them quickly is as important as getting onto them quickly. The less you do, the better things usually go. Your goal should be to manage the touch down so ideally you don't have to do anything on the rollout except just let the airplane roll

straight ahead. Sometimes it works out that way, but always be ready to respond. If the airplane starts chattering you may be holding the brakes a little. Ease off them and it will smooth out. Also, just as you are starting to relax, there is often a surprising slow speed wiggle that pops in. Expect it.

Taxiing

Taxiing falls in the category of flying the Pitts like an airplane, but it is worth mentioning that a nice rhythm helps with taxiing. Of course the challenge of taxiing is the same as the challenge of landing, which is being able to see. Finding a rhythm for S-turns during taxiing helps make taxiing fun and effortless.

My taxi rhythm is this: add rudder one way or another to set up an initial angle across the taxiway. As soon as the airplane starts to turn toward the angle, back out of the rudder and apply opposite rudder to set the angle. Thirty degrees or so works great. Once the angle is established, roll straight ahead at that angle across the taxiway and look out ahead down the taxiway being sure everything is clear. When your body crosses the yellow taxiway center line, begin a matching turn in the opposite direction.

Here is where the rhythm begins. It is sort of a taxi mantra: "Set the angle, roll straight ahead—*look*—when your body crosses the yellow line, *turn*." "Set the angle, roll straight ahead—*look*—when your body crosses the yellow line, *turn*." "Set the angle, roll straight ahead—*look*—when your body crosses the yellow line, *turn* . . ." And so on. Once you are in that rhythm, the discipline of S-turns becomes easy.

Getting Home

There is nothing as satisfying as shutting down a Pitts Special and sitting quietly in the cockpit after a great flight. It is hard to explain, but you will know what I mean. **IAC**

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TECH TIPS

REPRINTED FROM THE INTERNATIONAL AEROBATICS CLUB
TECH TIPS MANUAL, VOLUME IV

A Snap Roll is No Snap!

BY SAM BURGESS

SNAP ROLL



The quickest figure in Aresti is the snap and you can get a zero on it sooner than any other maneuver, too.

Look on page 45 of the IAC OFFICIAL CONTEST RULES and you will find a whole page on how you can go from a ten to a five in less than two seconds. “Correct plane, part line, critical angle of attack, attitude change, yaw around axis, angular velocity, flicking characteristics, identical attitudes, figure geometry” are just some of the judging criteria listed. However, it can also be a quick and easy ten if you add a certain technique.

Our sport should not contain secret formulas known only to aerobatic gurus to add to the anxiousness of the grass roots pilot. And the following is intended to serve as a guide to that elusive ten. Hence, the aspiring aerobat should first attend a contest or two as an observer, enroll in a judges school, and thoroughly digest the rule book where the description of what the judges are looking for almost tells you what control inputs are necessary to perform the graphical presentation of the Aresti figures — almost.

When Jose Aresti described aerobatics as “the most spectacular branch of aviation,” he was most likely thinking of the snap roll when writing his manual of “aerocryptographico” (a Greek word meaning aerial, concentrated and written). “The nose must definitely break or the figure earns a zero” seems like a fair enough judging criteria but what about the recovery? The rule book does not expound much on this phase of the maneuver but here is where most of the comments are heard and points are lost — “bobbled, overshoot, undershot, used aileron” (“when the aircraft will break but not stay in the stalled condition all the way around and

the contestant will finish the maneuver with the use of aileron,” page 45), etc. Ah, but you CAN use aileron and not be in violation of this rule — by using aileron to STOP the maneuver.

“The attitude before starting the flick roll and in the instant of stopping it must be identical” so say the rules. Basic methods taught to recover from a snap roll is to release the stick and rudder. This alone will not insure an identical attitude recovery and has been the prime point loser for snap rolls. So, add a flick of the ailerons to help stop the snap right on the plane intended. Fly around the axis like you were going to overshoot, and then with precision stop it in the desired flight attitude with a snap of the wrist.

Consider a four-point slow roll. Are not the ailerons used in this exact same manner to precisely stop on a point? Then why not use it to stop a snap roll? Several advantages are obvious in this trick of the trade suggestion: extending the rotation of the snap to its ultimate degree of roll rather than anticipating recovery at the 3/4 position (type of aircraft a factor), eliminating any guess work on a flat recovery by the use of elevator and rudder alone, and a more precise culmination of a figure that is really quite easy to judge.

For the past few months I have been critiquing an up and coming young, world class aerobatic pilot who demonstrated such a high degree of potential that he flew in Intermediate in his very first contest at Edna, Texas, and took first place. He did a Nadia Comaneci and got a TEN from all five judges on his snap roll — some kind of record — using the above recovery technique.

Take heed grass rooters and old codgers alike. It works!

IAC



Letter to the Editor

I just got on board with IAC and would like to thank all those responsible for the fine display over Wittman Regional Airport the weekend of August 23-25, 2013. Although I was unable to attend due to unforeseen circumstances, it was quite visible from my back yard. This was the first competition in Oshkosh since 1980 and it turned out to be a winner. My congratulations go out to IAC Chapter 1 and the hard working crew there. I hope more of this continues to materialize on behalf of those who fly.

—Stephen Ruby

Volunteer for WAC2013!

We are looking for volunteers during the World Aerobatic Championships. The event takes place from October 9 through October 20, 2013. If you'd like to volunteer for a day, a week or the whole 10 days of competition, **please contact our Volunteer Coordinator, Joy McKinney:** jmckinney29@gmail.com or phone: 905-772-5590.

Joy will be coordinating volunteers for the following positions:

Recorders: Sit with a CIVA judge and their assistant to record the judging scores. Prefer those with previous contest experience.

Line Judges (Boundary): This is an important role as we must have all four boundaries manned. Prefer experienced regional judges or assistant judges, or experienced boundary judges.

Drivers: Use of a truck to either move judge line items or drop off and pick up the boundary judges. Driver's must provide Driver's license for clean DMV check.

Transport/Mover: Help move the judge's line equipment, tables and seating to alternate judging locations.

Score Runners: Two types;
1). Pick up scores on judges' line and deliver them to the chief judge's table.
2). Transport the scores from the chief judge's table to the scoring room.

Video assistant: Help with the video work during competition.



TECH TIPS

REPRINTED FROM THE INTERNATIONAL AEROBATICS CLUB
TECH TIPS MANUAL, VOLUME IV

“How to Fly” Series Sportsman Technique: Sight Gauges

BY DICK LEWIS

LATERAL SIGHT GAUGES, mounted left and/or right on the wing or made of narrow strips of tape applied to the inside of the canopy, are essential to precision aerobatic flying. In Sportsman figures, vertical and 45-degree lines are judged on aircraft attitude (not flight track). The best way to set these lines accurately and quickly is by setting a lateral sight gauge line against the horizon.

Side-mounted (i.e., lateral) gauges should have a principal line set such that when it is aligned with the horizon the aircraft appears to a judge on the ground to have a horizontal attitude (not a level flight path). A good first approximation to this is to set the principal sight gauge line parallel to a line drawn from the nose to the tail (ignoring the vertical stabilizer). Most airplanes have the principal fuselage paint stripe aligned in this way.

Fine adjustment of the principal sight gauge line (and every other gauge line and spot discussed in this article) can only be done with the help of a judge, or other experienced observer, on the ground. In general, however, such fine adjustments are not necessary.

Other lateral sight gauge lines should be set at 90 degrees, +45 degrees, and -45 degrees to this

principal line. It is useful to locate the center of this star pattern of

Canopy-mounted, narrow-tape, lateral gauges have reciprocal advantages and disadvantages.

four intersecting lines such that it is straight out from the pilot's eye to the horizon in both horizontal AND vertical flight. That way the pilot can hold this point on the horizon in pitch change figures (such as loops), while looking continuously to one side only (say left), and know that the wings are always level.

Wing-mounted sight gauges have the advantage that they can be used with both eyes open without parallax (double vision) problems. The principal disadvantage is that the gauge lines are short as the pilot sees them and this makes it more difficult (at least for the beginner) to quickly see small angular errors between the sight gauge lines and the horizon. Other disadvantages are the relatively high cost and the physical vulnerability of wing-mounted gauges.

Canopy-mounted, narrow-tape, lateral gauges have reciprocal advantages and disadvantages. The lines can easily be made long as the pilot sees them. Thus it is easy to quickly discern attitude errors against the horizon. You need to close one eye (say the right eye when looking left) to avoid parallax. They are cheap and virtually invulnerable. If the aircraft canopy shape is strongly curved, as in a Pitts or Eagle, it will take some considerable effort to get the tape line-layout accurate.

Wing-mounted sight gauges can also be an advantage if more than one pilot uses the same aircraft — particularly if the pilots differ in height so that their eye position in the cockpit is differ-

ent. Because they are much farther away, the wing-mounted gauge is much less sensitive to eye position changes than the close-up tape gauge.

Some pilots add spot gauges (or aiming points) to the front of the canopy (windshield) with small pieces of tape—sometimes of different colors for quick recognition. The idea is to place a particular spot on the horizon to quickly and accurately set some pitch attitude. A typical array of spots might be: level erect flight at cruise speed, attitude at inverted position during a slow roll (for level flight path), 45-degree upline attitude inverted (which is the same as 45-degree downline attitude erect), and attitude for very low airspeed inverted power on level flight.

To this basic array of sight


gauges can be added spots of tape or visible places on the aircraft structure as initiation points. When these spots project onto the edges of the box you initiate something. Examples of this are: when this spot reaches edge of box a standard pullup will just keep the aircraft in box (at standard speed, into average wind), a spot to initiate 90-degree (or more) level turn that will just keep the aircraft in the box, and a spot to cut power to initiate final slowdown and stall into a spin such that you just stay in the box. You get the idea. This way you can drive figures to the edge of the box without fear of going out.

(The information contained in the initial articles of this series is, necessarily, based only on my own experience and that of a few pilots in IAC Chapter One who have

critiqued the articles before publication. I would appreciate reader feedback, suggestions, advice, etc. relevant to Sportsman level flying that you would be willing to share with others by inclusion in future articles of this series.) **IAC**

NOTE: Dick Lewis, IAC #11474, is the reigning Sportsman National Aerobatic Champion. A resident of Downers Grove, Illinois, who competes in a Super Decathlon, he has now advanced to the Intermediate category this contest season. We welcome him as a new volunteer Contributing Editor writing about Sportsman competitor techniques. His next nine articles deal individually with a specific figure.

—Jean Sorg.



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Recognizing



Frank Price Cup Purpose of the award is to recognize the person who has contributed the most to the sport of aerobatics in the previous year. The award is presented annually and will be selected by a secret ballot of the IAC board of directors. Nominations can be submitted by any IAC member. The award was conceived and donated by R.J. Rouse of Texas. It was created to recognize outstanding individuals in aerobatics and in honor of aerobatic pioneer Frank Price, the first American to compete in the World Aerobatic Championships.

WINNER: *Wayne Roberts*

Robert L. Heuer Award for Judging Excellence Member Sam Burgess of San Antonio, Texas, conceived a trophy for the outstanding aerobatic judge each year. He provided the permanent award to recognize the outstanding achievements made to competition aerobatics by the judges. It is given annually for outstanding performance as an aerobatic judge during the contest year. General guidelines, though not requirements, for the award include National Judgeship and having judged a minimum of three contests, one of which should have been the IAC Championships or the U.S. Nationals.

WINNER: *John Morrissey*



Harold E. Neumann Award for Outstanding Contribution as a Chief Judge The family of Harold E. Neumann has provided the permanent trophy in 1998 to recognize the outstanding chief judge and to honor the name of Harold E. Neumann, Collier Aviation Trophy recipient, Thompson Trophy Race winner, active IAC competitor and judge until well into his 70s. The award is given annually for outstanding contribution as a chief judge during the prior contest year. General guidelines, though not requirements, for the award include a person known for leadership qualities and fairness on the judges' line.

WINNER: *Lynne Stoltenberg*

IAC AWARDS OF MERIT:

Excellence



Curtis Pitts Memorial Trophy This award was donated by the Pitts family in the memory of Curtis Pitts. From the first design called the "Little Stinker" in 1944 to the Model 14 designed just before his death in 2005, Curtis Pitts was one of the most prolific aircraft designers in aviation history. His designs, and their descendants, forever changed the world of aerobatics.

WINNER: *Jim Rust*



2013 NON-FLYING



A Canopy Departs

Taking time for repairs and what could happen if you don't

BY RUSSEL PEITZ



IT WAS A NICE DAY FOR FLYING, ESPECIALLY aerobatics. The clouds were 9,000 feet scattered with great visibility, and I just couldn't pass up an opportunity to take out my One Design DR-107 and do some practicing. Taxi, takeoff, and climb-out were all normal, so after some clearing turns, a safety belt check, and inverted systems check, I was ready to go.

Entering my practice area with a dive to 170 mph and a 6g pull to the vertical put me into the humpty maneuver for the Sportsman routine. An uneventful run through and all was good—no indication of what was about to come.

I decided to practice some upright and inverted spins before leaving the practice area. While doing the inverted spins, my airworthiness certificate holder came off and landed in my canopy. Was it an omen that the airworthiness certificate separated from the airplane? I left it there in the canopy and finished the inverted spin. Upon rolling upright I simply grabbed the pouch and stuck it under my leg. Now, I thought, it's time to practice

It was on my to-do list to improve upon the design, but for the time being flying was more fun than designing a new canopy lock.

some snap rolls.

The airplane has 200 hours' total time and has been flown through Intermediate and some Advanced maneuvers. I've only owned it for eight months, and I've flown it 35 hours. I never liked the sliding canopy locking system on this aircraft. It was very simple, just a tab on the windshield and a bent piece of steel on the slider that grabbed the tab when you slid it closed. To release: simply pull the

steel piece down about 1/4 inch and slide the canopy back. It was on my to-do list to improve upon the design, but for the time being flying was more fun than designing a new canopy lock.

Entering the first snap, I did a 1/2 snap on the 45 upline, pulled to inverted, and did another 1/2 snap to upright, then a full snap to the right. I entered the last snap at 100 mph, pulled hard, planted full right rudder, and around it went. Three-quarters of the way through the right snap, and with a loud bang and rush of air, the canopy was gone in an instant. There was no warning, and it separated with intense force. On its way into thin air, the right side of the canopy caught the right side of my forehead and gave me what amounted to a 1-inch cut and a small bruise.

I instantly reduced the throttle, leveled the wings, and quickly started assessing the situation. Realizing that with the canopy gone a bailout would be fairly easy, I turned my attention to the condition of the aircraft. I quickly confirmed I was over a wooded area with no homes nearby, so if I decided to bail, the chances of damage to people or structures on the ground would be minimal. I felt a very slight buffet, but I determined it was due to the canopy missing. All controls felt normal. I twisted my shoulders and head around to inspect the tail. Everything looked good—no sign of torn fabric or damage on the tail; so I turned my thoughts to getting the aircraft home. During the three-minute flight back, I had a chance to place a hand on my forehead and found a little blood, but thankfully nothing of any real concern.

My home airport is a 1,900-foot private strip. The One Design does well into the strip, and I'm usually stopped 1,200 feet down the runway. Airspeed indications were inaccurate due to weird pressure across the static ports, so I ended up flying the aircraft by feel and pitch attitude. I considered for a moment flying to a longer runway that is nearby, but passing up a perfectly good home airstrip didn't seem prudent.

I was nicely set up for a dogleg entry to a straight-in final. However, we sometimes get wildlife on our runway, so not wanting to add a go-around into the situation, I elected to cross midfield, inspect the runway, and get a look at the windsock. In an emergency you want to keep things as normal as possible, so this overhead approach also allowed a normal pattern entry for me.

Coming down final, I definitely could feel the airplane was flying just a bit differently than normal, but keeping a familiar pitch attitude resulted in a nice touchdown and a normal rollout. After shutting down, I climbed out and gave the airplane a good look. I found a little scuff on the right elevator

near the trailing edge and some scratched paint on the turtledeck. It could have been a lot worse.

For the benefit of the reader, here are some takeaways from my experience:

- I should have taken the time to improve the canopy locking mechanism. Had I, this whole event may never have happened.

- I thought about wearing a helmet but didn't make purchasing one a priority before this event. I was likely fortunate to be only slightly injured. Had I been knocked out, I probably wouldn't be writing this story. They'd be writing my obituary.

- I did remain calm and made quick, positive decisions in the air that facilitated a safe, successful outcome. I do routinely fly without relying on the airspeed indicator, so this made the approach with false indications a nonissue. I kept things as normal as possible for the remainder of the flight and didn't self-introduce another emergency born from anxiety or poor decision-making.

- I don't regret anything that I did during or after the incident. I do wish I had listened to my inner voice regarding that latching system. The airplane is down for a bit while a new canopy and completely new latching system are installed.

Oh, and I have a helmet on order!



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Basic Hand Signals *for* Competition Pilots

Do you know sign language?

BY GARY DEBAUN, IAC 4145

At a recent contest while I was giving the “clear to start engine” signal, a pilot opened his canopy and asked what I was doing. It occurred to me that if a pilot does not have a military or airline background, he may not know aviation hand signals.

Communication between the starter and the competitor during the starting procedure can be simple and calm or complicated and frantic. I prefer simple and calm, and knowledge of the proper hand signals

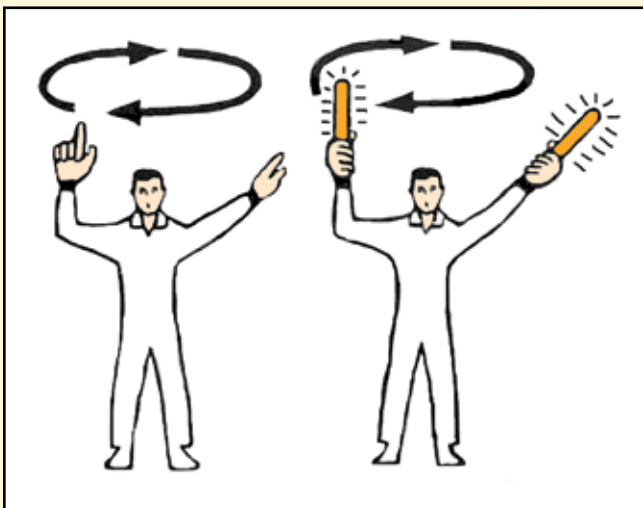
is paramount in communication when the engine is alive and things go wrong.

Although not mentioned in the *IAC Contest Rule Book*, hand signals should be part of the starter’s briefing at every contest.

There are dozens of hand signals used in aviation. For starter/pilot communication, I have chosen seven for the starter and three for the pilot which will serve our needs.

Starter Hand Signals:

CLEAR TO START ENGINE

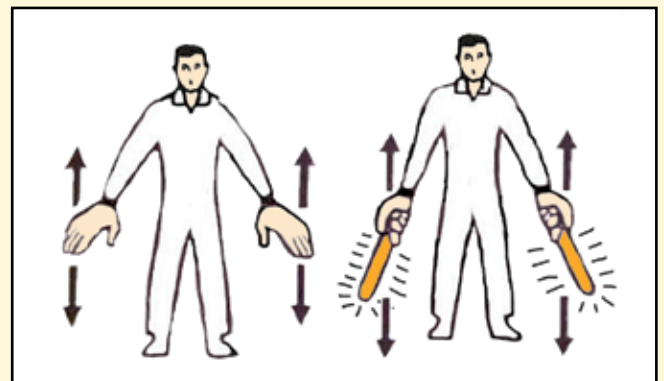


The pilot should *not* start the engine until the starter has given this signal. When the pilot calls *clear*, the starter will ensure the area is clear to start the engine. The starter will ensure the area behind the aircraft being started is clear and no

canopies are open which could be damaged by prop blast.

The *clear to start engine* signal is the right arm up in the air with finger pointing up and in a twirling motion.

REDUCE POWER / SLOW DOWN

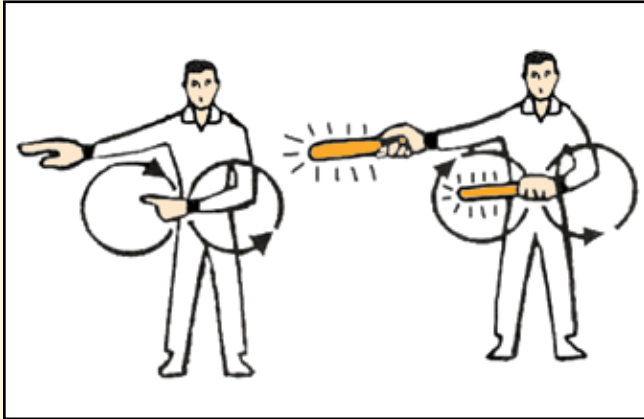


The *reduce power/slow down* signal is given when the pilot starts the engine but the rpm is too high for the prop blast area and may cause damage to aircraft in the area, or when the aircraft is taxiing too fast for safety.

The *reduce power* signal is the same as the *slow down*

signal. The starter will use both hands, palms down, and use an up/down motion. Please reduce power or slow down at this time.

ENGINE FIRE

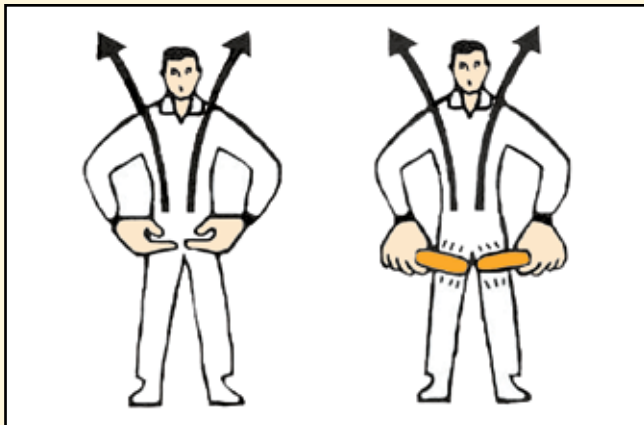


Depending on the circumstances, engine fires can be categorized as *induction fires* or simply *engine fires*. Induction fires being the most common. This is a fire in the air intake and can usually be put out by continuing to crank the engine. An engine fire is one caused by leaking or broken fuel, oil, or hydraulic lines, and it requires emergency egress of the aircraft and use of the fire extinguisher.

The *induction fire* signal is the left hand pointing at the nose of the aircraft and the right hand moving in a horizontal figure eight.

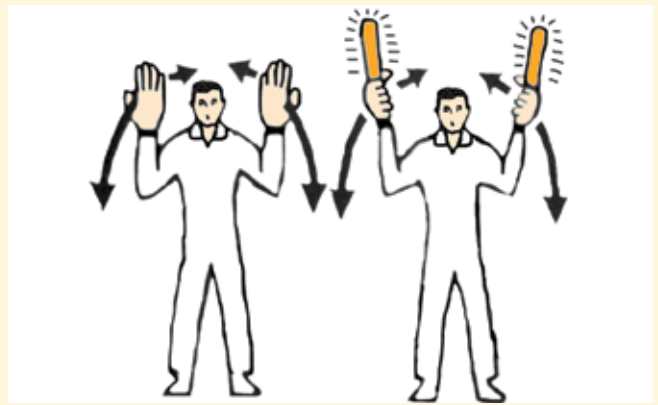
An *engine fire* signal is the same but with the emergency egress signal included.

EMERGENCY EGRESS



The *emergency egress* signal is used when it is highly recommended that you get out of the aircraft as quickly as possible. The emergency egress signal is both hands starting at the belt buckle and rapidly moving up and outboard.

MOVE FORWARD



The *move forward* signal is used to notify the pilot that it is clear to taxi or move forward with the aircraft. The move forward signal is both arms at 90 degrees, palms inward and moving back and forth.

HOLD/ STOP



The *hold* signal is used when the starter would like the pilot to stop and hold the current position. The hold signal is the crossed arms above the head.

The *stop* signal is used when the starter wants the pilot to stop the aircraft in the current position. The stop signal is the same as the hold signal.

Pilot Hand Signals:

I HAVE A MECHANICAL

If the pilot has a mechanical issue after engine start, the pilot should place his right hand on top of his head and move it up and down.

I HAVE RADIO PROBLEMS

Should the pilot have radio problems, he should look at the starter and cup his hands over his ears.

COME FORWARD TO THE COCKPIT

Should the pilot need something from the starter, he should look at the starter and move an open palm back and forth toward them.

IAC



CONTEST CALENDAR

Mark your calendars for these upcoming contests. For a complete list of contests and for the most up-to-date contest calendar, visit www.IAC.org. If your chapter is hosting a contest, be sure to let the world know by posting your event on the IAC website.

27th FAI World Aerobatic Championships

Wednesday, October 9 – Sunday, October 20, 2013
Practice/Registration: Tuesday, October 1 – Tuesday, October 8
Power Categories: Unlimited
Location: North Texas Regional (GYI), Sherman, TX
Region: South Central
Contest Director: Chris Rudd
Contact Information: Primary Phone: 850-766-3756
E-Mail: waccd2013@gmail.com
Website: wac2013.com

Borrego Springs Akrofest

Thursday, October 10 – Sunday, October 13, 2013
Practice/Registration: Thursday, October 10
Rain/Weather: Sunday, October 13
Glider Categories: Sportsman through Unlimited
Power: Primary through Unlimited
Location: Borrego Valley Airport (Lo8): Borrego Springs
Region: Southwest
Contest Director: Gray Brandt
Contact Information: Primary Phone: 970948016
E-Mail: graybrandt@yahoo.com
Website: www.iac36.org

Blue Ridge Hammerfest

Friday, October 18 – Saturday, October 19, 2013
Practice/Registration: Thursday, October 17
Rain/Weather: Sunday, October 20
Power: Primary through Unlimited
Location: Foothills Regional Airport (MRN): Morganton, NC
Region: Northeast
Contest Director: Brandon NeSmith
Contact Information: Primary Phone: 828-719-0391
E-Mail: brandon@tablerockaviation.com

Sebring Aerobatic Championships

Friday, November 1 – Saturday, November 2, 2013
Practice/Registration: Saturday, October 26 – Thursday, October 31
Power: Primary through Unlimited
Location: Sebring regional (SEF), Sebring, FL
Region: Southeast
Contest Director: mike mays
Contact Information: Primary Phone: 561-313-8503
E-Mail: soaerobatics@aol.com
Website: www.iac23.com

Tequila Cup

Friday, November 8 – Saturday, November 9, 2013
Practice/Registration: Thursday, November 7
Glider Categories: Sportsman through Unlimited
Power: Primary through Unlimited
Location: Marana Northwest Regional Airport (AVQ), Marana, AZ
Region: Southwest
Contest Director: Jim Ward
Contact Information: Primary Phone: 603-860-4456
E-Mail: cd@tequilacup.org
Website: www.tequilacup.org

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Lt. Col. Jeffery "Cheese" Riddlebarger



The Air Force Academy was saddened by the loss of Lt Col Jeff "Cheese" Riddlebarger on 14 Aug 2013 after an all too short battle with cancer.

Cheese was well known in the aerobatic and soaring communities over the last nine years for his work with the Cadet Advanced Soaring Teams at the US Air Force Academy (USAFA). Jeff graduated from USAFA in 1988, went on to fly F-15s during his active duty career, and transitioned to the reserves in 1998. He then began a civilian airline career with United Airlines while also flying AT-38s as an Instructor Pilot for the USAF Reserves. Cheese helped start up the first-ever reserve associate unit at USAFA in 2004. He was the trip-lead for many team trips to include Tequila Cup Aerobatic Competition in Tucson, Arizona, US Aerobatic Nationals in Denison, Texas, Sportsclass Nationals in Parowan, Utah, and Air Sailing Soaring Competition in Reno, Nevada.

He was also chosen to be the Contest Director for the 2013 Ben Lowell Aerial Confrontation with the International Aerobatic Club's (IAC) Chapter 12 hosted at USAFA. Cheese was qualified in six different gliders at USAFA and held certifications as an Evaluator



Pilot, spin, aerobatic, demonstration, and cross-country Instructor Pilot. He earned his share of IAC medals and accolades on his many aerobatic trips with the Cadet Aerobatic Demonstration Team and has thousands of Soaring Society of America On-Line contest miles with the Cadet Sailplane Racing Team. He also holds the distinction of having the longest flight duration in USAFA history (7.2 hours) in 2012 at Super-Regional Soaring Competition in Moriarty, New Mexico (which also turned out to be the slowest flight of the day).

Cheese was an outstanding pilot, mentor, and friend and will be truly missed by all. This is a tremendous loss for aviation, USAFA and the aerobatic and soaring communities he so loved. Our sympathies go to Jeff's family, friends, and colleagues. Rest now, my friend. You've got final glide.

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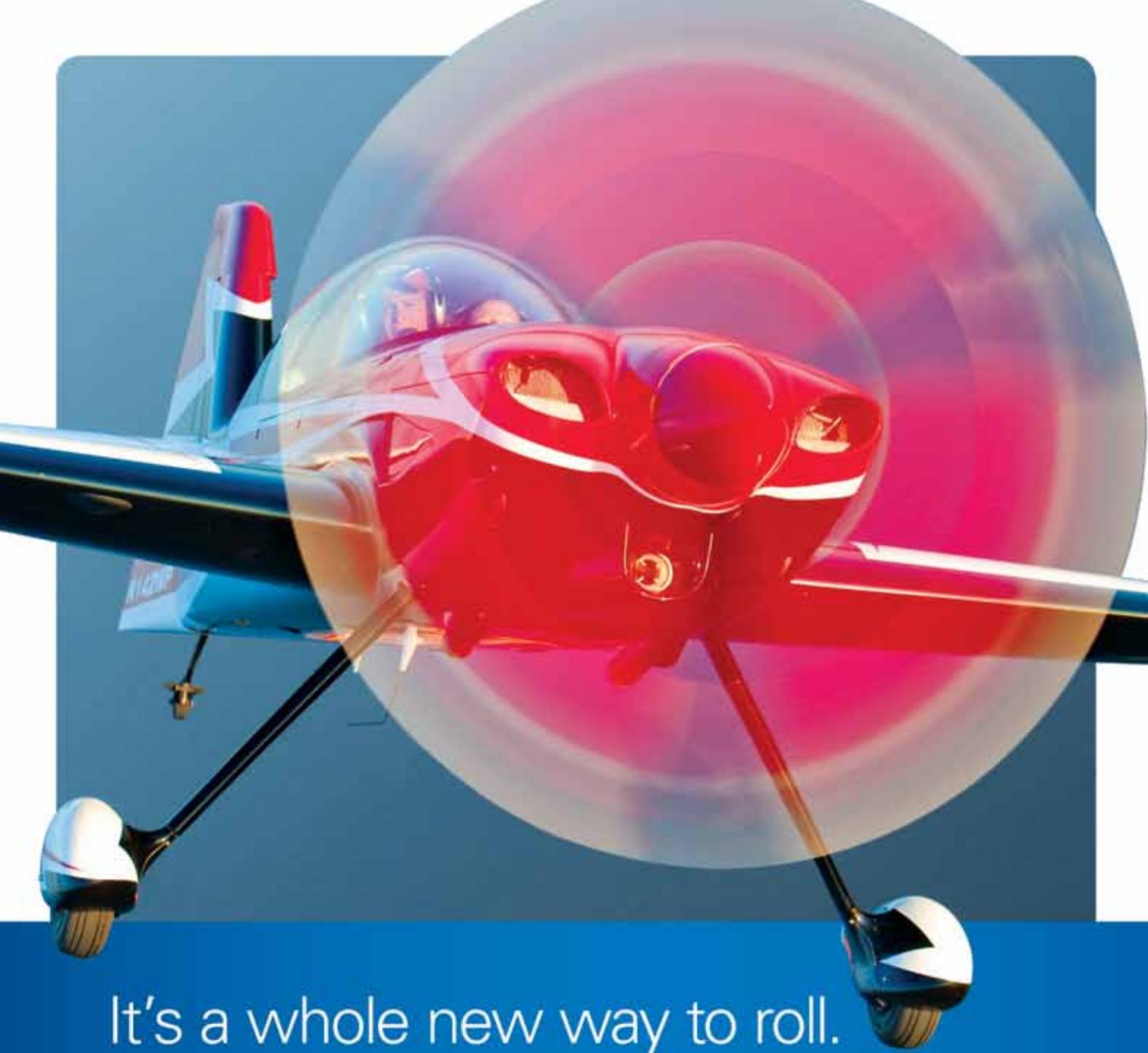
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