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AVIATION SAFETY FROM COVER TO COVER

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Creative Training For FAA Safety Inspectors

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FAA Aviation News

AVIATION SAFETY FROM COVER TO COVER

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FEATURES

DEPARTMENTS

FRONT COVER: A Stemme S10-VT enjoys the scenery. (photo by Ron Kanter, courtesy of the manufacturer)

BACK COVER: A BAe 800 in flight. (photo courtesy of the manufacturer)

Creative Training For FAA Safety Inspectors

story and photos by H. Dean Chamberlain

The FAA's Flight Standards Service is testing new ways to train its general aviation operations safety inspectors. The Service's Training Division (AFS-500) is working with Embry-Riddle Aeronautical University's (ERAU) Daytona Beach, Florida, campus, in a cooperative effort to try to determine the most effective and efficient way to train new FAA general aviation (GA) operations (Ops) aviation safety inspectors (ASI). This evaluation project is part of the FAA's ongoing efforts to meet its organizational excellence goals. In addition to the contract for the GA Ops inspector-training test, FAA also awarded ERAU an FAA grant to provide recurrency training for those working inspectors who need the training to meet a work requirement. That training course is the Instrument and Performance Refresher-Light Twin Course.

In explaining why Flight Standards is evaluating its GA operations inspector training programs, the manager of the Flight Standards Training Division's Plans and Program Branch, Milt Gilmore, a GA Ops inspector himself, said it once made sense for the FAA to maintain a fleet of aircraft at the FAA's Academy in Oklahoma City, when the FAA was training large numbers of inspectors as it did back in the 1980s. However, with today's much smaller GA Ops inspector classes, the cost to maintain single-and multi-engine aircraft sitting on the ramp waiting for a new inspector class has become very expensive. Even with leased aircraft, we had monthly minimums we had to pay while the aircraft were sitting on the ramp waiting for a class, Gilmore said. As he said, "It didn't make good business sense." And with either purchasing aircraft or leasing them, we had continuing funding problems with continuing resolutions and the prospect of budget cuts, a problem with a limited number of contract bidders, and other contract related problems, he said. All the while, he said, the aviation industry is moving ahead with new equipment and avionics that we need to keep up with.

As a result, a General Aviation Operations Inspector Work Group—made up of representatives from FAA regions, headquarters' policy and training divisions, and the inspector union—agreed to look at outside sources for inspector training.

Since the FAA had working agreements with the General Aviation Centers of Excellence (COE) schools, it was logical to work with ERAU, the lead university in that program along with four other schools. We looked at

ERAU's facilities including its Level 6 Flight Training Devices (FTD) and matching aircraft on the line and decided to conduct our test programs at ERAU.

According to Gilmore, the three GA Ops inspector indoctrination (Indoc) classes scheduled for this fiscal year (FY 04) will test the concepts developed by AFS-500. Forty-eight new GA Ops inspectors are involved in the project. Each class of 16 inspectors will test a different mix of instruction involving FAA facilities and instructors and ERAU facilities and instructors. In some scenarios, FAA instructors will use ERAU facilities and equipment. Although course content remains basically the same, how that content is delivered will differ. For example, the number of training days and amount of subject material presented at the FAA Academy will differ for each class. Although FAA inspectors will teach the initial classes, it is possible that ERAU instructors may teach later class segments after observing the FAA inspectors in the classroom. In the case of the first class, FAA instructors and their necessary gear were taken to ERAU to teach the FTD portion and classroom material. ERAU instructors taught the aircraft specific GPS and aircraft systems portions. The classroom work for the second class will be taught at the FAA Academy while the flight portion will be done at ERAU. One difference in the second class's flight training is that the flight portion will be done in two groups of eight students each rather than in one large group of 16 as was done with the first class.

As noted in AFS-500's Business Plan for FY 2004-2005, the test program is to validate the benefits and student acceptance of alternative training providers before committing large amounts of funding to a new training venue. AFS-500 training experts will monitor and evaluate the effectiveness of the test classes as part of the Division's decision-making process. A review will be conducted after the second class finishes training to determine what changes, if any, need to be made before the third class starts training. The General Aviation Operations Inspector Work Group will provide recomendations to the service as a result of the review.

WHY EMBRY-RIDDLE?

ERAU provides several training benefits in addition to being the lead school in the GA COE program. Located in the heart of central Florida's flight training area, ERAU provides state of the art training facilities and a well-organized and structured flight department. The University is also very accessible which makes it easier for the FAA inspectors, both those undergoing training at ERAU and those giving that training, to travel to and from the school. ERAU is located adjacent to the Daytona Beach airport and within easy driving distance from the Orlando and Jacksonville airports.

Being a major aeronautical university, ERAU has the capability to add a small class of FAA GA Ops inspectors to its campus without difficulty. With its classrooms, large number of aircraft, and its flight facilities, ERAU's Flight Department can add the FAA inspectors to its flight schedule with minimal impact on its own students or its own instructor pilots. And being designed to teach thousands of students, the University's infra-structure is such that a "handful" of FAA inspectors undergoing training is not even noticed on campus. Well, maybe they are noticed at times. The school's dining facility is only a short walk from the flight training area, and a few FAA inspectors are easily lost in the crowd of students with one exception. Age, more than numbers, may make the FAA inspectors noticeable going through the cafeteria-style facility with its hundreds of young students.

According to ERAU's Chief Flight Instructor Ken Doucette, the FAA training program will have little impact on his operation. "There may be times," he said, "during the year when more ERAU students may need access to the flight training devices, but the school can work around such issues."

From an FAA student's perspective, being at ERAU has its advantages. When asked if being on a college campus was a distraction for Indoc, one of the FAA inspec-

ERAU's Chief Flight Instructor, Ken Doucette, explains how the FAA's training programs fit into the overall ERAU Flight Training Department's student flight-training program.

FAA Inspectors Steve Grabowski (L) from the Orlando FSDO and Pat E. Bruce from the Atlanta FSDO fly one of ERAU's Level 6 Seminole *Flight Training Devices during a class session.*

tors said, "No." She thought it was an interesting experience being around college students.

ASI INDOCTRINATION TRAINING

The ASI indoctrination program consists of flight and classroom training. The General Aviation (GA) ASI indoctrination training places an emphasis on regulations, FAA policy, enforcement procedures, and testing. How to conduct FAA flight practical tests is an important part of the program. During the course, the new ASIs are trained to meet, at a minimum, the commercial airplane Practical Test Standards. Although, each new general aviation operations ASI must be a qualified pilot with a minimum of 1,500 flight hours before selection, the mix of students going through any GA indoctrination course can vary considerably. The first GA "Indoc" class to go through training at ERAU had students qualified in everything from a Boeing 757 to helicopters. Since each GA ASI is required to be at least a commercial pilot, most are Airline Transport Pilot rated, and be a certificated flight instructor with single engine, multiengine, and instrument privileges, Indoc is not designed to train the new ASIs to fly; rather it is designed to teach the ASIs how to fulfill their important FAA role in promoting aviation safety. The only issue is how best to provide that training.

INSTRUMENT AND PERFORMANCE REFRESHER-LIGHT TWIN COURSE

The light-twin refresher program provides field ASIs needing light-twin recurrency training the opportunity to regain currency in a controlled environment. In the test program at ERAU, the ASIs going through the 10-flight hour course fly ERAU's Piper *Seminole* twins as well as using the University's two *Seminole* Level 6 flight-training devices (FTDs). The *Seminole* FTDs introduce the *Seminole* to the ASIs and permit them to practice using the equipment in the aircraft including the aircraft's two onboard GPS units. Once the ASIs are comfortable in the FTDs, the inspectors move on to the actual aircraft. Flying with experienced instructor pilots from the University's Flight Standards organization, the ASIs work to regain their currency in light twin-engine aircraft. As part of the course preparation, the ERAU flight instructors providing the air portion of the training were trained in FAA procedures.

I asked two ERAU instructors supporting the FAA programs what it was like flying with FAA inspectors. Both admitted to being a little apprehensive at first. After all, every flight would be with a "Fed," and it could be viewed as a check ride. But after a few flights, both the ERAU instructors and FAA inspectors adjusted to the unique environment. It was also an interesting experience for the FAA inspectors. One challenge was the fact that in most cases, the ASIs were flying with much younger instructors. In some cases, some of those instructor pilots had just recently graduated from ERAU. But it was pointed out during my visit to ERAU that the school's instructor pilots are experts in their local training environment, which has one of the highest concentrations of flight training operations in the world. Plus, I was surprised to learn that the instructor pilots at ERAU are professional pilots with their own union at ERAU. I also learned that it is not a requirement to graduate from ERAU to be hired as an instructor pilot at the University.

FIRST INSPECTOR CLASS

The first inspector class com-

FAA Inspector Pat E. Bruce discovers that preflighting an actual Piper PA-44 Seminole *aircraft is not as easy as flying the* Seminole *Flight Training Device.*

pleted its training in May. To start their training, the students went to the FAA Academy for a brief introductory course. Then they were off to Daytona Beach for the remainder of the training. While the inspectors were at ERAU, FAA Academy instructors provided the basic classroom training as well as the training using the flight training devices (FTDs).

FTDs PROVIDE IMPORTANT BENEFITS

FTD training provides important benefits for the new FAA inspectors. First, it provides training in cockpit procedures and allows the new inspectors to regain instrument currency as the students familiarize themselves with the aircraft they will fly during the flight portion of the training. In some cases, those inspectors with years of flying helicopters or large aircraft may not have flown a small, fixed-wing single- or multiengine airplane in years. For some, the FTDs are a new experience. For others with an air carrier background, the FTDs may seem basic. But all benefit from the experience. The second and most important aspect of flying the FTDs is that it allows the new inspectors to learn and practice the FAA's procedures for giving pilot practical tests in a controlled environment.

For example, the typical GA Ops training scenarios have the new inspectors giving an initial certificated flight instructor practical test; planning and giving a private pilot retest, practicing how to give a 14 Code of Federal Regulation part 135 pilot in command check; and giving a practical test for an airline transport pilot certificate.

If the instructor wants to stop the training to make a point, the FTD can be put on hold, the point discussed with the two inspectors in the FTD, and the FTD put back in motion to resume the training. Being able to stop in midair and discuss a point are things that just cannot be done in an aircraft in flight. Since the Frasca C172S and PA-44 Level 6 FTDs simulate their respective aircraft in actual size from just behind the pilots' seats on forward, the FTD cockpits provide a realistic training environment. Wrapped nearly around each FTD is about a 10-feet high, 220 degree-viewing screen. To show the realism of these Level 6 FTDs, the projected visual images for the Cessna C-172S FTD models shown on the wide, wrap-around screen includes the aircraft wings' struts. When you look out the aircraft's door window, you see the same view you would see looking out an actual aircraft including the strut.

Although the mix of classes between the FAA Academy and ERAU will change, the flight portion for each class is the same. All three classes will use the same FTDs and related aircraft at the Daytona Beach campus. One of the values of the ERAU's FTDs and aircraft is that the aircraft being flown are identical to their respective FTD models. This makes it much easier for the new inspectors to make the transition from the FTD to the actual aircraft. Another plus for the concept is that the FTDs and respective aircraft are using installed GPS equipment. This provides advance training on some of the latest equipment and features found in modern GA aircraft.

If you are wondering why new GA Ops inspectors need any flight training, the answer is simple. The GA operations indoctrination course is not designed to teach new inspectors how to fly an aircraft. That skill is a hiring requirement. The purpose of

the indoctrination course is to teach the new inspectors how to be FAA safety inspectors. Subjects such as how to plan and give a practical pilot test, learning the regulations in detail, and being able to fly an aircraft to at least the FAA's Commercial Practical Test Standards are all part of the learning process. The question to be answered by this year's new inspector training classes is what is the best way to provide that required knowledge and skill training for future inspector classes.

THE GOAL: WELL QUALIFED INSPECTORS

The goal of the Flight Standards Service's training is to provide FAA, the world's leader in aviation safety, with the best possible inspector work force. The way to do that is by ensuring FAA aviation safety inspectors are the best trained in the world. What makes this a challenge for FAA is being able to keep up with the rapidly changing technical and training aspects of aviation while keeping within the allocated inspector training budget. As you add in the changes in FAA annual operating and training budgets to the changing number of inspectors to be trained each year, you can begin to see why the Flight Standards Service's Training Division is working hard to maximize its training processes with its limited training resources. The challenge for FAA is how to provide the best training possible while working with constantly changing requirements and funding.

According to Gilmore, these programs have the potential to increase training effectiveness while reducing training costs. Historically, the FAA Academy at the Mike Monroney Aeronautical Center in Oklahoma City provided this training. But as part of its ongoing goal of providing the best training possible to its work force, Flight Standards management decided to try something different. The training test courses at ERAU are the result.

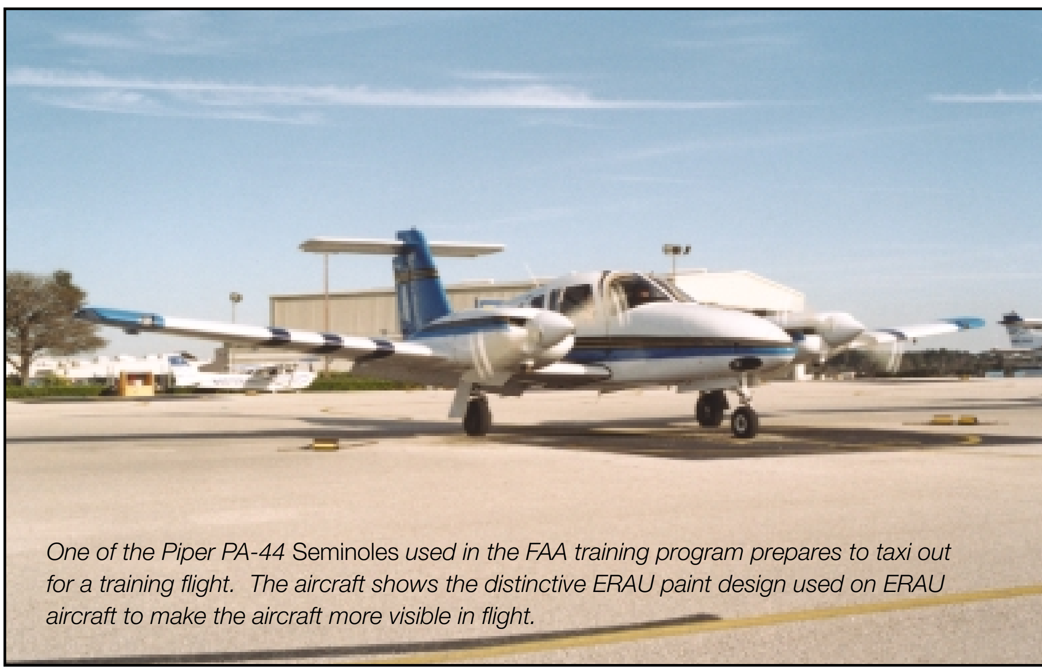
Gilmore said the aircraft cost savings are significant. For example, the FAA used contract Raytheon Beech *Barons* (BE-58) for its light-twin training requirements in Oklahoma City. If the contract option had been exercised, the contract cost for a BE-58 was going to increase to $900 per flight hour in fiscal year 2003. This cost included contract maintenance support. ERAU's contract rate per flight hour for the twin-engine Piper *Seminole* used in both the GA Operations Indoctrination Course and in the Instrument and Performance Refresher-Light Twin course is about $200 per flight hour. The Indoctrination course also uses Cessna 172s for single-engine training. Both courses use the respective flight training devices for initial aircraft familiarization. One of the reasons ERAU has such a low cost per flight hour is the fact the University amortizes its aircraft operating costs over a much larger student population. Another important safety benefit is the fact the University has to keep its aircraft and their systems in great condition and up to date. To do that, ERAU has its own maintenance organization to keep its aircraft up and flying to meet its daily student demand.

INSTRUCTOR CHALLENGES

Conducting these test courses at ERAU presents its own challenges for the FAA instructors involved. As one instructor said, deciding what material to pack for the course is difficult. He said you have to be prepared for most questions or issues that may come up in class. When you are at ERAU, you can't just walk back to your office to research a question like you can at the Academy, he said. You have to decide what manuals and reference materials you will need and pack it for the trip.

ORGANIZATIONAL ISSUES AND QUESTIONS

Issues that have to be reviewed by AFS-500 and important decisions the Training Division has to make include the value of the training at ERAU, the ratio, if any, of the amount and type of training at the FAA Academy versus that given at ERAU or at another approved site, the question of employee staffing and possible relocation of any FAA employees to ERAU or another site, and the ultimate question that has to be answered is what mix, if any, provides the best training for the next generation of FAA general aviation operations aviation safety inspectors at a cost the FAA can afford. Quality training is what this test program is all about. The question remains what is the best way to train FAA GA operations inspectors. That is what Flight Standards is trying to find out.



One of the Piper PA-44 Seminoles *used in the FAA training program prepares to taxi out for a training flight. The aircraft shows the distinctive ERAU paint design used on ERAU aircraft to make the aircraft more visible in flight.*

Please Fly Neighborly

by James E. Pyles

It is time for each of us to reflect on our responsibilities to each other in this great country in which we live. Every pilot needs to revisit a topic that we often overlook. The topic I am speaking about is our responsibility to fly neighborly.

The FAA has always received complaints concerning low flying aircraft over noise-sensitive areas. You've seen the list—open air assemblies of persons, churches, hospitals, schools, nursing homes, noise-sensitive residential areas, National Park Areas, to name but a few. Other organizations like the Aircraft Owners and Pilots Association (AOPA) and Helicopter Association International (HAI) have addressed this issue with handouts and guides, such as the "Fly Neighborly Guide" published by HAI in 1982 and revised in 1991, to help pilots make good sound decisions when it comes to the flight path and altitudes flown. The FAA has published Advisory Circulars (AC), such as AC 91-36C, "Visual Flight Rules (VFR) Flight near Noise-sensitive Areas," to encourage pilots to choose altitudes and flight paths that will minimize their adverse impact on others, especially around airports and navigational aids where it is natural to have an increase of aviation activities.

Ask yourself this question; "on my last flight did I take into consideration the effects of my flight on others?" So, what was your answer? Chances are, you did not.

The federal aviation regulations give us the "minimum safe altitudes" to start our planning, but all too often we pilots have the attitude that minimum is good enough. While it may be safe to fly at the minimum requirements for a particular flight, it would do the industry a lot of good in the public relations department to add a few hundred feet or alter our flight path to avoid needless aggravation to those below us. Flight instructors often practice over the same areas. They do "turns about a point" over the same barn, church, or intersection hour after hour, day after day. It is no wonder this kind of repeated activity solicits phone calls and letters to the local Flight Standards District Office (FSDO) complaining about the noise and danger of all the aircraft overhead. To add to the concerns of the general public, we have the security issues brought to the limelight after the tragic events of September 11, 2001. Heightened concerns about repeated flights over houses and neighborhoods and what "they" could be doing have accompanied the traditional complaints about noise and the possibilities of a crash.

SO WHAT CAN WE DO?

Here are a few ideas to help you plan in the future. They are just a few of the many you might come up with on your own, so do not feel like this is an "all inclusive" list. Above all, remember to use good judgment, common sense, and safety—safety should always be your first concern.

- Remember, "altitude above you and runway behind you, don't do you any good." Start your takeoff roll at the beginning of the runway, so that more of your climb to a safer, more neighborly, altitude will be over the air-

port. Besides, you might be glad you have that extra few feet should you have an emergency.

• If you do not know if you are over a "congested area of a city, town, or settlement," then assume you are and fly at the appropriate minimum altitude or higher.

• Remember the federal aviation regulations say "an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet." So, make sure you are at least that far away from the hillside that might contain houses or people.

• Take the time to find out where the noise-sensitive areas are around you, and then do your best to avoid them. Make a concerted effort to minimize your impact on them.

• During VFR operations over noise-sensitive areas, pilots should make every effort to fly not less than 2,000 feet above the surface, weather permitting.

• When conducting flight training be aware of what lies below you at all times. Use appropriate altitudes for ground reference maneuvers. Teach your students from the beginning to fly neighborly. (Don't forget 14 CFR §91.303, it really does apply to you!)

• Pilot examiners, too, can play an important role by adopting fly-neighborly practices in their flight exams.

• Get involved! Help your local airport authorities educate the communities around the airport about local navigational aids and the types of flights conducted there. Also, you should teach your local airport neighbors what is allowed by regulation and how to properly identify aircraft should the need arise.

• Help your local zoning commission understand the usefulness of the airport to the community and the necessity to have proper building and zoning laws in effect to provide for a safe airport environment. You never know, this just might keep a house from being built at the end of your runway.

James E. Pyles is the Regional Safety Program Manager for the Northwest Mountain Region, Seattle, WA.

§ 91.119 Minimum safe altitudes: General

Except when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes:

(a) Anywhere. An altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.

(b) Over congested areas. Over any congested area of a city, town, or settlement, or over any open air assembly of persons, an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft.

(c) Over other than congested areas. An altitude of 500 feet above the surface, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure.

(d) Helicopters. Helicopters may be operated at less than the minimums prescribed in paragraph (b) or (c) of this section if the operation is conducted without hazard to persons or property on the surface. In addition, each person operating a helicopter shall comply with any routes or altitudes specifically prescribed for helicopters by the Administrator.

§ 91.303 Aerobatic flight

No person may operate an aircraft in aerobatic flight—

(a) Over any congested area of a city, town, or settlement;
(b) Over an open air assembly of persons;
(c) Within the lateral boundaries of the surface areas of Class B, Class C, Class D, or Class E airspace designated for an airport;
(d) Within 4 nautical miles of the center line of any Federal airway;
(e) Below an altitude of 1,500 feet above the surface; or
(f) When flight visibility is less than 3 statute miles.

For the purposes of this section, aerobatic flight means an intentional maneuver involving an abrupt change in an aircraft's attitude, an abnormal attitude, or abnormal acceleration, not necessary for normal flight.

FROM THE LOGBOOK:

THE FAA AVIATION SAFETY PROGRAMS Do they really work?

by Jim Trusty© 2004

H. Dean Chamberlain photo

During the research for this article, I had the great pleasure of going back in aviation history with pilots, instructors, and FAA personnel—past and present, living and dead. I learned a lot about these individuals and their dedication to an objective that had never been tried before. For someone as addicted to aviation as I am, it was a great pleasure to be involved in this tale of living history.

As you read this story you will realize the devotion of those involved and learn that sometimes things just have to be done without compensation or supervision or a true plan of action, and somehow they work out. Thank goodness this particular endeavor did! The benefits are enormous and they involve the saving of lives. I thank each and every person involved. What they accomplished way back when probably saved aviation as a profession and showed the world that education mixed with a dash or two of enforcement works wonders. This is even more valid today.

WHO? While working on a presentation for an upcoming FAA safety seminar, I wandered off in thoughts of who, what, when, where, why, and how as they all applied to the safety programs offered to the aviation enthusiasts of our nation. Who came up with the idea for the Federal government to join forces with the general public and actually make something work for both sides? Most agree that it was a lot of ex-military pilots and leftover instructors from WWII and Korea who became new hires for the FAA and played a major role in getting it all started. The FAA hired these guys as peacetime approached and general aviation was advancing by leaps and bounds and it really got more than its money's worth.

A lot of names came up when I began researching this article and by trying to use all of them, I would surely miss a few. Apologizing in advance, I'm afraid, would not get me off the hook because they really did something great with this and no one or two people deserve all the credit. At the beginning there were probably 50 different individuals involved in almost every state. Many of them are now deceased. For my research, I made contact by conversing with those who knew them well when they were alive. Either by reading pertinent documents, by e-mail, telephone interviews, or personal meetings, the following individuals were all a great help. My thanks go out to: Al Milana, Pete Campbell, Jerry Schmeltz, Randy Robinson, Tom Liederbach, and Larry Williams. Without their input into the safety program, aviation would not be what it is today.

WHEN did they begin? It appears the beginning was slow, but sure, and took place around 1964. The actual thought process began earlier, but it took a little coaxing to get the ball rolling. It was kinda sorta haphazard until a lot of work was done and the FAA started accepting it as a doable concept in 1968. Once the first program started showing positive results, and that was the Flight Instructor Refresher Clinics, the other programs followed rather quickly. They all remain until this day as very successful ventures. There were startups in different FAA regions from 1964 until 1971. When to start and what to offer was left up to the respective offices and to those in charge.

WHAT? The first program was the Flight Instructor Refresher Clinics, which was followed by the Poker Run, the "WINGS" or Pilot Proficiency Award Program, the FAA PACE Program, and several that are simply called town meetings, safety gatherings, and something we do in my area almost weekly, the FAA Safety Seminars. No matter the various names or designations, they are offered by the FAA; helped by an active FAA Safety Program Manager; some FAA Aviation Safety Counselors; donations of time, energy, and money from the aviation public; and well attended by flying enthusiasts from all walks of life. They are something we in this ever-shrinking aviation community look forward to and, as a Safety Counselor myself, we are constantly looking for ways to make them more attractive to the flying public and to expand and grow

new attendees every time we meet. The numbers show we are succeeding. My hope and desire is that we can add some new and exciting programs to our busy schedule of events planned for this year just so we can keep everyone's attention.

There are plans in the works to try and incorporate some of the youth programs and see if that would work. I think the kids would enjoy the upgrade and information after we rework it slightly. If you have a chance, join us for a meeting. They are informative and enjoyable, and many of your friends will be there.

WHERE? After the FAA named Pete Campbell the National Accident Prevention Program Coordinator, he gave all the regional managers free rein to implement safety programs as they saw fit and a bunch began at about the same time. Al Milana had one of the first in Lincoln, Nebraska. He remembered it well when I spoke to him a short time ago. The first program was an all day affair with two Accident Prevention Specialists speaking and showing a slide show on takeoffs and landings and landing with/without flaps. He also remembered that the first lapel pin was made like a safety pin with a carving of the Spirit of St. Louis in it. I have one of these made by Jostens and wear it proudly.

I personally attended several clinics put on by Pete Campbell and his crew and they were a true learning experience. Some of the alphabet (AOPA, GAMA, PAMA, etc.) groups are still doing these meetings with great attendance and success, and we hope they continue.

WHY? When this group of new hires came on board, they quickly recognized that the accident rate was out of hand and that the FAA way of expecting enforcement to take care of every problem was not working. As former flight instructors and pilots, they all agreed that the problem started at the training level and that what had to be done was to educate the flight instructors first and very soon thereafter the licensed pilots and then the flying public. By the mid-1970's, less than 10 years after this group started working, training accidents were down over 60%, and we have managed to maintain that downward spiral through today.

HOW? It has been almost forty years since this brainstorm about education working in conjunction with necessary enforcement would reduce aviation accidents and it is working better each year. Aviation still accounts for less than 2% of all the transportation fatalities each year, and last year was no different. We transported over 650,000,000 passengers and had 695 deaths. That calculates to your chances of losing your life while on board an airplane as one in a million. No other industry in the world can match these numbers. By way of comparison, vehicle fatalities in the U.S. alone kill 820 people a week. As pilots and flight instructors we are all keenly aware that the root cause for most accidents is pilot error and that the best and most complete cure for this is education. Actually, we don't even mind that the FAA is always around for enforcement if all else fails. It really keeps us on our toes.

THE FUTURE: I look forward to newer and better offerings by all involved and would welcome the FAA back into the fold as presenters of this valuable information. Education has to be continuous for it to really work. How could anyone say no to being safer and smarter in this ever-changing world of aviation. When you total up the time spent staying current as a pilot—getting a medical, a flight review, instrument proficiency check, and then add an hour of instruction and an hour of flight—it figures out to less than a day, and it doesn't all have to be done in the same 24 hour period.

It's really not a big contribution of time to be current and fit to fly.

IN CLOSING: This article was written totally out of appreciation for a great bunch from the FAA who took on a task that offered them very little benefit. It is a program that over 4,000 FAA Aviation Safety Counselors work on daily for one project or another to make it possible for over 1,000,000 aviation enthusiasts to attend a Safety Program of their choice, free of charge, somewhere in America almost every week. I wanted you to know of this output of energy by everyone involved and to invite you to join us. We need your participation. Meeting places, sound equipment, door prizes, food and beverages, speakers, and everything else we use must be donated. Contact your local Flight Standards District Office and tell them you would like to help. Ask them to do a program in your area, get on the mailing list so that you and your friends can attend, and then visit a meeting and watch us work. See if you agree with the majority of the flying community that education really works and the only thing we need is more of it. I personally am still amazed that you can attract a room full of professionals who have the skill to fly an airplane by simply offering some information and free food. Only one person out of every 400 in the United States can fly an airplane and that means 99.8% of our population cannot!

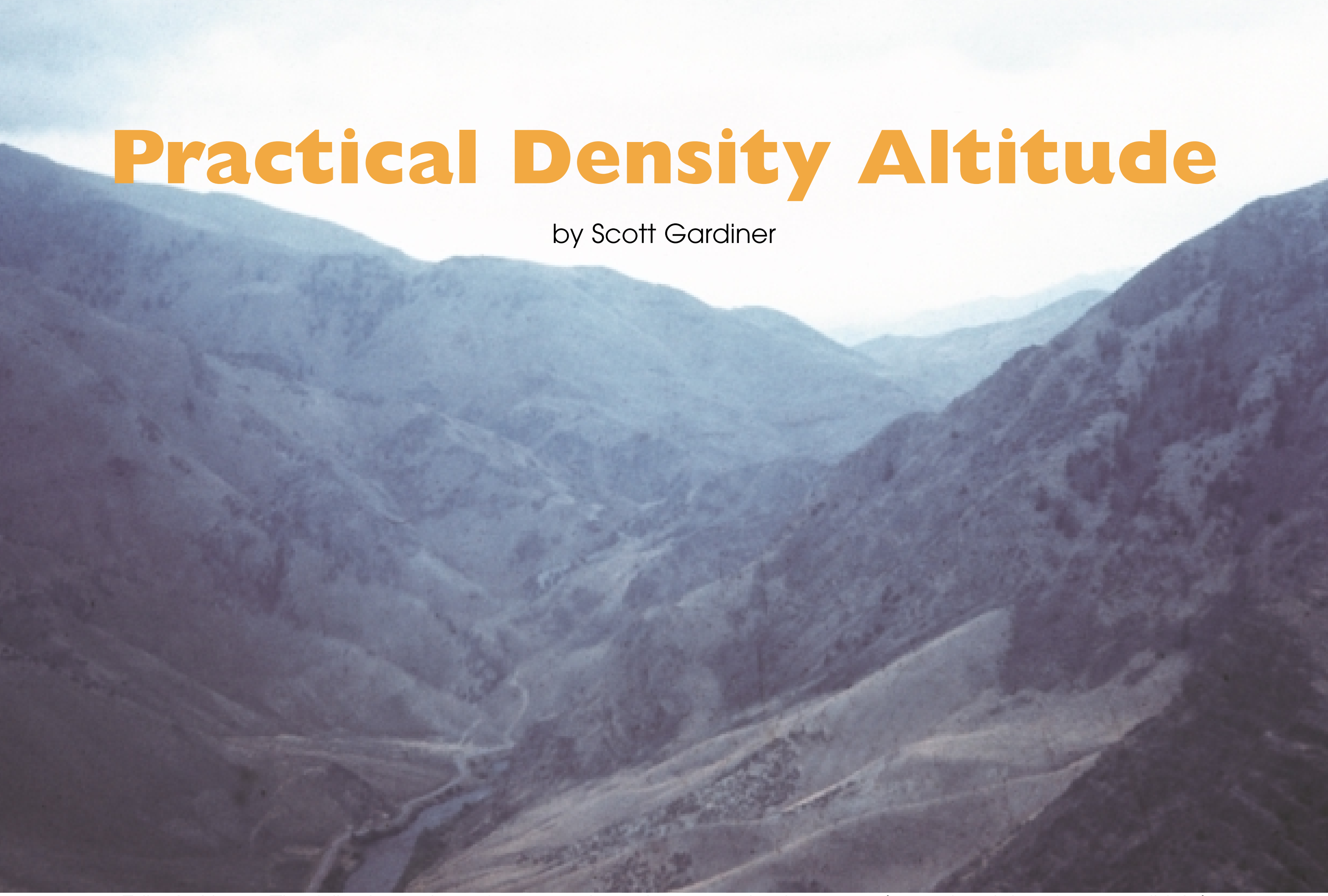
If after reading this article, you still have questions or reservations, check out <www.faasafety.gov>, contact the FAA (they have over 100 people in Safety Program managerial positions at the district, regional and national levels), or feel free to get in touch with me and I'll tell you what we have accomplished in my area since I started as an Accident Prevention Counselor over 15 years ago. As you can tell, I love to talk about this safety stuff.

Always remember: Accidents are caused and therefore preventable!

Permission is required to reprint this copyrighted article. Jim Trusty was the FAA/Aviation Industry National Flight Instructor of the Year (1997) and the first-ever Southern Region Aviation Safety Counselor of the Year (1995). He still works full-time as a corporate pilot/ flight & ground instructor/ FAA Aviation Safety Counselor/ National Aviation Magazine Writer at MQY in Tennessee. His e-mail address is <Lrn2Fly@bellsouth.net>.

Practical Density Altitude

by Scott Gardiner



Editor's Note: The following article is based upon a collection of density altitude articles published in the FAA's Seattle Flight Standards District Office's Aviation Safety Program's safety newsletter. Whenever we publish an aircraft operational-type article like this one, we want to emphasis that the purpose of the article is to stimulate pilots and instructors thoughts on the subject topic. We want to remind all pilots that their respective aircraft's operating manual or handbook is the source of information for the operation of that aircraft. When operating at or near the operational limits of an aircraft, pilots need to remember that the aircraft's published performance information was determined through the use of company test pilots using "average" pilot skills flying new aircraft. Your flight skills and your older aircraft's performance may not match the performance information published in your handbook. You may want to be more conservative in calculating any critical performance data when operating into or out of airports or landing areas with limited or no margin of error..

A few years ago, I had the pleasure of sitting in on a seminar on density altitude taught by National Transportation Safety Board (NTSB) Accident Investigator Kurt Anderson. It was the most insightful and, most inspirational seminar I have attended in 20 years. Mr. Anderson has interviewed many pilots who have survived airplane accidents, and he has gained incredible insight about what they were thinking just before they crashed.

During his NTSB career, Kurt has investigated more than 400 airplane accidents. His area of responsibility is the five northwest states. He is the owner of a light, single-engine airplane. He is also a Certificated Flight Instructor. Mr. Anderson has identified nine deadly sins, which he said are commonly involved in density-altitude accidents. Nine things pilots either learned and then forgot or didn't learn at all or learned wrong that contributed to the accidents.

DEADLY SIN NUMBER ONE

When climbing out from an airport at which density altitude is a concern, do not climb at the same indicated airspeed you would use at a sea level airport! Assume you are flying a non-turbocharged, piston-driven airplane. At sea level, the indicated best rate of climb speed is a higher number than the indicated best angle of climb speed. As density altitude increases, the indicated best rate of climb speed decreases, and the indicated best angle of climb speed increases. The amount of change between sea level and a density altitude of 8,000 feet is typically five to eight knots of decrease in indicated best rate of climb speed, and four to seven knots of increase in indicated best angle of climb speed. At some point best-indicated rate of climb speed and best-indicated angle

of climb speed merge and become the same number. When this happens the airplane has reached its absolute ceiling.

The misconception that is leading many pilots to disaster is attempting to climb out of airports where density altitude is a concern at the same indicated airspeed they use to climb out of sea-level airports. If you are flying a non-turbocharged, piston-driven airplane, don't do it!!! You lose performance either way. Assume you are trying to climb over an obstruction at the departure end of the runway from an airport with an 8,000-foot density altitude. Your indicated best angle of climb speed is likely to be four to seven knots faster than the indicated best angle of climb speed at sea level (check your pilot operating handbook). If you mistakenly attempt to climb at your sea level indicated best angle of climb speed, you are probably four to seven knots too slow. You have taken an airplane whose climb performance may be poor at best and made it downright lousy! There is a really good chance the airplane will not climb at all and will simply mush into the obstacle.

Next, assume you are departing from an airport with an 8,000-foot density altitude in the same non-turbocharged, piston-driven airplane. The challenge this time is to climb over the ridge that is four miles away. Your indicated best rate of climb speed is probably five to eight knots lower than your indicated best rate of climb speed at sea level (check your pilot operating handbook). If you mistakenly attempt to climb at your sea level indicated best rate of climb speed, you are probably five to eight knots too fast. Some pilots even add a few knots, "just to be on the safe side." You have taken an airplane whose climb performance may be poor at best and made it downright lousy! There is a really good chance the airplane will get itself out of ground effect and then refuse to climb at that indicated airspeed and simply mush into the ridge. This is a big factor in density altitude accidents. The speculation is that since it is proper to use the same indicated airspeed, while approaching to land, regardless of the density altitude, quite a number of pilots have come to the mistaken conclusion that the same is true during takeoff. NOT SO!!!

Airplanes with turbocharged, piston-driven engines must also use indicated best rate of climb speeds which are lower than sea level indicated best rate of climb speeds, but only above altitudes where the turbocharger begins to lose efficiency.

Most all of the density altitude accidents within the five northwest states involve situations requiring climbs at best rate of climb speed. Seldom do they involve climbs at best angle of climb speed. But either way, using sea level indicated climb speeds in high-density altitude situations has the ability to transform poor climb performance into zero or even negative climb performance.

When this article was originally published in *AeroSafe*, the Aviation Safety Program's newsletter in FAA's Northwest Mountain Region, one of our readers sent a letter detailing his encounter with density altitude.

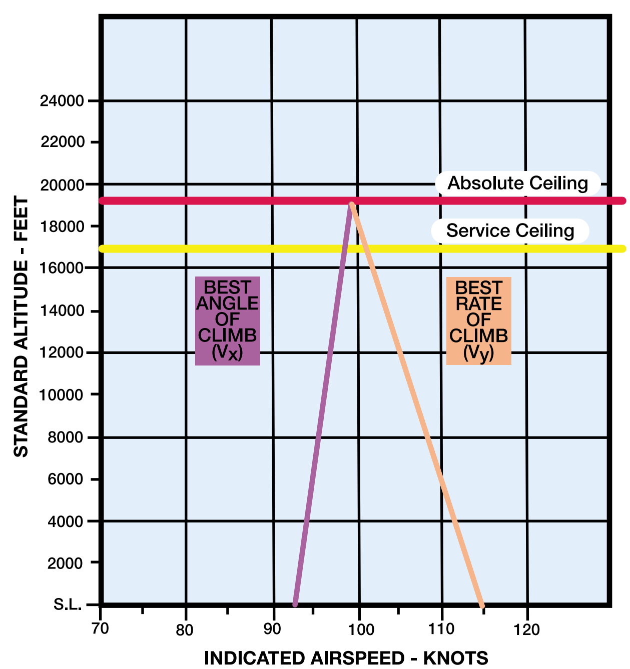


Figure 1

> *Several years ago, I was returning to Seattle from Winnemucca, Nevada, in my Cessna 152. I was given a clearance to takeoff on Runway 20. The elevation of the airfield is 4,303 feet and the temperature was about 80 degrees F. There is a 7,449-foot peak straight out from the runway about six or seven miles away. Since I would be turning to the northwest after takeoff, this didn't seem to be a factor. At full gross weight, I lifted off as usual and planned to continue on runway heading until I could gain enough altitude and airspeed to make my turn. When I got out of ground effect, however, I did not climb very much at all! I was scooting out over the sagebrush, barely climbing, and heading for the obstacle that now seemed to be a lot closer than I had originally thought. I checked the mixture control and confirmed that it was adjusted properly. I couldn't afford to lose any lift by banking. For a sickening moment it looked like I was doomed to either fly into the hill or land on the open grazing land covered with sagebrush and whatever rocks or other impediments were hidden from view. The latter was the preferred choice, but I was still flying.*
>
> *As gently as I could, I raised the nose to see if I could get any climb out of it. There was no buffet. I raised the nose some more. At this point I wasn't looking at airspeed; I was flying by feel. Slowly I began to gain altitude. It seemed terribly slow, but after a while I felt it was safe to attempt a shallow banked turn to the right. It worked! I had about 5,000 hours total time and had flown many different types of aircraft—military and civilian. I was now a private pilot, but I had been trained in the Army Air Force during WWII and had been a professional pilot for*

Remember to always check your pilot's operating handbook before a flight to avoid nasty surprises after takeoff.

many years after that War. My first 60 hours of flying were completed without an airspeed indicator as a matter of standard practice. But this experience taking off from Winnemucca was not like any I ever had before—or since. After that flight, I checked my flight manual and the correct airspeed for the conditions was 63 KIAS, not the 70 that I was using!!!

A resulting letter questioned the reader's attempt to climb at best rate of climb speed. Shouldn't he have been using best angle of climb speed? The misconception is a common one. In fact, it is one of the Deadly Sins that we were going to cover later, but we might as well cover it now.

You should not climb at best angle, unless it is absolutely necessary to do so. And the only time it is absolutely necessary to do so is when climbing toward an obstacle with no maneuvering room whatsoever. If there is enough room for an S-turn, or a 180 or 360-degree turn, or any other combination of turns, we're going to be climbing at best rate. When you have maneuvering room, you have the luxury of using best rate of climb; you're not stuck with best angle.

Instructors tell students to use best angle of climb speed to clear obstacles. This is generally good advice. Best angle gives you the most altitude for the distance traveled. But a lot of students come to the conclusion that best angle should be used for all situations requiring obstacle clearance. Not so. There are some serious drawbacks to using best angle. For instance, a full-power climb at best angle requires that the nose of the airplane be up so high that you can't see where you're going, making "See and Avoid" virtually impossible. Also, at such an attitude, there is little margin for error between best angle and stall! If you get that nose just a little too high, it is only seconds to disaster! You are doing all of this while still close to the ground and with an obstacle ahead. Additionally, engine cooling is reduced during climbs at best angle. Finally, if the engine even coughs with the nose that high, you're in a world of hurt.

We recommend that you not climb at best angle in situations where best rate will do. If there is room to climb straight ahead at best rate and clear the obstacle, use best rate. If there is room to maneuver while climbing at best rate and clear the obstacle, maneuver and climb at best rate. You will only see us climbing at best angle when it is absolutely necessary to do so, and then, only if we are proficient and absolutely certain we know the attitude that will produce best angle of climb speed for the given density altitude. So, in answering the letter, we thought the pilot of the C-152 was correct in selecting best rate, he simply did not know what the best rate of climb speed was under the prevailing density altitude conditions.

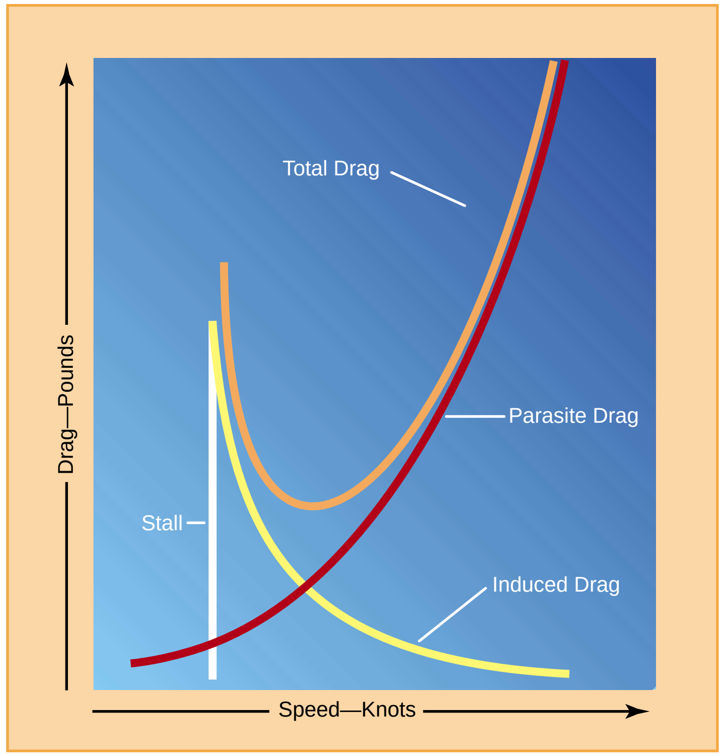
DEADLY SIN NUMBER TWO

When departing from airports in a general aviation airplane at less than maximum gross weight because of density altitude considerations, do not climb at your maximum gross weight, best rate of climb speed! It seems that a great number of pilots memorize only one best rate of climb speed—the one for maximum gross weight at sea level. In truth, best rate of climb speed (indicated) decreases as gross weight decreases. Depending upon which airplane you fly and how far below maximum gross weight you are operating, best rate of climb speed (indicated) can drop as much as 10 knots or more. (check your pilot's operating handbook.) Attempting to climb at your maximum gross weight

best rate of climb speed in a lightly loaded airplane, can take climb performance, which may be poor at best, and make it downright lousy.

If you attempt to climb out of a high density altitude airport at a reduced gross weight while using your sea level, maximum gross weight best rate of climb speed (indicated), you combine Sin One with Sin Two. The result can easily be that you are attempting to climb at a speed that could be 15 knots too fast! Such a mistake can turn minimal climb performance into negative climb performance!! This deadly combination is precisely what is leading to our most common density altitude accidents!

Figure 2



DEADLY SIN NUMBER THREE

A lack of understanding of the significance of true airspeed and its affect on turn diameter is Deadly Sin Number Three. The situation in Deadly Sin Number Three is the need for a course reversal to fly out of a tight, blind canyon situation. The pilot has waited far too long to initiate the turn and now needs to make a tight radius, 180-degree turn without losing any altitude. At sea level on a standard day, if we ignore calibrated and equivalent airspeeds, an indicated airspeed of 150 knots results in a true airspeed of about 150 knots. But at 8,000 feet MSL on a 95 degree Fahrenheit day, an indicated airspeed of 150 knots results in a true airspeed of 180 knots. Big deal, what is 30 knots?

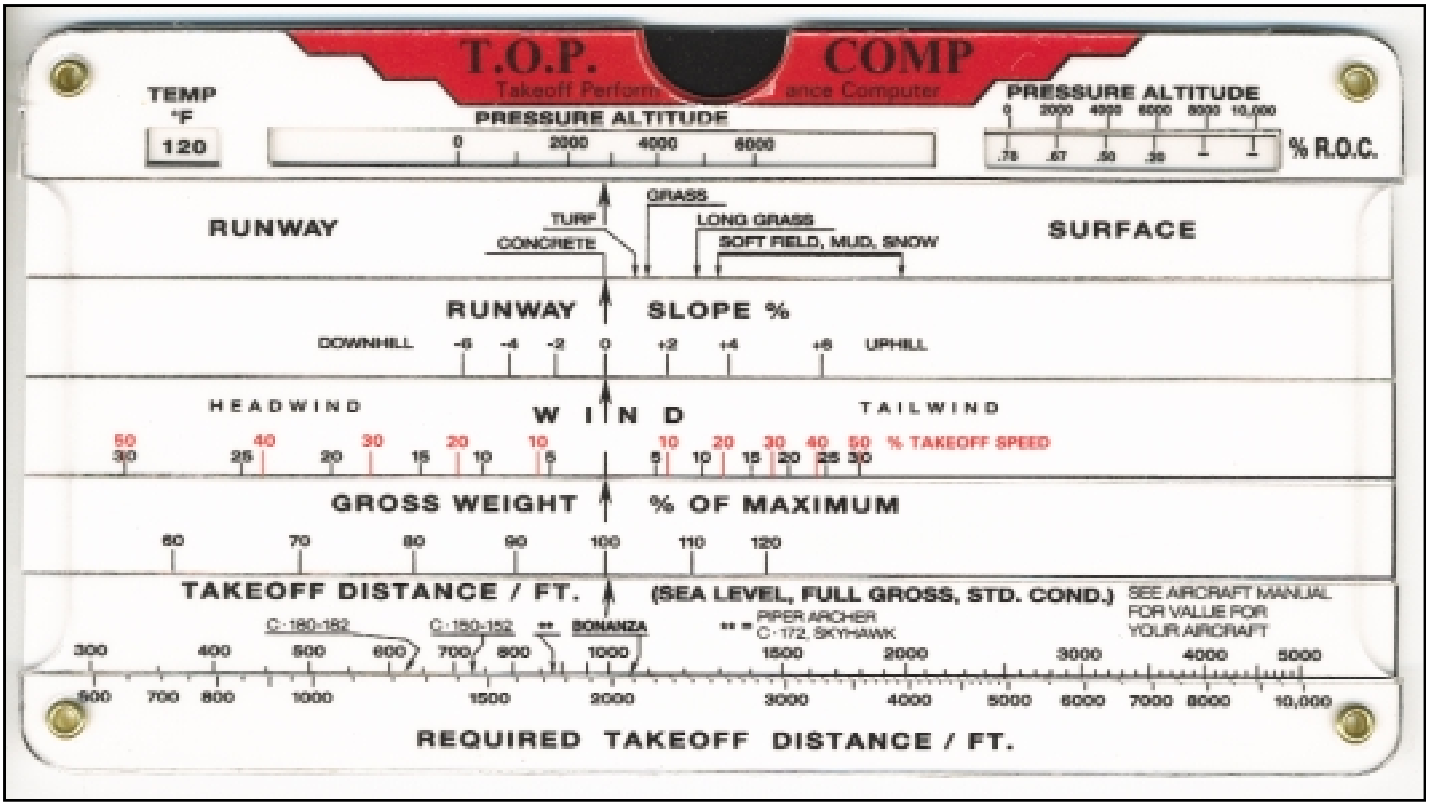
If we use a bank angle of 45 degrees, the formula for radius of turn is velocity squared divided by 11.26. At a true airspeed of 150 knots, the math works out to 1,998 feet (we're going to call it 2,000 feet). At a true air speed of 180 knots, the math works out to 2,877 feet. All right, so that's an additional 877 feet. But that's an additional 877 feet of radius. To make the famous 180-degree turn out of a valley where you are unable to out climb the terrain, you need to know the turn diameter. At the same indicated (150 knots) the 8,000 foot MSL, 95 degree Fahrenheit day turn diameter requires 1,754 feet more than the sea level, standard day turn. That's an additional third of a mile because of the fact that the true airspeed is 30 knots higher than indicated! The 180-degree turn requires 4,000 feet at 150 knots. At 180 knots it requires 5,754 feet. That's an increase of 44 per cent!

This is all complicated by the fact that we all have a pretty good mental picture of just how much room is required to make a 180-degree turn. After all, the turn from downwind to final is a 180-degree turn. And when we're on downwind we all know how far to space ourselves from the runway. But, if you fly up the high density altitude canyon and delay your escape turn until the cliff on the far side of the valley is about the same distance as the distance from sea level downwind to final (at 150 knots), there is a good chance you'll smash into the cliff about 44 percent of the way through the turn. As alarming as that sounds, it is happening far too often.

The fix? A lot of pilots think they can reduce the radius of that turn by slowing the airplane down. Slowing the airspeed does reduce the radius, but there is a trap if you slow it down too much. Keep in mind your density altitude induced power requirement for slow speed flight.

Let's discuss how induced drag increases as bank angle increases. In his lecture, Kurt Anderson pointed out that a 30 degree angle of bank will increase induced drag by 33 percent, a 45 degree angle of bank will increase induced drag by 100 percent, and that in a 60-degree bank induced drag will increase by 300 percent!

Now, please study Figure 2. Figure 2 shows a lift over drag (L/D) curve for a very typical light general aviation airplane. Notice that to the right of the L/D max point (where indicated drag and parasite drag intersect), induced drag is a relatively small part of the total drag. But to the left of the L/D max point, induced drag is a very large part of the total drag. Notice how the induced drag and total drag curves spiral upwards as you move left of the "Minimum Drag or (L/D) Max" point. As airspeed slows below the minimum drag point, drag increases rapidly. Now, take a really close look at the title of the vertical line that defines the left side of the graph. It is titled "Drag—Pounds." Once you slow below the "Minimum Drag or (L/D)" point, thrust required is increasing just as rapidly as is drag.



This takeoff performance calculator is non-technical and requires no batteries. It works like an old-fashion slide rule.

Near stall, induced drag makes up a huge percentage of the total drag. Assume you decide to slow to some speed close to stall because after all, the slower the speed the tighter the radius of the turn, right? And you need a tight radius turn to get out of this bloody canyon. Keep in mind that in a 45-degree bank, induced drag increases by 100 percent. At a near stall situation, induced drag amounts to approximately 80 percent of the total drag. If we try to use a 45-degree bank in this situation we will double the induced drag, which increases the total amount of thrust required by 90 percent. This means we would need to increase total thrust by 90 percent to maintain level flight. In situations where you are flying near stall on an 80-degree day at 8,000 feet MSL, how many times do you have a spare 90 per cent unused thrust available?

Remember the situation: you are attempting to do a 180-degree course reversal within the confines of a high-density altitude canyon. The slower you go, the more thrust required if you are going to maintain altitude during the turn. But just how much excess horsepower do you think you have in a high-density altitude situation? You can prove it to yourself. Fly your favorite airplane to 8,000 feet or more. Make sure you are NOT in a canyon. The hotter the day, the better the demonstration will be. Now, slow down. Slow way down. Slow to the point the stall warning horn is honking. Lower half flaps. Now roll into your 45-degree bank angle "escape turn" and try to maintain altitude. We'll bet if you're flying behind a non-turbocharged piston engine, you don't have enough excess horsepower to do it.

The bottom line is that when pilots delay their escape turn too long, then try to reverse course using a steep, constant altitude turn at very slow speeds, they are asking their airplanes to do something they simply cannot do! All too often the airplanes don't make the turn, they stall and crash into the side of the canyon.

Our advice? Make the turn long before the canyon becomes confined. Make the turn early enough that a shallow bank is all that's necessary to complete the turn. Better yet, you should stay out of those canyons. The only time you should be maneuvering within the confines of a canyon is shortly before landing at an airport located within the canyon or shortly after taking off from an airport located within the canyon. Other than that, you should be flying over the canyon, not through it.

DEADLY SIN NUMBER FOUR

Probably every pilot has seen Figure 3 at least once. However, misapplication of the information presented has been known to happen. It comes with an official explanation that goes something like, "Flying in the vicinity of a ridge results in downdrafts for the pilot of Airplane 1. Airplane 2 might escape the downdrafts, but a course reversal either to the right or to the left would leave little maneuvering room between the airplane and the ridge. Airplane 3 takes advantage of free lift from the up slope airflow and retains the advantage of an into-the-wind es-

cape route."

The official explanation is technically correct, but it does not go far enough. Since it is questionable whether or not Airplane 2 can complete a 180-degree turn, we can assume this valley is not very wide. Most pilots choose to fly up the correct side of the valley (Airplane 3 in this case), but push on too far before deciding to reverse direction. As long as things are going well for Airplane 3, the pilot continues bravely on course. It's only when things get tight that the pilot of Airplane 3 decides to make the 180. But turning around at this point results in a radius of turn that places the airplane somewhere between Airplanes 1 and 2. This is precisely the valley location described in the official explanation as an area of downdrafts! The trap has been sprung. Another aircraft smacks the terrain and generally with fatal results.

If you are going to fly through such a valley or canyon you must must decide to make the 180-degree turn while the valley is still wide enough to complete the turn using less than half of the valley! You've got to avoid the area of the valley left of Airplane 2. Too many pilots have not. Our search and rescue friends offer the following advice. If you absolutely, positively must fly in the valley, never fly up the valley. You should stay high and familiarize yourself with the terrain before you descend into the high end of the valley and fly down the valley.

DEADLY SIN NUMBER FIVE

Another mistake pilots make is not understanding the effects of density altitude on airplane landing performance. For example, suppose you find yourself in a situation where the field elevation is 8,000 feet MSL, and the temperature is 90 degrees Fahrenheit. The wind is blowing 10 knots and gusting to 18. The surrounding mountains are causing the wind to be quite variable and turbulence is abundant. Your aircraft flight manual recommends an approach speed of 70 to 75 miles per hour. What speed are you going to fly on final, and how will this landing compare to landings under similar conditions at sea level? Fly the same indicated airspeed that you would use at sea level, but remember that 75 mph indicated is 90 mph true in these conditions, so your ground speed is going to be 15 mph faster than at sea level.

Then you want to add one half of the gust factor. In this case add one half of the difference between 10 and 18, or four. The common mistake is to add one half of the 18, or nine. Don't add nine, just add four, but four indicated is five true. So now you're approaching at 95 true. With the same indicated approach speed your ground speed is 20 mph faster than it would be at sea level!

All things being equal, if you have precisely flown your approach at the correct indicated airspeed, your time in the flare will be the same at altitude as it is at sea level. But at altitude, your groundspeed is significantly higher than at sea level and your stopping distance is longer.

So the distance covered during the flare at altitude is considerably more than what you're use to at sea level. Combine this with the fact that most mountain airports are relatively short and often have cliffs, dense forests, or streams at the far end and the problem becomes clear.

DEADLY SIN NUMBER SIX

When departing airports, be aware of your climb gradient. We are all familiar with aircraft rate of climb — it's figured in terms of feet per minute. Climb gradient is figured in terms of feet per mile.

Consider two airplanes, each climbing at 500 feet per minute. But one is climbing at 60 miles per hour, and the other is climbing at 90 miles per hour. Each will climb 500 feet in one minute. But the first will cover one mile during that minute, and the second will cover a mile and a half during the same minute. The first airplane is climbing 500 feet per mile, and the second is climbing only 375 feet per mile.

When trying to out climb rising terrain, you need to think in terms of feet per mile as well as feet per minute.

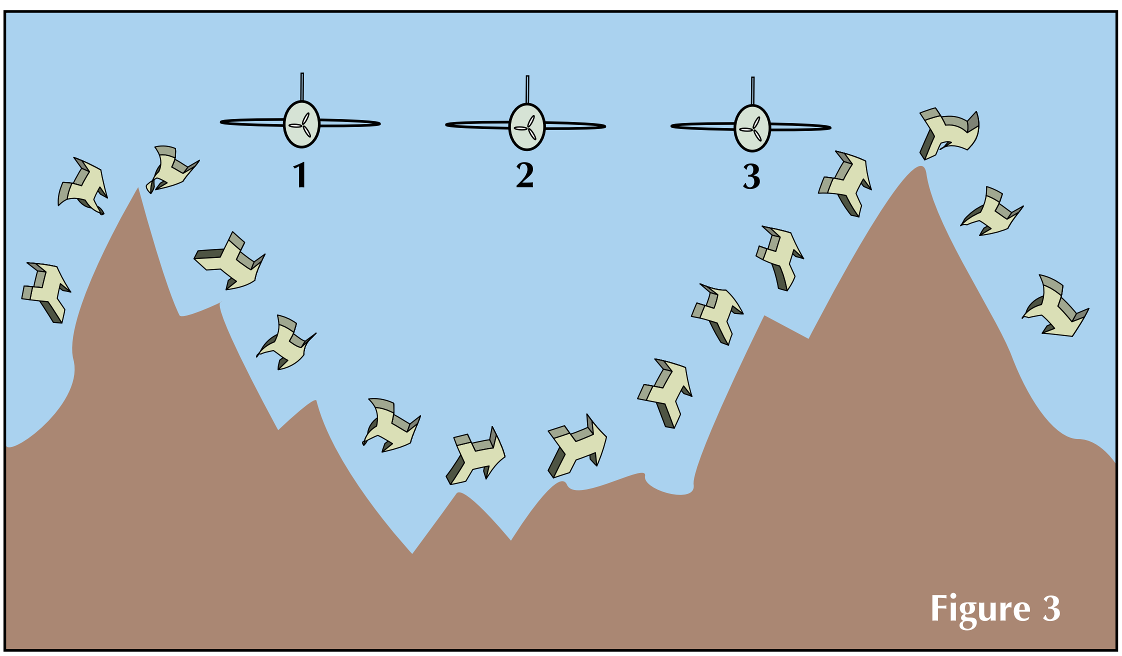


Figure 3

DEADLY SIN NUMBER SEVEN

Not knowing the aircraft's takeoff and initial climb-out performance numbers is another cause of accidents. Manufacturers give us performance charts to figure required runway length to get off the ground and distance required to out climb obstacles. They take into consideration such things as airport elevation, temperature, headwind component, and type of runway surface.

Just imagine you wanted to depart a dirt strip with a two-degree upslope, a 100-foot tree at the far end, at a pressure altitude of 6,700 feet MSL, and a temperature of 85 degrees. The charts work great—if you have a master's degree in mathematics. The problem is that the mathematical formulas required to determine the performance values for a specific aircraft at a specific airport on a specific day are cumbersome to say the least.

So, far too often, pilots give up on the charts and take a guess at the answers to those questions (and we pilots are notoriously optimistic). The problem is that your life and the lives of any passengers you might have onboard depend upon accurate answers to those questions. Wouldn't it be great if there were a simple, easy-to-use device that would quickly help you ascertain the answers?

There is one. It is a takeoff-performance calculator that is non-technical and requires no batteries. It looks like an old-fashion slide rule. The "Takeoff Performance Computer" is available from Sporty's Pilot Shop. It is item 2091A on page 45 of the current Sporty's catalog.

Today, there are also electronic calculators and computer programs that can help you calculate your aircraft's performance data. The important thing is to know your aircraft's performance data, especially when you are planning for critical situations involving high-density altitude or short-field operations.

DEADLY SIN NUMBER EIGHT

Using the wrong flap setting for takeoff was identified as another accident cause. Many light general aviation airplanes have a takeoff flap setting other than zero for operations on hard surfaced runways. When manufacturers recommend a takeoff flap setting other than zero (usually between 10 and 20 degrees) they do so to reduce the ground roll. Your use of the recommended flap setting works just fine when operating at near sea-level altitudes.

But keep in mind that for airplanes powered by piston-powered, non-turbocharged engines, there comes a density altitude above which the use of takeoff flaps actually increases ground roll. This is because the thrust available has deteriorated to the point where it is no longer capable of pulling the increased drag (as compared to flaps completely up) efficiently. This is exactly the situation you need to avoid when taking off from a high-density altitude airport.

DEADLY SIN NUMBER NINE

You should know the proper techniques for making obstacle takeoffs and for making soft-field takeoffs in the airplane you are currently flying at the density altitude you are currently contemplating, and you should not combine the two unless your airplane is turbocharged or turbine-powered. There are numerous instructors out there who routinely combine obstacle takeoff techniques with soft-field takeoff techniques to save time during training. But in actual density altitude situations, a pilot should not combine the two in a normally aspirated, piston-engine airplane.

The problem our fellow pilots are (literally) running into is having to takeoff in high density altitude situations with the need to climb over some obstacle. The obstacle may be a 100-foot tree at the departure end of the runway or a 100-foot tree on top of a 100-foot hill located a quarter of a mile past the departure end of the runway or a 100-foot tree located on top of a 1,000-foot mountain four miles from the departure end of the runway. In any case, typically the problem is not that the length of the runway is short; the fatal problem is the need to out climb an obstacle. So, for the purposes of this article, we are talking about obstacle clearance takeoffs and not minimum ground-run takeoffs.

The problem is that most airplanes in actual soft field situations call for the use of some flaps. The use of flaps help get you off the ground quicker, but in high density altitude situations the drag from those flaps will seriously hinder your efforts to climb over the obstacle.

Also, it is important to be able to recognize a soft field when you see one. Simply being unpaved does not make it a soft field. Soft field means the tires are sinking into something like mud or plowed earth or snow. Most mountain strips are not actually soft. And, it is a mistake to use soft-field technique when obstacle clearance is a concern. If you are taking off from an airport with rocks, ruts, and serious bumps, you might want to reduce the load on the nose wheel a little, but any more than that is not necessary and will only serve to increase drag and runway used if you increase your angle of attack too much.

For obstacle clearance takeoffs, follow the advice of your airplane manufacturer, which for the vast majority of non-turbocharged airplanes means flaps up and climb at best angle of climb speed for the density altitude.

If you ever find yourself in an actual soft-field situation in which obstacle clearance is a concern and you don't have the performance to fly out of the site, you should seriously consider removing the wings and trucking the plane home.

This wraps up the nine deadly sins that Kurt Anderson's years of accident investigation experience shows have lead to density altitude accidents. Please remember them when you are flying so that you don't become a density-altitude statistic.

Scott Gardiner is an FAA Aviation Safety Inspector and the FAA Safety Program Manager at the Seattle Flight Standards District Office. This article originally appeared in the FAA's Northwest Mountain Region's safety newsletter, AeroSafe.

CHECKLIST CHECKUP

From NASA's Callback

An FAA review of National Transportation Safety Board (NTSB) accident data revealed that during the period 1983 to 1993, approximately 279 aircraft accidents occurred in which a checklist was improperly used or not used. A review of Aviation Safety Reporting System (ASRS) "checklist" related reports for 2003 suggests that many of the same errors identified by the FAA and NTSB continue to be reported. The most common checklist errors include the following:

1. Failure to use a checklist.
2. Use of the wrong checklist.
3. Checklist flow interrupted.
4. Checklist item(s) overlooked

Recent examples of these errors are detailed in the following ASRS reports:

No Checklist

In a recent report to ASRS, a Cessna 172 pilot shared this valuable lesson: When you're in a hurry and too rushed to use a checklist—that's the time to use a checklist.

> • Everything felt okay until just after touchdown. I veered to the right...and I was unable to correct. I continued off the runway, and skidded into the dirt....After coming to a stop, I brought the plane back onto the runway. I decided just to takeoff and get out of there as quickly as possible....I did not look at my checklist as I always do. At takeoff speed I began to rotate, but the plane did not seem to respond. My attention diverted and I again drifted to the right. Nearing the end of the runway, I hit the brakes hard and skidded to the left off the runway and down an embankment...
>
> Instead of taking a breath and following normal procedure after the near crash landing, I was worried what others would think and I tried to depart the area as quickly as possible. Upon inspection of the plane the trim was found to be in an extreme nose low position....Had I stopped and used my checklist I would have taken off normally and not made a bad situation worse....

Wrong Checklist

By using the appropriate checklist, a crew can diminish or eliminate the adverse effects of a system malfunction. But, as this Boeing 767 crew learned, the wrong checklist can lead to inappropriate action.

> • On our initial descent out of FL330, we observed a RT ENG BLD OVHT [Right Engine Bleed Overheat] amber light on my [First Officer's] panel. I was flying so the Captain took out his QRH [Quick Reference Handbook] and started to review the procedures. He read it and seemed to be in a state of disbelief that the procedures required us to shut down the engine. He gave me the QRH and asked me to verify the procedures. I read the QRH and verified that the procedure required us to shut the engine down. What I didn't do is question the title of that particular checklist. The Captain had handed me an open QRH and pointed to the "RT ENG OVHT" checklist. I fell blindly into it. Once we read the checklist...we had tunnel vision and did not even consider that we might be proceeding with the wrong checklist....We ended up shutting the engine down when it was not necessary.... A valuable lesson was learned....Next time...I will look up my own checklist and back up the Captain with my own assessment....
>
> It should be noted that training took over and we handled the checklist with absolute professionalism, except the part about doing the wrong checklist. It won't happen again.

Interupted Checklist

Use of a checklist insures that standard procedures are followed and all systems are properly set even when distractions interrupt the normal sequence of events, This Boeing 737 crew thought they were all set for takeoff until the "unfinished checklist" warning horn sounded.

> • An aircraft swap put us behind schedule, then a particularly ugly customer service problem...delayed boarding another 15 minutes....After pushback and during the course of doing the after start checklist, the Master Caution "DOORS" light would not illuminate. [We] attempted [several procedures] to get the light to illuminate. Now we've gone from mildly irritated to irritated. We then consulted the MEL [Minimum Equipment List] for possible dispatch issues. About this time, the problem decided to cure itself. After being off on the Master Caution tangent for several minutes, the fact that we were not finished with the pre-takeoff checklist did not register. I called for taxi, and everything in our world seemed okay until the takeoff configuration horn sounded as I advanced the thrust levers for takeoff....I returned the thrust levers to idle and the Captain called for taxi off the runway. We realized that we had allowed the distraction after pushback to cause us to miss the completion of the pre-takeoff checklist and the flaps were not extended.... Now I am going to clip the checklist to the yoke until the pre-takeoff checklist is complete. If the checklist is still out of its holder during taxi, I should be asking myself why....

Overlooked Checklist Item

Completing every item on the checklist is the key to "unlocking" the secret of flight.

• On takeoff roll, when the airspeed reached 60 knots, I started to pull the yoke back, but the nose of the aircraft did not lift. I then pulled back the throttle to abort the takeoff, applied heavy braking, and ran off the side of the runway into a swamp. When I examined the plane afterwards, I found that the control lock had not been removed from the control yoke. A more thorough preflight and better use of the checklist would have prevented this incident.

Gear Up Checkup

A review of the ASRS database indicates that approximately 100 gear up landing incidents have been reported each year for the past five years. Ninety-six unintentional gear up landings were reported in 2003.

Two factors, distraction and preoccupation, are common to most of the gear up incidents reported to ASRS. In the usual scenario, a distraction occurs at the time when the gear would normally be lowered and the pilot then becomes preoccupied with the approach and landing.

The last six unintentional gear up landing reports from 2003 confirm the need to overcome distractions and preoccupation during the landing phase. These incidents (all remarkably similar to the 90 reports that preceded them) involve light aircraft. The lessons, however, are valid for any aircraft with retractable gear.

An Extension Course in Six Lessons

1. Traffic is often cited as a distraction in gear up landings.

• ...Turning short final I was doing my final checks...."Gear down" would have been at this point, but the controller said, "Prepare to go around. Number one aircraft is not off the runway yet." I could see that the aircraft was about to clear at the far end of the runway and said, "I think he will be clear" and that seemed to satisfy the Tower. By this time I had crossed the fence and Tower cleared me to land. Shortly thereafter the controller called out, "Go around. Gear up." Five feet off the runway was not enough time to arrest the descent.

2. Distractions can also be self-induced.

• ...I had to make an extended downwind for two incoming planes on final. After turning behind the last plane and becoming established on final approach, I began following the glideslope for practice. My concentration on sticking to the glideslope...distracted me from doing a proper landing checklist which included putting the gear down. Perhaps a foot off the runway, I realized that the gear was still up, but it was too late even though I applied go around power....

3. A thorough passenger briefing might have prevented this distracting situation.

• ...My [passenger] accidentally pulled the emergency release handle ejecting the escape window.... I could not hear [the Tower] very well due to the air entering the open window....I was able to understand that I was cleared to land. I did not lower the gear as I would normally on the downwind leg and with the confusion of trying to watch out for [my passenger] and fly the plane under these adverse conditions, I forgot to lower the landing gear as planned on final....A luggage pod absorbed all of the stress with minor scraping of the bottom of the plane....

4. Although an "accuracy" landing does entail hitting a specific point on the runway, taxiing beyond that point is easier when the gear are extended.

• The landing was intended to be a short approach, power off, accuracy landing....As we went from number three to "Cleared to land number one" on short approach, I...now concentrated on an aiming point to make an accurate landing, using flaps as necessary, and flying the airplane....I did not hear, or it did not register with me, that the gear warning horn was sounding. I did hear it after the gear up landing....

5. Lowering the landing gear should always be considered a two-part process. In this incident the pilot accomplished the first step — putting the gear handle down, but failed to perform the second step — confirming a down and locked indication.

• ...This was [my] first night landing in a small aircraft at an uncontrolled field without ILS guidance. I am accustomed to landing on Category II and III ILS runways at major airports. [I] was fully occupied with flying a stabilized approach with only VASI guidance and failed to notice that the "three green" indication was missing. [I] did an admirable job maintaining a stabilized approach and touched down on the runway centerline in the touchdown zone. If only the landing gear had been extended it would have been a really nice landing....

6. Raising the landing gear "temporarily" also raises the odds of a gear up landing.

• On a visual approach I put the gear down, but as I was flying over the city buildings, I lost some altitude. I retracted the gear because I thought that in the event of an engine failure I would not reach the runway. As I circled to land, I focused on the landing and forgot to put the gear down.

This article originally appeared in the January 2004 issue of Callback*, a monthly safety bulletin from NASA's Aviation Safety Reporting System.*

LIMITED VISION

Use hoods cautiously to keep students honest

by Tom Gilmore

Every instrument instructor knows how important it is to keep his or her student from looking outside, and when it comes to view-limiting devices, we have seen them all. From the old style Francis Hood to the newer long-billed hats, what enterprising CFII hasn't tried to invent a better mousetrap?

In the old Army Air Corps days, instructor pilots used a tandem aircraft with the front-seated trainee in a covered cockpit. The instructor sat in the rear seat and barked orders to the student. That's where the term "hood" originated—when instructors pulled the canvas hood over the front cockpit to isolate the instrument student. Likewise, the "Blue Box" pilot-maker—the Link Trainer—trained thousands of competent instrument pilots during the war. As crude as both of these training methods were, they made it truly impossible for a student to see anything other than the instrument panel.

The hoods of today don't even compare to this isolation, and it's gotten much easier to peek at the ground. For the sake of quality training, an instructor must understand the limitations of commonly used hoods and incorporate real world instrument meteorological conditions (IMC) flying into the curriculum.

The problem with the present instrument student vision restrictors is that we're working in reverse—we're getting further away from being more effective, and the students are getting cheated with more "information" from the outside world. This is more evident with each new hood design. Remember the first time you took your student into real IMC after hours of having him or her under the hood? The student probably lost it and started to drift off heading and altitude.

After World War II, as side-by-side cockpits replaced tandem seating, flight instructors covered the left side of the cockpit with view-limiting material to block the student's view. This was a primitive—if unsafe—solution to the advent of automotive-style seating in light aircraft.

There are a variety of view-limiting products available. To one extent or another they all have the same shortcoming. They allow students to see peripherally or to glimpse the outside world by fudging with slight head movements.

We've all seen the flip-up/flip-down plastic visor, and by far, the most common device is the Foggles glasses. There's some history here. The FAA originally questioned the Foggles' ability to adequately restrict the outside view, but allowed their use after weighing the increased safety benefits. Foggles did reduce the number of IFR training accidents because the student no longer wore a hood that blocked the instructor's traffic scan between the nine through eleven o'clock position.

There are other options as well. Upon learning they forgot the hood or Foggles, some creative CFII's have made view-limiting devices from a sectional chart. They fold the chart in quarters and slip it under the headset's headband. I've been successful with devices that are similar to a large baseball hat. In addition to being comfortable for a longer time, the hat-like view restrictors make it more obvious when students are peeking outside because they have to tip their heads up to do so.

Still, view limiters do not truly simulate IMC. Even though we're endorsing our students' ability to fly on the gauges, they might never fly in a cloud until after they pass their checkride. The FAA gives us lots of latitude because it doesn't specifically require CFII's to expose students to IMC. [It can be actual or simulated.] Our duty is to make sure they have the confidence and skill to be totally reliant on the gauges.

No view-limiting device is perfect. As instructors, we have to understand how the devices limit the student's success, and we have to keep our student honest. Only true IMC prevents student "cheating." Actual IFR experience is more important now than ever—that much is clear.

Tom Gilmore is a National Association of Flight Instructors (NAFI) Master CFI. This article is reprinted with permission from the NAFI Mentor.

Safety First

Performing An Aerial Ballet

by Patricia Mattison

Aerobatics comes naturally for most birds. Soaring and swooping effortlessly in the air, our avian friends delight in the freedom of unfettered airspace. With a few exceptions, a bird's structure and natural ability allow it to perform aerobatic maneuvers as a normal part of life. Pilots, on the other hand, must acquire training to perform the same sort of maneuvers that their feathered friends perform naturally.

The best example of this is at air shows, where highly trained pilots fly intricate maneuvers with precision and ease. The seemingly effortless manner with which the pilots perform the maneuvers belie the discipline, training, and practice it takes to make the show a success. Despite the obvious beauty of the aerobatic maneuvers, a certain modicum of ever-present danger lurks in the background. Training and planning can reduce the accident potential to a minimum. If this potentiality could not be reduced to a tolerable level, there would probably not be air shows for us to enjoy.

Which brings me to the real topic of this article; some pilots—after being exposed to the splendors of professional pilots performing graceful aerobatic maneuvers—decide to attempt this for themselves. They take their aircraft—generally a small aircraft not engineered for aerobatic flight—out to some remote area and attempt to emulate the professional aerobatic pilots' maneuvers. Granted this is an infrequent occurrence, but it does happen.

Several years ago a complaint was made to our Flight Standards District Office that an airplane was doing loops, rolls, and other assorted maneuvers over a populated area. Activity such as this is not only foolhardy but against the federal aviation regulations. During the course of interviewing witnesses and passengers aboard the flight, we found that the pilot was a private pilot and the aircraft was definitely not an aircraft to be used for performing aerobatics. Needless to say, the pilot disavowed any knowledge of the occurrence and went so far as to say that the town where the aerobatics had been seen was not even on the pilot's route.

The pilot was found to be less than truthful and was given a violation for his actions. The aircraft had undergone stresses that were not in the design limitations and had to undergo a mandated inspection. Now the plot thickens.

About a year or so later that aircraft was sold, but not to some unsuspecting soul buying an airplane and not realizing the stresses the airframe had been through. It was purchased by one of the passengers on the flight that the FAA investigated for illegal aerobatic maneuvers. Even though the aircraft had undergone an inspection, there was always the possibility that stress fractures had gone undetected. The new owner of the aircraft was on a long cross-country flight when something happened that caused an accident. To this day, the reason that it happened has not been determined. You see, the aircraft apparently came apart in flight and sank in several hundred feet of water. All that was found of the airplane was a tip tank. Was the accident caused by stresses imposed a few years back? Could turbulence have caused additional undue stress on the airframe? Did the pilot lose control for some reason? Weather was good at the time, so that was not the problem. We can only speculate as to the factors that caused this tragic accident to occur.

The moral to this story is: You need to get proper flight training in an aerobatic aircraft before experimenting with loops and rolls, etc. Also be sure that the aircraft is certificated for aerobatic use and that the appropriate inspections have been accomplished before flight.

I must say that I have never had as much fun in my life as when I took aerobatic flight lessons and found the pure thrill of flying an aircraft in an aerial ballet. There is nothing quite like it and I would encourage pilots to explore this as an addition to their continuing education in flight. Safely learning the flight characteristics of an airplane and realizing your limitations as a pilot will make you a more competent pilot overall.

Patricia Mattison is the *Safety Program Manager* at the *Juneau* (AK) *FSDO.*

The higher you fly, the less air in the sky or You may feel great...until it's too late

Breathing is one of the most automatic things we do—over 20,000 times a day. Each breath does two things for our body. It expels carbon dioxide when we exhale, and takes in oxygen when we inhale. It's a delicate balance.

Exercise or stress increases the production of carbon dioxide, so we breathe faster to eliminate it and take in more oxygen at a greater rate.

Because of the effects of gravity, the amount of air containing oxygen is greater at sea level. For example, the pressure at sea level is twice that found at 18,000 feet MSL.

Although the percentage of oxygen contained in air at 18,000 feet is identical to that at sea level (a little over 20%), the amount of air our lungs take in with each breath contains half the oxygen found at sea level. Breathing faster or more deeply doesn't help. In fact, because you're consciously over-riding a system that is normally automatic, you'll be compounding the problem by exhaling too much carbon dioxide.

Supplemental oxygen

The solution is simple, familiar to most pilots, and required by Title 14 Code of Federal Regulations §91.211: supplemental oxygen. This regulation specifies a 30-minute limit before oxygen is required on flights between 12,500 and 14,000 feet MSL, and immediately upon exposure to cabin pressures above 14,000 feet MSL. For best protection, you are encouraged to use supplemental oxygen above 10,000 feet MSL.

At night, because vision is particularly sensitive to diminished oxygen, a prudent rule is to use supplemental oxygen when flying above 6,000 feet MSL.

So, when you fly at high altitudes, supplemental oxygen is the only solution. That's because supplemental oxygen satisfies the twin demands of having enough oxygen to meet your body's demands and a breathing rate that excretes the right amount of carbon dioxide.

Hypoxia

Unfortunately, our body doesn't give us reliable signals at the onset of hypoxia—oxygen starvation—unless we have received special training to recognize the symptoms. In fact, it's quite the contrary. The brain is the first part of the body to reflect a diminished oxygen supply, and the evidence of that is usually a loss of judgment.

Hypoxia tests

Altitude chamber tests, in which high altitude flight conditions are duplicated, have shown that some people in an oxygen deficient environment actually experience a sense of euphoria—a feeling of increased well-being. These subjects can't write their name intelligibly, or even sort a deck of cards by suits. Yet, they think they're doing just fine!

Such is the insidious nature of oxygen deprivation. It sneaks up on the unwary and steals the first line of sensory protection—the sense that something is wrong—dreadfully wrong.

The higher you go

Bear in mind, the progressive reduction of oxygen per breath will continue the higher you go. Flying above a layer of clouds that doesn't look too high or flying in the mountains on a clear day are the very environments that have caused many good "flatland" pilots to get into trouble.

Symptoms

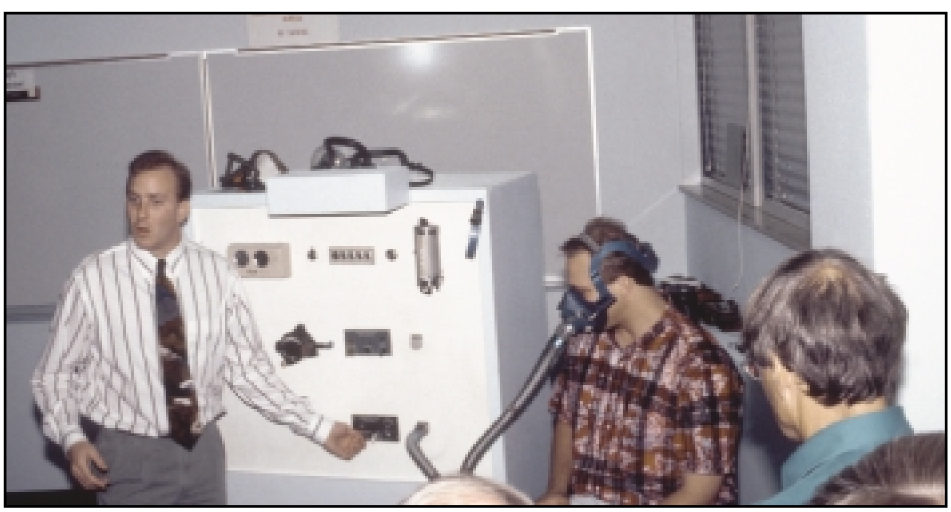
Everyone's response to hypoxia varies. Unless, as we've stated, you've had special training to recognize its symptoms, hypoxia doesn't give you much warning. It steals up on you, giving your body subtle clues. The order of symptoms varies among individuals: increased breathing rate, headache, lightheadedness, dizziness, tingling or warm sensations, sweating, poor coordination, impaired judgment, tunnel vision, and euphoria. Unless detected early and dealt with, hypoxia can be a real killer.

Caution and safety;

So, don't decide you'll try to fly over that range of mountains, thinking you'll turn back if you start to feel badly. You may feel great—until it's too late! Use supplemental oxygen.

Smoking and altitude

A western state pilot lived to tell about this one. Cruising at 13,500 feet MSL over mountainous terrain in his light single, he took a deep drag on his cigarette and next remembered being in a screaming dive with just enough altitude left in which to pull out! That deep drag replaced precious oxygen in his brain with carbon monoxide and he passed out.



Both photos accompanying this article show pilots taking physiological training in an altitude chamber.

Physiological training for pilots

The effects of hypoxia can be safely experienced under professional supervision at the FAA's Civil Aerospace Medical Institute's altitude chamber in Oklahoma City, and at 17 cooperating military installations throughout the U.S. If you would like to attend a one-day physiological training course, ask your FAA Aviation Safety Manager for AC Form 3150-7. You'll learn to recognize your symptoms of hypoxia. It could mean the difference between life and death.

Review

- When you breathe, you inhale oxygen and exhale carbon dioxide.
- With each normal breath, you inhale about one-half liter of air, 20% of which is oxygen.
- At 18,000' MSL, you have half the sea level air pressure; hence, only half the oxygen.
- We all react differently to the effects of hypoxia. Only physiological training can safely "break the code" for you.
- Oxygen starvation first affects the brain; judgment is impaired, so you may not know you are in trouble.

The Medical Facts for Pilots pamphlet, Hypoxia (Publication AM-400-91/10) *was prepared by the FAA Aerospace Medical Institute's Aeromedical Education Division in Oklahoma City, OK. Check its web site at <www.cami.jccbi.gov/aam-400A/400brochure.html> for a list of other pilot safety brochures.*

Tales of an ASI

by Al Peyus

Positional Awareness is not just for IFR

Now that winter is over (for those of us that had a winter), our hearts can return to our one true love. That beautiful winged creature has been sitting on the ramp waiting faithfully for our return while we stayed warm and toasty indoors. Now we are ready to take "her" out to reacquaint ourselves.

So, off to that perfect little piece of heaven, that non-towered airport that has always been the perfect hideaway for those exciting and enjoyable touch-and-goes. The radios are humming and tuned perfectly as we head for the runway. Each and every suggested "best practice" radio calls, starting from the start-up at the tiedown, through taxi, and up to the run-up area are made with care and clarity. The run-up is completed and the perfect aircraft is ready for takeoff. Up to the hold-short line she taxis as a visual check of base and downwind areas is made.

Just before the radio call for departure can be made, there he is, screaming down at us with no warning, no radio call, no nothing! I now this guy! He keeps his airplane on the same ramp close to mine! I know he has a radio! So, why does he choose NOT to use it?

Everyone who has been flying for more then six months has had this experience at one time or other. It is one of the more frustrating occurrences at a non-towered airport. Now, we can understand the "NoRads" (aircraft with no radios) and the occasional new student pilot who forgets to make the calls. But, more and more, the problem of the lack of radio calls at non-towered airports is rearing its ugly head. Without radio traffic pattern reports, there is no positional awareness of other traffic. How can we produce that needed mental picture of the traffic if we have no idea where they are or what they intend to do?

What is positional awareness in aviation? It is the understanding and knowledge of where you are at all times in relation to navaids, route structure, terrain, and the surrounding traffic. This is a term that has been utilized primarily in the IFR environment, but most definitely is just as important for the VFR pilot.

So, what do can be done about it? The *Aeronautical Information Manual* (AIM) publishes the recommended "best practice" procedures for radio use at non-towered airports. (See AIM, Chapter 4, Sections 1, 2, and 3.) It describes for pilots what is the RECOMMENDED procedure for using the aircraft radio. Yes, it is only "Recommended!" Just like the pattern indicators by the windsock, wind tee, or tetrahedron. But these "suggested procedures" are for everyone's safety and are based on sound, safe, "best practice" procedures. (The web site for the AIM and other air traffic publications is <http://www.faa.gov/atpubs/>.)

The intent of the AIM is to keep all pilots on the same page, doing the same procedures, the same way, at every non-towered airport to minimize traffic conflicts and increase safety! If we are all doing the same thing and respecting each other's rights, safety increases. It is just like the vehicular traffic in the mall parking lot. We use the same procedures on that private property as we do on the public road. The mall property does not have enforceable rules for vehicular traffic. But, we all "obey" the same rules of the road as we do on public roadways. It is easier, safer, and more practical. We are used to it. It makes sense! So, why not use the same philosophy for non-towered airports? And the "rules" are already published in AIM!

A perfect example of one of the problems of missing communication and missing positional awareness at a non-towered airport happened to me while out flying recently. As I was flying in the traffic pattern of a non-towered airport, I heard a pilot, as he flew over the top of the airport AT TRAFFIC PATTERN ALTITUDE, make his FIRST radio call asking, "…who was in the pattern?" Both of us acknowledged we were in downwind with one about to turn base leg. The pilot completed his mid-field crossing at traffic pattern altitude, turned directly into downwind behind the first aircraft, and, directly in front the second aircraft. I was in the second aircraft. (If this sounds familiar, I mentioned this incident in the last

issue.) The proximity of his aircraft to mine would have qualified as a "near miss" at a towered airport. Now, where did he learn non-towered airport and radio procedures?

I had the "opportunity" to talk to this pilot shortly after he got on the ground along with the resident airport Aviation Safety Counsellor. The pilot admitted that he heard the call for two aircraft in the pattern, but only saw the one he followed. After further questioning, he admitted he was taught to fly over the center of the airport at 1,000 feet MSL and to make his first radio call as he did. Further, he was taught to turn directly into the downwind leg for landing from this overhead approach. His instructor had taught him this procedure, "…right out of the AIM!"

Now, I see this as three different problems. First, did the instructor really teach this method of traffic pattern entry while citing the AIM? Second, why did the pilot blindly believe and follow the instructor's directions, even, as he admitted, after reading the AIM on non-tower pattern recommendations? Thirdly, was this pilot ever taught positional awareness?

There is a human issue that affects pilots. We all have a little more "ego" then the "average guy" on the street. Our time is more important. Our aircraft is more expensive, faster, burns more fuel, and, therefore, should have the right of way. Or we are better pilots than the next person so we can do the "unusual" non-standard pattern entry safely getting us ahead of the other guy. There are even those occasions when I hear, when the weather is CAVU (Clear Air, Visibility Unlimited), "With all this visibility, I don't need to use the radio. I can see all the traffic!" That statement has always failed to give me that warm and fuzzy feeling! Too many mid-air accidents occur in CAVU weather!

No matter what the reasoning or rationalization, when we use a different pattern entry than what is offered in the AIM and/or the *Airport/Facility Directory*, we are betting on safety. We take a chance that what we are doing will be accomplished without causing harm, damage, or infringe on someone else's right to the airport's airspace.

Remember back to your student pilot days. Your instructor told you to use the same procedures in downwind, base, and final for each landing so there will be little that has to change no matter what you are doing. Why not take that same philosophy and apply it to the non-towered airport traffic pattern work?

If we all fly the recommended departure, entry, and patterns offered in the AIM (Chapter 4, Sections 1, 2, and 3), there would be little or no confusion of where everyone is, what they are doing, or how they plan to accomplish the departure or landing! This provides protection for all of us by letting us know where an aircraft is supposed to be when entering the pattern, flying over the top, entering downwind, or going in on final. It also makes it easier for all of us to keep our positional awareness accurate.

So, what is the recommended entry into a non-towered airport? Let's all get on the same page in the AIM to begin this refresher. I am going to start at paragraph 4-1-9, "Traffic Advisory Practices at Airports Without Operating Control Towers." (If you are using a paper version, it is on page 4-1-2 in the AIM.) First and foremost, there is no greater way to increase safety then through the use of the radio announcing our intentions and location! Without communication, the next guy will have to use ESP to know where we are and what we intend to do. At every non-towered airport there are at least three ways to utilized the aircraft radio.

1. Communicate through the local Flight Service Station (FSS).
2. Communicate through the local UNICOM and the FBO (Fixed Base Operations).
3. Communicate through the local MULTICOM broadcasting in the "blind."

All we have to do is make sure we are using the correct published radio frequency. It is listed in the *Airport/Facility Directory*, as well as printed on the sectional near the airport symbology, along with the other pertinent airport data. No matter the means, the more we use the radio, the better the other pilots around us will have positional awareness, as we increase our own positional awareness.

So, when do we make the first call? The AIM is still our "best practices" guide. Let's break it down to three specific areas of flight. First is outbound, taxiing from the tie-down. AIM recommends that we make a call before taxiing and before taking the active for departure. We can add to the departure call what direction and altitude we will be departing. Also, it is recommended that we listen to the radio for that airport for the next 10 miles for inbound traffic, unless there is a need to talk to ATC because Flight Following, Temporary Flight Restriction (TFR) control, Class B airspace avoidance/penetration, or what ever is needed.

Next is the transit aircraft. If you are passing through the area above the traffic pattern, but you will be in or close to the airspace around the airport, it is always a good practice to monitor the traffic frequency while in that airspace. Surprises in aviation are best saved for the time spent on the ground doing our "hangar flying."

The last is inbound. AIM requests that as we fly to a non-towered airport, we make the first call 10 miles out. What a great time to make that call! We are now listening to the frequency, getting the most recent weather and traffic pattern, and broadcasting our intentions. A perfect chance to update our positional awareness! That puts us all on the same page.

While you have the AIM out, look at Table 4-1-1, Summary of Recommended Communication Procedures (top of page 4-1-3 in paper version). It describes the different locations for the recommended radio calls for outbound traffic as well as those inbound. As you look at this chart, a pattern develops that is hard to miss.

When outbound, we call taxiing, ready to take the active, and departing

the active. During this transmission we would also tell those listening which way we will depart the area and at what altitude to alert them of our intended actions outbound from the non-towered airport. Now, no one can say they did not know where or how we are "getting out of Dodge." If someone is coming into the airport from the direction we will be departing, it gives them a chance to let us know they are coming in from that location and what their intentions are. With these transmissions, all in the area have a better idea who is where.

Inbound traffic should start making the calls 10 miles out on the appropriate frequency. That is, only if we are not committed to talking to ATC for Flight Following or other needs of ATC. The next call recommended is our entry to downwind, then base, and lastly, final. If there are several aircraft in pattern, it also might be safe and courteous to make a call as we clear the runway.

There are going to be several pilots out there who will still refuse to use their radio in VFR conditions because they "can see all the traffic." At least the rest of us will be doing every thing that can be done to be safe, keep every one aware of where we are, what we intend to do, and how we are doing it. That keeps the positional awareness mental picture of all the traffic clear in everyone's mind. And that makes for safer flying!

One thing we as pilots can do to help promote communication is always talk radio use with other pilots every opportunity. This is our chance to discuss radio usage, the "best practice" of making those radio calls, and keeping the skies safe. Isn't that what it is all about? We can all use the same airspace, enjoy the magic of flying, share it with others, and still be safe, courteous, and respectful of the other pilot's needs and rights to enjoy themselves. What a concept!

Al Peyus is an Aviation Safety Inspector in the Flight Standards Service's General Aviation and Commercial Division.

Calendar of Events

May 1-2, 2004. McDonald's® Air & Sea® Show, Fort Lauderdale, Florida

The two-day extravaganza has something for everyone, including world-class military and civilian air, water, and entertainment activities on Fort Lauderdale beach. For more information call the McDonald's® Air & Sea® Show hotline at (954) 527-5600 ext. 4 or visit its web site at <www.nationalsalute.com> or <www.airseashow.com>.

June 5-6, 2004. Heroes of the Heartland Airshow, Little Rock, Arkansas

The Little Rock Air Force Base will host a special tribute to those who defend our country. Aerial demonstrations will focus on past, present, and future flight. For more information, check its web site at <www.littlerock.af.mil> or call (501) 987-3353.

June 18-20, 2004. Aerospace America International Air Show, Oklahoma City, OK

Warbirds, aerobatics and static displays at Will Rogers Airport. For more information, check its web site at <www.aerospaceokc.com>, or call (405) 685-9546.

June 19-20, 2004. Air Fest 2004, Fayetteville, Arkansas

To be held at the Fayetteville Regional Airport. For more information, contact Judy Hammond at (479) 521-4947

June 21-25 and July 19-23 (Returning participants only), June 29-July 2, July 6-9, and July 13-16, 2004. McCall Mountain Canyon Flying Seminars, McCall Idaho

These seminars are FAA WINGS approved instruction in Idaho backcountry flying. For more information, check its web site at <www.mountaincanyonflying.com> or call (208) 634-1344.

July 27-August 8, 2004. EAA AirVenture OshkoshTM 2004, Oshkosh, Wisconsin

For more information, check its web site at <www.airventure.org> or call (920) 426-4800.

September 13-16, 2004. Bird Strike Committee USA/Canada, Baltimore, Maryland

The meeting will be held at the Hyatt Regency. Anyone interested in minimizing conflicts between birds and aviation and reducing wildlife strike hazards will find more information at <www.birdstrike.org> or by calling (419) 625-0242.

And The Winner Is!

by Bill O'Brien

It is the start of the spring allergy season! So my first sneeze is my reminder to give everyone a heads up that his year's 2004 FAA's Aviation Maintenance Technician (AMT) awards program contest has less than six months to go before it ends on December 31.

This year's contest prizes are over the top and I will get to them shortly. But before I do, I need a moment of your time to cover the AMT program and the contest for the uninitiated.

The Program

The AMT awards program was started in 1993 and provides for FAA recognition of maintenance or regulatory training for the mechanics, repairmen, Part 147 students, and un-certificated folks working full-time in Part 121/135 air carriers. Individuals are recognized with a bronze, silver, gold, ruby, or diamond tie/lapel pin, plus the appropriate certificate based on the training received. You can earn a bronze award for six hours of training, a silver for 12 hours, a gold for 26 hours, a ruby for 60 hours, and a diamond award for 100 hours of training. Last year over 24,000 AMT awards were issued.

Employers can also receive an FAA award based on the percentage of their eligible employees who earn an AMT award. For example, a company can earn a bronze AMT Certificate of Excellence if 5% of their eligible employees get an AMT award. More committed companies can earn an AMT silver certificate for 10%, or a gold for 15%, or a ruby for 20%, or the diamond Certificate of Excellence if 25% of their eligible employees earn any one of the five AMT training awards. Employers who train 100% of their workforce under the AMT program are eligible for the top award, a 100% Diamond Award of Excellence plaque issued by the Aircraft Maintenance Division in FAA headquarters. Additional information and how to apply for this program is in Advisory Circular (AC) 65.25, *Aviation Maintenance Technician Awards Program*. The AC is available at your local FSDO or on the FAA's web site <http://www.faa.gov/avr/afs/> under information and advisories

The Contest

The AMT contest is managed and run by an all-volunteer industry group of exceptional individuals who have jointed together to help foster training for mechanics and technicians by promoting the AMT awards program. This all-volunteer group calls itself the AMT Safety Awards Program and Steering Committee and is composed of the following individuals. The Chairman is Tom Hendershot of Frontier airlines; in the Secretary position is Jennifer Baker of Baker School of Aeronautics. Other members are: Jim Smith, Director of Training for Delta Airlines; Mike Mulcare of the Aviation Maintenance Career Commission; Hasnain Ansari of Swiss Port; Matt Thurber, Aviation Maintenance magazine; Greg Napert of AMT magazine; Brian Finnegan of PAMA; and Paul Jones, FAA Aviation Safety Inspector out of the Nashville FSDO who servers as a non-voting, FAA advisor for the committee. These folks deserve at the least a large thank-you for all their hard work from all of us, because they are the ones who petition industry to donate prizes and set up and run the contest drawing every year at the PAMA convention.

In closing, I would like to remind you that your odds of winning one of the 20 prizes listed on this page are way better than any odds for a state lottery. But like a state lottery you have to participate in the AMT program in order to be eligible to win. It is not very hard to participate. Upon earning one of five AMT awards the FAA inspector will submit your AMT application to the AMT awards committee. Your application will then be added to the others and put in the big drum for the drawing at the PAMA convention in May of 2005. But even if you do not win a prize you do win! You got yourself some maintenance training and training like that is like having money in the bank. Now that you have been reminded, does anybody have a tissue?

Bill O'Brien is an Aviation Safety Inspector with Flight Standards Service's Aircraft Maintenance Division.

AMT Award Prizes for 2004

Grand Prize is sponsored by Delta Airlines.
Winner and one guest will receive -

1. A four-night vacation to any Delta domestic city in the U.S. contiguous 48 states.
2. Air transportation to and from Delta domestic City.
3. $300.00 spending money.

Aircraft Electronic Association (AEA) sponsored prize:
Winner will receive -

1. Round-trip coach airfare to/from AEA 2006 Convention
2. Lodging at the AEA Convention Hotel for three nights.
3. Full convention registration for the 2006 AEA Convention and Trade Show

AMT magazine sponsored prize:
Winner will receive $500

Aircraft Technical Publishers sponsored prize:
Winner will receive a one-year subscription to the Aircraft Technical Publishers U.S. Regulatory Library on CD Rom or DVD.

Alaska Airlines sponsored prize:
The winner will receive two coach, round-trip tickets on Alaska Airlines anywhere that Alaska Airlines flies.

The Association for Women in Aviation Maintenance sponsored prize:
The winner will receive a one-year membership in the Association for Women in Aviation Maintenance.

Aviation Data Research sponsored prize:
The winner will receive the Aviation Data Research, PMA Parts Finder CD-Rom with one year's worth of updates.

***Aviation Maintenance* magazine sponsored prize:**
The winner will receive a one-quarter page, four-color advertisement in one issue of Aviation Maintenance magazine.

Baker School of Aeronautics sponsored prize:
The winner will receive -

1. At no charge, a five-day inspection authorization course at Baker's School of Aeronautics located in Nashville, Tennessee.
2. The Baker's Inspection Authorization Kit
3. The FAA testing fee. The test will be administered if the winner meets the FAA requirements.
4. Five night stay at the Wilson Inn.
5. Transportation to/from school and the airport provided by the Wilson Inn
6. $400 cash to help cover training expenses.

CAE Simuflite sponsored prize:
The winner will receive a maintenance initial training event of his/her choice a CAE Simuflite's Dallas/Forth Worth, Texas Training center. (Not including travel, lodging, or food)

Flight Safety International sponsored prize:
The winner will receive attendance in the online Principals of Troubleshooting Course.

Frontier Airlines sponsored prize:
The winner and a guest will receive one round trip ticket to any destination that Frontier Airlines flies.

Professional Aviation Maintenance Association (PAMA) sponsored prize:
The winner will receive -

1. Free one-year membership or renewal in PAMA
2. PAMA logo polo shirt
3. PAMA baseball hat

Skyway Airlines sponsored prize:
The winner will receive two round trip, positive-space tickets to anywhere that Midwest Airlines or Midwest Connect Airlines flies.

Superior Air Parts sponsored prize:
The winner will receive -

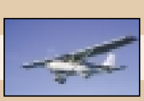
1. A Hawkeye Boroscope Kit # HH12kit.
2. A Fluke Autoranging Digital Multimeter # FLUKE 12

Tdata sponsored prize:
The winner will receive a one-year subscription to Tdata's IA approach regulatory library on CD-Rom with biweekly updates or a one–year subscription to Tdata new MTrax maintenance-tracking software.

Timco sponsored prize:
The winner will receive a Snap-On Gift Certificate in the amount of $2,000.

US Airways sponsored prize:
The winner will receive two positive-space, round trip, coach-class domestic tickets to include Canada, Mexico, and the Caribbean.

Women in Aviation International(WAI) sponsored prize:
The winner will receive a complimentary registration to WAI's annual March conference and a one-year membership.



Aviation Maintenance Alerts

AIR NOTES:
A TRIBUTE TO THE FORGOTTEN MECHANIC

Through the history of world aviation many names have come to the fore....

Great deeds of the past in our memory will last, as they're joined by more and more....

When man first started his labor in his quest to conquer the sky
he was designer, mechanic, and pilot, and he built a machine that would fly....

But somehow the order got twisted, and then in the public's eye
the only man that could be seen was the man who knew how to fly....

The pilot was everyone's hero, he was brave, he was bold, he was grand,
as he stood by his battered old biplane with his goggles and helmet in hand....

To be sure these pilots all earned it, to fly you have to have guts....

And they blazed their names in the hall of fame on wings with bailing wire struts....

But for each of these flying heroes there were thousands of little renown,
and these were the men who worked on the planes but kept their feet on the ground....

We all know the name of Lindbergh, and we've read of his flight to fame....

But think, if you can, of his maintenance man, can you remember his name?

And think of our wartime heroes, Gabreski, Jabara, and Scott....

Can you tell me the names of their crew chiefs?

A thousand to one you cannot....

Now pilots are highly trained people, and wings are not easily won....

But without the work of the maintenance man our pilots would march with a gun....

So when you see mighty aircraft as they mark their way through the air,
the "grease-stained man" with the wrench in his hand is the man who put them there....

The anonymous author of this composition must surely have had an appreciation and respect for those of us past and present who endeavor to promote aviation safety to the highest possible level. We endure the environmental extremes of the flight line and are content to allow those who are pilots to reap the glory of the public eye. We are content to remain in the background with the calm assurance that we have given our all in the pursuit of safety in aviation. We swell with pride as we watch the product of our labor rise gracefully from the runway and embrace a pristine sky.

The greatest and most valued recognition we can hope to receive comes from our peers and from within. The Aviation Maintenance Awards Program (see article on page 26) has become one of the most coveted forms of recognition for maintenance personnel. This program stresses education, training, and superior performance, as well as the other attributes mentioned here, to praise those worthy of its tests. Our most valued assets are the tools of our trade, our reputation and integrity, and the respect of our customers who put their lives in our hands.

With the many technological and sociological advances in aviation over the years, many of the ideas put forth in this poem are no longer valid. “Bailing wire” for example, is very much frowned upon as wing strut and hinge pin material.

Maintenance personnel, for the most part, no longer fit the stereotype “grease-stained man” with a rag hanging from his pocket, cap with a turned up bill, and a less than intelligent look on his face, is purely a fictional character created to provide contrast and further embellish the flyer. Also, not all maintenance men are men; there are many women now who have earned a position among the ranks and have made significant contributions to aviation maintenance safety.

Through the evolution of aviation maintenance, the requirement of brawn has been replaced by an ever-expanding requirement for brainpower. With the complex nature of today’s aeronautical products has come maintenance people who can analyze, forecast, and troubleshoot problems by use of the computer. (Usually, we do not get “grease stained” from this activity.) The ever-changing demands of maintaining today’s aircraft present a new challenge each day which is met with an eager enthusiasm to learn something new and to put things right. We approach each new challenge with pride and confident demeanor, which seems to say, “You can’t break anything that I can’t fix!”

ELECTRONIC VERSION OF MALFUNCTION OR DEFECT REPORT

One of the recent improvements to the Flight Standards Service Aviation Information Internet web site is the inclusion of FAA Form 8010-4, *Malfunction or Defect Report*. This web site is still under construction and further changes will be made; however, the site is now active, usable, and contains a great deal of information.

Various electronic versions of this form have been used in the past; however, this new electronic version is more user friendly and replaces all other versions. You can complete the form online and submit the information electronically. The form is used for all aircraft except certificated air carriers who are provided a different electronic form. The Internet address is: <http://av-info.faa.gov/isdr/>.

When the page opens, select “M or D Submission Form” and, when complete, use the “Add Service Difficulty Report” button at the top left to send the form. Many of you have inquired about this service. It is now available, and we encourage everyone to use this format when submitting aviation, service-related information.

The *Aviation Maintenance Alerts* provide a common communication channel through which the aviation community can economically interchange service experience and thereby cooperate in the improvement of aeronautical product durability, reliability, and safety. This publication is prepared from information submitted by those who operate and maintain civil aeronautical products and can be found on the Web at <http://www.faa.gov/avr/afs>. Click on “Maintenance Alerts” under Regulations and Guidance. The monthly contents include items that have been reported as significant, but which have not been evaluated fully by the time the material went to press. As additional facts such as cause and corrective action are identified, the data will be published in subsequent issues of the Alerts. This procedure gives Alerts’ readers prompt notice of conditions reported via *Malfunction or Defect Reports, Service Difficulty Reports, and Maintenance Difficulty Reports*. Your comments and suggestions for improvement are always welcome. Send to: FAA; ATTN: Aviation Data Systems Branch (AFS-620); P.O. Box 25082; Oklahoma City, OK 73125-5029.

Airport Surface Operations At Non-Towered Airports And Airports When The Tower Is Closed

The following information comes from Advisory Circular 91-73, Part 91 Pilot and Flight Crew Procedures during Taxi Operations and Part 135 Single-pilot Operations. *This advisory circular provides guidelines for the development and implementation of standard pilot procedures for conducting safe aircraft operations on the airport surface. It focuses on the activities occurring on the flight deck/cockpit (e.g., planning, communicating, coordinating), as opposed to the actual control of the aircraft (e.g., climbing, descending, maneuvering). Although there are many similarities, taxi operations for single piloted aircraft, as opposed to taxi operations for aircraft that require more than one pilot, present distinct challenges and requirements.*

Over the past several issues, we have presented portions of this advisory circular. This section is devoted to operations at non-towered airports and airports when the tower is closed.

The absence of an operating airport traffic control tower creates a need for increased vigilance on the part of pilots operating at those airports. There are also specific communications procedures that differ from those used at towered airports. As is the case at towered airports, planning, clear communications, and enhanced situational awareness during airport surface operations will reduce the potential for surface incidents at airports without an operating control tower. This section will focus on those aspects of airport surface operations that are unique to airports without an operating control tower.

PLANNING

The following should be considered when operating at an airport without an operating control tower:

(1) Familiarize yourself with the local traffic pattern. Remember, not all airports use a standard traffic pattern. Don't forget to check the pattern altitude.

[CAUTION: During calm or nearly calm wind conditions, be aware that pilots may have a choice of what runway to land on or take off from, and that other pilots' choices may conflict with your own choice. Also, aircraft may be utilizing an instrument approach procedure to runways other than the runway in use for VFR operations. The instrument approach runway may intersect the VFR runway.]

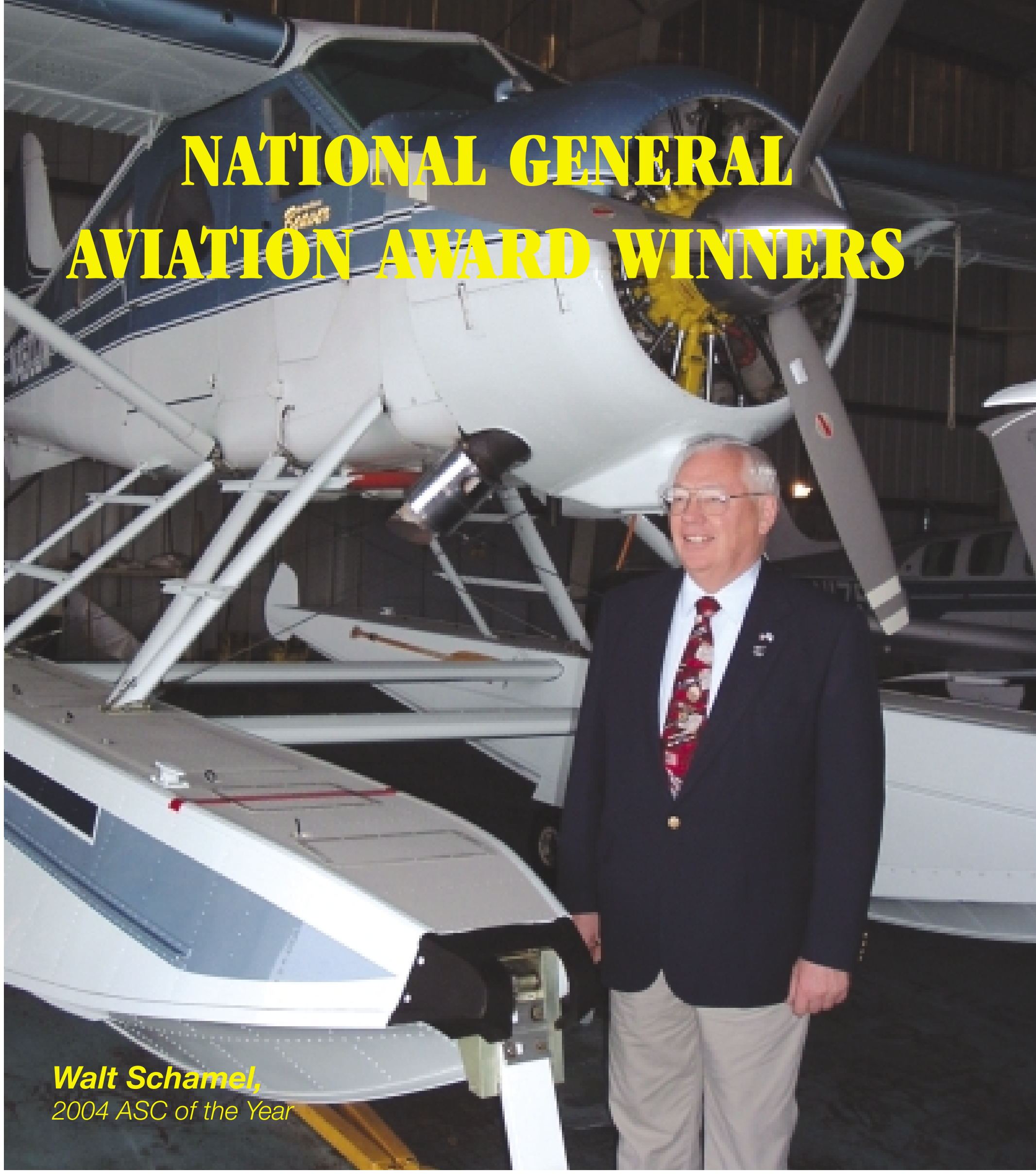
(2) If there is more than one crewmember, brief your taxi plans and be sure that all crewmembers have a common understanding of the plan.

SITUATIONAL AWARENESS

While maintaining situational awareness is important in all circumstances, it is particularly important when operating at an airport without an operating control tower. To achieve situational awareness, you should be fully aware of your intended taxi route and be able to follow the planned route correctly. Without ATC to verbally tell you where you should taxi and where and when to stop, you must rely on visual cues to maintain situational awareness and maintain your planned taxi route. These visual cues include airport signs, markings, and lighting, together with the airport diagram. Other things to consider that can help you maintain situational awareness while operating at an airport without an operating control tower:

(1) Monitor the appropriate frequency. Listen to what the pilots of other aircraft on the frequency are saying.
(2) If possible, monitor the approach control frequency to alert you to IFR traffic inbound to the airport.
(3) Prior to crossing the hold short line or entering or crossing any runway, scan the full length of the runway, including approach areas. Do not engage in any other flight deck/cockpit duties while crossing a runway. Give your full attention to crossing and clearing the runway.
(4) Use exterior lighting to make your aircraft more conspicuous to other pilots.

NATIONAL GENERAL AVIATION AWARD WINNERS



Walt Schamel,
2004 ASC of the Year

COMMUNICATION

Some of the most important guidelines for radio communications at airports without an operating control tower include:

(1) Ensure that your radio is tuned to the appropriate Common Traffic Advisory Frequency (CTAF) or Unicom frequency. Monitor the CTAF frequency for a few minutes before beginning taxi to help you "get the picture."
(2) Ensure that the frequency is available by listening before transmitting.
(3) Transmit your intentions clearly, but be as brief as possible.
(4) Always state the name of the airport at which you are operating at the beginning and end of your transmission.
(5) Use your full call sign whenever there is another aircraft on the frequency with a similar call sign.

[Caution. Some aircraft operating at airports without operating control towers may not be equipped with a radio. You must remain alert for them.]

TAXIING

Except for not having communications with ATC, taxi operations are the same as at towered airports.

For more information about operations at non-towered airports, refer to the current versions of AC 90-42, Traffic Advisory Practices at Airports Without Operating Control Towers, *and AC 90-66*, Recommended Standard Traffic Patterns and Practices for Aeronautical Operations at Airports without Operating Control Towers. *Also, follow Runway Incursion Prevention Best Practices presented in Appendix 1 of A 91-73C. To obtain the advisory circular in its entirety, it and other advisory circulars can be found at <www.faa.gov/runwaysafety/cockpit.cfm>.*

The General Aviation Awards Program and the Federal Aviation Administration (FAA) have recognized a small group of aviation professionals in the fields of flight instruction, aviation maintenance, avionics and safety for their contributions to aviation safety and education. This year's national award winners are Douglas "Doug" Stewart of North Egremont, Massachusetts, the Certificated Flight Instructor (CFI) of the Year; Gary Stephen Goodpaster of Cincinnati, Ohio, the Aviation Maintenance Technician of the Year; Keith Bryan Lewis of Spartanburg, South Carolina, the Avionics Technician of the Year; and Walter Schuyler "Walt" Schamel of Winter Haven, Florida, the Aviation Safety Counselor of the Year.

FAA Administrator Marion C. Blakey will present this year's national awards during a "Theater in the Woods" program at EAA AirVenture™ Oshkosh 2004 in Oshkosh, Wisconsin.

"These awards highlight the important role played by these individuals in promoting aviation safety and education," said JoAnn Hill, General Aviation Awards Committee chairman. "The awards program sponsors are pleased that these outstanding aviation professionals will receive the recognition they so richly deserve before their peers in Oshkosh."

This awards program is a cooperative effort between the FAA and numerous industry sponsors. The selection process begins at local FAA Flight Standards District Offices (FSDO) and then moves on to the nine regional FAA offices. Panels of aviation professionals within the various fields then select the national winners.

Organizations providing support and sponsorship for the awards program in-

clude the Aircraft Owners and Pilots Association (AOPA), the Experimental Aircraft Association (EAA), the General Aviation Manufacturers Association (GAMA), the National Air Transportation Association (NATA), and the National Business Aviation Association (NBAA) along with the Aircraft Electronics Association (AEA), the Aeronautical Repair Station Association (ARSA), the Federal Aviation Administration (FAA), the Helicopter Association International (HAI), the National Association of Flight Instructors (NAFI), the National Association of State Aviation Officials (NASAO), the Professional Aviation Maintenance Association (PAMA) and Women in Aviation International (WAI).

Information about the General Aviation Awards Program, as well as applications for next year's General Aviation Industry Awards, is available at <www.faa.gov/avr/afs/safety/INDUSTRY.cfm>.

Doug Stewart,
2004 Nat'l Certificated Flight Instructor of the Year

Certificated Flight Instructor of the Year

Doug Stewart has been a CFI since 1991 and owns Doug Stewart Flight Instruction (DSFI), a flight school located at Kline Kill Airport (NY1) in Ghent, New York. DSFI specializes in confidence-building instrument training programs and tailwheel transitions. The school is also Cirrus certified and is approved by several large aviation insurers to offer *Malibu/Mirage* recurrent training.

Stewart's considerable contributions to the FAA's safety program make him well known throughout the New England area. "Flying the Hudson River VFR Corridor" is a comprehensive, multimedia presentation Stewart developed that has received wide acclaim from the region's pilots.

For enjoyment, he flies a 1947 Piper *Super Cruiser* (PA-12). His extensive experience in that aircraft landed him a monthly column in *Vintage Airplane*, a publication of the Vintage Aircraft Association. The column is entitled "The Vintage Instructor" and is devoted to training and safety issues. He also serves as an FAA designated pilot examiner for the Albany FSDO.

For the last several years, Stewart has served as Chief Flight Specialist in AirVenture's Flight Instructor Headquarters operated by the National Association of Flight Instructors (NAFI). In recognition of his exceptional efforts on behalf of NAFI and aviation education, he was named the 2003 Flight Specialist of the Year. In addition, he is one of approximately 400 aviation educators worldwide who holds a Master CFI designation. This professional accreditation is granted by NAFI to outstanding aviation educators who are demonstrating an ongoing commitment to excellence, professional growth, and service to the aviation community.

Stewart represented the Windsor Locks FSDO as well as the FAA's New England Region.

Gary Goodpaster,
2004 Nat'l Aviation Maintenance Technician of the Year

Aviation Maintenance Technician of the Year

Gary Goodpaster graduated with honors from Cincinnati State Technical College in August of 1975 and started his aviation maintenance career as an airframe and powerplant mechanic (A&P). After graduation, he worked as an A&P for several aircraft maintenance facilities in the Cincinnati area including Key Aviation and Federated Department Stores.

In 1985, he began maintaining the fleet of aircraft operated by the Kroger Company at Cincinnati's Lunken Field (LUK). In February of 2000, he was granted inspection authorization by the FAA and now serves as Kroger's chief of aircraft maintenance. He also holds an FCC General Radio Operator's license.

His achievements in the maintenance field opened yet another door for him. In 1999, he began serving as an adjunct instructor of aviation at Cincinnati State, his alma mater. At the same time, he was also recognized as a distinguished alumnus by the college. He is a longtime member of the Professional Aviation Maintenance Association

(PAMA), is a recipient of PAMA's Joe Chase Award and presently serves as president of the Association's Cincinnati chapter.

When not overseeing the maintenance of Kroger's aircraft fleet, he enjoys flying radio controlled airplanes, serves as an aviation safety counselor for the Cincinnati FSDO, and is a Boy Scouts of America merit badge counselor. In addition, he holds a private pilot certificate and is a member of the Cessna Pilots Association.

Goodpaster represented the Cincinnati FSDO as well as the FAA's Great Lakes Region.

Avionics Technician of the Year

Keith Lewis developed an interest in electronics as a teenager in the 1960s. This interest soon led to a Ham radio operator's license. However, it was the United States Air Force that provided him with his start in the avionics field. In 1967, he completed Air Force Avionics Technician School in Biloxi, Mississippi. After practicing his trade for two years, he joined the 460th Tactical Reconnaissance Squadron in the Republic of Viet Nam. In recognition of his outstanding achievement and meritorious service while troubleshooting and repairing avionics equipment, he was awarded the Air Force Commendation Medal.

In June of 1970, Lewis joined Stevens Aviation Incorporated as an avionics technician. Stevens Aviation is a full service FBO located at South Carolina's Greenville-Donaldson Center Airport (GYH). In August of 1982, he was promoted to avionics service manager, a position he still holds today. In that capacity, he does scheduling, works directly with customers and supervises the avionics repair department.

Keith Lewis,
2004 Nat'l Avionics Technician of the Year

During almost four decades in the avionics field, he has attended more than 35 avionics factory training schools along with numerous weather radar and management seminars. He also regularly participates in safety seminars offered by the FAA's West Columbia FSDO and is an active member of the Aircraft Electronics Association (AEA).

His early interest in amateur radio continues unabated. Lewis now holds an FCC General Radio Telephone license with radar endorsement. He is an active member of the Spartanburg Amateur Radio Club as well as the American Radio Relay League. He also participates in the Weather Skywarn program.

Lewis represented the West Columbia FSDO as well as the FAA's Southern Region.

Aviation Safety Counselor of the Year

Walt Schamel's involvement in aviation began with his first flight in 1956 as a Civil Air Patrol (CAP) cadet. Within ten years of that first flight, he was working as manager of the U.S. Army Flying Club at Fort Ord, California. In that position, he immediately recognized a need for aviation safety counseling and began offering monthly flight education and safety meetings to club members. Thus, he became an "aviation safety counselor" before that FAA designation even existed. Since then, he has served as an FAA Aviation Safety Counselor (ASC) or Safety Program Manager in nine different FSDOs nationwide.

The Civil Air Patrol has long been a part of Schamel's life. After his days as a CAP cadet in the mid-fifties, he moved up through the ranks. From 1994 to 1997, he served as the CAP's Oklahoma Wing commander. He is also credited with the development of CAP's check pilot standardization program.

His commitment to safety education continued throughout his 25-year FAA career as an aviation safety inspector. In that capacity, he has worked at FSDOs in Tampa, Orlando, and Fairbanks. He also did a 15-year stint with the FAA's Pilot Examiner Standardization Team in Oklahoma City where he conducted worldwide examiner training seminars.

Since retiring in 2001, Schamel has worked as training manager for Airline Transport Professionals at Craig Airport (CRG) in Jacksonville, Florida. A certificated flight instructor (CFI) for more than three decades, he is one of approximately 400 aviation educators worldwide who holds a Master CFI designation.

Even in retirement, Schamel's support of the FAA's safety program continues unabated. He is active in the WINGS and PACE programs while volunteering hundreds of hours each year as a member of the FAA Safety Center's production crew in Lakeland, Florida, home of Sun 'n Fun®. He also actively recruits and trains new ASCs in the Orlando area.

Schamel represented the Orlando FSDO as well as the FAA's Southern Region.

• Zero-Zero Memories

When I learned to fly instruments, my instructor taught me to do zero-zero takeoffs in single-engine piston airplanes. It was a huge challenge and very rewarding when I learned to make it work. So, when I became an instrument instructor, I taught my students zero-zero takeoffs. Years later it occurred to me that if one of my students takes off zero-zero, runs into a problem, and needs to land shortly after takeoff, there is no chance they will be able to land back at the departure airport because the weather there is below landing minimums. In fact, if they had an engine failure anytime while flying over that zero-zero area, they would have to make an off-airport landing, dead stick, and they would not know what they were going to hit until after they hit it!!! I stopped teaching zero-zero takeoffs. I stopped practicing zero-zero takeoffs. I wish I had never learned the technique. It is something that I really don't need to know. Dean Chamberlain is absolutely right – zero-zero does not add up.

Scott Gardiner, CFI-AIM
Seattle, Washington

Thanks for your comments. It is relatively easy to teach or learn a new skill. The challenge is having the decision-making skills to know when you should not use that new skill.

FAA AVIATION NEWS welcomes comments. We may edit letters for style and/or length. If we have more than one letter on the same topic, we will select one representative letter to publish. Because of our publishing schedules, responses may not appear for several issues. We do not print anonymous letters, but we do withhold names or send personal replies upon request. Readers are reminded that questions dealing with immediate FAA operational issues should be referred to their local Flight Standards District Office or Air Traffic facility. Send letters to H. Dean Chamberlain, FORUM Editor, FAA AVIATION NEWS, AFS-805, 800 Independence Ave., SW, Washington, DC 20591, or FAX them to (202) 267-9463; e-mail address:
Dean.Chamberlain@faa.gov

• First Flight of Another Kind

Please would you give my compliments to Marion Blakey and pass on the information that the first pure jet, the de Havilland *Comet*, made its first flight on 27 July 1949. The first full fare passenger flight was on 2 May 1952 from London to Johannesburg.

Regrettably, the *Comet 1* was withdrawn from passenger transport service in April 1954, after three aircraft suffered fatal structural fatigue failures at the corner of a window.

The lessons taught by this experience were embodied in the later *Comets*. By July 1954 the *Comet 3* was flown for the first time, this was developed into the *Comet 4*, which, in BOAC service was used on the North Atlantic route from 1958, and were to continue flying world-wide into the 1970s.

I understand that aviation is so big in the U.S. that events elsewhere can be overlooked. I hope you do not mind my banging a small drum on behalf of the Brits.

Enjoy the magazine, many thanks.
Peter J Davis
(FAA and CAA pilot)
via the Internet

Thanks for sharing the information.

• Change of URL Address

In the March/April 2004 *FAA Aviation News*, the web address listed in the Runway Safety Corner article for obtaining Advisory Circular 91-73, *Part 91 Pilot and Flight Crew Procedures during Taxi Operations and Part 135 Single-pilot Operations*, doesn't work. Has it changed and if so what is the new web address?

Via the Internet

The FAA web site is being updated and, unfortunately, we got caught during the transition and printed the wrong URL address. The correct address is <www.faa.gov/runwaysafety/cockpit.cfm>.

• A Global Equation

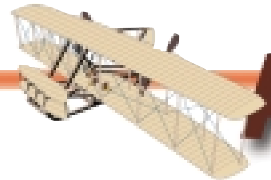
It was after my friend introduced me to the world of Californian general aviation during my professional days that I began reading your magazine with the most valuable contributions to flight safety. It was exactly 30 years ago. This not only contributed to my accident-free *Comanche* life, but also kept me in contact with the more easy ways of American flying versus European over-regulations.

Nevertheless I missed in the most interesting article regarding "Relative Humidity Versus Density Altitude" the reference to (global) Centigrade. Even the conversion from the honorable German physicist Gabriel Daniel Fahrenheit (1686-1736) is no secret (°F-32 x 5/9=°C). It would have been less than a dime to add the corresponding figures to your drawings and table.

Forgive me for the "global" desire, I remain an admirer of your excellent magazine.

Karl Uhl
Via the Internet

You are right. We should have included Centigrade for our friends around the world. Thank you for reminding us of our global readership and for being such a loyal subscriber to the FAA Aviation News. *If you have any ideas for articles, please contact us.*



TSA TO MONITOR FLIGHT SCHOOL ACCESS FOR FOREIGN STUDENTS

Following the passage of Vision 100 – Century of Aviation Reauthorization Act, the Transportation Security Administration (TSA) is preparing to assume operation of the program that monitors access to U.S. flight schools by foreign students.

The Alien Flight Student Program, currently operated by the FBI, prevents persons who are known terrorist threats from receiving pilot training in the U.S. TSA is preparing an Interim Final Rule in the *Federal Register* that will fully describe the new program, its requirements and timetable.

As directed by the new legislation, TSA's credentialing program office will adopt several significant changes to the current program including:

- Reducing the application assessment period from 45 days to 30 days. Expedited review for eligible applicants (such as current pilots of foreign carriers) will be completed in five days instead of the current 15 days.
- Allowing fingerprints to be submitted from overseas so that schools may admit students prior to arrival, aiding visa applications.
- Requiring flight schools to submit identifying information on applicants seeking training in the operation of aircraft weighing less than 12,500 pounds.
- Defining "recurrent training" to cover training only on aircraft that the prospective student is qualified to fly.
- Mandating that flight schools provide security awareness training for appropriate staff.
- Allowing TSA to set a fee for processing security assessments.

Details of the program and of *Federal Register* submissions will appear on the TSA web site, <www.tsa.gov>, under the Law and Policy subhead.

TSA expects to begin operations of the program in July.

This information is from a TSA press release. For more information call (571) 227-2829

FAA NEWS

Personnel Appointments

James P. Schear is the Air Traffic Organization's (ATO) new Vice President of Safety. Schear comes to the FAA from the Transportation Security Administration where he served as Deputy Assistant Administrator for Aviation Operations. In that capacity, he was responsible for all TSA inspection personnel and the airport screeners at 442 airports. He also comes to the FAA from U.S. Airways, where he was a pilot. Schear also is a former naval aviator.

The FAA's Dave Canoles is now Director of the new Air Traffic Safety Oversight Service in the Office of Regulation and Certification. He'll report directly to Associate Administrator Nick Sabatini. Canoles has been serving as FAA's Director of Emergency Operations and Communications for two years. Previously, he was Manager of the Air Traffic Evaluations and Accident Investigations staff and Director, Office of Air Traffic System Effectiveness. He started his FAA career in 1971 as an air traffic controller at Lynchburg, Virginia.

Schear will provide day-to-day focus on safety from within the ATO, and Canoles will provide independent safety oversight of the ATO.

Field Approvals

Advisory Circular (AC) 43-210, *Standardized Procedures for Requesting Field Approval of Data, Major Alterations, and Repairs*, is now available. This AC describes the standardized procedure, which is one means, but not he only means, for requesting field approvals for certificated products. It also contains information that can help you determine if a proposed alteration is eligible for a field approval. This AC is available on the FAA web site at <http://www.faa.gov/regulations/index.cfm>. Click on Advisory Circulars and type in 43-210. Or it can be ordered free from U.S. Department of Transportation, Subsequent Distribution Office, Ardmore East Business Center, 3341 Q 75th Avenue, Landover, MD 20785.

Regulatory Review

As part of its ongoing plan for periodic regulatory review, the FAA is requesting the public to identify three regulations, in priority order, that it believes we should amend or eliminate. The FAA's goal is to identify regulations that impose undue regulatory burden; are no longer necessary; or overlay, duplicate, or conflict with other federal regulations. The comments are due by May 25, 2004. Please send your comments (identified by Docket number FAA-2004-17168) by one of the following methods (please send two copies of written comments):

Go to the DOT Docket web site at <http://dms.dot.gov> and follow the instructions for sending your comments electronically.

Mail or hand carry to Docket Management Facility, U.S. DOT, 400 Seventh Street, SW, Room PL-401, Washington, DC 20590-001

Fax to (202) 493-2251.

AVIATION ACCIDENTS INCREASE IN 2003

The National Transportation Safety Board has released preliminary aviation accident statistics for 2003 showing an increase in several civil aviation categories, including scheduled airliners, air taxis and general aviation.

The total number of U.S. civil avia-

tion accidents rose from 1,820 in 2002 to 1,864 in 2003. There were a total of 695 fatalities in all aviation accidents in 2003. The majority of these fatalities occurred in general aviation and air taxi operations. There were 351 fatal general aviation accidents, up from 345 the year before. Total general aviation accidents increased from 1,713 in 2002 to 1,732 in 2003. The accident rate remained relatively unchanged from 6.69 in 2002 to 6.71 in 2003 per 100,000 flight hours.

There were three fatal accidents involving scheduled passenger service last year: a Beech 1900 operated by Air Midwest crashed on takeoff out of Charlotte, North Carolina, and a Northwest Airlines DC-9 aircraft fatally injured a tug operator in Norfolk, Virginia. These two accidents, operating under Title 14 Code of Federal Regulations (14 CFR) Part 121, resulted in 22 fatalities. A third accident involving a 14 CFR Part 135 flight in the Bahamas, resulted in 2 fatalities.

Air taxis reported 77 accidents in 2003, which shows an increase from 59 in 2002. The total fatalities also increased from 35 to 45. The accident rate rose from 2.03 per 100,000 flight hours in 2002 to 2.61 in 2003. The accident rate for this segment of aviation has been questioned by the Safety Board due to a lack of precision in the flight activity estimates provided by the Federal Aviation Administration (FAA). The FAA made major revisions to flight estimates in 2002, retroactive to 1992. In 2003, the FAA revised the flight hour estimates for 1999-present.

HISTORIC SUB-ORBITAL MANNED ROCKET LAUNCH LICENSED BY FAA

The U.S. Department of Transportation has issued the world's first license for a sub-orbital manned rocket flight. The license was issued April 1 by the FAA's Office of Commercial Space Transportation to Scaled Composites of Mojave, Calif., headed by aviation record-holder Burt Rutan, for a sequence of sub-orbital flights spanning a one-year period. Within days of receiving the license, Scaled Composite's *SpaceShipOne* took a test flight at somewhere around Mach 2 at 105,000 feet

The FAA sub-orbital space flight license is required for U.S. contenders in the X-Prize competition, a high-stakes international race ultimately to launch a manned, reusable private vehicle into space and return it safely to Earth. The X-Prize foundation will award $10 million to the first company or organization to launch a vehicle capable of carrying three people to a height of 100 kilometers (62.5 miles), return them safely to Earth, and repeat the flight with the same vehicle within two weeks.

Twenty-seven contestants representing seven countries have already registered for the X-Prize contest, modeled on the $25,000 Orteig Prize for which Charles Lindbergh flew solo from New York to Paris in 1927.

In its 20 years of existence, the FAA's Office of Commercial Space Transportation has licensed more than 150 commercial launches of unmanned expendable launch vehicles. This license is the first to authorize manned flight on a sub-orbital trajectory.

While the highest criteria to issue a license is public safety, applicants must undergo an extensive pre-application process, demonstrate adequate financial responsibility to cover any potential losses, and meet strict environmental requirements.

FAA DEVELOPS TOOL TO PREDICT ICING

Predicting in-flight icing just got a little easier, thanks to a new tool developed by the U.S. Department of Transportation's Federal Aviation Administration (FAA). Using the new, web-based Forecast Icing Tool, aviation meteorologists and airline dispatchers can warn pilots about icing hazards up to 12 hours in advance.

"One of the best ways to manage the effects of bad weather is to avoid it altogether. With information provided by this automated tool, pilots flying aircraft under 18,000 feet can make critical flight decisions," said FAA Administrator Marion C. Blakey.

In-flight icing is most hazardous to private pilots and air taxi and commuter aircraft operators flying at lower altitudes. Those aircraft may not have sophisticated wing-deicing equipment used by larger commercial aircraft. The FAA tool provides a high-tech color weather map and/or a flight route display of icing potential at flight levels from 3,000 to 18,000 feet. The user can select forecast times from three-, six-, nine-, and twelve-hour intervals to plan safe routes of travel.

With funding from the FAA's Aviation Weather Research program, the National Center for Atmospheric Research in Boulder, CO, developed the new tool. It joins the growing FAA-developed suite of weather tools, such as the Current Icing Potential tool. All are publicly available on-line <http://adds.aviationweather.gov/icing>. The National Weather Service operates these products for the FAA.

WRONG NUMBER

In the March/April issue the article on International Pilot Weather Briefing Services listed the wrong telephone number for the Honolulu Automated Flight Service Station. One of the last paragraphs encouraged pilots to provide feedback and comments about the service by contacting the facility management staff. The telephone number should have been (808) 839-5086. The numbers for obtaining services was correct. They are 1-800-WX-BRIEF or 1-866-766-0820.

Editor's Runway

from the pen of H. Dean Chamberlain

AIR SHOWS: AMERICA'S SPECTATOR SPORT

In today's world, there are names and titles for everything and everyone. For example, we have our "soccer moms" and "NASCAR™ dads." Although I have not heard of any names for those of us who love to go to air shows, there must be one or two names flying around, pun intended, the air show community. Make no mistake about it. Air shows are big business. If you go to any major show, you will find the same type of sponsorship for top performers as you do at any automotive racing event or other sponsored sporting event.

However, unlike most major spectator sporting events, air shows lack some of the supporting infrastructure other sporting events offer. Most air shows do not have grandstands and other facilities like say a major racetrack or baseball or football stadium. In most cases, at an air show, regardless of its size, people sit behind the crowd control line wherever they can along a runway. And since most air shows are daytime events, everyone is sitting in the sun—we hope. Rain and low clouds make for bad air shows.

The point of this brief discussion on air shows is to remind everyone that since air shows lack some of the creature comforts of other events, everyone needs to be prepared to be self-supporting at an air show.

First, as said earlier, all air shows will have some type of crowd control line. This is a minimum distance from the air show centerline that spectators have to remain behind for their own protection. Please observe the line and comply with those responsible at each air show for ensuring no one moves or sits in front of the line.

Second, pets and very young children have special needs that may not be available at a large air show. You may want to reconsider taking them with you knowing you will be spending many hours in the hot sun.

Third, everyone needs to remember to take the basic personal safety precautions for protection from the sun and heat. Drink plenty of water, wear clothing that protects you from the sun, and take plenty of sun block and remember to reapply the sun block periodically. In many cases, you will need to take your own seat or blanket and sun shade.

Fourth, please bring plenty of patience. Whether it is trying to find parking, sitting in the sun getting hot or irritable, or wondering why that person sitting in front of you has such a large hat or umbrella, you need to remember, you came to the show to have fun. So, relax and enjoy the show.

Fifth, I would ask you to remember to invite your friends and neighbors to the air show. Not only can you share your love of aviation with them, but they might gain a better understanding of why you become plane crazy each summer. After all, it is your neighbors who will name you. Have a fun and safe summer of flying.

U.S. Department
of Transportation

Federal Aviation
Administration

800 Independence Ave., S.W.
Washington, D.C. 20591

DO NOT DELAY -- CRITICAL TO FLIGHT SAFETY!