FAA AVIATION NEWS

MARCH/APRIL 1974

COVER: Balloon fever may be the most contagious thing since measles. See page 10.

FAA AVIATION NEWS

DEPARTMENT OF TRANSPORTATION/FEDERAL AVIATION ADMINISTRATION VOL. 12, No. 11-12

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FAA AVIATION NEWS is published by the Office of Flight Standards Service, Federal Aviation Administration, Washington, D. C. 20591, in the interest of aviation safety and to acquaint readers with the policies and programs of the agency. The use of funds for printing FAA AVIATION NEWS was approved by the Director of the Office of Management and Budget, August 9, 1971. Single copies of FAA AVIATION NEWS may be purchased from the Superintendent of Documents for 45 cents each. All printed materials contained herein are advisory or informational in nature and should not be construed as having any regulatory effect. The FAA does not officially endorse any goods, services, materials, or products of manufacturers.

Flying on the Ground

Gasless Sundays need not spell an end to pilot proficiency

They tell the story of the general aviation pilot who was experiencing mammoth difficulties on the day when he practiced his first ILS approaches—he had two fatal crashes within five minutes.

The first time around he failed to read the instruments on his panel accurately, came in over the field too high, realized at the last moment that he was going to overshoot, pulled back too quickly on the stick, and the airplane shot up into a stall. He tipped over on one wing and crashed from an altitude of 200 feet.

So, he tried it again five minutes later, this time intent on not overshooting. He came in too low at an excessively steep angle of descent, and failed to reach the runway. He crashed 500 feet short, slamming into the ground at a nose down attitude of 45 degrees.

It was now definitely time to stop and take stock! Clearly he was doing something wrong. He steadied his nerves while his instructor patiently explained how to make a proper ILS approach. Then he was ready again. And this time he did it accurately, making a smooth landing in the middle of the runway. Nothing like a non-survivable impact to convince you that you need help.

Okay, what's the joke? There is no joke, because (as you've undoubtedly guessed) the pilot was practicing on a ground trainer.

Ground trainers have been around for a long time, and they have probably saved countless pilots' necks. Traditionally, the commercial airlines have made the most use of simulated training. Some carriers conduct about 80 percent of their pilots' "differences training" (teaching experienced pilots to fly new airplanes) in ground trainers. However, in recent years there has been an increased use of ground trainers by general aviation pilots in both initial training and in gaining increased ratings. During recent months, in a tight energy crisis, many general aviation pilots have found that simulators are a fuel-less way of "flying" practice hours.

Ground trainers were first developed in the 20's, but today's earth-bound aircraft are far more sophisticated machines than those early devices—originally called "pilot makers." The first trainers, constructed by people like Edwin A. Link, resembled large toy airplanes: they had a stubby wooden fuselage with a cockpit mounted on a universal joint; and beneath was a type of organ bellows which pulsated and rocked the contraption around to give some of the sensations of pitch and roll. Variations and developments of this original type trainer were used right through World War II. During the war more than half a million American airmen were trained in devices of this type. However, these earlier trainers were designed primarily to teach basic instrument skills, without attempting to duplicate actual flying characteristics and situations.

After World War II, with the development of the analog computer, it became possible to reproduce a broad range of actual flying situations in a ground trainer, thus giving the practicing pilot a greater feel of what it was actually like to work the controls aloft. A series of advancements in electronics and digital computers during the early and middle 60's have made the modern trainer an even more realistically simulated flying experience, reproducing such procedures as ADF, VOR or ILS approaches, and even such emergency situations as engine out, engine fire or hydraulic failure. Today's trainers come in a variety of sizes and in varying degrees of sophistication and capability. They range from portable trainers, weighing less than 60 pounds, all the way up to a totally simulated cockpit of a Boeing 747, where the pilot sits in an enclosed flight deck which is an exact physical and functioning replica of a large 747 out on the line.

Which brings us to the somewhat confusing question of terminology concerning the modern ground trainer. Since most of these are computer driven, it has become the practice to use the terms "ground trainer" and "simulator" interchangeably. The term "ground trainer" is a general one that applies to all equipment used for practicing flight operations on the ground. Strictly speaking the word simulator can only be used for those training devices which exactly duplicate a single model of airplane, providing an absolute replica of the airplane's cockpit size, configuration, arrangement, and performance—like the simulators the airlines use for training their jumbo jet pilots. All "simulators" are trainers, but not all trainers are simulators.

Benefits of Trainer/Simulators

The most obvious value of simulated training is the safety factor for the pilot. He can practice unfamiliar procedures—and keep on practicing them—without fear of cracking up his airplane, or colliding with others. If he finds he is having problems in a particular maneuver, his instructor is able to go over it with him again and again until he gets it right.

There is also an advantage for the instructor and his program of instruction. Because he does not have to scan the sky for other aircraft while his pupil is struggling with a new procedure, he can give the student and his problem his full attention, analyzing what he is doing wrong, and instructing him in the proper technique. Many modern trainers also allow the instructor to "freeze" the controls at any point in the middle of a maneuver, either to make corrections, to discuss what is happening or to review procedures.

The capability which modern trainer/simulators have of programming emergency situations is an enormous learning benefit for a pilot. Many emergencies, which are too dangerous to be practiced in the air without the presence of a qualified instructor, may be worked on under the trainer's hood in perfect safety.

The cost factor is another great advantage for the general aviation pilot. He can ordinarily spend an hour on a trainer/simulator for far less money than actually taking an airplane aloft. Some simulators can be rented for as little as six dollars an hour; if your only purpose of going aloft is to practice one unperfected maneuver, that can be a considerable saving of money. Furthermore, many firms now have in-town simulators, where a businessman could spend some time in the cockpit during his lunch hour or after work without the necessity of going out to the airport. This not only saves him money and time, but it might also save him some automobile fuel—no small consideration today.

The development of the modern simulator was not planned as an energy and environmental saver, but by one of those latter day ironies of history—we now realize that every hour of training you are able to spend on a simulator is an hour's saving in energy and environmental pollution.

Some concept of the cost-energy savings produced by simulators can be gained from a 1973 report by the Controller General of the United States to Congress which encouraged the greater use of flight simulators in the training of military airmen. The study showed that increased use of simulators at basic military pilot schools could reduce air time by about *49 percent* by the mid 1980's, an hourly saving of from $400 to $1,400. By way of illustration an FB-111 bomber has an average hourly operating cost of about $1,400 an hour as compared with a simulator cost of $90 an hour for the same airplane. As for fuel: the A-7 attack airplane consumes an average of about 680 gallons of fuel per flying hour, and the F-4 fighter consumes about 1,400 gallons. The simulator consumes virtually none.

The most sophisticated of the modern simulators are so astonishingly realistic that they duplicate the very sounds of the airplane—the screech of the engines, the thump of the gear as it's being retracted. Some even have visual simulation, a motion picture which duplicates the view from the cockpit window as seen in flight.

Limitations of the Simulator

But there is one inevitable limitation to even the most sophisticated of ground trainers, a factor which is impossible to simulate, or even calculate: the human element. A pilot in a simulator *knows* he is not actually flying, and no matter how you try to fabricate his environment by motion and sound and sight he nevertheless knows deep in his consciousness that he's still on the ground and that he can step out of the simulator any time he wants. Thus, the total feel of flying can never be completely duplicated—you simply have to fly at 35,000 feet to know the total reality of piloting an airplane in a pressurized cabin in a hostile environment.

This is particularly true of those emergency situations which can be programmed into a trainer. The instructor can push the fire button, and your panel may react like you have a fire on board and you may handle the simulated emergency procedures perfectly. But there is no way of calculating the stress factor or the panic that a person would actually experience in a real fire situation thousands of feet in the air.

Simulated experience will never take the place of actual practice flying time. It is intended as a safe and economical way to practice procedures which will later be accomplished in the sky. The expectation is that ground training in combination with actual flying practice will make a better and safer pilot.

At an FAA Safety Clinic in New Jersey pilots "flew formation" in 40 table-top simulators.

Above—This trainer records your progress. From the desk an instructor can radio instructions, then monitor instruments and flight path as it is drawn automatically on chart.

FAA Regulations

How much ground trainer time will the Federal Aviation Regulations allow you to substitute for actual flying time in getting a ticket? There are two answers to that question. First, the various certifications have different allowance times for the general aviation pilot, and they will be outlined below. Secondly, FAA has been permitting an increased use of trainer time over the years, and it is likely that more will be permitted in the future.

1. Private pilot certification: Under present regulations, five hours spent in a ground trainer is usable for any of the hours required for a ticket.

2. Commercial Pilot: In an approved flight school, 40 of the 190 required hours of flight training may be taken in an approved ground trainer.

Otherwise, the FARs allow you to use a trainer for 50 of the required 250 hours of flight training needed for a commercial ticket.

3. Instrument rating: According to the regulations (Part 61, effective Nov. 1, 1973), the instrument flying time required for an IFR ticket is 40 hours, but 20 of those hours may be "instrument instruction by an authorized instructor in an instrument ground trainer acceptable to the Administrator." What this means is that your local FAA general aviation operations inspector makes a judgment about the capabilities of the specific trainer you have used—or want to use—and if he feels that it has the ability to effectively duplicate the procedures and maneuvers required for an IFR rating he will credit your 20 hours. That means, of course, that you could do half of the required flying hours for an IFR ticket on a simulator.

When you attend a flight school for your IFR rating, the present regulations require only 30 hours of instrument flying time, but 10 of those hours may be done on a trainer. In accordance with a notice of proposed rulemaking for pilot schools, the required flying hours in a flight school may be increased to 35, but the allowable simulator time will be increased to 15 of those hours.

FAA regulations also recognize the usefulness of ground trainers in enabling pilots to meet recency of experience requirements for maintaining or re-establishing the currency of an instrument rating. To stay current, an IFR pilot must log at least six hours of IFR time within the past six months, but up to three of these hours may be simulated.

Furthermore, the use of a ground trainer may be authorized by FAA for all or part of the instrument competency check, required of any IFR rated pilot who fails to meet the recency of experience requirements for a period of one year or more.

Types of Trainers

Modern ground trainers range all the way from small portable units weighing only 52 pounds, and measuring only 42 inches wide and 18 inches high, up to fully simulated jet transport cockpits. Trainers of the smaller type can be carried around to offices and schools, brought to flying clubs in the evening, and even to private homes. The instructor simply flips open the case, sets it on a table, and there you have the instrument panel with its various flight and navigational instruments. The student is able to sit himself down at this sophisticated little machine and actually "fly" his airplane in every type of instrument approach.

There are many fine types of these "table models" available today, some of them offering a self-instructing program of increasing complexity, with "random difficulties" programmed in. Cross country flights with programs of progressively greater distance and weather problems include all of the common inflight environment—including ATC clearances, background noises, contacts with other aircraft, vectors, frequency changes, transponder code changes, vectors to approach course, clearance for an approach and hand-off to tower, and ILS approaches. Some trainers have a turbulence control for even greater environmental simulation.

Simulators now available for the general aviation pilot provide an astonishingly realistic flight simulation. Some have a cockpit mounted on a rotating axis, so that the student who works the controls can actually feel the corresponding motion of climbing, diving, turning, and banking. The audio system reproduces the sounds of the engine, the swish of the slipstream, the screech of the tires touching the runway and the vibration of rough air. Instructors outside the cockpit, can monitor the "flight" and can create various inflight malfunctions such as attitude gyro failure, or altimeter failure, ADF receiver failure, VOR localizer failure, etc.

The more sophisticated simulators use actual motion pictures of takeoffs, approaches, and landings which are displayed before the pilot through his cockpit window. The pilot can actually "see" the landing strip move up on him as he descends. If he should deviate from proper execution, the film shows him to be landing long, short, or wide, as the case may be.

Trainers of this realistic type are especially valuable to the VFR pilot who has no intention of ever flying IFR. If he should blunder into an IFR situation, perhaps through no fault of his own, he is less likely to panic if he has had some experience with flying in clouds in a trainer. ■

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Beside each FAR volume number below are listed all transmittals for all Parts in that volume, to date. Number in parentheses after each Part indicates the latest transmittal, if any, to that Part.

FARs

STATUS of the FEDERAL AVIATION REGULATIONS

(As of April 1, 1974)

FAA VOLUME/PART	TITLE	PRICE
Vol. I: (Transmittals 1-5)		$2.50 + 75¢ foreign mailing
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Part 63	Certification: Flight Crewmembers Other Than Pilots (13)	
Part 65	Certification: Airmen Other Than Flight Crewmembers (13)	
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* Changes to individual airspace designations and airways descriptions, individual restricted areas and individual jet route descriptions are not included in the basic Parts 71, 73 and 75, respectively, because of their length and complexity. Such changes are published in the Federal Register and are included on appropriate aeronautical charts.

** Due to the complexity, length, and frequency of issuance, airworthiness directives, enroute IFR altitudes and standard instrument approach procedures are published in the Federal Register and are not included in basic Parts 39, 95, and 97. In addition, enroute IFR altitudes and instrument approach procedures are depicted on aeronautical charts.

Standards instrument approach procedures are published in the Federal Register by reference to FAA documents which are available for examination at the Rules Docket (AGC-24) and the National Flight Data Center, in FAA Headquarters, Washington, D.C. and at FAA Regional offices and Flight Inspection District Offices.

Blown Out to Sea

When you plan a flight along the seashore, and you decide to change cruising altitudes it is a good idea to check on the winds aloft, especially if there is any chance you will lose visual reference to the surface. Otherwise you may find yourself in the position of the Mooney pilot who in a recent flight up along the middle Atlantic coast was blown out to sea by a 60 knot westerly wind and forced to land some 25 miles short of terra firma.

The flight, a return trip from Nassau in the Bahamas to the Baltimore area in a single-engine Mooney *Mark* 20, had begun on January 5. Plagued by bad weather, the pilot and his companion had spent one night in Florida and another at Myrtle Beach, S.C. On the morning of January 7 he decided that the weather around Baltimore was clearing ahead of him, and he took off at noon. By the time he had reached the vicinity of Norfolk, Va., several hours later, he had been obliged to climb up to 12,000 feet in order to stay above the clouds. An effort to establish radar contact with Norfolk Approach Control was unsuccessful, so Norfolk called the Washington Center radar controller and asked for help in locating the Mooney with their longer range radar.

1829:50 GMT

Norfolk Approach: I've got an aircraft east of here . . . probably off our scope. He's on (transponder) code zero one one five. Do you see anything east of Norfolk . . . more than 50 miles?

Washington Center: Yes, about 90 miles out.

Norfolk Approach: Nine zero miles?

Washington Center: That's affirmative.

Norfolk Approach: How about my putting him on your frequency and you working him toward Norfolk. He's VFR on top, Mooney nine eight five, has about an hour and 15 minutes of fuel now.

Washington Center: Roger. Mooney nine eight five, Washington, go ahead.

Mooney N985: Okay, I have a navigation problem and I'm rather east of Norfolk or, ah, east of Salisbury, somewhere in that area.

Washington Center: Okay, Mooney nine eight five, understand you're squawking zero one one five. Give me an ident, please.

Mooney N985: Squawking ident.

Washington Center: Okay, Mooney nine eight five, I show you approximately 90 miles east of Norfolk, sir . . . what are you requesting?

Mooney N985: I'd like to get to the Baltimore area.

Washington Center: I've been advised by Norfolk Approach that the winds aloft at 12,000 feet are from 270 degrees at 60 knots, sir.

Mooney N985: At how many knots?

Washington Center: At six zero knots. Six zero knots, sir, and I show you tracking northbound. Suggest you turn westbound.

1839:15 GMT

Washington Center: Mooney nine eight five, I still show you tracking northbound, sir. Do you concur?

Mooney N985: Ah, indication that I'm going into the two seven oh degree radial of Norfolk.

Washington Center: Suggest you start a half standard rate turn to the left if you would like to go to Norfolk, sir. Understand you've got only about an hour's fuel, sir, and if you want to go to Salisbury I'll try and get you there, or Norfolk, sir—it's your choice.

Mooney N985: If I can just get on that radial to Salisbury I'll be okay.

Washington Center: Okay, Mooney, the Salisbury VOR frequency is one one four point five, and, ah, see if you can receive it suitable for navigation. Suggest a heading of about three one zero.

Mooney N985: I've got indication now. It's ah (transmission lost).

As it appeared that the aircraft was having trouble with radio navigation, Washington Center contacted Navy and Coast Guard stations in the area to learn what rescue aircraft might be available. Coast Guard 1346, a C-130 returning to Elizabeth City, *N.C., after a routine training flight, was dispatched to the scene. The C-130, commanded by LCDR. Bill Cunningham, was originally routed over and above the Warning Zone that was active between Elizabeth City and the distressed Mooney (because of considerable military air activity in the Zone), but LCDR. Cunningham estimated that the detour could mean arriving at the scene of trouble too late to be of assistance. He asked for and received clearance to fly through the Warning Zone maintaining VFR conditions.*

Washington Center: Roger, Coast Guard four six. If you want to go direct VFR we'll try and give you vectors for the Mooney.

Coast Guard C-130: Four six. Roger. Otherwise this fellow will be in before we get up there.

Washington Center: One three four six, advise me of your VFR cruising altitude.

Coast Guard C-130: Nine thousand five hundred. We're passing eight for that now.

Washington Center: Okay, zero six zero heading looks pretty good for now. Approximate distance, nine zero miles. He's burgundy and white and he's got two souls on board. Advised he has an intermittent transmitter.

Coast Guard C-130: Okay, November nine eight five, this is Coast Guard Rescue one three four six, we are level nine thousand five hundred proceeding to your direction on radar vectors from Washington Center. We'll try to join up with you and guide you into the nearest airfield, which should be Oceana (Naval Air Station, Virginia Beach). Are you still at twelve thousand feet?

Mooney N985: Yes, sir, that's affirmative.

Coast Guard C-130: The pilot is instrument qualified—is that correct?

Mooney N985: Negative on that.

Coast Guard C-130: Understand you have life jackets but no rafts and no flares—right?

Mooney N985: Negative on that.

Coast Guard C130-: Okay, nine eight five, go ahead and put on your life vests just in preparation. We're coming up close on you and you should be able to see us in just a minute. What is your airspeed now?

Mooney N-985: Indicating one thirty five miles per hour.

Coast Guard C-130: Okay, we have you in sight, heading two seven four now. How is your fuel state. How many minutes have you left?

Mooney N985: About 50 minutes.

Coast Guard C-130: Five zero minutes, understand. Washington Center, I have a helicopter proceeding to a point two zero miles on the zero nine zero radial of Oceana, on your frequency.

Washington Center: Roger.

Mooney N985: Coast Guard, how far off am I now.

Coast Guard C-130: You're about 60 miles off shore.

Mooney N985: Ah, how far is it down to the water?

Coast Guard C-130: The cloud layer should be about two thousand feet. Have you ever gone through an overcast before?

Mooney N985: Oh, a few times, but not quite that many feet.

Coast Guard C1-30: Okay, you shouldn't really have a problem coming through it. Just take your time as you go down, make sure your wings are level and don't let your airspeed get below about a hundred knots. Let me know when it looks fairly clear for you to start down, and we'll come on in behind you then.

Mooney N985: I think I'll sit up here for a little while.

Coast Guard C-130: Okay. If you do run out of fuel and have to ditch, we will give you a heading to turn to that will be parallel to the major swells and in that case you would fly the airplane right into the water . . . make sure you don't stall, just a nice easy flight into the water. Inflate your life jackets after you get out, and sit on the wing until the helicopter picks you up. The Coast Guard helicopter should be right on the scene if you have to ditch.

With fuel running out, Mooney was led down through overcast by Coast Guard C-130, which issued step-by-step ditching instructions. The airplane landed, as instructed, gear and nose up, parallel to the swells, skipped once, and sank within two minutes. Coast Guard helicopter rescued occupants.

Mooney N985: Okay, nine eight five.

1932:29 GMT

Coast Guard C-130: Nine eight five, you're going to have to start looking for a hole to get down through. You should be able to break out at about five hundred feet, or you may have to go down a bit lower than that. You're bucking too much of a headwind at this altitude, sir.

Mooney N985: Okay, I'm on my way down now. What is the base of this stuff?

Coast Guard C-130: You should get down to about five hundred or a thousand if you can.

(At this point a Coast Guard Air Evacuation helicopter, summoned by the C-130 and flying just above the surface of the sea, spotted the Mooney through a hole in the overcast.)

Coast Guard Helicopter: Nine eight five, This is Coast Guard one four one five. We see you and you look like you're coming down real good. About 25 miles off shore everything picks up real nice so you should be able to stay out of the clouds. Ease around to heading three zero zero and just hold it. How are you doing?

Mooney N985: Oh, pretty good. How many miles off shore am I?

Coast Guard Helicopter: About 45 miles. What is your altitude now?

Mooney N985: Ah, I think I would like to level off. I'm at forty five now.

Coast Guard C-130: Okay, the winds at 4,500 feet might be easy enough so you could make it okay to shore, just keep going.

Mooney N985: Coast Guard, I got a jet right out here in front of me playing around . . .

Coast Guard C-130: Okay, Mooney, he's off an aircraft carrier down below. He should be leaving now. Just continue your heading of two seven zero and stay over the tops of clouds. I have land in sight so you should have no problem.

Mooney N985: Okay, I've got about, maybe, another 15 minutes of fuel.

Coast Guard C-130: Okay, go ahead and get on down as fast as you can now to about one thousand feet.

Mooney N985: I'd rather stay up here for a while.

Coast Guard C-130: Okay, the helicopter has you in sight and he's going to fly wing on you right on down. Better secure all loose objects, in case you have to ditch, and brace yourself as soon as you hit water. Make sure you stay above stall speed going in. Any questions about ditching?

Mooney N985: You want me to turn to three three zero, right?

Coast Guard C-130: That is correct, three three zero will land you parallel to the swells. You'll have about five knots of wind on the surface, so it should be nice and easy. You are now about 23 miles off the beach.

Mooney N985. Where am I in reference to the airport.

Coast Guard C-130: Oceana Naval Air Station is about 27 miles at two seven five from your position. I should mention that if you have to land in the water make sure your gear is up and your flaps down. Suggest you open the door on short final for a water landing.

Coast Guard Helicopter: Nine eight five, look down toward the surface at about your one o'clock position. Do you have us in sight?

Mooney N985. Ah, that's affirmative.

1955:20 GMT

Mooney N985: We just ran out of fuel!

Coast Guard C-130: Okay, take it easy now, pick yourself a nice clear spot and come around to heading three three zero and hold it all the way down. The helicopter will be right alongside you.

Mooney N985: Okay, I'm three three zero.

Coast Guard C-130: Okay, nice and easy now, the helicopter is right next to you . . . when you get in the water just open the door and step out on the wing and you've got it made. Just make sure you don't hit nose low.

There were a few white caps and streaks of foam on the sea as the Mooney with a dead engine glided down, accompanied by the Coast Guard helicopter flying within 50 yards of its wing. On making contact with the water the airplane skipped up once, spun around 180 degrees and came to rest rightside up on the surface. Both the pilot and his passenger, neither of whom were wearing shoulder harness, struck their heads sharply against the windshield, enough to break out the glass on the pilot's side. Both, however, managed to scramble out on the wing and inflate life vests. They were taken on board the helicopter immediately, by means of an extended platform and a boathook. Water temperature was 49 degrees. The airplane sank within two minutes of splashdown.

The Mooney occupants were flown to a hospital at Virginia Beach, Va., treated and subsequently released. Their debt to the FAA air traffic controllers who sensed their predicament and summoned aid, and to the flight teams from the Elizabeth City Coast Guard Station, who exposed themselves to danger in racing to their rescue, is obvious. It is also obvious that if you let yourself get blown out to sea in a small land plane with dwindling fuel, no instrument qualification, no flight plan and no life rafts or flares on board, you had better have a friend somewhere in high places. Survival time in 49 degree water is measured in minutes—assuming the sharks are not hungry.

Participants in Rescue at Sea

Mooney N985. Single-engine, four-place airplane, bound for the Baltimore area from Nassau in the Bahamas. Pilot and one passenger on board.

Norfolk Approach Control. Radar IFR position at FAA's control tower at Norfolk, Va., airport.

Washington Center, north low radar sector. Radar position at FAA's Washington (D.C.) Air Route Traffic Control Center, handling en route traffic along mid Atlantic coast.

Coast Guard C-130. Four engine turboprop patrol plane out of Elizabeth City, N.C.

Coast Guard Helicopter. Sikorsky HH52A, single engine turbine amphibian.

Balloons are Back

New sport may mean a lot of hot air, but FAA is ready for it.

"We are about to land, so face forward . . . bend your knees on contact . . . and *please don't fall out of the basket!*"

Facetious as it may sound this statement is a serious part of the pre-landing briefing a balloon pilot gives to his passengers, who may not realize that sometimes a balloon landing is a little rough, particularly in a brisk wind. Since the occupants are usually standing, protected only by the three-foot-high sides of the gondola, it would be easy for a novice balloon passenger to tumble out on the first bounce.

If someone did fall out, the consequences could involve more than a shake-up and a bruised ego. The balloon, minus a hundred-plus pounds of ballast in the form of live weight, would probably bound back into the air and perhaps return to earth a mile away in a dense woods or in the middle of a highway. So it is vital that everyone stay on board during landing, until the craft is secured. The pre-landing briefing is but one of many ways that ballooning differs from other types of contemporary flying.

Contemporary flying? Balloons? Didn't they go out of style about a hundred years ago, when David Niven used one to start his trek around the world in 80 days?

Well, balloons are back. At least that is the word from the west coast, where lighter-than-air enthusiasts from across the nation recently gathered to attend a three-day seminar on the modern sport balloon, how it is constructed, flown, and protected from becoming involved in accidents. The seminar, which met at a large hangar in Santa Ana, Calif., participated in numerous tethered and free balloon ascents for the purpose of examining the wares of the four major American balloon manufacturers (Barnes, Piccard, Raven and Semco); to review techniques of balloon handling; and to consider what additional standards might be desired for maintaining adequate safety in this field of general aviation, and what existing requirements should be eliminated.

The attendees at the seminar were 30 FAA general aviation inspectors from Flight Standards District Offices all over the country where the need for certification or regulation of ballooning might be expected to grow surprisingly in the near future. Their instructors were topflight balloonists, such as Dr. Will Hayes, who directed the seminar, and manufacturer's representatives. The 30 "graduates" are now qualified to conduct flight checks in balloons and to assist balloonists with the various problems associated with the sport.

A dozen years ago anyone in good health could walk into a District Office and be issued a certificate as a balloon pilot essentially for the asking. It was almost something of a joke, since you could practically count the number of operable balloons on the fingers of one hand. What changed all this was the development in the early sixties of the portable-burner, propane-fired sport balloon, which may be the next "far-out" recreational activity to capture the zeal of young and old.

Ballooning, considered by some to be the first successful form of manned flight, goes back nearly 200 years, to that memorable day when the brothers Joseph and Etienne Montgolfier filled a large linen bag with hot smoke and watched it fly away, over the rooftops of Paris. Soon afterwards they sent the first passengers aloft—a duck, a rooster and a sheep—with no ill effects, and on November 21, 1783, two young gentlemen of France, the Marquis d'Arlandes and Pilatre de Rozier, made the first human ascent.

For half a century ballooning was the rage of Europe. The laborious, time consuming process of heating the air inside the bag was soon discarded in favor of hydrogen (and later helium) as the source of lift, and ballooning subsequently became a scientific and military activity rather than an amusement. Then the invention of the airplane in 1903 apparently relegated ballooning, as a form of aviation, to the dust bin of history. The high cost of helium made it uneconomical for ordinary usage, and the highly explosive nature of hydrogen made it dangerous in large quantities—de Rozier was killed eventually in a hydrogen balloon fire over the English Channel.

The invention of portable burners for hot air balloons in the early sixties changed the picture again. With a single burner capable of producing some four million BTUs per hour, a bag 60 feet in diameter and 7 stories tall can be filled in half an hour, and kept aloft for many hours more with short bursts of additional heat. Such balloons have a climb speed of up to 1,000 feet per minute. The balloon pilot does not have immediate vertical control, as in an airplane, since there is an appreciable lag before the increase in air temperature (or loss, when valving off hot air) affects the specific gravity of the bag enough to start it moving up or down, but if he is alert and skilled he can swoop down over interesting vistas or soar over obstacles with the greatest of ease.

Since the balloon moves with and within a body of air, rather than in opposition to it, as is the case with airplanes, balloonists normally experience only a very gentle feeling of movement. There is an exhilarating sense of freedom to be found in standing on a wicker platform a mile or so in the sky, or even sitting nonchalantly on the padded sidewall of the gondola. (If the occupant-carrying vessel is made of wicker, it is a *basket*; if it is made of metal or fiberglas, it is a *gondola*). The knowledge that you have no control over lateral direction but are merely drifting with the wind provides, for many, a unique sensation of detachment from all worldly problems.

Ground crewman at left prepares to make old-fashioned wind check before letting go.

Below—balloon seminar activities included inspections of the envelope, as well as balloon inflation. Right—liftoff over southern Michigan. Balloon at left is a "homebuilt."

Whatever the reason, ballooning appears to be one of the most infectious of modern day activities. The wandering balloonist often receives the open-hearted welcome and secret admiration in the countryside he skims over that was once accorded to the pioneer airplane pilot. Like that stalwart American folk hero, the balloonist (some call themselves aeronauts) can land virtually anywhere at will, wherever the prospects for helping hands, a good homecooked meal, or a pretty smile seem to be most promising. And like his leather jacketed forbears he carries a certain mystique, as though he has been sprinkled with stardust. His flying togs are apt to be flamboyant, and his manner just a bit out of this world. No wonder he is besieged with requests to be taken aloft ". . . just to see how it looks from up there."

He is also asked, occasionally, "Is it difficult?" And, "Is it dangerous?" He will shrug enigmatically in answer to the first question, and shake his head at the second. In point of fact, the hot-air balloon is inherently a very stable and crashworthy (or crash survivable) aircraft. Contrary to some popular notions, the bag is not vulnerable to sudden escapage of air (the bag is, in fact, open at the throat, or base, at all times). The fabric can be pierced by pellets or bullets from malicious marksmen, with little or no effect on flight. Even a tear or rip is of no immediate consequence, except possibly in the upper or pressure area.

A bird strike would probably not penetrate the fabric, and even if it did the bird is the only one who would come to harm—it conceivably would end up on the front burner. If the heat source failed completely, the balloon would have to be about 1,500 feet above the surface in order to reach its terminal velocity—850 to 900 feet per minute—on impact. (That velocity is only a bit higher than the safe descent speed of a parachutist.) Fuel failure at altitudes of 500 feet or lower would only result in a very gentle descent to earth. Many flights are made quite close to the ground, for the pleasure of observing nature, or chatting with strangers along the way. (Only dogs and cattle appear to take unkindly to balloonists.)

The one constant danger at low levels for the balloonist, of course, is the presence of power lines, which can entangle the balloon and even electrify it lethally—an experience most aeronauts can do without. The slow pace of the floating sphere can lull the mind, and the pleasing panorama below can beguile the eye to the extent that the pilot fails to spot power lines, poles, or other obstacles in time to avoid them. A dragline is an invitation to danger: hemp or nylon will conduct anything over 600 volts.

Two other "natural" enemies of balloon safety are fire and wind. The fabric can be damaged by the burners, if the equipment is not properly handled during inflation, or if the burners are not shut down before landing. (It is also possible to set fire to crops, such as a wheatfield, if one is careless; with the current price of wheat that could prove a very costly error.)

Safe handling of the balloon on the ground is very closely related to the wind conditions. It is not considered safe to launch if the surface wind is 12 knots or higher, and it is much more comfortable to land before it exceeds that velocity.

Both balloons and balloonists are regulated by FAA. This includes tethered or moored balloons, which are also enjoying a revival of popularity as an attraction at fairgrounds and commercial enterprises. Tethered balloons (larger than 6 feet in diameter or 115 cubic feet in volume) may not be flown within 5 miles of an airport or higher than 500 feet above the surface without a waiver from FAA. If a moored balloon is to be flown higher than 150 feet above the surface, all particulars of the flight must be reported to the nearest FAA air traffic facility at least 24 hours beforehand. If flown at night, both the balloon and its lines must be appropriately illuminated. At all times moored balloons must have an automatic deflation device in working condition. Like all balloons, they can only be flown in VFR conditions.

All manned free balloons require the presence of an FAA certificated pilot, and the agency further recommends that passengers not ascend in a moored balloon without a rated pilot on board. The general requirements for a private certificate in ballooning are the same as those for powered aircraft, except that the free balloon rating may be granted at the age of 16 (instead of 17). No experience in airplanes is required, but the applicant must log a minimum of six balloon flights, including one solo, totalling at least 10 hours, under supervision of a person holding a commercial free balloon rating. Instruction from a certificated flight instructor is not mandatory.

The balloon itself requires a type certificate unless it is homebuilt. In that event construction would have to be closely supervised by the appropriate Flight Standards District Office, as is done with airplane homebuilts. Any modification of a commercial design should also be FAA approved. "Preventive maintenance" in the form of mending rips and tears in the bag may be done by the owners, but major repairs must be done by a certificated airframe and powerplant mechanic, who also performs the annual checkup. Local unfamiliarity with the equipment often makes it advisable to contact the manufacturer for maintenance assistance.

One thing a balloon can seldom do is return to its launch site on its own power. Rarely are 180 degree wind shears encountered in the lower atmosphere where the free balloonist wanders, and you cannot tack the craft against the wind as you might a sailboat. Normally you just are content to go with the wind. This necessitates a chase crew with a suitable car or truck and/or trailer. The chase vehicle may maintain a "hot pursuit" aided by radio contact via citizens' band radios. Or in the case of a longish flight, a retrieval group may be put together only after the aeronaut has landed in a faraway farmer's pasture.

Consequently ballooning is usually a *group*, or at least a *family* activity. There are about 300 balloons in this country and most are owned by clubs. No more than four persons normally may go aloft on a flight, and space aboard the gondola is usually at a premium. The Balloon Federation of America, with headquarters in Washington, D.C., has about 600 members, but balloon enthusiasts believe perhaps ten times that number have participated in the sport. If bright-colored air bags start popping up all over the countryside this spring, FAA is prepared to extend its traditionally friendly hand to all who need help.

(A following article on this subject will discuss the structure, safe operation, and maintenance of the modern hot-air balloon.)

Famous
Flights

J. J. Montgomery

California's Early Birdman

When a five year old boy wants to climb a mountain so he can sit on a cloud and later throws stones at a pelican just to watch its changing flight pattern, it would seem only reasonable that he is airminded. This was the beginning of John Joseph Montgomery's life long interest in aviation, and although neighbors thought him a bit touched, some historians would later credit him with being the first man to fly.

Born in Yuba City in central California in February 1858, he moved with his family to Oakland when he was six years old. As a child, the lad's major interest was birds, alive and dead. He not only studied the soaring patterns and wing motion of buzzards, pelicans and seagulls, but was constantly experimenting and testing air currents with bits of feathers and thistledown. Quite often after watching a gull soaring, and throwing stones at it to make it veer and dive, he would shoot it down, then study the wing structure in minute detail, measuring its wing spread and area in relation to its weight. He did the same thing with pelicans and other birds, building up a fundamental knowledge of the laws of aerodynamics.

John Montgomery grew up to be a slim, quick moving young man with wiry dark hair, a wide brow, deep dark eyes, and intense emotions that found an outlet in his enthusiasm for aeronautics. Although ridiculed by his neighbors, he stuck to his conviction that flight was possible. He was more interested in confirming his theories on the principles of flying than in actual flight. He enjoyed working alone or with his brother James, and was most secretive about his tests and accomplishments. His young sister Jane was one of his greatest admirers and spent many a day stitching fabrics to thin wooden wing supports.

In 1874 he entered Santa Clara University and a year later transferred to St. Ignatius College in San Francisco. After acquiring his Master of Science degree in 1880, he joined his family at their 80-acre Fruitland Farm near Otay Mesa where they had gone the year before. His father, a well-known attorney, tried to interest him in law, which he did not like. His mother built and opened a general store on their property and turned it over to John, who ran it into a financial hole saying he "just couldn't keep my mind on dull business."

But the move to the fruit farm did make it possible for him to experiment further with flying. It was in the barn on this farm that he set up his experiments in aerodynamics. He was fascinated by the movement of various shaped surfaces when flung into the air. One day he found a piece of slightly bent metal which he threw into the air to observe the peculiar way it glided, rising quite a bit, circling, then diving to the ground. Eventually these observations led him to design a cambered wing, which gave his aircraft stability in flight and effective control.

Montgomery decided that he must learn the knack of operating a "soaring machine," of achieving equilibrium, then control, and finally continued soaring flight, all in that order. With this in mind he built his first large machine in the spring of 1883. It was an ornithopter, with flapping wings operated by manpower and, of course, it did not work. A second effort with double wings also failed. He then built a glider.

The year was 1883 (some historians say 1884), 20 years before the Wright brothers' success at Kitty Hawk, 8 years before the first successful gliding efforts were recorded by the internationally famous Otto Lilienthal. The Montgomery glider weighed only 38 lbs., consisted of 90 square feet of gull-shaped wing area, and a flat, half moon tail, hinged and controllable by the pilot, who sat on a centrally located seat. The wings were covered with unbleached muslin, sewed to the ashwood ribs.

Before dawn (to avoid prying eyes and tattling tongues) the machine was placed in a donkey cart, covered with straw, and trundled down to Otay Mesa near San Diego Harbor. John was accompanied by his brother James, and both carried shotguns, to give the impression they were out for some early morning fowling. From the crest of a small hill, facing into a gentle westerly wind, John took off. In his own words:

In 1905 in California a manned glider designed by Montgomery (left) was towed to 4,000 feet above the earth by a balloon and released. It flew for 20 minutes before landing gently at a designated point.

". . . there was a little run and jump, and I found myself launched in the air. I proceeded against the wind, gliding downhill for a distance of 600 feet . . . I was able to direct my course at will. . . . The first feeling in placing myself at the mercy of the wind was fear. Immediately after came a feeling of security when I realized the solid support given by the wing-surface . . ."

A flight of 600 feet, even downhill, was an astonishing feat in the year 1883, and there were many who doubted that it ever took place. John's brother was his only witness, and he did not attempt to repeat the flights publicly. Few persons had ever heard of John Montgomery, of his claim to have been the first man to control an aircraft in sustained flight. The Californian took little part in the noisy disputations, but in 1909 he was pleased to receive a letter from the Austrian Government conceding that their investigations showed Montgomery came before Otto Lilienthal "in being the first to fly." (Recognition from his own state was even more tardy, and, in fact, posthumous. A stone tablet dedicated in May 1950 marks the spot at San Diego's harbor where Montgomery's flying machine first rose into the air.)

After his successful 1883 flight, he began more intensive research into air currents and their effect on various models, some flat-winged with trailing sections hinged with leather, the forerunner of the aileron. When time was available constant improvements were introduced. In 1894 he joined the faculty of St. Joseph's College and taught mathematics while continuing his aerodynamic research, and two years later changed over to Santa Clara College. From 1896 to 1904, in addition to his academic duties, he experimented with large, eight-foot airplane models, sometimes controlling their flight with a cable stretched across a canyon. He also built a wind tunnel to test all phases of plane structure.

Oddly enough Montgomery consistently avoided contact with others who were working on aeronautical problems. He was compelled to pursue an independent course, with only a vague knowledge of investigations such as those of Lilienthal, Pilcher and Langley.

In 1904, he began experimenting with tandem-winged, man-carrying gliders, designed to fly at unheard-of altitudes. Successful short test flights were made that year and the following Spring. By this time, Montgomery decided to stage his first public demonstration. On April 29, 1905, before a crowd of 15,000, including reporters from many papers, and with Daniel Maloney as pilot, the glider was attached to a balloon which soared to 4,000 feet before the cable was cut. Slowly, gliding, dipping and turning, Maloney exercised perfect control, maneuvering his glider for almost 20 minutes to a predesignated spot a mile and a half away, and landing with so slight a jar that his knees hardly bent. Octave Chanute characterized the flight as "the most daring feat ever attempted."

Montgomery and Maloney then gave many exhibitions in California until the now-famous pilot was killed in a crash. Meanwhile Montgomery's other activities demanded his attention. He completed work on an electric typewriter and patented a rectifier for alternating current.

In 1910 he was married. He resumed gliding experiments in 1911 at a camp he built south of San Jose and made over 50 flights in October. On the 31st day of that month he was on a normal flight when, according to several eyewitnesses, he apparently released the steering wheel and fell sidewise into the glider's frame, which landed lightly but was turned over by a gust of wind. Two hours later the inventor was dead. The accident was attributed to an attack of vertigo, but his death was due to a stove bolt penetrating his brain. Alexander Graham Bell commented that ". . . all subsequent attempts in aviation must begin with the Montgomery machine."

John Montgomery died in 1911 from injuries received in a crash following an attack of vertigo during a flight in his glider.

Pilot
BRIEFS

■ SLIDE TO THE REAR. A pilot seat that slides back during a critical stage of flight can lead to anything from an unnerved pilot and frightened passengers to a serious accident. Maintenance reports indicate problems with seat adjusting mechanisms in some single engine aircraft continue to present a potential hazard. Pilots are urged to make certain the seat is locked in place before fastening safety harness, and to check the seat assembly from time to time, noting particularly the condition of seat rails, including locking pin holes and back stops; locking mechanism such as actuating arm, linkage, locking pin; and rollers and roller brackets. If in doubt about any of these items have your airplane mechanic check it out.

■ BONEHEAD PILOT OF THE MONTH AWARD goes to a Piper Cherokee pilot who forgot to remove a wheelchock before attempting to taxi out for takeoff. He allowed a passenger to deplane and remove the chock, without turning off the engine or warning the passenger of the danger of the propeller. The passenger was struck and killed by the spinning prop.

■ CONTAMINATION OF TURBINE FUEL from solids such as rust particles, sand or other debris is being reported with increased frequency, possibly resulting in part to using fuel from the bottom of storage tanks during shortages. Whatever the cause, the problem is a serious one. For one thing turbine fuel, being denser than gasoline, holds solid contaminants in suspension longer than gasoline does; for another fuel passage orifices of turbine engines are more susceptible than those of reciprocating engines to malfunctions caused by small foreign particles in fuel. Turbine aircraft operators should inspect fuel frequently for foreign substances.

■ BEWARE THE ILL WINDS OF MARCH. An analysis of accident causes during the second half of 1973 in FAA's Great Lakes Region disclosed that the leading cause was—a surprise to many—improper operation of brakes and/or flight controls on the ground. Since late March and early April are traditionally gusty weeks over much of the country, the problems of controlling the airplane safely on the ground can be especially troublesome just now. Expect the unexpected.

■ WHEN TO BE A TEST PILOT. If your aircraft has had repairs or alterations that require flight testing, be sure that the test flight is accomplished before the craft is used to carry passengers. FAR 91.167 requires such tests after work that "may have appreciably changed its flight characteristics or substantially affected its operation in flight." (If in doubt, ask your Flight Standards District Inspector.) The test pilot, who may be the owner or normal operator of the aircraft, must log the findings of the test flight in the aircraft logbook or maintenance record. (Pilots who would like to have their mechanic accompany them on the test hop are reminded the practice is forbidden since the mechanic would also be a "passenger.")

First AOPA/FAA Mechanic Refresher Course Held in Ohio

The first AOPA/FAA sponsored National Aviation Mechanics Refresher Course, held last month in Columbus, Ohio, provided the sponsors and some 100 attendees with a glimpse of the many important benefits this program is expected to bring to general aviation maintenance personnel.

During the two-day trial session, experienced professionals in aviation maintenance were brought up to date on the latest techniques for handling special repair problems—in aircraft by three manufacturer's representatives (from Beechcraft, Bell Helicopters, and Grumman/American)—in ignition (Champion Sparkplugs and Bendix)—and in starter motors and generators (Certified Aircraft Products).

Attendees felt that the opportunity to talk over knotty problems with industry representatives frankly and openly would be worth many hours of labor saved in the course of the coming year, and possibly would be reflected in a better safety record.

Also on the program were Flight Standards maintenance specialists who briefed the group on current FAA thinking on maintenance related Federal Aviation Regulations, especially as applied to major and minor alterations; and on the status of the general aviation Service Difficulties program.

Virtually all major manufacturers in the industry plan to appear at one or more of the clinics, which will be scheduled frequently through the year across the nation, according to Ralph Nelson, Director of AOPA's Air Safety Foundation. Invitations to attend future clinics will be sent out by the Foundation to all aviation repair stations, all known maintenance airmen and to interested organizations.

Two-Year Airworthiness Review Program Inaugurated

To help keep pace with aviation manufacturing, FAA has instituted a periodic review of airworthiness standards. The goal of the new "Airworthiness Review Program" is to revise existing airworthiness standards and develop new standards on a systematic basis rather than in a piecemeal manner. The program, which will be administered by a special staff in FAA's Flight Standards Service, provides for maximum public participation.

The review program will operate on a two-year cycle keyed to a biennial Airworthiness Review Conference, open to industry and individuals from the United States and foreign countries. The first meeting will be held in Washington, D.C. on December 2-11, 1974. The agenda will include discussions of proposals previously submitted by the public and broadly distributed by FAA for comment. Proposals which evolve from the conference as a consolidation of ideas will be published as a Notice of Proposed Rule Making no later than May 30, 1975. Comments will again be invited from the public and will be considered in the final rulemaking action, which is scheduled to be effective by mid-February 1976. As this first two-year review cycle ends the second will begin.

Proposals are solicited on all matters pertaining to airworthiness and certification of airplanes, rotorcraft, balloons, engines, propellers and other components.

They should be submitted by April 15 to the FAA Airworthiness Review Staff, AFS-77, 800 Independence Ave. S.W., Washington, D.C. 20591. Proposals should identify the affected regulation (if any) by title, number and section and include justification for the proposed change and suggested language and/or the precise objective being sought.

Complete details appeared in the Federal Register of February 15, 1974. For a copy of the notice, write the Airworthiness Review staff, AFS-70 at the above address.

Safety Courses Expanded for Handling Hazardous Material

The DOT safety training course on air transportation of hazardous materials designed for air carriers, air taxi operators, air freight forwarders and air shippers, has been increased from three to four days. The new courses, limited to 15 participants, will begin on April 1, May 13, and May 28. Fee is $100, payable to FAA Aeronautical Center, and registration must be received three weeks in advance of the starting date. Hotel accommodations should be arranged by the applicant.

The extended course is expected to better assist industry to comply with FAA regulations requiring the training of persons involved with air shipments of hazardous material. For additional information and registration forms, write to the Transportation Safety Institute, 6500 S. MacArthur Blvd., P.O. Box 25082, Oklahoma City, Oklahoma 73125.

Inventor Donates Lighting Patent

More than thirty years after he first assigned the rights to a patent on aircraft position lights to the Civil Aeronautics Administration, in 1941, Charles Adler, Jr. of Baltimore has donated his fourth patent to FAA. The latest is for a streamlined gas discharge anti-collision beacon, a double-reflector strobe which projects light 360 degrees horizontally and 180 degrees vertically. Adler also assigned the government patent rights for reflector bulbs, in 1943, and for items relating to aircraft proximity warning indicators, in 1951.

Although he will receive no personal gain from production of the anti-collision beacon, Adler has offered a gift to $3,000 to anyone who puts the light into production.

Flight FORUM

FAA Aviation News welcomes comments from the aviation community. We will reserve this page for an exchange of views. No anonymous letters will be used, but names will be withheld on request.

• A Light Question

I was interested in your recommendation in the October, 1973, issue ("Operation Lights On") for keeping landing lights turned on day and night. I have no doubt that such a practice is a protection against bird strikes and mid-air collisions. I wish it were practical to do this but your article does not consider the limitations of electric power and lamp life in general aviation aircraft. My owner's manual states, "The landing lights should be used sparingly to prolong battery and lamp life." It would certainly jeopardize safety if landing lights were used so continuously in day flights that they would be inoperative in a night landing.

Wolcott C. Treat, Ph.D.
Poway, Calif.

It is true that the useful lifetime of the lights will be shortened by their use as suggested, but we believe this cost is small compared to the added visibility of the airplane. The "Lights On" program is voluntary and is encouraged in the interest of safety. Each pilot must weigh the cost versus the safety benefits and act accordingly. You may wish to check with your manufacturer to see how much landing light use he regards as too much.

Incidentally, it is possible to land safely at night (at a lighted airport) without landing lights. This type of landing is not difficult after practicing a few times with an instructor—in fact, many pilots make smoother night landings without lights than with them on.

• Pressure Suits in SSTs?

In "Pilot Briefs" the paragraph entitled "Too High For Comfort" puzzled me. Presumably, an executive jet certified for 47,000 would offer the same cabin altitude capability as current jets. If this is true, can we expect future SST passengers to don pressure suits so that they may cruise at FL 600? Surely the physiological criterion is one of cabin altitude (with pertinent safety considerations) rather than flight altitude. Please explain.

Terence C. Honikman
Santa Barbara, Calif.

Executive jet aircraft decompress in a matter of fractions of a second, as compared to large aircraft. Accordingly, you are absolutely correct when you reference the necessity for pressure suits in executive jet aircraft at flight level 600, but it is incorrect to apply that rationale to large transport aircraft. The criterion for decompression related to window loss provides for a greater capability to maintain cabin altitude in the large aircraft. These large aircraft have an excess of power available for this purpose, whereas small aircraft such as business jets, do not.

• Airports for Indians

In a news item in your September 1973 edition I read of an FAA Planning Grant for an airport within the Navajo Indian Reservation. I have been interested in aviation for the American Indians, and I have wondered if any steps have been taken to help them. I am a high school math teacher and I'm working on my commercial and instrument ratings under the GI bill.

I would be interested in knowing what is being planned and whether—and how—I can help?

Doug Michelsen
Costa Mesa, Calif.

The September article referred to a "Planning Grant" for the Navajos. This is money allocated for the purpose of determining the airport needs of the Navajo nation over the next 20 years. However, an Airport Development Aid Program (ADAP) allocation has already been made to another Indian tribe. The two-runway airport of the Standing Rock Sioux Tribe, in the development stage, is being built on Indian-owned land. For further information you can contact the airport sponsor: Tribal Chairman, Standing Rock Sioux Tribe, Fort Yates, N. Dak. 58538.

• TACAN Receivers

At some military aerodromes a UHF station supplies the primary ground navigation and the only means of conducting an IFR approach to that airport. I would like to know where airborne TACAN receiver units can be purchased by the civil aviation user who has a need to operate into and out of such a military field?

Richard D. Henderson
Santa Monica, Calif.

We know of no manufacturer that offers such a receiver for civilian purchase. A military surplus outlet would seem the best possibility.

• The Right Approach

It seems that many pilots completely ignore traffic patterns at uncontrolled airports. Please clarify the following: At an uncontrolled airport, where right or left turns are indicated by a segmented circle (or light at night) in VFR conditions, is a pilot in violation of FAR 91.89 or any FAR if he makes a straight-in approach, or if he flies a wrong-way pattern?

Also, FAA has talked about establishing a standard traffic pattern at uncontrolled airports. Why has this not been done?

Howard L. Fenner
Jefferson, Ohio

Although it is not always considered a "good operating practice" it is not necessarily a violation of any FAR to make a straight-in approach to an uncontrolled airport under VFR conditions, where airport displays indicate left or right turns. It would, on the other hand, be a violation for a pilot to disregard the segmented circle and make left turns where right turns are indicated, or vice versa. FAR 91.89 does not require that turns be made in approaching to land at a non-tower airport, but if turns are made they must be in the appropriate direction, i.e. to the left, unless airport markings or light signals indicate they should be made to the right.

The many comments received in response to the FAA proposal for a standardized traffic pattern procedure for uncontrolled airports are still being evaluated. A regulation is being developed to be issued as soon as practicable. Details will be announced prominently by this magazine as soon as they become available.

ATTENTION PILOTS:

The goal of this magazine is to help private pilots fly safely and better. We need your help to determine how well we are accomplishing that goal. Please check the boxes below that apply to you. Use this form or make a copy. We will also welcome any comments or suggestions you may care to enclose, but bear in mind that our mission is the promotion of aviation safety. Mail to: FAA AVIATION NEWS, AFS-18, 800 Independence Ave., SW, Washington, D.C. 20591.

As a result of reading FAA AVIATION NEWS have you:

Acquired safer flying habits?	☐ Yes	☐ No
Increased your knowledge of aircraft performance?	☐ Yes	☐ No
Improved your navigation or communication techniques?	☐ Yes	☐ No
Learned about the importance of aircraft maintenance?	☐ Yes	☐ No
Been better able to follow approved air traffic procedures?	☐ Yes	☐ No
Gained a better understanding of weather and flying?	☐ Yes	☐ No
Learned more about how health affects flying?	☐ Yes	☐ No
Been able to keep up with rule changes?	☐ Yes	☐ No
Learned of helpful publications and resource material?	☐ Yes	☐ No
Benefitted in any way?	☐ Yes	☐ No (Explain below)

You need not sign your name unless you choose.

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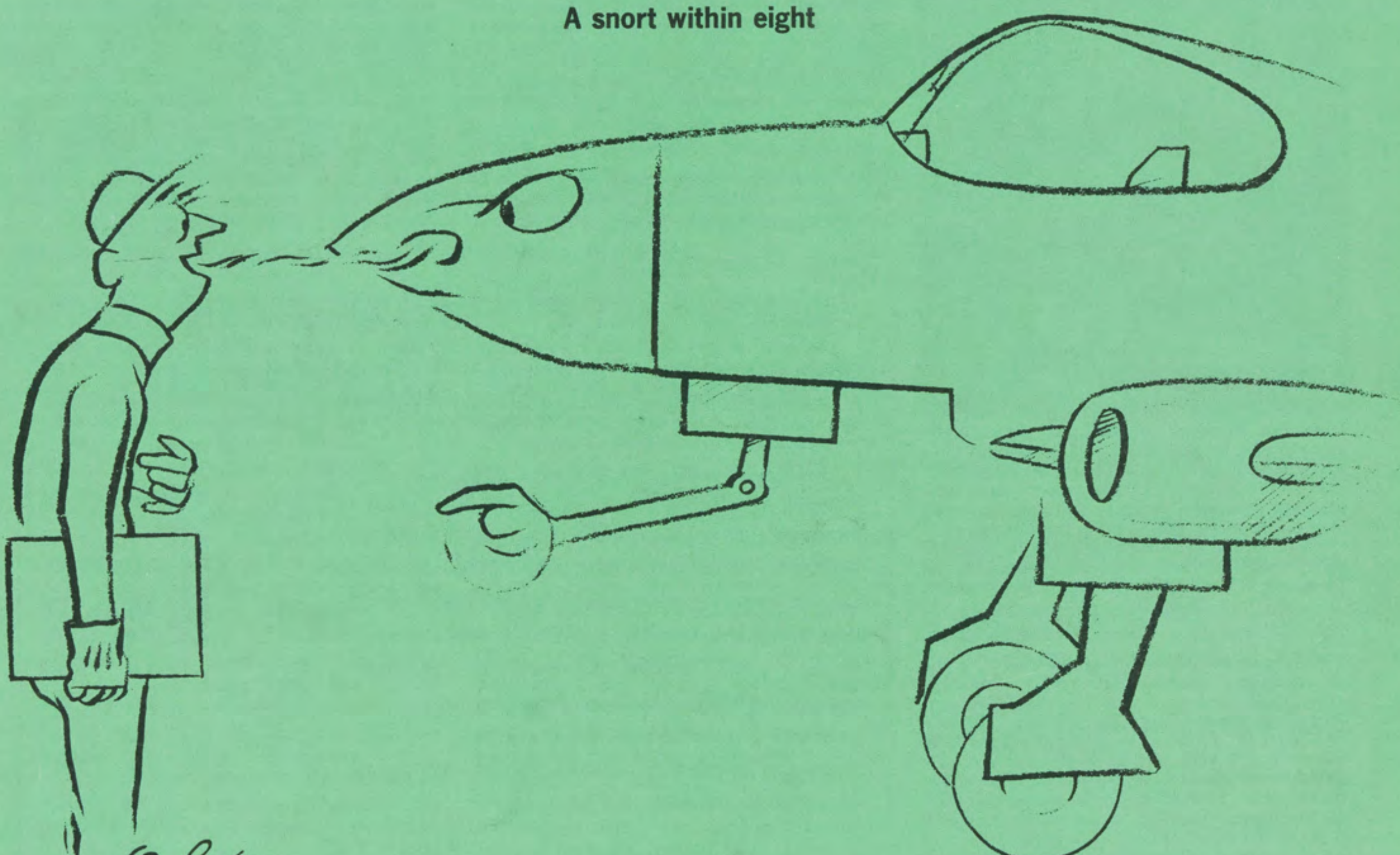

can scuttle your fate.

Suggested by Jerry Forsythe, FAA GADO
Houston, Texas