

FAA Aviation news

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AVIATION SAFETY FROM COVER TO COVER



THE HAZARDS OF LOW ALTITUDE
AND OFF-AIRPORT
FLIGHT OPERATIONS.....

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FRONT COVER: A Cessna 182 Skylane
(Cessna Aircraft photo)
BACK COVER: Having fun in a Kitfox.



by H. Dean Chamberlain

As pilots start to prepare for another season of flying, there are some annual safety issues that need to be reviewed.

First is the suggestion that pilots who haven't flown much over the winter should get some recurrent training with their local flight instructor. With a little planning and the flight and ground training needed to qualify for a phase of the Pilot Proficiency Award Program (see Advisory Circular 61.91H), a pilot can receive refresher training and earn a phase of the "Wings" program that also can be used in lieu of a flight review. It is a classic win-win situation that not only can polish a pilot's rusty techniques; it can also reset the flight review clock for another two years.

Like rusty pilots, aircraft that have sat out the winter can use some tender loving care after being neglected over the cold, winter months. A good check out by their local aviation maintenance technician or at least a very, very, careful preflight would be appreciated by the aircraft. After all, who knows what creatures spent the winter living in the cowling or cabin? Even in early spring, birds also like to build their nests in the tails and wings of aircraft, not to mention exhaust stacks or inside the cowling.

SPECIAL RISKS OF SPECIAL PILOTS

Although many pilots and aircraft will need the dust brushed off them and the old motor rewound, there are several groups of pilots that could use some special care and feeding. Because of their unique operating environments, seaplane, helicopter, and agriculture pilots deserve special attention when getting ready for a new operating season--especially if they have not flown much over the winter. Some pilots are lucky. They live or work in the warmer areas of the country where they can maintain their currency year round. Others are not so lucky. For those pilots who had to hibernate over the freezing winter months, the following accident reports should serve as a reminder that seaplane, helicopter, and ag pilots require a greater level of proficiency because of the unique operating capabilities of these type aircraft.

OFF-AIRPORT OPS

Seaplanes and helicopters share a special operating risk that fixed-wing aircraft don't normally share: Frequent off-airport operations. Yes, we know

that many Alaskan and other fixed-wing pilots routinely operate off-airports, particularly those in more remote areas, but we think the majority of fixed-wing pilots operate off some type of designated grass or paved "airport" rather than an unimproved "bush airstrip."

To avoid burying ourselves in controversy, we are referring to any cleared, maintained, or monitored landing area as an airport. We are doing this to contrast a fixed-wing aircraft landing at such an airport with seaplanes and helicopters that can and do frequently land in areas that may not be maintained or monitored frequently like an airport. For example, seaplanes frequently land in rivers and lakes where floating objects such as trees and logs lie in wait for the unwary; submerged objects such as decaying piers and pilings wait to rip open a float or hull; and hidden objects such as sandbars and rocks silently wait beneath the surface to ruin your day. They all pose special risks to seaplanes. Add in the common aviation hazards of trees, power lines, telephone cables, tall towers, and the latest threat to anything that flies--the growing number of cellular telephone towers that keep popping up around the country like



mushrooms, plus throw in a few boats and bridges and the hazards of off-airport operations become real for seaplane pilots, posing risks that those who land on paved runways seldom have to think about.

HELO OPS

Although most helicopters seldom face submerged piers (some helos do operate on floats), most helos face many of the same risks as seaplanes with a few unique ones of their own. For example, steep slope operations have upset more than one helo trying to land. Add in the dangers of whirling rotor blades and tailrotors, tall grass and brush that the rotors can hit, and off airport landings, and the potential dangers of helicopter operations become more of a concern.

Are we saying that such operations should be prohibited? No. But we are saying that such risks have to be identified and managed through good pilot training, good company operating procedures, and attention to detail. Add

in the lack of proficiency of someone who didn't fly much over the winter, and you get someone who could benefit from some refresher training before venturing out into the wild.

And the "wild" may be as near as your local parking lot as one helicopter pilot found out several years ago. According to the incident report, the commercial pilot "made a hard landing while trying to land in parking lot. Lost left pedal effect. Spun 3 times. Entered autorotation."

In another case, the commercial helicopter pilot, "allowed aircraft to drift into outcrop while hovering. Landed in wash. Damaged blade tip." Another commercial pilot, while "surveying flood damage, skid slid under power line. Backed off. Landed to check. Minor damage." Our final helicopter example reported that the pilot "hit wire on takeoff from highway. Air ambulance operation from highway. Landed safely."

These helicopter examples show that because of their ability to operate in confined areas, helos also

have some unique operating risks. Nothing that good training can't overcome, but helicopter pilots need to be especially careful when regaining currency and proficiency after a layoff from flying. This is especially true of non-commercial pilots flying helos because they may not have access to the safety information a commercial operator may have, plus pilots flying for commercial operators have to pass recurring proficiency check rides.

AG OPS

Like helo pilots, agriculture pilots also operate in a special

environment. Wires and trees around fields pose special risks for them. As reported in the on-line incident data from the FAA's Office of System Safety, the 4,000 hour commercial ag pilot "failed [to] clear wire on pull-up from spray run. Caught on spray pump. Broke a blade. Landed safely." Another ag pilot's report was to the point and very succinct, "During spray runs flew under power lines. On next run hit wire. Wire hit windshield and tail. Returned to base." And since both ag planes and helicopters are involved in ag operations, one 11,000 hour commercial pilot's incident report of an ag helo incident simply said, "Contacted power line at the end of a spray run. Landed safely."

SPECIAL RISKS AND DANGERS

Pilots operate daily in areas with some or many of the risks listed. And they do this safely. The pilots at risk are those who fail to recognize potential risks, or those who ignore them.

For example, seaplane pilots need to remember that whenever a waterway floods, there is always the possibility that trees and other objects may be floating downstream. Flowing water can also create or move sandbars and other natural objects.

CELLULAR TELEPHONE AND DIGITAL TV TOWERS

Like a rapidly changing river, low-level helicopter flight paths can change almost overnight. Cellular telephone towers tend to "pop up" along highways that helicopter pilots like to use as low-level flight routes. Add in the low visibility operating capabilities of helicopters, and the new towers become an even greater potential threat.

The latest danger to all low-level flight operations is the new towers being built around the country with the introduction of digital television. Entrepreneurs wanting to cash in on the developing high definition television market are building these new towers in areas that may pose risks to pilots, i.e., landing areas and airports.

In some cases, these new towers may not be charted. These new towers are at the center of a controversy between the aviation community, local governments, and the Federal Communications Commission (FCC). At issue is the FCC's desire for these new towers to be installed and the question of whether or not these new structures are subject to local zoning control.

With all of these potential risks, the challenge for aviation is keeping up with all of the changes in the low-level landscape.

POWER LINES AND TOWERS

Out of the list of potential hazards that seaplane, helicopter, and ag pilots may have to face on a daily basis, two of the most dangerous ones are, arguably, power lines and towers. Low altitude, unmarked power lines pose even a greater threat. Although large power lines are normally charted for their navigational value, such lines pose significant risks for pilots flying low through valleys, mountain passes, and down the center of rivers and other water ways. The problem is not all such lines are marked by the traditional color balls that were designed to make such lines more visible. Because not all lines are marked, and because power lines are difficult to see, pilots must learn to look for parts of the power line system that can be seen such as the towers supporting the wires crossing a river or mountain pass. Once aware of such support towers, pilots then can search for the wires before descending to an altitude where the wires hanging between the towers could pose a threat.

Unknown power lines are not always the threat. Although ag pilots routinely fly near power lines and telephone cables, their risk is different. They normally know the wires are there. Their problem is remembering the wires while maneuvering. Wind, turbulence, blinding sunlight, fatigue, loss of power, and operating on the edge of the aircraft's limitations have all contributed to ag accidents and wires. For pilots who may have to

make a last minute decision to fly over or under a set of wires, one misjudgment can result in a potentially fatal wire strike.

The same is true of flying around towers. Like power lines, towers pose a potential threat to low flying aircraft. Add in a tower's support wires for those towers with them, and the danger zone around a tower extends both vertically and horizontally around the tower. The secret is to locate charted towers while flight planning and planning how to safely circumnavigate them or to over fly them.

SO HOW CAN YOU HELP?

First, all pilots should operate high enough to comply with the Federal Aviation Regulations minimum altitude requirements. Then all pilots should keep a watchful eye out for towers, power lines, and other such obstacles. Those charted, those not charted, and those not required to be charted. Pilots can also report new tower construction to their local Flight Service Station or local FAA air traffic facility to alert FAA to the tower. Although FAA doesn't have any authority over the construction of towers, FAA can formally object to both local and other federal government organizations that do have authority over such construction and local zoning.

Second, before flying at a low altitude, all pilots should carefully review their appropriate sectional charts for potential threats along their projected flight route. This review needs to include the published chart changes listed in the Aeronautical Chart Bulletin in the appropriate *Airport/Facility Directory* that have not been added to the published chart. Pilots should also check for any NOTAM that might list a new obstacle. The NOTAM check should also include any airport, navigational, or operational changes for the route and airports along the route at which the pilot may land. The *Airport/Facility Directory* also contains information about hazards around airports listed.

Finally, a trick that seaplanes and helicopters routinely use is to fly at a

safe altitude over the intended point of landing and once they determine that no unknown risks await them, they descend to their respective operating/landing altitude. Helicopter pilots call this making a high reconnaissance.

MINIMUM SAFE ALTITUDES

FAR §91.119, Minimum safe altitudes: General, outlines the minimum altitudes that apply to all aircraft except when necessary for takeoff or landing. The rule states, "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."

The key to another safe season of flying is to remember to fly high. There is safety in altitude. But when you have to operate low, first fly high while checking for low altitude dangers, and once you are satisfied that it is safe to descend, go down to the appropriate altitude while remembering the minimum operating rules. Don't let a power line or tall tower ruin your summer. ✈





BIG-O-EGO

Instructor-Student Relationship

by Dr. Mike Hakim

It was a beautiful day for flying that early morning in April 1967. I was to meet my flight instructor for preflight on the Quantico Virginia AirO Club flight line. However, as I approached, he barked. "Well, let's get this over." It was becoming painfully obvious he didn't believe that the best learning conditions often depend on a favorable instructor-student relationship.

Throughout my first lesson his motto seemed to be, "I talk, you listen!" After all, it wasn't his responsibility to create a favorable relationship—he was the instructor and I was a mere student. Of course, it would have helped if he had been a bit more communicative. As we took off, I didn't have a clue as to what the flight instructor expected of me or what I would be expected to learn and do. This apparently was a closely guarded military secret.

After we had been flying for about 15 minutes a demon must have taken over the flight instructor. His eyes bulged and face got extremely red as he shouted, "That's NOT the altitude I told you to hold! What's wrong with you? Are you stupid or just 'plane' dangerous?"

My instructor was obviously suffering from some sort of disease. I think the medical term is BIG-O-EGO. Some of his symptoms were:

1. **Authoritarian training techniques.** If I asked why a task had to be accomplished, he answered, "Because I said so."
2. **Emphasis on relative status.** The flight instructor is the important person and is not to be bothered with the petty problems of the student, who by definition occupies a lower place in life.
3. **Peculiar methods of instruction and correction.** Ridicule, sarcasm,

personal insults, and threats were used liberally to train and to correct my mistakes.

The underlying philosophies of "break them down before you can build them up" and "remove their will so that they will respond to orders without question" may be applicable in some situations. However, wasn't the flight instructor supposed to try to foster confident decision-making and independent problem-solving in my flying abilities? If so, his BIG-O-EGO would seem to be counterproductive to those goals. The result of the use of these training "techniques" was a loss of mutual respect. I am sure this type training doesn't go on now, or does it?

Some instructors who aren't sure of themselves employ authoritarian training techniques because they lack the attributes of sound judgement, knowledge, and good personal relationships with people. Authoritarian

trainers are not certain to what degree of control they can maintain over their students, if they release any control in the decision-making process to the student.

Remember, the key to successful training is to make it student-centered, not instructor-centered! Professional trainers involve their students in the learning process by asking their advice and coaching their students to success. Ideally, the process of positive training gains the willing cooperation of students through the use of sound training techniques. Because of the instructor's sound judgement, knowledge, and personal relationship with the student, the instructor can direct positive attitudes as well as correct technical behaviors during learning.

A point to remember is that the proper use of training techniques is the style that gets the best results, yet maintains mutual respect. We are not restricted to one, stereotyped, method of training. But, if we go around all day with a scowl on our faces, ranting and raving, making every student around us wish we would disappear, we have BIG-O-EGO.

For a good instructor-student relationship to exist, three key factors are required:

- **Rapport.** A close or harmonious relationship; general agreement on objectives and methods.
- **Empathy.** Identification with another; the instructors place themselves "in the other person's shoes" and look at things through the eyes of the student.
- **Positive Relationship.** Students identify with the instructor in a positive way. They view the instructor as a leader and teacher, not a disciplinarian or guardian.

Some Other Key Factors To Consider

Boring or repetitious material. At times a subject may be, by its very nature, boring and repetitious. Anticipate the adverse affect on the student and plan accordingly. A new approach, novel examples, and other interactive teaching strategies can often rejuvenate

old material and make it more palatable. Do not allow your teaching personality to become lax or stale. Be as dynamic, enthusiastic, and sincere as possible.

Difficult material. Very difficult material can pose a challenge. Carefully plan your methods. During the training, be certain that the student fully understands each teaching point before you go to the next, and allow ample time for student questions.

Individual learning traits. No two people are alike; each possesses a unique personality. The general level of education, the average age, experience, and many other factors all influence the overall attitude, motivation, acceptance of instruction, and willingness to learn. Be aware of this fact, be alert in evaluating student characteristics, and be ready to adjust your material and methods accordingly. By so doing, you can avoid antagonizing an individual and determine the best means of creating an effective learning situation. Failure to do so, will almost certainly result in reduced student learning.

Students have responsibility for learning. Students should be expected to accept certain responsibilities, regardless of individual desires or situations. You should assume that the majority of students will be responsible for their learning. In general, students are expected to:

- Conform to flight standards and regulations.
- Show respect for the instructor by taking an active part in learning activities and completing assigned work, i.e., ground school assignments.
- Accept the fact that in the adult learning situation the student has a major responsibility for what he or she learns.

Instructor responsibilities. You must accept the responsibilities which accompany the challenging profession of being an instructor. As a minimum, you must set the example. This includes:

- Maintaining a high standard of integrity.
- Modeling behaviors you want the

students to emulate. (Avoid the "do as I say not as I do" syndrome.)

- Managing the training activities efficiently.
- Constantly evaluating the learning conditions.
- Checking teaching materials for accuracy and effectiveness.
- Observing and recognizing student progress.
- Reviewing your methods and techniques, and objectively judging your effectiveness.
- Maintaining professional growth. As an instructor you must deal with various conditions in teaching people to fly. The ability to handle individual and group situations comes with practice. Develop your own techniques; however, experienced instructors follow a few definite rules:

Never bluff. If you don't know the answer to a question, say so. Tell them that you will get it for them, then follow through.

Be sensitive. Don't use sarcasm or ridicule. It alienates the student. It is eminently unfair to misuse your authority in this way.

"Do unto others..." Never talk down to a student. Although you know more about your subject area, this does not imply that you are superior to the student. To suggest in any manner, however small or minor, that you feel superior will bring instant resentment and seriously affect your ability to teach.

Don't lose patience. There is an adage to the effect that when the student fails to learn, the instructor has failed to teach. This may be questionable in some cases, but it is worth considering. If students seem slow, remember your early experiences in the cockpit, which now seem simple. Keep your temper, and try to invent different ways of explanation.

A final point to remember is that learning is NOT about what you know, but rather what you can teach others about what you know. ✈

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THE MYSTIC ART OF BEING A LOW-TIME PILOT



by Bill Belanger and Al Schnur

In this article, we'll be talking about proficiency, not legal currency. The currency requirements are bare minimums. Being current does not mean the same as being proficient. We'll start with the assumption that being proficient means exceeding the legal currency requirements for most pilots.

Let's try a word association test. What word comes to mind when you hear "low-time pilot?" How about "inexperienced" or "unskilled?" "Unsophisticated," "unworldly," and "green" probably fit in there, too. Did we hear anyone say "incompetent?" Now here are a few words that might not have come to mind. How about "sharp" or "up-to-date?" How about "flight instructor?" Or perhaps even the word (heaven forbid) "me" crossed your mind. If it did, this article is for you. We hope to offer some tips to keep or improve your proficiency.

First, let's decide whom we're talking about when we speak of a "low-time pilot." Are we talking about

someone with fewer than 400 hours? To a recently certificated private pilot, 400 hours is a lot. How about 1,000 hours? Well, to a 400-hour pilot, 1,000 hours is a lot. How about a 10,000 hour jet pilot who is doing an initial checkout in an ultralight? Very experienced pilots have gotten themselves killed doing this. What about the person who has a couple thousand hours but hasn't flown since 1988 (or kept up with the changes in aviation)? Yes, there's a tendency to try to put it in terms of hours, but this might not tell the whole story. There are differences among pilots that can't be described in terms of total hours. Recency counts. So does variety of experience--you get a whole lot more out of flying 100 hours under differing conditions than you do by flying the same hour 100 times. And don't forget that most flight instructors begin teaching with only a few hundred hours, and instructional flying has one of the best safety records.

If it begins to look like we're going to dodge the issue of hours, you're

right. But this isn't just because we don't want to define a low-time pilot as anybody who has fewer hours than we do. It's because we don't know of a good breakpoint that would be meaningful in all situations. Sure there are minimum hours written into the Federal Aviation Regulations: 35 hours (FAR Part 141) or 40 hours (FAR Part 61) for a private certificate, 250 for commercial, and 1500 for ATP. But those minima are carefully selected for pilots who are immersed in the learning process. In this article we're not only addressing the pilot who has low hours, but also the pilot with a really fat logbook but not much recent activity. Or the pilot with all his or her experience in a different environment that may not be totally relevant to the kind of flying he or she is doing now.

So why would anyone want to be a low-time pilot in the first place? Odds are that nobody deliberately sets out to be a low-time pilot or wants the label when they have earned it. Nobody awards a lapel pin for fewest hours flown. People become pilots in the

first place because they love to fly, but flying is an expensive hobby. So what makes a low-time pilot? You either have all the time in the world and not much money, or you have enough money for a high performance aircraft and not much time. Or maybe you have neither the time nor the money--a sorry state indeed for one addicted to the joy of flight. But there's a big difference between pilots limited by time and those limited by money. If you have a lot of money and not much time, you might own a high performance single or a twin. Your problem in staying proficient is probably not very much like the problems of a person with lots of time and not much money, who can only afford to occasionally rent a basic airplane. There's a huge difference between staying proficient in a high-performance single or a twin versus a basic single.

Perhaps we're hitting on one of the keys to proficiency--what kind of flying do you do? Whether you lack the time or lack the money, the kind of flying you do will have a lot to do with what you need to do to stay proficient. We'll focus here on the pilot whose flying time is limited by some external factor, not the pilot who is just plain new to flying and is rapidly accumulating hours. This fortunate soul doesn't have the problems we're here to address.

If you look at it this way, there seems to be no single problem that results in a low-time pilot. And if the reasons for being low-time are different, then perhaps their proficiency needs might also be different. So let's look at those differences and see what we can conclude.

The time-limited pilot with lots of money probably has the most difficult (and dangerous) problem. This is the guy or gal we'd all like to be, with enough money to buy a high-performance single or maybe even a twin. At the upper end of this range is the person who buys and flies a business jet. The excuse is usually to save time getting to the work that makes the money, but nobody really believes that story--except maybe the tax accountant. The problem is that the lack of

time is real, and the problem is compounded because the high performance aircraft demands a higher skill level.

So let's look at this person who regularly flies a complex airplane on business. Maybe there's even a few thousand hours in the logbook. But is this person proficient? When was the last time he or she was up with an instructor to practice engine-out procedures? How much of the recent IFR time was partial-panel or involved other simulated emergencies such as communications failure? More simply, how much flight instruction has this person had since the last rating was earned? If it's only a flight review every two years, it's probably not enough. Emergency management skills get rusty when the last couple hundred hours is uneventful flight along the airways. That's why we'll call this pilot a low-timer; because he or she is low-time in the skills that can save your neck when things get weird.

The only real option for this person is to devote some time to staying proficient, and that means taking some dual whether or not it fits in well with the schedule. A twin owner needs engine out practice, preferably about twice a year, regardless of the legal requirements for currency. A person who flies a high performance airplane needs regular practice on the emergency procedures peculiar to that airplane, such as emergency gear extension, electrical failure, etc. This pilot is much more likely to depend on electronic navigation at the expense of practice in good old pilotage and dead reckoning and therefore more likely to be in trouble when all those expensive electronic aids suddenly decide to pack it in.

Fortunately, returning to a previous skill level is a great deal easier than building the skill in the first place. Regaining proficiency doesn't have to be a time consuming enterprise. A few hours of dual every six months might be all that's needed. Participation in the "Wings" program can also help, and counts as the required flight review in the bargain. It might be possible to charter a flight instructor to go

along on a trip. This way, the dual could be given as a part of the trip with little or no extra investment of time. It's worthwhile remembering that flight instruction is probably one of the best bargains in the United States today. Where else could you pay so little for instruction in such a complex skill that might save your life someday? Just compare it with the cost of a golf pro, and a good golf swing won't save your life (though some golfers would say otherwise).

The money-limited pilot seems to have the opposite problem in many ways. He or she will probably fly a basic single with forgiving manners. If the airplane is rented from the local FBO, there might be a few different types involved, but the rental fleet is not well-stocked with high performance aircraft with quirky handling traits. These aircraft would be quickly removed from the rental market. Of course, this pilot might fly a complex airplane only very occasionally, and this could lead to trouble, but in general the aircraft flown will be quite forgiving. This suggests a somewhat different approach to proficiency.

For this person, we'll repeat the ancient adage, "flight instruction is probably one of the best bargains in the United States today." It doesn't cost a whole lot more to rent an airplane with an instructor than it does to rent just the airplane. An even better bargain are the FAA safety seminars, which are even cheaper--they're free. So if money is the limiting factor, then put it to the best possible use. This might mean flying a few less hours but with an instructor, even when it's not legally required. When flying alone, practice flying to the practical test standards to keep yourself sharp. (If you don't know the practical test standards, they are often available at pilot shops and local FBO's, and are also on the FAA's Internet site--these are the standards you must satisfy to get your pilot certificate.) Occasionally try a turn around a point or some slow flight or practice the commercial maneuvers if you have a commercial ticket. If you find yourself getting sloppy, maybe it's time for some dual. Spend time with as many





different instructors as you can. Each will have his or her own strong points and weak points, just like everybody else. Seek variety and quality in instruction. It's a lot like seeking variety in your flying--the number of hours isn't as important as the quality of the hours. In the same way, the quality and variety of the instruction is more important than the number of hours, even though they all count the same in the logbook.

There are a lot of other opportunities to reduce the cost of staying proficient. One of the easiest is simply to do a couple of takeoffs and landings at the beginning of each flight. This takes only a few minutes and can bring you up to speed while you're still fresh. After a long, tiring flight, it's not a very good time to discover your landing skills have gotten rusty, especially at a strange airport where you don't know the local landmarks, aren't used to the runway width, and are generally just too tired to concentrate on anything but a trip to the rest room.

Some ground training devices (those now designated as level 1 flight training devices) also offer a low cost means of staying proficient in instrument flight. If you have access to such a training device and an instrument flight instructor or instrument ground instructor, you may log the instruction given in the device toward meeting instrument currency requirements (FAR Part 61) without ever burning a drop of avgas. The value of

these devices is recognized by the FAA because you can credit up to 15 (Part 141) or 20 hours (Part 61) of instrument instruction given toward an instrument rating. Personal computer-based aviation training devices, which have been qualified by the FAA as PCATD, may be used to acquire 10 hours of instrument training creditable toward an instrument rating under Parts 61 or 141 when that training meets specific conditions and is given by an authorized instructor. Although PCATD's are not authorized for use in meeting the FAR currency requirements and may not be logged as creditable pilot time, their use may be helpful to a pilot in maintaining currency in procedural aspects of instrument flying. This is especially true when the PCATD significantly replicates a specific model airplane. But that doesn't reduce its value in staying sharp. If anything, it at least makes you think about flying a real airplane, and this kind of "visualization" has been shown to improve learning skills. The point is to do some meaningful practice, preferably involving situations you don't normally encounter, whether or not it can be used for legal currency or even entered in the logbook. The objective is to make you think.

Another option is to join an aviation organization such as the Civil Air Patrol. This provides an opportunity for additional free instruction in specialty flying skills and can provide low-cost access to airplanes. Sorry, the flying's

not free, even in the Civil Air Patrol, and there is a certain amount of discipline required. However, if you want to be proficient it might be worth the investment of time and a little money.

If you're a renter pilot, you might want to avoid renting the complex airplane until there's more time and money to stay proficient in that airplane. It takes a lot less time and money to stay current in a simple single. Perhaps it would also be good to limit your flying to less demanding situations. For example, if you have an instrument rating and don't have the time or money to stay proficient in instrument flight, it might be time to limit the flying to VMC. If you're legally current but don't feel up to actual IMC, there's nothing wrong with getting a clearance just to get above a ceiling--as long as you're sure you won't get stuck in a situation you can't handle. If the time and money situation suddenly improves, it's surprisingly painless to recover the instrument skills, and you don't have to take another check ride. All you need is an instrument proficiency check from a CFI.

In other words, limit your flying to the skills you can comfortably maintain, or decide on a favorite type of flying and concentrate on it. It might be cross country to visit the relatives or to find a really great hamburger, it might be local sightseeing, or it might even be something a little more exotic like aerobatics. The less-used skills can be quickly rebuilt when the time and money become available. This can take a lot of the burden out of staying proficient. If possible, do some flying with others who have more experience to further develop your skills, even if it's only watching from the right seat.

Another option is to become a professional student of aviation. Read every aviation book you can, and subscribe to serious aviation magazines like *FAA Aviation News*. Spend all your available flying time and money, however limited, toward learning a new skill or getting a new certificate or rating. This will always place you with an instructor, and it can be a heck of a lot of fun. And isn't that what flying is all about in the first place? ✈



"GET-HOME-ITIS"

by Patricia Mattison

A significant cause of accidents in the United States is the strong desire to reach a destination. Better known to pilots as "get-home-itis," it is a serious, yet curable, contamination of the normally clear-thinking brain cells.

The following story happened to a pilot while on a very long cross-country flight. It was a cold and windy night. (Isn't that how most mysteries start?) The pilot and his family (spouse and two children) were traveling from Los Angeles, CA, to join the rest of the family in Springfield, IL, for the holidays. Weather was good during the entire route of flight, which was to have taken 14-15 hours initially. The pilot decided to spread out the flight over two days. He had planned several fuel stops.

Somewhere over Texas one of the children got sick. Not your garden variety of air sickness but something closely resembling the flu. The pilot's line of thinking was that, when they arrived at their destination, medical assistance could be obtained for the ill child. Darkness was rapidly approaching, and the pilot was flying into unknown territory.

It became darker and darker. As a matter of fact, the night was the darkest the pilot had ever seen. Being accustomed to seeing at least some lights in the distance or on the horizon, the pilot became temporarily disoriented. Naturally, the child took that time to become sicker and sicker. Regaining a semblance of spatial orientation, the pilot started to look for a suitable airport, one fairly close to medical assistance. By now the little plane had crossed into Oklahoma proceeding northeast. Looking at the area chart the pilot found that the nearest large airport was quite a distance from the route of flight.

Fuel was getting low and the pilot didn't see the airport, which had pilot-controlled lighting, where he had

planned to refuel. Certain that he had overflown the airport, the pilot used radio navigation to return to where the airport should have been. No airport lights were to be seen on the field. How could the lights be turned on? The pilot looked at the *Airport/Facility Directory* and used the directions to key the mike. But no lights went on anywhere. The pilot was getting concerned. And the child's condition was getting worse by the minute.

On the pilot flew. Occasionally a small group of lights would appear off in the distance. But there was no airport. The pilot decided that--discretion being the better part of valor--a call to approach control in Springfield, IL, would be a wise idea. Approach control was trying to locate the small airplane on radar, when, as destiny would have it, the engine sputtered. Just a little sputter, like the calm before the storm. Then the engine quit all together. Landing the airplane was a sure bet now. However, no option was given as to where.

The luck of the Irish was with the pilot, however, because right below the plane was a strip--smack in the middle of nowhere. By now both children were sick, one sicker than the

other, and the pilot's spouse was furious. The plane finally landed. Radio contact from the ground to approach control was unsuccessful, so they spent the night on the small strip right in the middle of Nowhere, USA.

This story has a happy ending. The pilot got fuel the next day and, after explaining what happened to the proper authorities, the family was on their way for the remainder of the trip, which was uneventful. Incidentally, that was the last time the family ever flew together. The pilot flew home alone and the rest of the family took an air carrier. Imagine that.

This pilot was fortunate. The plane landed safely and no one was hurt. But the pilot had pushed to get to the destination, even though the situation was looking grim earlier in the flight. Remaining the night in a populated area would have been the best decision. Why do pilots let ego and "gethomeitis" get in the way of good judgement?

Remember--nothing is as important as your safety. Nothing at all. ✈

The author is the Safety Program Manager at FAA Juneau (AK) Flight Standards District Office.



FIRST FAA MECHANIC CERTIFICATE

by Rich Mileham

We all have had the opportunity to familiarize ourselves with the first mechanic Charles E. Taylor, who built the engine for the Wright Flyer and was mechanic for Orville and Wilbur Wright. However, we have not had the opportunity to know who the first certified mechanics were--male and female--and it is time that they were recognized.

We have to go back to 1926 when the Air Commerce Act charged the Secretary of Commerce with fostering air commerce, issuing and enforcing air traffic rules, licensing airmen, certificating aircraft, establishing airways, and operating and maintaining aids to air navigation. The new Aeronautics Branch, located in Washington, DC, would require mechanics to apply for a mechanic license. Certificates were issued based on the education, training, experience as to airplane structure and rigging types, and length of experience. Renewal of the certificate required aviation employment for at least two years and an explanation of the nature of work being performed at that time. Failure to do so would require the mechanic to undergo reexamination of the theoretical and practical test prescribed as requisites for the original license.

The first male mechanic certificate (No. 1) was issued July 1, 1927, to Frank Gates Gardner of College Park, MD. An Airplane and Engine mechanics license was issued. Mr. Gardner was born March 15, 1897, in Girard, IL. He graduated from Girard Township High School and took Extension Courses at the University of Illinois for one and one-half years and Correspondence School for one year. After attending the Air Service Mechanics School, U.S. Army, Mr. Gardner served as a Flight Chief, a Crew Chief, and an Assistant to the Engineering Officers in charge of the U.S. Army and Navy's Air Service aero repairs and motor overhaul shops.

Two women were licensed as mechanics by the Department of Commerce, Aeronautics Branch, on the

same date, July 22, 1927. Their names were Mrs. Phoebe Fairgrave Omlie, mechanic license number 422 and Miss Ruth R. Nichols, mechanic license number 401. At the time Mrs. Omlie was from Crosstown Station, Memphis, TN and Miss Nichols was from Grace Church Street, NY.

A review of the mechanics folder of Miss Nichols confirms the fact that she holds the lower mechanic certificate No. 401; which ordinarily would indicate that she was licensed ahead of Mrs. Omlie. However, a review of Mrs. Omlie's mechanic folder shows that she was already the holder of a Letter of Authority authorizing her to operate as a mechanic with an Airplane and Engine rating when Miss Nichols filed her application for a mechanic certificate on June 4, 1927. So Mrs. Omlie was actually licensed ahead of Miss Nichols, regardless of the fact she (Mrs. Omlie) holds a higher mechanic license No. 422.

Here is how it happened. Mrs. Omlie filed her application for the Mechanic License on April 28, 1927, and [under the existing Air Commerce Regulation Sec. 92, amended effective March 22, 1927]; was issued a Letter of Authority dated June 2, 1927, by the Chief of Air Regulation Division, Clarence M. Young. It authorized her to perform the duties of an Airplane and Engine Mechanic pending official examination by the Secretary of Commerce.

Later, when each of the women applicants took their mechanic examinations on July 22, 1927, passed, and were approved, their papers were forwarded by the field inspector to the Washington Office for issuance of their mechanic licenses. Accordingly, when the applications for license issuance and mechanic license numbers were assigned, Miss Nichols' mechanic case was reached first in the work-pile purely by chance.

Miss Nichols' mechanic folder contains a letter from her making an inquiry as to whether or not she was licensed as a mechanic before Mrs. Omlie. In answer to the inquiry, Miss Nichols was

informed that Mrs. Omlie was licensed as a mechanic on June 2, 1927. Therefore, Mrs. Omlie would be considered the first woman mechanic.

The Civil Aeronautics Act of 1938 transferred the Federal civil aviation responsibilities from the Department of Commerce to a new independent agency--the Civil Aeronautics Authority (CAA). The CAA required the same renewal requirements as the Department of Commerce. Each mechanic renewed his/her license every 24 months before the expiration date shown on the certificate. Failure to renew on or before the expiration date would necessitate submitting a new application and taking all the exams for issuance of the license. However, CAA inspectors would now post their schedules at local airports and the mechanic could present his or her renewal application during the inspector's visit.

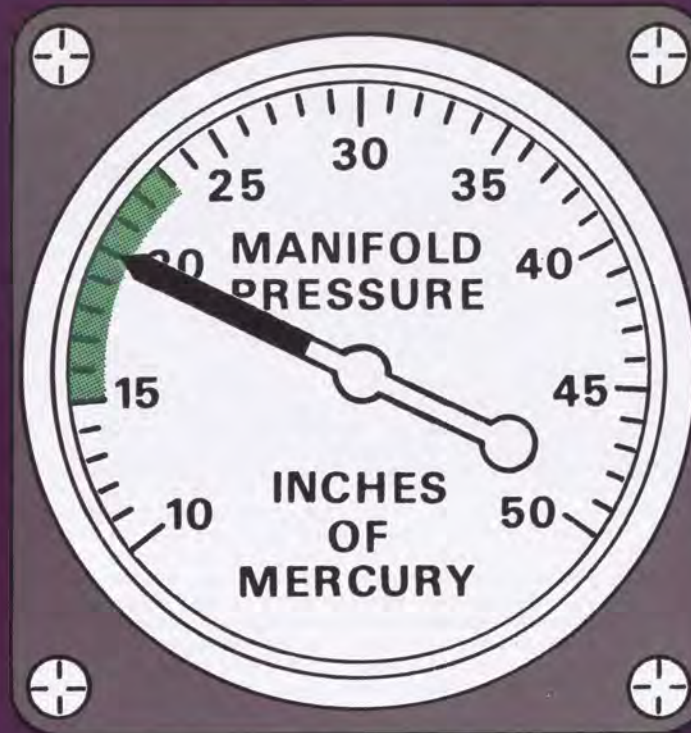
In 1940 another change occurred when President Franklin Roosevelt split the CAA into two agencies: the Civil Aeronautics Administration (still the CAA) and the Civil Aeronautics Board (CAB). With this new agency it was decided to bring all categories of airman certificates into a single certificate series of license numbers, instead of the existing separate series. On or about May 1, 1940, all mechanic certificates in existence (1 to 19,000) were reissued at the time of renewal to show an "M" prefix, (such as: M-13796) in order to distinguish them from pilot numbers. Certificates issued by the CAA were recognized as a "Certificate of Competency" with ratings of "Aircraft" and "Aircraft Engine."

The FAA has seen many changes over the years since the first mechanic certificates were issued. It will be interesting to see what the outcome of draft FAR Part 66 will be and how the requirements will affect the next generation of aviation mechanic. ✈

Rich Mileham is an Aviation Safety Program Manager (Airworthiness) in FAA's Great Lakes Region.

MANIFOLD PRESSURE GAUGE

by Henry W. Davison



Contrary to many beliefs, the manifold pressure (MAP) reading does not indicate power output. How can it be, when the MAP reading displays field barometric pressure before the engine is started. The conflict exists in the power performance charts where MAP/RPM is given for a specific percent of power developed. As presented, this data certainly leaves an impression that MAP is a direct indication of power output. A statement that is lacking on these performance charts would clarify this misconception as follows: "This data is based on an engine and propeller that is functioning properly."

Just ask a reciprocating, multi-engine rated pilot about MAP being an indication of power output. With one engine failed, the throttle position unchanged, and the propeller windmilling, the MAP and RPM are the same as the good engine, for all practical purposes. Large transport cate-

gory aircraft usually have a torque pressure gauge or a BMEP (brake mean effective pressure) gauge for each engine to indicate power output at the propeller shaft.

So What is Manifold Pressure?

While the engine is running, the MAP reading is the ratio between what is allowed through the front gate (meaning the throttle valve) and what is passing through the back gate (meaning the cylinder intake valves). Whenever the throttle valve is fully open on a normally aspirated engine (meaning without boost pressure) regardless of RPM, the MAP should read ambient barometric pressure, less a residual amount by virtue of air filter resistance.

If ambient barometric pressure is reached before the throttle is fully open, there may be a leak in the induction system. If a sharp rise in the MAP

occurs when the throttle is initially opened before maximum throttle is reached, there may be a restriction in the exhaust system. If the MAP never achieves ambient field barometric pressure (less residual), a restriction in air filter network could be the culprit. On the takeoff roll, the MAP should be checked to verify that none of the above conditions prevail. If so, the takeoff should be aborted.

Summary

The manifold pressure gauge is a communication link between the design engineer and the pilot to tell the pilot where to set the throttle valve so that he/she can expect a percentage of power output by virtue of MAP/RPM, provided the engine and propeller are functioning properly.

✈
Mr. Davison is an R&D Flight Instructor, ATP, and A&P.



CONDOLENCES TO PATRICK AND A LOOK AT SOME LESSONS HE TAUGHT US

by Jim Hein

According to nearly everyone associated with sport skydiving, Patrick "Deug" de Gayardon was "the best." *Skydiving Magazine* called him one of the brightest stars and ambassadors. He had an enormous passion for skydiving. He is credited with making one of the first skysurfing jumps. *Skydiving Magazine* named him Skydiver of the Year in 1991 for his "mediagenic achievements" both on TV and in print.

At the age of 38 he had more than 11,000 jumps in just 18 years of skydiving. His boundless energy and ceaseless globe trotting may have put him into personal contact and freefall with more people than any other skydiver in history. Muriel Macaux said, "Patrick was to French skydivers what Princess Di was to the British."

On April 13, 1998, news of Patrick's death shocked parachutists all over the world. I would like to extend condolences from the FAA Honolulu Flight Standards District Office. Patrick's death was indeed a sad event for sport skydiving communities everywhere. I was one of the FAA Safety Inspectors who helped at the site investigation that day and I can unequivocally say that everyone there seemed amazed that Patrick of all people could make a mistake that would cost him his life.

Just for a moment, allow me to share with you some information about why Patrick's death was preventable. Please understand that I do not mean this to be disrespectful of Patrick, his accomplishments, or his friends. He taught us some awesome lessons while he was with us, ones that apply to each and every aviator. In the end, Patrick paid for those lessons with his life. I believe that he would want each of us to take full advantage of these lessons and continue

the work he started without having to cut short another brilliant career.

In the investigation of the equipment worn by Patrick during his fatal jump, we found a pouch attached to the base of the main parachute container. This pouch was a modification to stow the main parachute pilot chute during free fall and was attached with what appeared to be a piece of 1,000 LB test line and a zipper. Witnesses reported that Patrick had removed this pouch the night before to accomplish some adjustments to the pouch and that he had apparently removed and replaced it while the main parachute was still packed in the container. The investigation further revealed that when he reattached the modification to the container, he routed the 1,000 LB test line through two grommets located on the right outboard side and base of the main parachute container and that he inadvertently caught the right main parachute steering line. This trapped steering line kept the main parachute from properly deploying, which resulted in a certain main parachute malfunction. During his last few moments, it is apparent that he futilely attempted to cut away from the main parachute malfunction and open his reserve parachute. The reserve parachute never opened because the main and reserve parachute bridle and pilot chutes became entangled.

The obvious lesson here is to completely repack your equipment when making changes to its configuration. But there are other lessons. Did you know that for sport parachuting in the US, reserve parachutes and harness and container assemblies are manufactured under Technical Standard Orders or US military specifications and fall under regulation by the FAA when used for sport parachuting? Under those regulations, any alteration to the harness and container must be ac-

complished by a US certificated parachute rigger. Patrick was not certificated to make alterations. In addition, other parachutists jumping with Patrick had knowledge he had been making alterations to his equipment and that he was not in compliance with FAA regulations. Probably, no one bothered to challenge him because he was perceived as the best and you just don't mess with the "best."

A related side note was that the required reserve parachute packing data card for Patrick's reserve parachute and the sister parachute system used by Patrick were missing. Furthermore, witnesses reported that he had been seen packing his own reserve. Again, since Patrick was not a US certificated parachute rigger, he was not in compliance with FAA regulations. He should not have been packing his own reserve parachute nor should he have been jumping a reserve parachute that was not packed by a properly certificated person. Apparently, those who had been jumping with him hadn't been challenging this behavior either.

I never knew Patrick, but while reading stories about some of the jumps that he made, I began to get a sense that his behavior and demeanor were perhaps unorthodox and egocentric, much the way "the best" might be.

Stories like "he jumped from and then flew back into a Pilatus Porter," "he did high altitude jumps without oxygen," "he swooped the ocean and got his parachute completely sopping wet, then packed it up, and went up and jumped again." Patrick had reportedly been using a French manufactured Tandem rig in the United States. This Tandem system was not TSO'd under US rules, and using it in the US would not be in compliance with the FAR. I have serious doubts that the USPA would sanction such

behavior. Robin Heid wrote an article about him for *Skydiving Magazine* and said, "play is the term that probably best sums up Patrick de Gayardon's recklessly joyful romp through life." I couldn't help but wonder if any of them had ever tried to slow him down, be a buddy, and suggest that he be a bit less "reckless."

Patrick's untimely death underscores the idea that there is always a chain or thread of events which lead up to an accident or incident. If you carefully look at his story it is possible to find numerous times when someone could have broken that chain and perhaps prevented his death.

Simple things. Someone could have refused to let him jump with a modified system unless it was altered in accordance with the FAR, or refused to let him jump with a reserve parachute that was not packed by a US certificated parachute rigger. If only people could have been his buddy (just like is taught to every new parachutist and aviator) perhaps Patrick would be with us today.

Let Patrick's accident be a reminder for us all to never equate "he's the best" with "he can't make a mistake." It doesn't matter how many hours a person has at the controls or how many jumps they have, they're still just as vulnerable to making mistakes as the person who is just learning to fly or making their first jump. If you're jumping or flying with someone else, no matter how many hours or jumps they have, make it your responsibility to be a buddy and challenge them to prove that their preflights, flight plans, checklists, and equipment meet current industry standards and comply with the rules of regulatory agencies.

Mr. Hein is the Aviation Safety Program Airworthiness Representative at the Honolulu Flight Standards Office.



Pilot Dutch Fridd (center) holds the night vision goggles (NVG) he wore for the first civilian commercial NVG flight. Sharon Hinshaw, flight paramedic, is on the left, and on the right is flight nurse John Sherman. Said Fridd, "The NVG takes the stress out of flying at night."

ight vision technology has long been a part of our military's repertoire, among them night helicopter operations, so, it seemed only necessary to enhance the safety of civilian helicopter operations by allowing helicopter pilots to use Night Vision Goggles (NVG).

This past January, the FAA issued the first NVG Supplemental Type Certificate (STC) and Operations Specifications (Ops Specs) to a FAR Part 135 helicopter air ambulance operator. The STC and Ops Specs allowed the installation of an NVG compatible internal lighting system and for the use of NVG during enroute night operations.

The operator receiving the STC and Ops Specs was Rocky Mountain Helicopters of Utah. Rocky Mountain Helicopters conducts operations in many states across the country.

This application of advanced military technology will enhance situational awareness and reduce pilot workload for the emergency medical service (EMS) air ambulance operators during night and low ambient lighting conditions.

This was a complex team effort which involved Rocky Mountain Helicopters and the following FAA offices: the Salt Lake City, UT Flight Standards District Office (FSDO), the Dallas/Ft. Worth FSDO, and the Ft. Worth Air-

craft Evaluation Group, as well as FAA headquarters groups in general aviation and air transportation. The FAA's Rotorcraft Directorate and Rotorcraft Certification Office conducted the testing and certification of the system eventually granted the STC (SR9208-RC-R) and Op Specs.

The STC was issued on January 29, the Op Specs on February 4, and the first NVG civilian flight took place on February 5. That night for the first time in the country's history, an air carrier pilot used FAA-certified NVG on an actual medical airlift. The Rocky Mountain Helicopters flight was from Mission St. Joseph Hospital in Asheville, NC to Yancy County, NC and return. The PIC was Dutch Fridd, the flight nurse was John Sherman, and the flight paramedic was Sharon Hinshaw. The flight from the hospital was to a field in a poorly lighted rural and conducted under clear skies with no moon but plenty of starlight.

Rocky Mountain Helicopters commented, "Dutch reports this is the most relaxed flight he has ever had to Yancy County. The system works!"

Now that this first "hurdle" has been cleared for civilian use of NVG in certain operations, FAA expects other helicopter EMS operators to apply quickly for the STC and Ops Specs.

LASIK Refractive Surgery: Clinical Considerations for the Pilot

by Van B. Nakagawara, OD, Kathryn J. Wood, and Ron W. Montgomery, BS

Approximately 145 million Americans (54.6% of the US population) are dependent upon corrective lenses (glasses or contact lenses) to achieve a quality of vision satisfactory for their daily needs. These individuals have refractive conditions, i.e., myopia (nearsightedness), hyperopia (farsightedness), astigmatism (irregular corneal curvature), that prevent light rays from being focused as a clear, single image on the retina.

It is essential that pilots have optimum vision, since visual cues supply about 80% of all flight information. Pilots must detect and identify airborne traffic, as well as hazards that may be on runways and taxiways. Printed materials, such as flight manifests, charts, maps, and cockpit instruments need to be clearly seen to ensure that proper flight procedures are safely followed. In an aviation environment, where visual conditions are not always optimal, an aviator's choice of refractive correction becomes a serious consideration. Currently, more than 50% of the civil airman population use some form of visual correction to meet aeromedical certification standards.

Laser assisted in situ keratomileusis (LASIK) is an alternative method of refractive correction performed by ophthalmic surgeons for the treatment of myopia. LASIK is performed using two Food and Drug Administration (FDA) approved ophthalmic devices, the microkeratome and the excimer laser. The microkeratome is a planing scalpel that has been used for 30 years to perform other types of refractive surgery. The excimer laser, approved in October 1995, is used to perform a refractive procedure called photorefractive keratectomy (PRK) (see Figure 1).

With PRK, the excimer laser emits a beam of light that vaporizes (photoablates) corneal tissue to a predetermined depth and diameter. The removal of corneal tissue reduces the cornea's curvature, which corrects or minimizes myopia.

The clinical difference between the LASIK procedure and PRK is that LASIK reshapes an underlying layer of corneal tissue, while PRK ablates tissue on the surface of the cornea. LASIK involves the use of the microkeratome to slice a thin flap from the top of the cornea, leaving it connected by a small hinge of tissue. The corneal flap is folded aside and the excimer laser is used to reshape the underlying corneal stroma. The corneal flap is then returned to its original position (see Figure 2).

The patient selection criteria for LASIK are similar to those of PRK (see Table 1). Clinical studies indicate that LASIK can be used to correct mild to moderate (up to 15 diopters [D]) myopia and a substantial amount of astigmatism with greater predictability and decreased probability of refractive regression, compared with PRK. LASIK is an option for patients who have conditions that can delay healing for which PRK is contraindicated, including lupus, severe dry eyes, and rheumatoid arthritis. LASIK minimizes the area of the epithelium that must heal, reducing the risks associated with the healing process. However, other contraindications associated with PRK still apply for LASIK including collagen vascular disease (corneal ulceration or melting), ocular disease or abnormalities (dry eye, keratoconus, glaucoma), pregnancy, or a history of side effects from steroids.

A pilot considering refractive surgery should know that there are advantages of LASIK over PRK. For example, surgery on the fellow eye may be performed within 2-3 days of the initial procedure, and the patient may return to normal work activities within a few days after surgery. Some surgeons feel comfortable performing bilateral LASIK procedures during the same visit. Also, ablation of the underlying stromal tissue results in less corneal haze and refractive regression during the healing process. As a result, the LASIK patient usually does not require long-term post-operative steroid use, decreasing the possibility of steroid-induced complications (cataract, glaucoma). Furthermore, studies have shown that the risk of vision-threatening complications is reduced with LASIK. (Note: PRK patients are five times more likely to develop an infection, 10 times more likely to develop haze, and 10 to 20 times more likely to have corneal scarring.) In the majority of LASIK patients, their vision stabilizes within three months to near predicted results, and residual night glare usually diminishes within six months. However, as with PRK, the final results are a combination of the surgeon's ability to perform the laser procedure proficiently and the patient's ability to heal.

LASIK may have complications for a small number of patients. Some individuals experience mild irritation, sensitivity to bright light, and tearing for a few days. If infection occurs, it can result in corneal scarring that may reduce sharpness of vision. Additional complications include: under- or over-correction of refractive error (requiring an additional laser "enhancement" procedure or corrective lenses); reduced



contrast sensitivity, best-corrected visual acuity or acuity in low light levels; and myopic regression (may be exacerbated by exposure to ultraviolet radiation or bright sunlight). Following LASIK, patients should be cautioned to avoid vigorous rubbing of the eyes, contact sports, etc., as it can take up to six months for the corneal flap to completely re-adhere. LASIK has an increased surgical risk over PRK, since it requires a corneal flap to expose the inner layers of the corneal tissue. Therefore, the ophthalmic surgeon needs more technical skill and training. The surgical complications from LASIK are summarized in Table 2.

A recent study for the period January 1, 1994, to December 31, 1996, identified 3,761 civil airmen who carried pathology codes for refractive surgery. Of this population, an estimated 372 (9.9%) had PRK and 64 (1.7%) had LASIK. While the number of pilots with LASIK may appear to be low, U.S. market projections indicate that more than one million laser procedures will be performed annually by the year 2000. Presently, LASIK accounts for about 29% of all laser refractive procedures, but it is expected to increase to 90-95% of all refractive surgical procedures in the future. Therefore, it is reasonable to assume that a substantial number of pilots will elect

to have laser refractive surgery.

Civil airmen with refractive surgical procedures, such as PRK and LASIK, can obtain a medical certificate without a waiver. They must meet the visual acuity standards for the class of medical certificate requested, and an eye specialist must verify that surgical healing is complete, visual acuity is stable, and no significant glare intolerance is present. Most major air carriers allow their pilots to fly after having had refractive surgical procedures. However, active duty and reserve military forces consider refractive surgery a disqualify-

ing condition for flying. Pilots contemplating refractive surgery should consult an eyecare specialist to learn how a particular procedure could correct their refractive condition and how it may affect their occupational or avocational aeromedical certification status.



Dr. Nakagawara, Ms. Wood, and Mr. Montgomery are members of the Aeromedical Research Division's Vision Research Team at the FAA's Civil Aeromedical Institute. This was originally printed in The Federal Air Surgeon's Medical Bulletin, Winter 1998

Table 1: Selection Criteria for LASIK

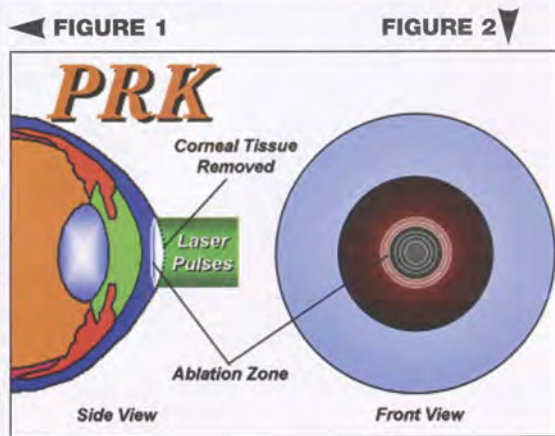
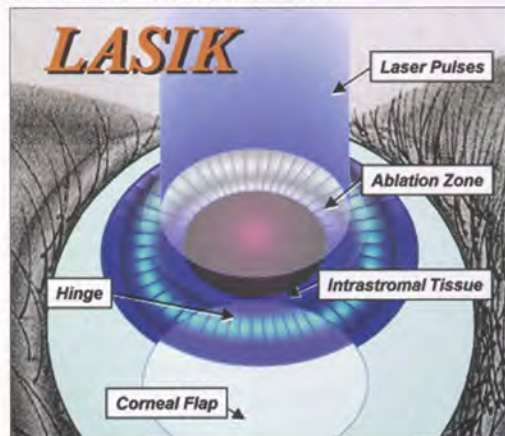
- Normal ocular health
- Age 18 years or older
- Stable refractive error and correctable to 20/40 or better
- >-1.00 to $-15.00D$ of myopia and $< 8.00D$ of astigmatism
- Pupil size $< 6mm$ (in room light)
- Realistic expectations of the final results

Table 2: Surgical Complications of LASIK

- Decentered ablation zones resulting in monocular diplopia
- Decentered or detached corneal flap
- Epithelial ingrowth in the corneal flap
- Perforation of the eye
- Subconjunctival hemorrhages
- Technical problem with the surgical instruments

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AIDS, HUMAN PERFORMANCE, AND FLYING

by Frederick V. Malmstrom, Ph.D.

I'd like to assure the reader up front that this is not the usual article about practicing safe sex. It's much more serious; it's about safety -- period. The FAA, NASA, and the U.S. armed forces all view the problems of Autoimmune Deficiency Syndrome (AIDS) and the Human Immunodeficiency Virus (HIV) quite seriously, as their degrading effects on flying performance, although largely still unknown, can be potentially deadly. Considering that the HIV virus has been identified only since 1981, the amount of knowledge we've acquired about it, and microbiology in general, has been mind-numbing. And no wonder. The 1998 World AIDS Conference reports that HIV now infects an estimated 15,000 unfortunate people daily, and of this an estimated one to two million Americans are now HIV

positive. Being HIV+, of course, isn't (yet) the same as having full-blown AIDS, but it does indicate that the victim harbors the HIV virus which waits patiently to begin its long course of destruction. It's estimated now that between 40,000 to 80,000 Americans are infected yearly with AIDS, and approximately the same number of us die. Although we've come to recognize most of the physical symptoms of HIV infection and/or AIDS (and there are scores of them -- they keep popping up like gophers out of a colony of holes), we know surprisingly little about the mental and performance effects of the disease. It follows that we know even less about the effects of the HIV on flying performance. What follows is my review of over 100 recent professional articles and textbooks on how AIDS affects human mental

and physical performance. It isn't very pretty.

HIV Heads for the Central Nervous System

AIDS is a neurotropic disease. That is, it is preferential to the central nervous system. Despite the conventional wisdom that HIV is a virus which "only" opens the autoimmune floodgates to other opportunistic diseases, there is some considerable evidence (and heated discussion) that AIDS has a direct, degenerative effect on the central nervous system. Often long before overt physical AIDS symptoms appear, CAT (3-D X-ray) scans can pick up distinctive signs of white-matter nerve scarring, and ERP's and EEG's (a.k.a. "brain waves") may show odd and distinct AIDS-related firing patterns, especially when the patient is presented with new and different information.

AIDS, the Subcortex, and Murphy's Law

AIDS-related mental impairments are generally considered to be "subcortical." Unlike Alzheimer's disease, which seems to cripple the brain from the outside-inward, AIDS seems to cripple the brain from the inside-outward. "Subcortical" is a fancy way of saying that it makes its initial and greatest impact in areas below the "cortical" or outer layer of the brain. Figure 1 shows the "subcortical" areas of the brain in which AIDS will most likely show pathology. For simplicity sake, these general areas are referred to as the basal ganglia and the cerebellum.

The basal ganglia areas

of the brain are especially responsible for our very basic yet critical mental processes such as attention, alertness, and vigilance. Not only do these subcortical structures direct you to attend to novel events, they, equally importantly, disengage that attention after it isn't needed. They suppress the noise and help you tune out irrelevant information. These are the areas that jump-start you into activity, and they shut down mental activity where it isn't needed. It is also in the basal ganglia areas that the great nerve switching stations for vision and hearing are located. (I learned in school that a visual signal goes through at least 22 distinct neural transforms and switches before it is processed and recognized.)

The cerebellum is where our delicate motor skills, postural stability, and balance are fine-tuned. Damage to this densely packed brain structure often leads to clumsy, uncoordinated movements. The vestibular-ocular reflex (VOR) which allows the eyes to maintain fixation while the head and body are in motion can be impaired. Patients may experience nausea akin to motion sickness. One rather common feature of cerebellar damage is hypermetria, the tendency to overshoot voluntary muscular movements. Murphy's Law especially applies to errors in subcortical brain wiring. You couldn't find a better (or worse) place than the subcortical areas to start short-circuiting the entire works. HIV does just that.

"Attention" Isn't That Simple

Take the mental function of "attention" for example. We take it for granted when something new and different somehow catches our attention. But attention is a very complex phenomenon rooted deeply in our subcortical physiology. The consequences of even momentary inattention for the pilot and crew can be catastrophic. Hence, the FAA, NASA, and the Department of Defense employ Ph.D. psychologists who spend their whole careers using positron emission tomography (PET), magnetic resonance imagery (MRI) scans, and even ordi-

nary stopwatches to study this curious-but-necessary-for-survival phenomenon. The FAA official accident report could find no other explanation for the 1987 Northwest Airlines Flight 255 takeoff crash at Detroit Metropolitan than momentary inattention by the entire crew to attend to proper flap setting. And that episode of crew inattention had nothing to do with subcortical disease. It was just plain old garden variety inattention.

It's Official—AIDS Dementia

The psychiatrist's diagnostic cookbook, the *Diagnostic and Statistical Manual IV (DSM-IV)*, now has a special psychiatric diagnostic category for dementia called "dementia due to HIV disease." This type of dementia falls into a category of its own. The AIDS dementia is clearly distinct from the more commonly seen Alzheimer dementia (i.e. senility); AIDS dementia is more closely resembling, yet curiously different from, the equally devastating dementias associated with multiple sclerosis, Parkinson's disease, and Huntington's chorea.

A dementia is commonly defined as, "a loss of intellectual abilities enough to interfere with social or intellectual functioning." Taken to the extreme, demented patients not only exhibit intellectual, cognitive decline but they also don't know the time and day, where they are, or even who they are. They are lost to the world.

Not Every HIV+ Person Will Show Mental and Performance Deficits

The only good news about this disease is that not all persons infected with HIV will eventually show signs of cognitive decline and/or dementia. The usual grouping of populations with AIDS and/or HIV+ falls into three somewhat distinct mental categories:

- one-third will show no mental or performance deficits,
- one-third will show cognitive deficits, and
- one-third will show signs of dementia.

["Cognitive deficit" is a polite way of saying that some aspect of intelligence

is impaired.] Table 1 lists many of the symptoms associated with the AIDS dementia complex.

In his acclaimed, 1993 National Book Award winner, *How We Die*, Sherwin Nuland, M.D. describes the grim and devastating course of AIDS. From the earliest stages of HIV infection, patients may initially present with headaches, simple forgetfulness, and loss of concentration. Unlike Alzheimer's victims, AIDS victims are usually quite aware they have memory problems. Eventually, some patients may experience difficulty with balance and muscular coordination, then proceed to seizures and convulsions.

Effects of AIDS on Emotions

The effects of HIV infection on emotions are less clear. There is no question whatever that some HIV+ persons are depressed, but are they depressed because they know they have HIV+ or are they depressed because of direct effects of HIV on the central nervous system? Here also is disagreement. The scientific literature says that depression is a mostly secondary effect. However, even my own professional intuition says that HIV has direct effects on emotion. During his last six months of life, one of my very first AIDS-diagnosed patients entered a state of almost constant euphoria and subsequently went giggling to his grave. I've known of some AIDS patients who became quite angry and irrationally demanding one minute and apathetic the next. They switched just as suddenly to tears or laughter. Quite often, they may appear to be calmly in control of their emotions. In the latter stages of AIDS, stony apathy seems to be most common. One thing is quite clear; persons with AIDS are likely to be emotionally labile; these patients can flip-flop their states of mood quite easily and unpredictably.

Is AZT the Answer?

What about the anti-retroviral and protease inhibitor medications such as zidovudine (AZT) and indinavir (Crixivan)? First, these medications may have unpleasant side effects such as nausea, blurred vision, and dizziness --

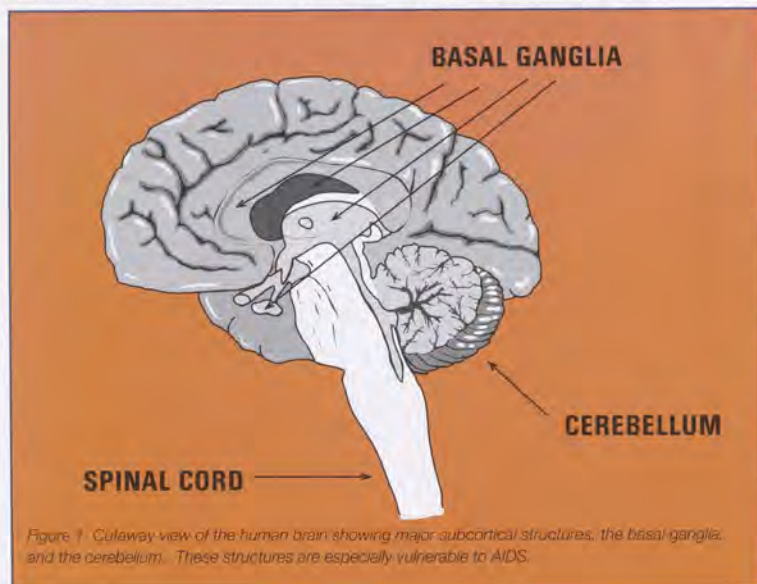


Figure 1. Cutaway view of the human brain showing major subcortical structures, the basal ganglia, and the cerebellum. These structures are especially vulnerable to AIDS.



the side effects alone may be enough to ground a pilot. Second, we're aware they do not cure AIDS -- rather they help to manage it and extend victims' lives. But do they reverse these mental performance deficits? They do not. According to most of the scientific literature, at best the anti-HIV medications will either slow down or arrest the symptoms from appearing, but they don't cure the deficits. Once the cognitive decline and dementia symptoms appear, they are permanent.

HIV and Flying

So, should HIV+ aviators continue to fly? Our flying community is naturally worried about the mental and performance effects of HIV on flyers. Nobody looks forward to flying with a demented pilot. Robert Mapou and his colleagues in a 1993 literature review published in *Aviation, Space, and Environmental Medicine* determined that there was no research which could demonstrate any obvious flying-performance related decrements in HIV+ (but asymptomatic) aviators. However, they also stressed that most mental test and performance research has been done with gay men and intravenous drug abusers, a group hardly representative of your average aviator. Mapou, et al., further advised that our present-day clinical neuropsychological tests probably just aren't sensitive enough to pick up these performance decrements. It's not that the symptoms weren't there, they were just subclinical. Indeed, many finely tuned human performance laboratory experiments can suggest and even identify HIV+ related deficits long before full-blown AIDS appears. Hence, Mapou recommended that HIV+ aviators be carefully, but individually and periodically, evaluated.

HIV+ Doesn't Necessarily Mean You're Grounded

FAR Part 67, Medical Standards and Certification, dated 19 March 1996 (also the Air Force's AFI 48-123, para A6.18, dated 15 November 1994) does not specifically disqualify pilots who are HIV+ from a First-Class Airman Medical Certification. Hence, fly-

ers who are HIV+ do not face automatic grounding but will instead be individually evaluated. However, what it does mean is that the HIV+ airman could be medically decertified for the following impairments:

1. Impaired equilibrium (sec. 67.105 para 3[c])
2. Mental psychosis, (sec. 67.107 para 2)
3. Neurologic disorder (sec. 67.109 para 3[b])

The bottom line is that those airmen who turn up HIV+ will have some medical hoops to jump through in order to retain their First-Class Airman Medical Certificates. The final medical determination whether-to-ground-or-not-to-ground will, of course, come from the Federal Air Surgeon.

AIDS Research Still Has a Long Way to Go

And so, federally funded U.S. biomedical research on AIDS continues at

a breathtaking billion-dollar-plus annual pace, and our knowledge base continues to expand. But much of this knowledge is still only in laying out the ground rules for a basic understanding of how these diseases operate. This is a long, long way from claiming that the medics have conquered AIDS. Back in 1981, nobody ever imagined AIDS would be so complex. To the microbiologist, knowledge obtained from research only six months old can be obsolete, and AIDS is still in the research phase. I reemphasize that while the FAA, NASA, and the Department of Defense do take the problem of HIV and AIDS quite seriously, most of our knowledge of the effects of this disease on flying performance is, unfortunately, mostly a byproduct of this initial research effort.

+

Dr. Malmstrom is a Certified Professional Ergonomist, and AIC Jeff Baer, 74th AMDS/SGPF, was his research assistant.

Table 1. Performance Deficits Associated with AIDS Dementia Complex (ADC)

Language	Difficulty naming objects, if severe (anomia)
Memory	Impaired recall, but aware of impairment. Impaired short-term memory span
Attention & Visual Systems	Broadly impaired
Olfaction	Impaired, sensitivity decreased
Judgement	Disproportionately impaired
Cognitive Processing	Slowed during early course of disease
Personality	Apathetic, inert
Mood	Depressed and/or labile
Speech	Slow or labored (dysarthric)
Posture	Bowed or else extended
Coordination	Impaired, including hypermetria
Voluntary Movements	Chorea, tremor, tics, jerkiness

Adapted from Kaplan & Sedack (1998) Synopsis of Psychiatry, 3rd ed.

OUT OF THE NEST!

by Jim Trusty

I can sometimes sense that a student doesn't really want me to leave the cockpit and do some work by him/herself. But I know they have to get out alone if they are ever going to become pilots. My method is to take another airplane and fly off their wing, two or three miles behind them and up some, too--just in case they need a little help. It works! I've done it a dozen times over the years, and all those pilots are still flying.

It isn't unsafe as long as you adhere to the requirements of FAR § 91.111, and it's not cheating--it's just that they need a little more reassurance than other students, and I'm willing to give it to them. My goal is the finished product, and I'll go to any lengths to get them there safely.

I decided to write this article after having lunch with a former student who reminded me of a funny story from a few years back. He was well on his way to becoming one of those dreaded "Patch Pilots" because he simply did not have the nerve to go on a cross-country by himself. He asked me to fly nearby just to give him a burst of confidence. I really thought he was ready to go it alone, but I agreed.

We designed a mini cross-country that would take him to five other airports in the same area, all within 25 miles of the home airport, all with different runways, radios, pattern attitudes, VOR, and NDB. Then he and I flew it. He did a great job with not one mental mistake--good altitude, good heading, and great radio work--but still he wanted me to fly along in another airplane.

Okay. My deal was that he would take off first. Fly the entire route at 2,800 feet. Do all the landings and the radio work. I would fly at 5,000 feet and about three miles to the rear. Under no circumstances would he require my help, I reiterated. Absolutely not, he stated.

Next it's off to the airplanes. He



David Clemmer photo

would be first off then, three minutes later, off I'll go. There he went and three minutes later I got out of the airplane and climbed upon a fuel truck for 90 minutes of peace and quiet and some sunshine, handheld radio at the ready!

Twenty miles away he calls UNICOM, gets the weather, flies upwind, crosswind, downwind, left base and long final. "Picture perfect," I told him, "just like we practiced." "Safety first," he agreed. On the second trip everything went great again. I'm still basking on the truck, but I asked him if he really needed me anyway. He said no, that I was right and he just needed to get out there and fly. "But," he said, "since you are already on the route, might as well finish what we started."

Making this article even shorter than usual, to make my editor even madder, here he comes back to home base. Perfect altitude, two minutes ahead of schedule, and right on target with his radio. Courteous guy that he is, he asked if I wanted to land first since I had been up there so long without a break, being the nice instructor that I am. I said no, you go ahead so that I can watch you make one more great landing.

I told him after landing to taxi up to the fuel truck for a top-off so the next student wouldn't have to fill it up. I watched as he held it off and

squeaked it in, turned off at the first exit, and started toward the pump. The closer he came, the bigger his eyes got. Finally it soaked in that, yes, it was me sitting up there on the truck and, no, I had not been with him for 88 minutes on this cross-country and, yes, he was going to kill me as soon as he could get the airplane stopped. By now a crowd had gathered and he didn't want any witnesses to a cold blooded murder--which is probably the only thing that saved me.

The lessons to be learned: Never trust anyone but yourself, and believe in your ability, especially if your flight instructor tells you that you are ready.

The last thing he told me at lunch was, "You know, I actually saw you two or three times and wanted to tell you to go back, but I was afraid it would make you mad after putting so much pressure on you to go with me." Still friends, he paid for lunch, and he flies anywhere he wants to go. We are getting ready to start on his Instrument ticket. I can hardly wait for the long cross-country. Wonder where he wants to go?

I'll see you at the airport!

Jim Trusty was the 1997 National Flight Instructor of the Year and is an FAA Aviation Safety Counselor in Nashville, Tennessee.

AIR TRAFFIC COMINGS INTO THE 21st CENTURY

FAA FACT SHEET - The FAA's Air Traffic Modernization Program

The FAA is aggressively upgrading its air traffic systems to meet the challenges of the 21st century. The Display System Replacement (DSR) is a major part of that effort.

The FAA is responsible for the largest, most complex and safest aviation system in the world. It includes more than 18,000 airports, 470 air traffic control towers, 176 terminal radar control facilities (TRACON), and 21 en route air traffic control centers.

In addition to DSR, other important systems are:

- "Host" computers -- The FAA is replacing the "host" computer at all of its en route centers. The host processes flight plan and radar data and sends that information to controllers at the center and other air traffic facilities. Host replacement involves hardware only, no new software.

- Standard Terminal Automation Replacement System (STARS) -- STARS will replace computers (hardware and software) at the nation's busiest airport terminals and pave the way for future upgrades. The new displays will help controllers handle traffic more efficiently while maintaining today's extraordinary level of safety.

- Wide Area Augmentation System (WAAS) -- WAAS enhances signals from the Global Positioning System (GPS) to satisfy civil aviation navigation requirements. When the first phase of WAAS is operational in September 2000, pilots will be able to make precision GPS-guided landings throughout roughly half of the continental United States.

- Data Link -- Data link is essentially airborne e-mail flowing between computers on the ground and in the cockpit. It reduces the time lag and chances of errors associated with voice communications. Data link can provide critical flight and weather information from various data bases directly to pilots. The technology already is being used to transmit pre-departure clearances to pilots.

- Free Flight -- The concept of Free Flight will give operators maximum flexibility, consistent with safety, to fly fuel efficient routes. The prospect of greatly increased flexibility to fly direct routes could have substantial benefits, including fuel and time savings, fewer delays and a more efficient use of airspace.

- Free Flight Phase 1 -- Based on a consensus from all sectors of aviation, the FAA established the Free Flight Phase I program to bring significant benefits to airspace users by 2002. The program is installing selected technologies at specific air traffic facilities to help reduce risks and resolve many of the technical and procedural issues connected with the transition to Free Flight.

- Year 2000 (Y2K) -- The FAA had to overhaul its computers to make sure they roll over at midnight Dec. 31, 1999. Without a fix, computers would see "00" and may assume it meant 1900. The FAA has already renovated its systems, and is on schedule to implement the fixes in June 1999.

- The FAA has already completed other important modernization projects. The Display Channel Complex Rehost, a program that replaced aging computers driving the controller displays at five major en route centers (Chicago; Fort Worth, Texas; Cleveland, Washington; and New York) was finished in 1997. The Voice Switching and Control System, which replaces equipment dating back to the 1960's and provides much clearer, more reliable voice communications, also was operational at all 20 en route centers in 1997.

by Louise C. Oertly

On January 20, Secretary of Transportation, Rodney E. Slater, and FAA Administrator Jane F. Garvey were at the FAA's Seattle Air Route Traffic Control Center (ARTCC) in Auburn, WA, for a dedication. What is unique about this dedication is that it celebrated the first step in an intensive FAA program to modernize the air traffic control system using Display System Replacement (DSR).

DSR is even now being installed and tested at FAA's other 19 centers across the U.S. with completion scheduled for the summer of 2000. It replaces the centers' 20 to 30 year-old equipment with new color displays and consoles for controllers, and upgraded computer hardware and software. (See the comparison chart of the old and new control rooms.) So far, the project has been on schedule and within budget.

"President Clinton, in his State of the Union address, stressed the need for meeting the challenges of the 21st century," said Slater. "This state-of-the-art system is another milestone in our continuing effort to infuse new technologies in the air traffic control system of tomorrow. It will also help keep our skies the safest in the world while air traffic continues to grow."

Old and New Control Room Systems Comparison

OLD FEATURES

Large steel structures designed in early 1960s.

Contains a circular 19" monochrome plan-view display (PVD) for radar tracks and other Air Traffic Control (ATC) information.

Each ATC position is hard-wired to support a single sector (limited airspace), or small combinations of sectors.

Modified in 1995/96 to incorporate the Voice Switching Control System (VSCS) digital communication system.

Constrains operational flexibility required for peak traffic, severe weather, and outages at adjacent facilities.

Viewed as a limiting factor to ATC efficiency by the operators, and targeted by the airlines and other air traffic user bodies as limiting growth and operational efficiency of National Airspace System (NAS).

Not capable of displaying real-time weather intensity as recommended by the National Transportation Safety Board (NTSB).

Little to no built in redundancy to protect against outages.

Supports national releases of software upgrades through individual site actions.

Because of proprietary, difficult to upgrade technology.

Increasing operational costs due to end-of-life components and worsening reliability.

DISPLAY SYSTEM REPLACEMENT (DSR)

Composite structure designed in the 1990s.

Contains a 20"x20" high resolution color monitor to display radar tracks, improved real-time weather, and other ATC information.

Each ATC position is designed to support any single sector, or combination of sectors needed for operational flexibility.

Designed with human factors inputs to best integrate the VSCS digital communication system, improved flight data, improved weather displays, and recommended improvements in Computer Human Interface.

Increased operational flexibility to accommodate peak traffic, severe weather, or outages at adjacent facilities.

Designed to allow increased efficiency, and supported by the operators as a foundation for further increases in traffic growth and operational efficiency of NAS.

Capable of displaying real-time weather intensity as recommended by the NTSB.

Built-in redundancy to protect against outages.

Supports national releases of software upgrades through automated distribution.

Includes many commercial-off-the-shelf products, and designed to allow technology refresh with little to no development.

Centralized monitor and control of the DSR system to include all ATC position equipment and backroom equipment.

It reduces training time because functions and controls are similar to the old system.

Replaces the older flight strip printers with quieter, more efficient printers.



Think Small... Think Smart... Think Safe...

For the past year the FAA has been educating the public on the need to think small, think smart, and think safe about how much luggage can be carried on board a commercial airliner. The FAR state that carry-on luggage must be stowed either beneath a seat, in an overhead bin, or in other approved stowage areas and that luggage which cannot be stowed safely in either place must be checked. It is up to the airlines to formulate specific rules on how many, exact size, etc. However, it is still incumbent upon the FAA to provide educational, safety materials to the public in this area.

In partnership with the Luggage and Leather Goods Manufacturers of America, who represent the major baggage manufacturers, below is our latest attempt to get the word out to the public that the smaller and the fewer the carry-ons the better.

Clip out the illustration below, and give it as a reminder to a friend who is a frequent airline traveler. The information card is also what we call public domain, so if you have Internet access and want to be a partner in this safety effort as well, go to www.faa.gov/avr/afs/cabin.htm and download onto a diskette two

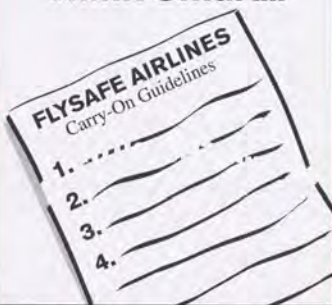
files: Cover.pdf and Back.pdf. You can print as many of these as you like and distribute them to friends, family, and business associates who fly. Also on that Internet site, you can obtain a copy of FAA Advisory Circular 121-29A, "Carry On Baggage," which outlines FAA safety requirements.

If the occasion ever arises that you or a friend or family member need to exit an aircraft and quickly, you do not want to navigate an obstacle course of carry-on bags on the way out. Thinking smaller and smarter as far as your carry-on baggage goes makes for a safer trip.

Think Small...



Think Smart...



...About Carry-On Baggage

Think Safe...



Airline Carry-On Baggage Checklist

Planning a trip? Thinking about carrying on your luggage? If so, here are a few tips for you.

✓ Think Small...

- The maximum size carry-on bag for most airlines is 45 linear inches (the total of the height, width, and depth of the bag). Anything larger should be checked.
- No oversize packages or luggage can be stowed onboard.
- Pack less to carry-on. Stow only your essentials (such as prescriptions, personal hygiene items, passports and other documentation) and valuable items, such as jewelry or cameras, in your carry-on bag.

✓ Think Smart...

- Plan to check more of your baggage and carry-on less.
- Check with your airline before packing to determine its carry-on guidelines regarding the number of items you may carry-on and the maximum size of those items.
- In certain situations the airline may require most or even all of your bags to be checked, so be prepared to do so.

✓ Think Safe...

- Carry-on items which may fall from overhead bins can injure you or other passengers during flight or in the event of an emergency evacuation.
- Stow heavy items under the seat in front of you, not overhead.
- Don't stack items in the overhead storage bin.
- If an emergency evacuation is necessary, leave your carry-on items on the plane. Retrieving personal items may impede the safe evacuation of passengers.
- Remember, be safety conscious when stowing your carry-on items.

Have a Question?

Call your airline or visit its web site. Check with your travel agent. Check the FAA cabin safety web page at: www.faa.gov/avr/afs/cabin.htm

A public service announcement from the Federal Aviation Administration and supported by the Luggage & Leather Goods Manufacturers of America
AFS-200-99-01

• Safety Pilot Revisited

In the July/August 1998 issue there were two letters inquiring about logging pilot in command time as a safety pilot and the regulation cited allowing this was FAR §61.51(e)(1)(ii). However, FAR §61.55(d)(4) seems to say that you can log safety pilot time as second in command.

Is it the choice of the pilot as to when type of time to log? Is this between two consenting pilots?

Does the safety pilot just log the time that the pilot flying is under the hood?

Any clarification would be helpful.
Nils van Ammers
Allentown PA

Yes. A qualified safety pilot can log either pilot in command or second in command time during that time when the pilot flying is flying under simulated instrument conditions and the regulations require a safety pilot.

Although it is the safety pilot's choice how to log the time the safety pilot is performing the duties as a required crewmember, there can be very real legal responsibilities attached to that choice. For example, let us say that the aircraft enters Class B airspace during the flight without air traffic permission. The pilot in command will be held responsible for the airspace violation. Now, do you want to log the time as pilot in command or second in command? The choice is yours. The same comment can be made about any other type of airspace violation, incident, or accident in which the pilot in command will be held responsible.

• Re: Non-Towered Airports

I commend you on your series regarding non-towered airports. Not only for the thoroughness of the coverage, but that you recognize that these "beehives" have the most bees per given amount of airspace and consequently the most danger.

While near-miss horror stories abound both in print and anecdote, actual collisions at non-towered airports amounted to "only" seven in 1996 according to AOPA *Pilot* magazine. Considering all of the traffic involved, that indicates that most pilots must be paying attention. But "only" is a relative term.

There seems to be something inconsistent in that the traffic pattern at non-towered fields is only "recommended"—coming from an agency that is constantly criticized for over-regulating. It would seem that by regulating it, everyone would be playing by the same rules and thereby make it safer.

While the wording "pattern altitude" appears frequently in the *Aeronautical Information Manual* (AIM), there is nothing specific and it seems to be loosely left up to the airport operator to establish based upon local considerations of terrain and noise and is usually in a printed handout. This doesn't much help in inbound transient pilot. The traffic pattern altitude (TPA) is not shown in the *Airport/Facility Directory*. Aircraft flying at the same altitude have greater ability to see one another as this almost always places them in view above the horizon as compared to the difficulty of seeing planes below against variegated terrain background. Perhaps segmented circles should display a pattern altitude representation.

Vincent D'Angelo
Naples, FL

Thank you for your comments. We would like to point out that all aircraft traffic is regulated in that there are operating rules that apply to all aircraft such as FAR Part 91. Included in those rules are the rules for operating at all airports. The critical see and avoid rule is one of those. (FAR §91.113). These rules apply equally to aircraft (and ultralight vehicles) that operate at towered and non-towered airports. Rules also exist for those aircraft that operate on water. But we are drifting downwind from the point of

our discussion. (This was an attempt to inject some seaplane humor, but it sank.)

The recommended pattern altitude in the AIM is 1,000 feet above ground level (AGL) (AIM paragraph 4-3-3). But as you said, many airports have alternative pattern altitudes. Also, you are correct in your assessment of the limited number of traffic pattern altitudes (TPA) printed in the Airport/Fa-

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 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.dot.gov



ality Directory (AFD).

The problem is many of the airport traffic pattern altitudes were established years ago when different standards were in effect. And yes, local non-towered airports establish their own TPA's based upon local needs. This part of aviation is still very "grass roots."

So, what can be done? First, many airports with other than a standard FAA 1,000' traffic pattern could review their operations to see if the FAA-recommended 1,000' AGL traffic pattern could be established. Plus, an even 1,000' TPA number is easier to add to the airport's field elevation to determine the entry altitude. No great math skills are needed in this case. Then regardless of whether or not the airport traffic pattern is changed, those airport managers that have not updated their airport's traffic pattern entry in the AFD, should do so now. This update should include the traffic pattern altitude. The Airport/Facility Directory's inside front cover explains how to update data.

Now it is up to the many local airport operators to decide if they want to help Mr. D'Angelo solve this ongoing problem.

• Airworthiness Certification

The sample airworthiness certificate shown on page 22 of the October 1998 issue article titled "Trying to Teach Pilots About Airworthiness" has two subtle mistakes that most people would not catch.

First, according to Piper's J3C-65 Aircraft Specification A-691, the serial number 14073 does not exist. (Ok, so this is an example.)

Secondly, according to FAA Order 8130.2C, Airworthiness Certification of Aircraft and Related Products, paragraph 238(d), the category block 4 should be CAR4a. The J3C-65 was certi-

fied prior to adoption of the regulations which established categories, therefore a listing of "Normal" would be incorrect.

These old airplanes may be simple in construction, but for an Airworthiness Inspector (AWI) or Designated Airworthiness Representative (DAR) used to more modern aircraft, the paperwork may be different enough to make an easy mistake.

Steven Whelan
Designated Airworthiness Representative
Germany

Thanks for the corrections. How many other people saw the two errors? For the record, FAA Aviation News does not like to use real aircraft numbers when they can be avoided. So a sample "N" number will normally be a fictitious number. The category data, however, was incorrect.

• CO Poisoning

On page 14 of the October 1998 issue of FAA Aviation News, the symptoms of CO poisoning are listed to include cyanosis. I seem to remember that unlike hypoxic hypoxia, CO poisoning saturates hemoglobin and

thereby produces a bright red color. Which is right?

Michael D. Woods
Major, USMC, retired
Via Internet

You are correct. According to Dr. Melchor J. Antuñano, Manager of the Aeromedical Education Division, FAA Civil Aeromedical Institute in Oklahoma City, OK, "Carbon monoxide competes with oxygen for the blood's hemoglobin, causing hypoxia. The signs and symptoms of carbon monoxide poisoning are indeed very similar to those caused by altitude induced hypoxia (hypoxic hypoxia) with one exception.... Unlike the cyanosis caused by hypoxic hypoxia, the most characteristic sign of hypoxia caused by carbon monoxide poisoning is the cherry color of skin and mucous membranes, which is due to the bright red carboxyhemoglobin.

"Signs and symptoms of hypoxia caused by carbon monoxide poisoning or by altitude exposure include headache, irritability, mental confusion, dizziness, visual disturbances, nausea, vomiting, and fainting on exertion. These may progress to coma, convulsions, respiratory failure, and death," Dr. Antuñano said.

UNITED STATES OF AMERICA DEPARTMENT OF TRANSPORTATION—FEDERAL AVIATION ADMINISTRATION STANDARD AIRWORTHINESS CERTIFICATE			
1. AIRCRAFT IDENTIFICATION MARKING 833596	2. MANUFACTURER AND MODEL PIPER J3C-65	3. AIRCRAFT SERIAL NUMBER 14073	4. CATEGORY NORMAL
5. AUTHORITY AND BASIS FOR ISSUANCE This airworthiness certificate is issued pursuant to the provisions of Part 21 of the Federal Aviation Regulations of 1965 and certifies that, as of the date of issuance, the aircraft or aircraft engine has been inspected and found to conform to the applicable type design, to the applicable airworthiness standards, and to the applicable airworthiness conditions as provided by Annex 8 to the Convention on International Civil Aviation, except as noted herein. Exclusions: NONE			
6. TERMS AND CONDITIONS This certificate is issued subject to the conditions, limitations, and restrictions set forth in the applicable Federal Aviation Regulations, and to the applicable airworthiness conditions as provided by Annex 8 to the Convention on International Civil Aviation, except as noted herein.			
DATE OF ISSUANCE 2/10/98	FAA REPRESENTATIVE Rusty Rivets	DESIGNATION NUMBER AEA-P500-62	
Any alteration, reproduction, or use of this certificate may be punishable by a fine not exceeding \$1,000, or imprisonment not exceeding 3 years, or both. THIS CERTIFICATE MUST BE DISPLAYED IN THE AIRCRAFT IN ACCORDANCE WITH APPLICABLE FEDERAL AVIATION REGULATIONS.			
FAA Form 8100-2 (4-87)		GPO: 1992-504	

WAAS SCHEDULE REVISED

The FAA will take more time to complete development of a critical software safety package that monitors, corrects and verifies the performance of the Wide Area Augmentation System (WAAS). The original July 1999 commissioning date for Phase 1 of WAAS has been rescheduled for September 2000.

"The FAA remains committed to implementation of WAAS because of its safety benefits for the aviation community and the flying public, and because it is central to our overall efforts to modernize the National Airspace System (NAS)," said FAA Administrator Jane Garvey.

The revised schedule came after the final and most complex software module proved to be "a much greater challenge than originally anticipated," said Steven Zaidman, associate administrator for research and acquisition. "We will not commission Phase 1 of WAAS until we are satisfied this technical challenge has been resolved," he added.

All other major software modules have been completed, except for the correction and verification system, which performs more than 20 critical monitoring, correction, and verification functions. In addition, all the required hardware systems for Phase 1 are in place. These include 25 ground reference stations, two master control stations, two geosynchronous (GEO) satellite uplink stations, and two transponders on GEO satellites that are operating successfully.

1998 AIRCRAFT BILLINGS AND SHIPMENTS HIGHEST SINCE 1984

At a February news conference the General Aviation Manufacturers Association (GAMA) reported that 1998 was a record-breaking year for general aviation. Indicators were up across the board with one exception--accidents were down.



AVNEWS

GAMA Chairman L. David Caplan said, "For the third year in a row, the industry has set a new record for billings. For the fourth year in a row, shipments have increased dramatically. Last year was the first time since 1985 that the industry shipped more than 2,000 aircraft."

In 1998, billings were up to \$5.9 billion from \$4.7 billion, and units shipped were 2,223 compared to 1,569 in 1997. That was also the highest number of units shipped since 1984. Piston-engine aircraft shipments increased 55.7% to 1,534, and turbine-engine shipments were up 18% to 689. Aircraft exports increased 19.2% to 535 units, and industry employment increased nearly 12% in 1998.

If that news wasn't good enough, student pilot starts are up nearly 12%, and the industry had the best safety rate in 60 years. Not only were student pilot starts up. New pilot certificates were up 25% and instrument ratings up 45%.

The nation's economy, the 1994 General Aviation Revitalization Act, and the industry's renewed investment in research and development were cited as behind the improvement. Industry efforts such as AOPA's Project Pilot, EAA's Young Eagles, and the nationwide "Be A Pilot" promotion (1-800-992-3335) were cited for the increase in student starts.

FLIGHT STANDARDS NAMES NEW GENERAL AVIATION MANAGER

The manager's position in the FAA's top office for formulating general aviation policy, Flight Standards' General Aviation and Commercial Division, has been filled with a veteran general aviation and U.S. Army pilot, Michael L. Henry.

Henry, a native of Kansas, served in the U.S. Army from 1966 to 1970 and is still an active U.S. Army National Guard pilot, where he flies the Army's

equivalent of the Beech KingAir. An airline transport pilot and certificated flight instructor, he is typed in several large aircraft and, until recently, was the owner of a Tripac based in Easton, MD.

Henry's career in the FAA began in 1970 as an en route air traffic controller in Kansas. In 1985 he transferred to Flight Standards as an aviation safety inspector in the Des Moines, IA Flight Standards District Office. In 1991 he came to FAA headquarters in Washington, DC as the manager of the Airman and Repairman Program of the Flight Standards National Field Office. In May of 1992 he was named Assistant Manager of the General Aviation and Commercial Division, a position he has held since then. Henry had been Acting Manager of the division until his selection as manager by the Director of the Flight Standards Service, L. Nicholas Lacey.

Henry has a degree in Independent Studies from Columbia College and a masters in safety from Central Missouri State University. He has studied civil engineering and aviation safety management as well as attending the U.S. Army Aviation Flight School and James Madison University's Leadership Development Program. Henry is a Master Army Aviator and a recipient of the Purple Heart, Bronze Star, and Air Medal with Valor Device.

Henry and his wife, children's author Kristina Henry, live in Easton, Maryland.

SUN 'N FUN PROCEDURES ON-LINE

You can now download the arrival and departure procedures for the 1999 Sun 'n Fun EAA Fly-In at the fly-in's web site:
-><http://www.sun-n-fun.org/arrival>

The online NOTAM is available in HTML, PDF, and e-mail formats, but if you want a printed booklet, call Sun 'n Fun at (941) 644-2431.



MECHANIC'S BIBLE


FAA has revised Advisory Circular 43.13-1B, "Acceptable Methods, Techniques, and Practices-Aircraft Inspection and Repair." This advisory circular (AC) contains methods, techniques, and practices acceptable to the Administrator for the inspection and repair of nonpressurized areas of civil aircraft, only when there are no manufacturer repair or maintenance instructions. This data generally pertains to minor repairs, but this AC may also be used as a basis for FAA approval for major repairs.

The price is \$55.00, and the AC may be ordered from: Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954. The stock number is SN 050-007-01227-6.

ASRS Encourages Mechanics to Report Safety Problems

The FAA/NASA Aviation Safety Reporting System (ASRS) has long encouraged pilots in all aspects of aviation to report unusual occurrences and unsafe conditions fully and completely with the promise of anonymity and immunity from enforcement action. For all that time, an important section of aviation safety was not so much overlooked as not marketed to: aviation mechanics.

With a slight re-design of the familiar ASRS form, mechanics can now report safety information via ASRS without the possibility of company reprisal or FAA enforcement actions. The same immunity conditions apply: FAA can't use the ASRS report as the basis for enforcement action, but if we become aware of possible non-compliance by other means, we can take appropriate action.

Mechanics, get a start in making your voice heard in this important program. Remove the sample form to the right and use it for good effect. It's the newest tool in your toolbox. 

CALENDAR OF EVENTS

May 7-9 • Minnesota Seaplane Fly-In will be held at Cragun's Lodge in Brainard, MN. There will be safety seminars and flight demonstrations. For more information contact the Minnesota Department of Transportation, Office of Aeronautics at 1-800-657-3922.

May 8 • Safety Fest 1999 is a day-long safety extravaganza at Brainard Airport, Hartford, CT, at the Connecticut Army National Guard Facility, 269 Maxim Road. Fly-ins are encouraged. Whether you fly or fix an ultralight, glider, balloon, helicopter, experimental aircraft, or even a conventional airplane, FAA's New England region will have something for you! There will be static displays, safety presentations, and aviation vendors. The show will go on come rain or shine, so come along and bring a friend. For further information contact either Safety Program Manager at the FAA Windsor Locks FSDO at (860) 654-1002.

June 5 • 9th Annual AOPA Fly-In and

Open House at AOPA Headquarters, Frederick Municipal Airport, MD. For more information contact Warren Morningstar at (301) 695-2162.

June 11-13 • Speculator Lake Seaplane Fly-In, NY, features safety and information seminars, flight demonstrations, and float proficiency rides. For area lodging information call Office of Tourism in Speculator, NY at (518) 548-4521 or reservations at Camp of the Woods call (518) 548-4311.

July 16, 17, and 18 • The 13th Annual Northwest Mountain Family Fly-In and Aviation Safety Conference, sponsored by the FAA's Helena, MT, FSDO will be held in West Yellowstone, MT. This is an all-around event for flyers and their families with lots of aviation goings-on. For further information contact the Helena FSDO toll-free at 800-457-9917, and watch for an article in the May/June issue of *FAA Aviation News* on the safety information provided at last year's meeting.

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HOME Area _____ No. _____ - _____ Hours _____
 WORK Area _____ No. _____ - _____ Hours _____

NAME _____
 ADDRESS/PO BOX _____
 CITY _____ STATE _____ ZIP _____

TYPE OF EVENT/SITUATION _____
 DATE OF OCCURRENCE _____
 LOCAL TIME (24 hr. clock) _____

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EXPERIENCE

Describe your qualifications A & P A P Repairman Inspection Authority FCC Other _____
 What is your technician/maintenance experience in years? Lead technician _____ Technician _____ Repairman _____ Avionics _____
 Other _____

FACTORS

Location _____
 Was training a factor? Yes No I was instructing I was receiving training
 What other factors may have contributed? Lighting Work cards Briefing
 Weather Manuals Other _____
 Check items which were involved in the event
 Inspection Yes No Installation Yes No
 Testing Yes No Scheduled maintenance Yes No
 Repair Yes No MEL Yes No
 Logbook entry Yes No * Other _____
 Fault Isolation Yes No (* Describe in the Describe Event/Situation sector)

Component/System/Sub-system involved: _____

Was maintenance deferred? Yes No When was problem detected? Routine inspection While aircraft was in service at gate
 In-flight Pre-flight
 Taxi Other _____

CONSEQUENCES/OUTCOME

Flight Delay Gate Return Aircraft Damage Improper Service
 Flight Cancellation In-flight Shut Down Rework Air Turn Back
 Other _____

AIRCRAFT/AIRWORTHINESS STATUS

MISSION

OPERATOR

(Check all that apply)
 Aircraft released for service Passenger Air Carrier Government
 Aircraft records completed Cargo Commuter Military
 Aircraft required documents aboard Business Corporate Part 121
 Not released for service Training Air-Taxi Part 135
 Unknown Pleasure Charter Repair Station
 Other _____ FBO Self Employed
 Flight School Other _____

TYPE OF AIRCRAFT (MAKE/MODEL) AND ENGINE TYPE

Type of Aircraft _____ Series _____ ATA Code _____
 Aircraft Zone _____ Engine Model _____ Other _____



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