ON APPROACH

Avemco Policyholder News
Summer 2006

AVEMCO® INSURANCE COMPANY

Dear Avemco Customers,

Welcome to another issue of *On Approach*, a general industry and safety information newsletter from Avemco Insurance Company.

In this issue, Chris Burns offers a veteran pilot's perspective on changes in aviation culture over the decades. His article includes insightful thoughts on the intersection of process-oriented safety and traditional pilot values of independence, self-reliance and confidence.

As part of our ongoing series on specific safety concerns, Thomas Turner addresses one of the most common (and ultimately avoidable) reasons for general aviation accidents—gear-up landings. This experienced pilot offers a range of advice on how to increase awareness and improve pilot routines that will result in greater safety.

If an upgrade in equipment is part of your immediate or long-range plans, you'll want to read the articles by Brian DeMay and Richard Harder, Avemco employees. Based on his own experience, Brian describes what to expect when you first take control of a different, more powerful aircraft, and how to adjust your flight routines accordingly. Richard offers information on how aviation underwriters approach aircraft upgrades, and the type of graduated approach that Avemco recommends.

Finally, Mike Gaffney offers a response to the feedback from his article on operations at non-controlled airports generated from the previous issue of *On Approach*.

In closing, I want to emphasize that the purpose of *On Approach* is to provide a forum where we can all learn from one another—pilot to pilot. The opinions and experiences shared by our contributing authors are just those—opinions and experiences. On Approach is not intended to replace regular flight instruction or to infer anything other than diligent adherence to FAA regulations and procedures. Additionally, the opinions expressed in these articles are not necessarily those of Avemco Insurance Company.

With those comments aside, I invite you to find twenty minutes and a comfortable chair, and to enjoy this issue of On Approach. See you in the skies!

James A. Lauerman
Executive Vice President
Avemco Insurance Company

Those Who Won't™: Avoiding Gear-Up Landings

By Thomas P. Turner ©2006

There's an old saying about flying airplanes with retractable landing gear: "There are those who have, and those who will have" a gear-up landing. Landing without extending the landing gear is a frighteningly common occurrence, almost always arising from pilot distraction or an interruption of usual habit patterns. Studying the problem of "landing gear-related mishaps" for over six years I've found factors in gear-up landings that are repeated again and again. Learning from these patterns, we can come up with several techniques for avoiding landing with the gear up—becoming not one of those who will, but instead one of those who won't have a gear up landing.

Far More Than You Think

Perhaps the reason "those who will" is so pervasive is the fact that gear-up landings happen so very often. The number of gear-related mishaps is much higher than most studies would lead us to believe. Most gear-related mishaps are by definition exempt from National Transportation Safety Board (NTSB) reporting requirements. Since virtually all mishap studies take their raw data from NTSB, the true number of gear-up landings is vastly underreported.

Tracking the Federal Aviation Administration (FAA) preliminary reports closely in a multi-year study, I've found that nearly 20 percent of all FAA-reported accidents in piston-powered, retractable gear airplanes are gear-up landings. The FAA tells us there is an average of three gear-up landings reported every week. Given that there is no regulation requiring mishaps be reported to the FAA (those that are called in are done when the reporter doesn't know any better), even this figure is likely quite low.

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Insurance and Other Costs

The high incidence of gear-up landings costs us all. Insurance sources report the typical "minor damage" gear-up landing claim costs between $40,000 and $60,000. Using the low-end figure and the underreported FAA numbers, the U.S. insurance industry pays well over $6 million every year in gear-up landing claims. As we've said, the number is likely far higher. No wonder insuring a "retract" is more expensive than similar, fixed-gear models, or that the experience requirements to insure an "RG" airplane are much higher than comparable fixed-gear designs.

The cost of gear-up landings goes beyond just insurance. Although rarely is someone hurt in a gear-up landing, there are significant exceptions, so gear-ups present an injury hazard to pilots and passengers. Airplanes, propellers and engines are very expensive to repair, so increasingly the cost of repairing gear-up damage is great. Often an airplane is "totaled" after a seemingly benign gear-up landing—especially as the fleet ages and parts become expensive and scarce—meaning that more and more airplanes are withdrawn from service, raising industry costs for the rest of us, retractable-gear or not.

What Causes Gear-Up Landings?

What could be more fundamental than putting the wheels down before landing? And in light of this, why are gear-up landings so common?

Gear-up landings almost always result from two things—pilot distraction, and deviation from a normal routine. Anything that interrupts the pilot at a critical time can contribute to a gear-up landing. Poor pilot procedure can prevent a pilot from catching the error before it's too late.

One reason gear-up landings are so common, in my opinion, is that pilots do not take the time during a retractable-gear checkout to ingrain a new habit pattern for landing, one that is different from that used in fixed-gear airplanes. Say you're flying downwind in a fixed-gear airplane. When you want to begin your descent from pattern altitude, what do you do to initiate the descent? You reduce power and the airplane begins to descend. Do this a few dozen or hundred times and you don't even think about the need to reduce power to descend.

Now say you're flying a retractable-gear airplane. What might you do when it's time to descend from pattern altitude? Extend the gear. In most retractable-gear airplanes, extending the landing gear causes the airplane to enter a roughly 500 foot per minute descent. Putting the gear down to initiate descent achieves the performance requirement while helping you to prevent a gear-up landing.

But let's say you get distracted by other traffic, or a sick passenger, or any number of other things just as you are ready to descend below pattern altitude. If you revert to what's most familiar to you, what you first learned in fixed-gear airplanes, you'll pull power to begin your descent. And the airplane will go down. If you continue to be distracted and don't deliberately check gear position, the first indication that you forgot may be the sickening sound of the propeller hitting the pavement.

THOSE WHO WON'T™ TIP #1:

Use gear extension, not a power reduction, to initiate final descent.

Initial checkout in retractable gear airplanes needs to give sufficient practice in the pattern to replace the law of primacy (the act of doing what we learned first, such as pulling power to descend, from our fixed-gear experience) with the law of repetition (the act of doing what we practice the most) and the law of recency (doing what we practiced most recently). Psychological studies tell us that it takes twenty or more repetitions to change habit patterns, and continuous practice with the new habit to change behavior permanently. Clearly, the mishap record shows the traditional "three times around the patch" RG checkout is not sufficient to avoid gear-up landings.

THOSE WHO WON'T™ TIP #2:

Budget enough time during RG checkout to develop habit patterns that will "stick" when you're distracted or under pressure.

Proper RG landings must include a final-approach check of gear position. Many pilots use the "GUMP" check—for gas, undercarriage, mixture, prop—to ensure configuration for landing. Calling the check aloud helps you not just think, but actually do the check. I like to do this verification no lower than 400 Above Ground Level (AGL), to catch an error with plenty of time to smoothly go around if needed.

THOSE WHO WON'T™ TIP #3:

Always make a short-final gear position check.

Contributing Factors

There are several contributing factors that appear with regularity in gear-up landings.

Modified pattern. Often a gear-up landing results when another airplane interrupts the pattern for the retractable-gear airplane. Airplanes cutting ahead in the pattern, taking off or landing in the opposite direction or on an intersecting runway may cause the RG pilot to have to modify his or her approach. This results in a non-standard pattern that distracts and interrupts the pilot's flow, and contributes to forgetting the landing gear.

Strong or gusty surface winds are a very frequent factor. Strong surface winds usually mean low-altitude turbulence,

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which itself can be distracting. Turbulence may also lead to distraction from nervous or sick passengers. Flying downwind in the pattern in windy conditions, ground speed is high, rushing the pilot and perhaps interrupting the flow of events. Turning onto final approach into strong winds, ground speed will drop, and the angle of descent over the ground will steepen. Both result in visual cues that make it look like the airplane is descending slower on a steep gradient—the approach looks as if the landing gear is down.

Electrical failures often correlate with gear-up landings. Since most retractable gear is powered by electric motors or by hydraulic systems that are in turn electrically activated, an alternator or generator failure may contribute to a gear-up landing. Every retractable gear design I know has a method of manually extending the landing gear if the electrical system fails. Frequently the pilot is so distracted by the electrical failure, however, that he or she forgets to extend the landing gear. In some cases the pilot later reports not knowing a manual landing gear procedure even exists—testimony to very poor instruction when getting checked out in the specific model of airplane.

THOSE WHO WON'T™ TIP #4:

Recognize that modified or interrupted traffic patterns, strong or gusty surface winds, and electrical failures frequently contribute to a gear-up landing. Be especially gear-conscious if you find yourself in these conditions.

THOSE WHO WON'T™ TIP #5:

Know and practice the airplane's emergency gear extension procedure, and keep the checklist handy at all times.

Instructor on Board

I've tracked FAA preliminary mishap reports for over five years and was surprised to discover a large percentage of gear-up landings happen with an instructor pilot on board, providing dual instruction. In fact, this is the single most common contributing factor (when compared to electrical failures, high surface winds, and other gear-up correlations). And it's not always during an initial checkout in the airplane—it often happens with an experienced pilot receiving a flight review.

... modern noise-canceling headsets often prevent the pilot from hearing a warning horn, unless the airplane has been modified to pipe the warning through the intercom.

You'd think that a second pilot on board would make a gear-up landing almost impossible. It may be, however, that the student pilot subconsciously thinks the instructor will keep him safe, while the instructor may become complacent as the lesson progresses. Usually, it's the third or fourth time around the traffic pattern when the dual-instruction gear-up landing occurs.

Similarly, touch-and-go practice often results in a gear-up landing, whether during dual instruction or solo flight. The pilot may "remember" lowering the gear from an earlier landing, and forget on what becomes the last time around the pattern.

THOSE WHO WON'T™ TIP #6:

Keep your edge when flying with an instructor. Don't abdicate your pilot-in-command responsibility to the person in the right seat.

THOSE WHO WON'T™ TIP #7:

Avoid touch-and-goes in RG airplanes. Make all landings to a full stop, which allows time to "clean up" the airplane, brief the landing (to yourself or with the instructor), and begin the next trip around the pattern as a distinct event with its own gear-down requirement.

Warning Systems

Most RG airplanes have gear-up warning systems, but there are normal flight situations where warning systems won't help.

For instance, most gear warning horns are rigged to sound when the throttle is brought to idle if the gear is not down. But if you use power to touch down, which many pilots do in windy conditions or to cushion even a normal landing, the gear warning horn will not sound.

In some airplanes the gear warning also sounds if the flaps are fully down when the gear is not. This warning only works, however, if you select full flaps; some pilots don't use full flaps for every landing, and in these cases the warning will not sound.

In some airplanes the gear warning also flashes an annunciator on the instrument panel. Pilots generally focus their attention outside the airplane on final approach, however, and may not see a cockpit warning. Conditions that prevent the gear warning horn from sounding will also inhibit the annunciator light.

If you make full-stall landings you get used to hearing the stall warning horn on touchdown. You may not notice the difference between a steady stall warning and the intermittent gear advisory.

Lastly, modern noise-canceling headsets often prevent the pilot from hearing a warning horn, unless the airplane has been modified to pipe the warning through the intercom.

THOSE WHO WON'T™ TIP #8:

Understand the limitations on gear advisory systems and actions you may take that inhibit their function. Don't depend on warning systems to the exclusion of good landing gear discipline.

Being One of Those Who Won't

Anyone can forget to extend the landing gear on any given day. Total time and time-in-type alone do not protect us from natural human failings. We have to consciously work to avoid a gear-up landing every time we land the airplane. Concentrate on extending and verifying the landing gear every time you land, and you'll not be one of those who have, or those who will have—you'll be one of Those Who Won't land the airplane gear up.

Thomas P. Turner is widely published on topics of flying safely. An ATP/ CFII/ MEI, he holds a Masters Degree in Aviation Safety. For more on avoiding landing gear-related mishaps see www.thomasp-turner.com or attend Tom's EAA Forum presentation at AirVenture 2006.

CULTURE AND CRISIS IN GENERAL AVIATION

by Chris Burns, ATP

Imagine for a moment that every fallen aviator who died as a result of his own decisions could be revived for a discussion of his accident. How would being outside of the event that killed him affect his perspective on the choices leading up to an accident?

Aeronautical Decision Making (ADM) is a hot topic currently because a number of interested parties are concerned about the effect that poor decision making will have on the future of General Aviation. I propose that General Aviation must look beyond individual merit and skill to examine how general aviation culture—that unseen collection of accepted values—influences the way pilots make decisions.

My aviation experience has followed parallel paths—one path the pursuit of professional aviation employment, and the other my passion for family travels by light plane. During a 23-year airline career, more of my fellow airline pilots were killed in general aviation accidents than in their profession. These accidents looked like most general aviation accidents and reflected poor decisions. After many years of observation, I concluded that the dramatic disparity in accident rates between general aviation operations and airline operations is not fully explained by the obvious differences between the two environments. Comparing my own experience in both settings, I found something more subtle at work that I would like to share with my fellow pilots. Because I frame the problem of general aviation decision-making as being under the influence of culture, I ask you to take a short detour and follow me through airline culture as I have seen it develop from 1984 to the present day.

Captain "Smitty" and I met on the maintenance ramp at the Boeing 737 we were assigned to ferry down to Hub City. I stuck out my hand and introduced myself. Before he could respond, I blurted out that this would be my first flight after training.

"Nice to meet ya, Chris. Now you don't worry about a thing. Take your time and do your walk-around. I'll get the inside set up and then we'll fly this thing down to Hub City."

After completing the preflight walk-around, I climbed the air stairs and settled into the right seat. I was digging in my flight kit to get out my Jepp manual and putting on my shoulder harness when I heard the unmistakable whine of a JT8 coming to life. Before I plugged in my ear-piece we were taxiing towards the edge of the ramp with both engines running. Captain Smitty had already gotten us a taxi clearance and sixty seconds later we were at the end of the runway where he glanced over at me and said: "Ready to go." It was not a question. I wondered, "What happened to 'take your time?'" Three minutes after takeoff, we were level at ten thousand feet with the airspeed building past 300 knots. Captain Smitty smoothly pulled back the thrust levers and the airspeed pointer came to rest just below the barber pole. One more knot would sound the Vmo/Mmo clacker.

I got the ATIS and made a radio call or two, but other than that, I was a passenger in the co-pilot's seat for the 17-minute flight. The Captain effortlessly slicked the airplane onto the runway at Hub City. At the terminal, he snapped both start levers to cutoff and, as the engines began to unwind, his hands glided over the overhead panel, flipping switches. He pulled at the clasp on his lap belt but his shoulder harness was dangling behind his seat where it had been the whole flight. He pulled his unopened flight kit from alongside his seat, glanced at me and said,

"Nice to meet ya, Chris. See you around." With that, he glided up the jet-way. I slowly collected my things and my thoughts. I did the After Landing and Parking Checklists—the only checklists of our brief flight. The Captain's practiced hand had left every switch in its proper position.

Captain Smitty was neither famous nor infamous at our little airline. A glance at the names in my logs from those years as a First Officer recalls with vivid detail a cast of characters that nearly jump off the pages. I had become part of a captains' airline. Command authority was supreme and all-knowing. The captain could impose a cruel tyranny or a benevolent and enlightened dictatorship. It depended on personality but, in either case, the institution supported his rule. This was the culture. Four years later, my friend "Hal," himself a very senior captain, gave me some additional perspective:

"All of us old coots were trained by the guys coming out of World War II. We were the objects of intense abuse and disdain. These fellas who flew in Europe and Asia had no use for First Officers and they regarded us as an inconvenience. My peers reacted principally in one of two ways: We vowed that we would never be the way these guys had been to us or we resolved to exact the same punishment on our own First Officers to avenge the years of abuse that we took."

Within the small airline, stories circulated at the speed of Boeing—telling of this and that and who did what. First Officers were chameleons who passed tales about the captains in the crew room as a means of survival. We were convinced that we were building an airline. Words and actions communicated the true values of the organization—safety, reliability and customer service. The oddities of individual human behavior, those excesses that demanded a comment, served two purposes: They defined the margins of acceptable behavior and preserved homage to the rugged individualism of our shared aviation heritage.

As small companies grow and their entrepreneurial flames dim, the informal systems that tie people together falter. By the early Nineties, the size of the airline had more than tripled and was now saddled with the effects of mergers. Joining different small-airline cultures led to the neglect of procedure and standardization. Those oddities of individual behavior were no longer cute and laughable, but a shameful aspect of an organization that lacked a formal culture fit for survival. A cockpit anarchy of sorts prevailed. We crashed jets and lost lives. It would be very difficult to establish a direct link between these accidents and a failure of culture, but the airline set out on one of the most massive and successful efforts to intentionally reform the culture in a large enterprise. By the mid Nineties, the captains' airline had given way to Command Authority and Crew Resource Management (CRM). The advent of CRM was the most significant change in my airline career. Hanging the weight of decisions on a single fallible human mind had become unacceptable. Our procedures, training and checking began to de-emphasize basic flying skills,

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which were well established in airline pilots, and placed new emphasis on how decisions are made. First Officers, previously permitted (even expected) to keep their opinions to themselves, were required to be involved participants. The Captain was held accountable for using all available resources.

The stunning 1989 crash landing of United Airlines Flight 232 in Sioux City, Iowa gave the industry something that it needed very badly—a new archetype to replace that leather helmeted, swashbuckling, self-reliant, all-knowing persona formerly known as Captain. Thirty-five year Captain Al Haynes stepped into the role. He masterfully utilized every possible resource within his reach to bring a crippled DC-10 to earth. The span of his Command Authority included tasking an off-duty Check Airman who was riding in the back of the plane to assist. This accident was studied in detail and its many lessons were used to provide a new model for effective command of an aircraft. The central aspect of industry-wide change has been a systems approach to aviation safety that acknowledges human fallibility and includes an understanding of human decision-making as part of the safety system.

Airline flying, even in the early cultures described, is dramatically safer than general aviation flying for many reasons. The most obvious reason is that the airlines operate large, reliable jet-powered aircraft with redundant all-weather systems crewed with experienced and well-trained pilots. This is a critical difference to be sure but there is a less obvious reason that plays a significant role—one that an airline pilot can easily overlook as he steps into a light aircraft. Airline decisions are presented in a structure that places the flight crew emotionally outside of the decision, looking at clear choices. The question is not "What is possible?" but "What is routine?"

To understand what I mean by being emotionally outside of the decision, consider the following example. During taxi to the runway, tower announces "Runway one-two right RVR [Runway Visual Range] is 1200 [feet]." Glancing at the tabulated takeoff minimums, the First Officer remarks, "We need 1600." The Captain says, "What do we need on twelve left?" The First Officer replies, "6, 6, and 6." The Captain says, "Ask for a clearance over to twelve left." If the crew has been inching towards the runway in a long line of traffic for the last 30 minutes, the foregoing circumstances will be annoying but the Captain's decision to change runways is nonetheless detached and unemotional. The idea of taking off anyway—ignoring the limits—does not enter his thoughts even though it would be physically possible to pull off the task with very little risk. The Captain gets no brownie points for taking off below limits. In fact, the opposite is true—he exposes himself and his First Officer to a possible violation.

Consider a similar example where the Captain places himself emotionally inside of the decision. After thirty minutes of taxiing, the crew finds itself number one for takeoff holding short of runway 12R when the tower announces, "Runway one-two right RVR is 1200." The Captain, pretending not to hear the tower, says, "Isn't it the Patriots and Steelers tonight?" Participating in the deception, the First Officer says, "Yeah, we ought to make it just in time for kickoff." The tower clears the flight for takeoff and the First Officer responds, "Cleared for takeoff one two right." When the Captain resorts to self-reliance alone, he places himself emotionally at the center of the decision. He is in the spotlight. He is involved and something personal is at stake. With personal involvement in the decision, his perspective becomes narrowed. He finds it difficult to see the forest for the trees.

Can we live with pilots who are not independent and self-reliant? Absolutely not! Self-reliance will always be an indispensable quality of an effective pilot. An airline captain must be willing and able to be decisive and make decisions that he cannot and should not delegate because

there are still circumstances where he may find nothing to rely on but his own experience. However, modern airline training and culture minimizes the number of occasions where safety is dependent upon individual competence by giving the captain tools and resources that anticipate a wide range of potential decisions. With the focus on other resources, the captain is not trapped in the center of the circumstances but has perspective.

The model of command in general aviation has remained essentially unchanged through my entire aviation career. It traces its roots to the same source as the captains' airline. The pioneers, the early aviators, truly undertook a dangerous endeavor that gave every aviator in the lineage their swagger, their self-reliance, and their bold, decisive, individual action. Today, when a new aviator is crowned—be it with a private pilot's certificate or a fresh instrument rating—he or she is expected to display a sovereign self-reliance. For those that enjoy responsibility, the command of an aircraft—even a Cessna 150—is intoxicating. An exaggerated sense of self-reliance can get in the way of good decisions.

What can there be but self-reliance in a cockpit that only has one pilot? To talk of any other basis for general aviation safety is almost heretical. To better understand why an attachment to self-reliance and individual effort is harmful, we must look inside the human mind. Knowledge of the brain, as far as it goes, admits that human decision-making is always intertwined with emotions. The effect of emotions is variable depending on an individual's relationship to the decision. Personal attachment to a particular outcome seems to be the factor that strengthens the influence of emotion on human mental processes.

I watch a stonemason do his work and I see that he works with a certain amount of indifference. He makes errors, corrects the big ones, and moves on. His practiced routine is insulation against his emotional involvement. If the novice tries the stonemason's job, his efforts are a badge of personal esteem. He tries excruciatingly hard to do a perfect job, and in the correction of small errors, he loses sight and makes bigger errors. When I am in a general aviation aircraft with my family as passengers, the outcome can be very personal. Carrying 145 strangers in the back of an aluminum tube on the fifth leg of a twelve-hour duty day is, by comparison, never personal. When emotionally attached to an outcome, we choose to put our merit on display. Putting our merit on display as a pilot decision-maker translates to the wrong-headed idea that good outcomes (completed flights) raise our stock and bad outcomes (cancelled flights) decrease our stock. This leads to decision making that is constantly exploring the question: "What is possible?" and puts the aviator emotionally at the center of every decision. You have seen the aviator who is carrying this burden. How many times have you seen a fellow pilot pacing in the lobby weighing a decision while family or friends sit restlessly on a sofa nearby?

The idea of the *Personal Minimums Checklist* or what I refer to as a *Personal Operations Specification* is the best idea that has entered general aviation in my time. In its recognition of the foibles of the human mind, in the structure it gives to routine decisions, the *Personal Operations Specification* bears very strong resemblance to the advent and practice of CRM in airline cockpits. That it has not received universal support across the numerous stakeholder groups in general aviation is disappointing to me. Every aviator has at his availability a chief pilot within, who reclining in the comforts of his own home, far from the howling wind, can calmly examine what he wants to accomplish with an airplane and what will be normal for him. Here the aviator can safely consider the question, "What is possible?" This assessment is far more reliable than the appraisal of that other self who considers the same things in an airplane. From his armchair, he can alter his routine with perspective but when he gives this task to his other self—the one in a leather helmet and scarf—he puts a fool in charge. *The Personal Ops Spec* gives him a structure for starting every flight within the range of his normal abilities. When inevitable circumstances take away the comforts of routine, that same structure points the way back to a normal operation.

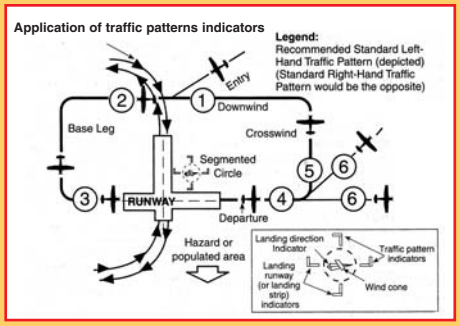
When a pilot shares his *Personal Operations Specifications* with his employer, family member or other regular passengers, the structure for his decision making is reinforced. The passenger develops acceptance, confidence and support for what is normal. The pilot has strengthened his or her commitment to making decisions from a detached perspective.

Many general aviation pilots already use mechanisms or processes that give them perspective in decision making. But to improve General Aviation safety as a whole, these *best practices* must become part of the common culture that is transferred to every aviator. When this occurs, when the need for structured decision making is understood as thoroughly as the need to take fuel samples, then the overall safety of General Aviation will be improved.

About the author: Chris Burns served as Captain of a Boeing 737 for the last 16 years of his 23-year airline career. He was previously a C-130 Pilot in the United States Coast Guard. He has owned and flown general aviation aircraft for the last 37 years.

OPERATIONS AT NON-TOWER CONTROLLED AIRPORTS-PART II
NO RADIO AIRCRAFT

By Mike Gaffney, MCFI



Aeronautical Information Manual Diagram 4-3-2

In the Winter 2005 Avemco "On Approach" newsletter, we discussed suggested operations at non-tower controlled airports and we looked at a number of possible entry and exit scenarios for conducting safe operations in accordance with the Aeronautical Information Manual (AIM) section 4-1-9 and diagram 4-3-2. Shortly after the article was published we started hearing from readers who had a variety of opinions about the operations suggested in the article. "What about those of us with no radios?" "What about departures from the field in this direction or that direction?" "That is not how we do it at our airport." One pilot reported that he was berated by other pilots when he attempted to make a "courtesy report" in the traffic pattern to an incoming aircraft about other aircraft already in the pattern that were not making reports.

One thing to bear in mind is that in an article like this, we cannot cover all possible aspects of flying at every airport. We cannot possibly imagine and therefore write about operations at some of the airports that readers described. But what we can do is take a snapshot of a number of situations and compare it to the printed materials from the FAA and try to help pilots draw some conclusions about how things work at their airport in the interest of enhancing safety.

First of all, we look at the AIM for guidance on arrivals and departures from a non-tower controlled field. This is the diagram that they give you. Literally, when you are departing the pattern using this diagram, you essentially are offered directions 5 and 6 to cover every departure scenario. We know from experience that many pilots do whatever they want unless they see another aircraft coming. The bottom line is this: the pilot's job is to perform maneuvers and follow procedures that are consistent with safety. To do otherwise and get caught is punishable by a 91.13 Careless and Reckless Operation, or worse—bent airframe components.

Referring to AIM Chapter 4-1-9 Traffic Advisory Practices at Airports without Operating Control Towers, the section begins by saying that "There is no substitute for alertness while in the vicinity of an airport." It goes on to say that "pilots should exchange traffic information when approaching and departing an airport especially since there may be no radio aircraft operations there."

Call Sign. Those of you observant readers who pointed out that using "November" and a full call sign is not needed are correct. AIM also points out that simply giving an aircraft type and the last three digits of the call sign is sufficient unless establishing initial contact with Air Traffic Controllers (ATC). Therefore saying "Cherokee 8 Alpha Delta" is a sufficient report for non-tower controlled operations.

NORAD or "No Radio" Operations at a non-tower controlled airfield involves many of the same procedures as those described in the article for those of us with radios. The difference is that the NORAD operators must be ever more vigilant prior to engaging in operations in the traffic pattern since they have no way (other than a handheld transceiver) to announce their intentions to others who may already be committed to a course of action arriving at or departing from that airport. Taxiing in a tight circle scanning the ground and traffic pattern area prior to moving forward is the best advice I can give to pilots on the ground both with and without a radio. When you see another aircraft already taxiing toward a runway or run-up area, follow them but make sure that they know you are there, if possible. The NORAD operator must always make the assumption that he is not seen and then act accordingly. Show your lights as a way to enhance the chance that you will be seen. Don't take shortcuts and follow the AIM or the approved procedures for your airport.

For the NORAD operator approaching a field, I again recommend that the pilot approach with extreme caution until a complete assessment of the airport can be made from above. This assessment should include viewing the traffic pattern indicators, wind direction, and visual observation of existing traffic flows. When you observe other aircraft already present, fall in with their flow and establish safe distances in the pattern so as not to crowd or rush the pilot ahead.

For those operators who wrote and said that their operations at a rural airport had always been done without a radio since there was rarely anybody to talk to, I commend their spirit and love for aviation and their love for their classic aircraft. I encourage you to maintain an attitude of safety and follow AIM recommendations as closely as possible. Consider purchasing a portable radio and keep a spare set of batteries on board. You never know when you will need them!

For those who have ever attempted to report other traffic in the pattern thinking you were doing people a favor and then were berated by other pilots for being a "yahoo with a radio," I commend you for your courage. Some pilots will not allow anybody to tell them what to do or how to do it—including the FAA. I can only urge you to follow the rules yourself and stay clear of those who think that they are able to rewrite the rules.

Mike Gaffney is an FAA Aviation Safety Counselor, A&P mechanic, ATP pilot with a CFI, CFII, and CFMEI and over 3200 hours to his credit and is a Cessna FITS Accepted Instructor (CFAI) for the Garmin G1000 and factory trained in Diamond Aircraft. He was designated a Master CFI by the National Association of Flight Instructors, and is the President of Skyline Aeronautics at Spirit of St. Louis Airport. He can be reached at mgaffney@skylineaero.com.

TRANSITIONAL TRAINING

By Brian A. DeMay,
Avemco Aviation Underwriter

MOVING UP TO COMPLEX AIRCRAFT

The first takeoff is amazing. I push the throttle forward and hold the brakes, and as I release them the plane jumps off the line and accelerates much faster than anything else I have ever flown. Screaming off the runway, up into the sky and out of the pattern before I know it.

Now the first landing, my CFI and I enter the downwind leg, then base, and it hits me-I am so far behind this airplane! Mixture, props, throttles, undercarriage. Then the unfamiliar stress - I begin to think "Pull the gear knob. No, not yet. I'm still going way too fast… Slow down…Now put the gear down and look for three green. Good-I've got them. Check traffic again and call the base leg on Unicom."

I was flying a Piper PA-44-180 Seminole. It was my first flight in a multiengine, complex aircraft. As I flared and touched down, I was glad that the torture was over. Landing at 90 knots was much faster than the 65 knots I was used to in a Skyhawk. No doubt, it got easier the more times I did it, but I felt as though I was back in my student pilot days, just trying to keep up. Transitioning to a complex aircraft was going to be tougher than I expected.

I currently have 250 hours in my logbook, mainly in Cessna 172s and 152s and a little time in a few taildraggers. I found myself lacking challenge in my flying and was ready to move on to the next level. I wanted a complex endorsement so I could fly something faster, farther, and higher.

What I discovered is that making this transition would be more challenging than I realized. Upgrading to the next level of aircraft would be a journey with stumbling blocks and frustration. I knew I could master more complex aircraft, but I underestimated just how much work it would be.

One of the factors that led to my problems is not having an instrument rating. An instrument pilot, of course, learns how to caress the aircraft with small, fine control inputs. I didn't have this experience. I just moved from the simple to the complex. As I found out, "complex" was just that. My workload roughly tripled, especially on landing. Not only did I have to adjust the mixture and throttle controls, but with props, cowl flaps, and gear. There was more to do in less time with a lower margin for error. In short, the checklist was longer and the frame time was shorter.

Here are a few things I noticed:

Taxiing seemed about the same, but with more power. The slightest touch of throttle makes the plane lurch forward.

The GUMPS check: GUMPS stands for Gas, Undercarriage, Mixture, Props, Set switches and flaps. You perform a GUMPS check on downwind, base and final, and on short final you check the gear again, confirming the essential "three in the green," signaling that the gear is all down and locked, ready for landing.

At first glance into the cockpit, most everything looks the same, with a few more buttons, levers and dials. Of course, they're all important for something. For instance, instead of looking only at RPM, you'll need to manage a new engine control-manifold pressure. (Manifold pressure is a good measure of power, at any given RPM).

Operating a constant speed propeller isn't about just moving the prop lever. It's about understanding the prop hub and governor-what it is, what it does, and how it works.

There are other things to learn, such as how the hydraulic and gear systems work. And of course there's the important item of how to tame the extra speed.

Even routine flights take a good deal more attention. When climbing to cruise, you'll set the throttles and then the props, in this case at "25 square" (25 inches of manifold pressure, at 2500 RPM) and trim the pitch to get 100 knots for the climb. After reaching cruise altitude, there's another checklist: mixtures, props, throttles, cowl flaps, fuel pumps, and lights.

The challenges continue even in cruise; you can't simply set the throttle and sit back watching the land go by. This twin wants to climb, and a moment's inattention lets it gain 200 feet before you know it. You'll pay a lot more attention to power and trim in a high-performance, complex airplane.

Descent is busier, too. I was used to planning for landing about 10 miles out. In this airplane I needed to plan 50 miles out. Because it's so much faster than what I was used to, it took practice to descend and fly the pattern, merging appropriately with much slower traffic.

Speed management at every phase is critical. This aircraft has higher wing loading than I was used to. In the Skyhawk, I just pulled the throttle and settled into a good landing. When I tried this in the Seminole, it sank like a rock. You need to learn to carry power through the landing and make that final adjustment to idle when you're just over the numbers to settle in to a nice soft landing on the mains, then the nose gear.

Preparing for emergencies is a central aspect of any flying. With complex aircraft there is more to do when something goes wrong, and there are more systems that can cause problems. What if the gear doesn't come down? Follow the emergency checklist and use the emergency gear release. I had an actual "two in the green" experience on an early training flight. I learned a lot about checklists then.

What happens if an engine quits? Do you have to get the prop full forward or full back? A windmilling prop is like a giant speed brake, slowing you down and reducing your glide distance. You want to get the least resistance on the prop, to full pitch. If an engine quits on takeoff, things are even more exciting and quite dangerous. And you sure won't have time to find a checklist!

After 30 hours in a complex, multiengine aircraft I am finally starting to feel comfortable in it. Even though making small, controlled movements is now second nature, landings are still a handful. But planning makes it much easier to fly and complete the checklist.

TRANSITIONAL PILOTS: WHAT INFLUENCES UNDERWRITERS

By Richard Harder,
Senior Avemco Aviation Underwriter

If there is one thing that aviators seem to have in common with their boating counterparts, it is the desire for something bigger, faster and heavier.

Every day at Avemco our Insurance Counselors field calls from pilots who are interested in moving up from their current aircraft. There seems to be no end to it. The Cessna 140 pilot longs for a 170. The 170 pilot would really like a 180. The 180 owner feels everything would be perfect, if only he had a 185. Meanwhile the 185 owner is cruising *Trade a Plane* looking at DeHavilland Beavers. You get the idea.

Many times we are the first to break the news to pilots that their upgrade plans may need to be deferred pending an improvement in their overall experience. Insurance is an important consideration in the complex aircraft ownership equation, and invariably the advice and information provided by our Insurance Counselors helps our customers decide which aircraft to buy next, and possibly which aircraft to avoid.

If you do have your heart set on a moving up, what can you do to ensure that insurance coverage will be available and affordable when you make the transition? Plenty! But first, I think it might be helpful if you understand some of the factors that are evaluated when we consider a transitional pilot.

The Aircraft

Most aircraft are going to require a certain level of pilot experience as a minimum requirement. For an airplane like a Cessna 150 or Piper Cub, the basic requirement could be as simple as a student pilot certificate. For a Lake Amphibian however, we will want the pilot to have significant flight experience, and a seaplane rating. For a newly minted private pilot interested in buying a Lake, the discussion might end right there.

Another factor we consider is the value of the aircraft. You may be easily insurable in a $75,000 Cessna 182, but are you insurable in a 2006 Cessna 182T with a Garmin G1000 avionics suite and a hull value approaching $400,000? Aircraft with high values typically require more pilot experience and are subject to stricter underwriting guidelines.

The Pilot

What is the pilot's experience, and does it correlate with the aircraft he intends to fly? For example, thousands of hours in a Piper Super Cub are highly relevant when the insured aircraft is to be a new Maule. But those hours may not be as equally relevant when the insured aircraft is to be a pressurized Baron. Generally, we prefer that a pilot's experience support a logical upgrade, for example a Piper Archer to a Piper Arrow to a Piper Saratoga.

Airport Base

The airport base will be reviewed to ensure it is an adequate match for the performance characteristics and configuration of the aircraft. Runway length and width, the availability of an ILS approach, and the airport elevation are all evaluated depending on the type of aircraft. A Skyhawk based at a private unpaved airport may be insurable on a finely groomed turf airstrip at sea level, however it would not likely be insurable at a high elevation rough gravel strip or on an airstrip surrounded by obstructions or power lines.

The Human Element

Lastly, do not forget that underwriters are human and cannot help but base their decisions in part on subjective information, personal bias or past experience. At Avemco, you are largely immune from this because we classify risks in a very standardized fashion which removes almost all of the subjectivity. However, individual impressions can still influence the underwriting process. I can share a personal example of this.

One morning, I spoke to a customer who owned and operated a heavy piston pressurized twin. He was a successful businessman and an experienced pilot who regularly participated in recurrent training for his aircraft at a recognized school. He had a few questions about some policy documents that were recently mailed to him. The call was unremarkable in that it was just like any one of the thousands of calls that Avemco receives from its customers each year. Except that by dinnertime this particular customer and his passengers had perished in an accident involving the insured airplane.

The news of the accident shook me. At first I was sickened by the loss of life. Then I began to question myself and the brief and benign interaction I conducted with the customer that morning. Did he sound well rested? Alert? Suicidal? As ridiculous as it sounds, I even wondered if there was something I could have said or done to have prevented the accident. Then I became angry. If an experienced, qualified, current and proficient pilot cannot safely complete a flight in this type of aircraft, then who can?

As a result of this tragic accident, I can assure you that if you were a low time pilot calling me for a quote on a heavy piston twin in the days following that accident, you were likely subject to a lot more scrutiny.

What can you do?

The best way to ensure that coverage will be available for you is to decide early in the process the type of aircraft that you wish to move into, and then to "build" your pilot résumé to support the transition. Let's look at a few examples.

If you really want to own and fly a Pitts S2, let's face it—you should first be a master in the art of the tailwheel. If you are not already tailwheel proficient, we would likely suggest that you first spend some significant time flying an aircraft such as a Piper Cub, Cessna 140 or Citabria. A pilot who already has considerable tailwheel experience should be able to transition into the Pitts after a modest period of dual flight instruction.

If you are moving up from a Skyhawk into a heavy single such as a Cessna 210, we would prefer that you already have accumulated some relevant flying experience. Building some time in a complex trainer such as a 172RG will definitely aid your transition to the 210. The instrument rating, while not mandatory, will certainly reward you with a lower premium.

If you want to move into an aircraft equipped with a glass panel, and you have no glass panel experience, you may want to look first into a FITS approved glass panel transition course or complete a home based glass panel course, a new G1000 course is offered by King Schools. Since those aircraft equipped with glass

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PROBABLE CAUSE

Courtesy of the National Transportation Safety Board

An RV-4 home-built nosed over in a field during an emergency landing following a complete loss of power. The two pilots aboard received minor injuries, and the aircraft sustained substantial damage. Visual meteorological conditions prevailed for the local area personal flight operating under Title 14 CFR Part 91. No flight plan was filed. The flight lasted approximately 54 minutes prior to the accident. The pilot said that at the time of the flight's departure, the airplane had 11 gallons of fuel on board.

According to the pilot, after arriving they conducted three touch-and-go landings and were on a cross wind leg for a full stop when the engine "abruptly" quit. The pilot said three restarts of the engine were attempted without success, and he conducted a forced landing into a plowed field. During landing roll, the right main landing gear collapsed and the aircraft nosed over.

Following the accident, two FAA inspectors examined the aircraft on two occasions. The first examination took place the day of the accident. According to the attached statement provided by the FAA inspectors, they found no evidence of fuel in or around the aircraft. In addition, in a statement made to the FAA inspectors, the pilot stated he should have had approximately 12 gallons of fuel on board at the time of the accident.

The same inspectors returned the following day, and at that time found fuel in the left tank. In addition, the right magneto was inoperative. This was attributed to impact damage by the inspectors. No other evidence was found to prevent the engine from operating.

A review of the engine performance information was conducted. According to the engine manual the engine at 75 percent power (2450 RPM) burns approximately 10.5 gallons per hour.

A review of pilot information produced evidence that the pilot's medical certificate and his biennial flight review were not current. Also, according to the information provided in the Pilot Operator Report, the pilot had not flown in the previous 90 days prior to this flight.

The pilot/passenger in the rear seat owned the airplane. He was a certified flight instructor (CFI), and was current in all respects. The flying pilot said that he was the pilot in command and that the CFI was a "passenger."

The rear cockpit in this aircraft was equipped with aileron and elevator controls only. There were no rudders, throttle, mixture control, flap control or instruments.

The NTSB determined the probable cause(s) of this accident as follows: the pilot's inadequate preflight planning and preparation in that he failed to ensure the aircraft had sufficient fuel to complete the flight. A factor was the soft terrain.

A Cessna 152 was substantially damaged during a forced landing following a loss of engine power while on a VFR approach to the airport. The instrument-rated commercial pilot and his passenger were not injured. Dark night visual meteorological conditions prevailed for the 14 Code of Federal Regulations Part 91 personal flight, for which a flight plan was not filed.

According to the pilot, the planned flight was about 265 nautical miles and the time en route was to be about 3.1 hours. He stated that both fuel tanks were full at the time of departure, and he flew at 2,500 feet MSL and used a power setting of 2,300 RPM during the cruise portion of the flight. The pilot reported that he did not lean the mixture during the flight since he "remained below 3,000." He added that based on his computations utilizing the Cessna 152 performance charts, he would be able to complete the trip with the required 45 minutes of reserve fuel. According to a recording of communications with approach control, the pilot initially requested vectors to the airport, and shortly thereafter, requested vectors to the arrival airport. As the airplane descended through 1,000 feet AGL, the engine RPM began increasing and decreasing, and the pilot requested vectors to the nearest airport. The controller continued to vector the airplane toward the destination airport. Subsequently, the engine lost total power and a forced landing was initiated. The airplane touched down on soft terrain, nosed over, and came to rest inverted 5 miles northwest of the airport.

The FAA inspector, who examined the airplane at the accident site, reported that there was "very slight bending of the propeller," and the engine firewall was structurally damaged. He stated that there were no indications of fuel leakage and he did not smell fuel at the accident site. The inspector drained 1.5 gallons of fuel from the left fuel tank and .5 gallons of fuel from the right fuel tank. According to the pilot's operating handbook (POH) for the Cessna 152, the total fuel capacity is 26 gallons, of which 24.5 gallons is usable.

According to the FAA inspector's report, based on the altitude and power settings the pilot stated that he used, the Cessna performance charts revealed an endurance of 3.7 hours and 45 minutes of reserve at 45% power. These figures are based on full tanks, maximum gross weight or less, and operations in accordance with the POH. The figures in the POH are based on leaning the mixture during cruise flight. Based on the recorded start hobbs meter time of 4443.4, and the reading of 4447.1 at the accident site, the duration of the flight was 3.7 hours.

According to the FAA inspector, another Cessna 152 airplane departed on the same route of flight shortly after the airplane involved in the accident. The pilot of that aircraft landed at the airport and refueled his airplane. The fuel receipt revealed that 24.1 gallons were added to the airplane (useable is 24.5). The pilot of the second aircraft stated that he flew at 2,500 feet, 2,300 rpm, and leaned the mixture during the cruise portion of his flight.

The NTSB determined the probable cause(s) of this accident as follows: The failure of the pilot to refuel the airplane which resulted in fuel exhaustion. Factors were the pilot's poor preflight planning, failure to lean the mixture in accordance with the POH, and lack of suitable terrain for the forced landing.

Transitional Pilots

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panels are likely to be new and therefore expensive, you should anticipate greater overall requirements for pilot experience due to the value of the aircraft.

Are these suggestions reasonable? Couldn't a pilot with the right combination of instruction and training step right out of a Cessna 150 and transition into a Pitts? Possibly. But remember that insurers are in the business of risk management. With well over a million dollars on the line in combined hull and liability exposures for any given aircraft, insurers must balance the need to provide competitive coverage for all policyholders with the need to provide an acceptable level of return to its shareholders. With over 40 years of experience, Avemco has a solid reputation of successfully achieving this balance.

Ultimately, you can take comfort in knowing that with some planning and preparation you can be insurable in just about any aircraft in the general aviation fleet. We will be happy to guide you through the steps you will need to follow in order to qualify for insurance coverage in the aircraft of your dreams. And your next aircraft after that!

Aviation Trivia

1. The first Flying Club in the United States was formed:
   a. The same year Charles Lindbergh flew across the Atlantic
   b. One year prior to the Wrights' first flight
   c. The year prior to Amelia Earhart's disappearance
2. The predecessor to the Piper Cub was the Taylor Cub, first flown in:
   a. 1937
   b. 1940
   c. 1930
3. The first airplane built by Boeing was:
   a. a land based biplane
   b. a multi-engine monoplane
   c. a biplane on floats
4. What year was Charles Lindbergh born?
   a.1895
   b.1902
   c.1927
5. Who was the first woman to circumnavigate the earth?
   a. Jackie Cochran
   b. Bessie Coleman
   c. Jerrie Mock
6. When was Wilbur Wright born?
   a. 1848
   b. 1903
   c. 1867
7. What year was the first flight of the Spirit of St. Louis?
   a. 1902
   b. 1954
   c. 1927
8. Who was the first woman to fly faster than the speed of sound?
   a. Amelia Earhart
   b. Katherine Stinson
   c. Jacquelyn Cochran
9. What year did the Wright Brothers receive a patent for the airplane?
   a. 1903
   b. 1906
   c. 1909
10. Who was the first person(s) to fly across the Atlantic?
    a. Charles Lindbergh
    b. Lt. Commander A. C. Reed and the crew of Navy flying boat NC-4
    c. Amelia Earhart
11. What popular general aviation airplane has remained in continuous production for over 50 years?
    a. The Cessna 172
    b. The Beechcraft Bonanza
    c. The Piper Cherokee
12. Which members made up the famous Eagles aerobatic team?
    a. Paul Poberezny, Art Scholl, Charlie Hilliard
    b. Tom Poberezny, Gene Soucy, Wiley Post
    c. Tom Poberezny, Charlie Hilliard, Gene Soucy
13. What single engine retractable gear aircraft was put out of production in part due to a flood?
    a. Beechcraft Sierra
    b. Cessna Cardinal RG
    c. Piper Comanche

1. (b) The Aero Club of New England was formed in 1902; the Wright Brothers first flew in 1903. 2. (c) 1930. 3. (c) The design was inspired by a Martin seaplane flown by William Boeing. In addition there were no airfields in Seattle. 4. (b) 1902. 5. (c) Jerrie Mock in a Cessna 180 in 1964. 6. (c) April 16, 1867 7. (c) April 28, 1927. 8. (c) Jacquelyn Cochran May 19, 1953. 9. (b) 1906. 10. (b) Lt. Commander A. C. Reed and the crew of Navy flying boat NC-4, May 31, 1919 which included seven stops. 11. (b) The Beechcraft Bonanza has remained in continuous production since 1947. 12. (c) The Eagles aerobatic team, sponsored by Avemco, was made up of Tom Poberezny, Charlie Hilliard and Gene Soucy. 13. (c) When Pennsylvania's Susquehanna River flooded in 1972 it wiped out Piper's Lock Haven manufacturing facility. Following the flood, Piper decided to discontinue the Comanche and focus on PA-28 series built in Vero Beach, Florida.

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