FAA GENERAL AVIATION NEWS

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A FLIGHT STANDARDS SAFETY PUBLICATION FOR AIRMEN

COVER:
Spring comes to
Mt. Hood, Oregon

FAA GENERAL AVIATION NEWS

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The Impossible Climb

. . . a fatal airspeed error

On the night of December 1, 1974, an aircraft climbing through clouds stalled out and crashed into the side of Bear Mountain in upstate New York, killing all three persons on board.

Fatal stalls in clouds are, unfortunately, not an uncommon experience in civil aviation. What made this accident different was the fact that it occurred not to a light aircraft but to a Boeing 727 jet, equipped with the very finest of instrumentation and flown by a professional crew all properly certificated and qualified. Nevertheless a condition developed which was not recognized by the crew in time to prevent the stall, and the crew's failure to understand what was happening to the airplane resulted in an uncontrolled descent from nearly 25,000 feet into the ground.

This accident is of special interest to general aviation because the probable cause—pitot tube blockage—is one which is suspect in many light aircraft fatal stall accidents, but which often cannot be identified because of lack of evidence. In this cast, flight data and voice recorders, which were recovered intact, carried a clocked record of the events leading up to the crash. (Air carriers have both a Cockpit Voice Recorder, which retains the last 30 minutes of cockpit conversation, radio communications, and sounds of engines, switches, etc.; and a Flight Data Recorder, which stores such information as heading, airspeed, altitude, vertical acceleration—usually recorded on aluminum tapes. All data are keyed to the time of occurrence. The tapes are in crash-protected containers located in the aft section.)

On this particular flight the three-engine jet was chartered by a professional football team and was on its way from New York Kennedy Airport to Buffalo to pick up the players. There were no passengers on board.

The aircraft departed at 7:14 in the evening during a period when moderate to heavy snow and rainshowers were forecast, with "frequent moderate icing" in clouds predicted. The crew consisted of a captain, first officer and second officer, all of whom were properly certificated and qualified for the flight in accordance with FAA and airline regulations. The aircraft was determined to be fully airworthy, and loaded correctly as to weight and balance.

Incidentally, this type of aircraft has three independent pitot systems and three independent static systems. In addition to providing sensory information to airspeed and other instruments for the pilots and the flight data recorder, two of the systems are designed to activate warning horns whenever the aircraft approaches maximum operating speed, which is approximately .9 Mach speed in the 727.

The recorded log of the 727 jetliner began shortly before takeoff with the preflight checklist being read off by the second officer. The first officer responded, apparently under the supervision of the captain. One segment of the printed checklist reads as follows:

Second Officer:	**First Officer:**
Flaps	*15, 15 (25, 25)*
Marked Bug (Marker showing rotation speed set on airspeed indicator)	*Numbers set*
Ice protection (engine nacelle heat)	*OFF (ON)*
Pitot Heat	*ON*

A transcript of the actual readout and response shows that after the first officer responded to the flapsetting query, and the second officer called for the "bug" setting, there was no immediate response—and that consequently the engine anti-ice query was skipped:

First Officer: *(responding to "Flaps?")* "Zero, zero and thirty-one, fifteen, *fifteen* . . ."

Second Officer: "Bug? . . ."

Second Officer: "Pitot heat?

First Officer: "Off and on." *(NTSB concludes he was apparently responding to the missed query on engine anti-ice, and to the pitot heat item.)*

Captain: "One forty-two is the bug."

First Officer: "Er . . . do you want the engine heat on?"

First Officer: "Huh?" *(Perhaps responding to a hand signal.)*

Sound of five clicks.

Since the sequence of items on the checklist was interrupted, it appears likely a mistake occurred at this point, and that the five clicks heard on the tape were the movement of the pitot heater switches to the "OFF" position and the movement of the engine anti-ice switches to the "ON" position—a reversal of their normal positions on takeoff. National Transportation Safety Board investigators found this assumption supported by the position of these switches in the wreckage, by the condition of the engine anti-ice lights, and by the lack of any reference during the flight to the need for engine anti-ice.

Apart from the irregularity in this checkoff, all other preparations for the departure proceeded in a standard manner, according to the voice recorder tapes, and at 7:14 p.m. the three-engine jet left Kennedy Airport on a standard instrument departure. The aircraft was cleared to 14,000 feet by Departure Control, and then to 31,000 feet by the New York Center as it took the handoff. As the aircraft climbed through 13,000 feet a climb rate of 2,500 feet per minute was established, with the airspeed at 305 knots. So far, everything was normal.

But as the airplane climbed through 16,000 feet the indicated airspeed began to increase (with no change in power setting). Oddly enough the rate of climb indicator also began to show a marked increase. The first officer commented.

"Do you realize we're going 340 knots and I'm climbing 5,000 feet a minute?"

Implications of the high airspeed and the high rate of climb (which are beyond the performance capability of the B727-251) were discussed by the crew, and the second officer concluded:

"That's because we're light."

Airspeed Distortion

Nowhere in the recorded conversation was there speculation that the instrument readings could be wrong, that ice could have sealed off the pitot tube heads, rendering the airspeed indication totally false. (In certain circumstances, when the pitot tube system is sealed off by ice or other blockage, the instrument's indication is no longer related to airspeed at all, but acts something like an altimeter, showing an increased reading as the aircraft climbs, and a decrease as it descends, regardless of actual airspeed.)

The first officer, who was handling the flight controls, continued to exert back pressure in an effort to prevent the airspeed from becoming excessive. But as the aircraft passed through 23,000 feet the recorded rate of climb was more than 6,500 feet per minute, the indicated airspeed was 405 knots, and the overspeed warning horn (which is linked to the airspeed indicator) sounded. The following conversation was recorded at this point:

Captain: "Would you believe that *#X?"

First Officer: "I believe it. I just can't do anything about it."

Captain: *"Pull her back and let her climb."*

The overspeed warning horn was heard again, followed ten seconds later by the sound of the stall warning stick-shaker, which is independent of airspeed measuring systems. The flight data recording showed that within five seconds vertical acceleration reduced to 0.8 g. The aircraft stopped climbing at 24,800 feet. Airspeed indication was 420 knots. The aircraft was now on the verge of a stall, and the stall warning device was activated again.

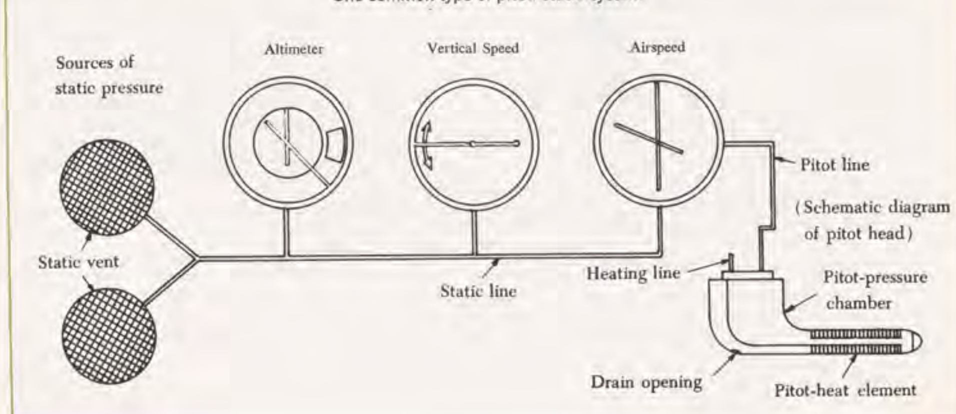
First Officer: "There's that Mach buffet, I guess we'll have to pull it up."

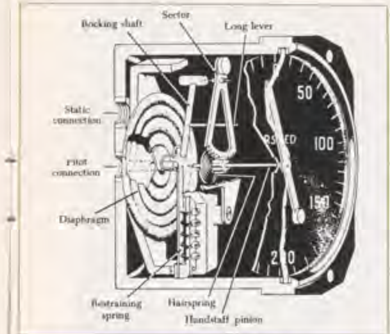
Captain: "Pull it up."

(The Mach buffet is a vibration that takes place when an aircraft exceeds its critical Mach number, which is a percent of the speed of sound at a given altitude. The buffet is caused by the formation of a shock wave on the airfoil surfaces and a separation of airflow aft of the shock wave. The change from laminar flow of air to turbulent flow causes a high-frequency vibration in the control surfaces, which is described as a "buffet," or "buzz." Apparently the First Officer and the Captain—believing the airspeed to be 420 knots—mistook the stick-shaker stall warning effect for the Mach buffet.)

The landing gear warning horn sounded, indicating that the throttles had been retarded, with gear up.

One common type of pitot/static system





Cutaway showing how airspeed indicator operates

Thirteen seconds after arriving at 24,800 feet the aircraft was falling at a rate of 15,000 feet per minute, turning rapidly to the right. The airspeed indication was decreasing at a rate of four knots per second.

Mayday! Mayday!

The New York Air Route Traffic Control Center acknowledged the call immediately. "Go ahead . . ."

"Roger, we're out of control . . . descending through 20,000 feet."

The Center controller advised that altitudes below the jet were clear of traffic, and asked for details of the emergency.

"We're descending through 12—we're in a stall!"

It was their last transmission. The recording tapes picked up a command from the Captain—"Flaps two!"—and a sound which might have been the movement of the flap handle. But there was no apparent reduction in the rate of descent, which was recording peaks of more than 3 g's (three times the force of gravity). Airspeed indication went to zero, and the stall warning horn sounded intermittently. The last voice recording was at 7:25 p.m.

First Officer: "Pull now! Pull—that's it!"

The flight data recorder showed that vertical acceleration increased to 5 g's. Most of the left horizontal stabilizer separated at about 3,500 feet, rendering the big jet uncontrollable. The aircraft crashed into frozen ground at the base of Bear Mountain at an elevation of 1,090 feet, falling from 24,800 feet in 83 seconds. There was no fire, but the three-man flight crew—the only persons on board—were killed on impact.

An investigation of the accident, carried out under the supervision of the National Transportation Safety Board with the participation of FAA and air carrier and manufacturer's representatives, found no evidence of a system malfunction or failure or any structural defect in the aircraft. Significant findings of the Board included:

1. Weather conditions encountered during the flight were conducive to the formation of "moderate" airframe ice. The flight crew had been adequately briefed on the weather.

2. The pitot head heater switches had *not* been turned on (contrary to standard operating procedures).

3. At an altitude of about 16,000 feet the inlet ports and drain ports of the pitot heads had become completely blocked by ice.

4. The complete blockage of the pitot heads caused the airspeed indicators to read erroneously high as the aircraft climbed above 16,000 feet and the static pressure decreased.

To understand this latter statement, it is necessary to have some idea of how an aircraft airspeed measuring system works. The standard pitot system is based on the fact that when an aircraft moves through the air, pressure is created ahead of the aircraft. This is known as *dynamic* pressure, as distinguished from *static* pressure, which is the atmospheric pressure of the air at any given altitude. When a symmetrically shaped object, such as a pitot head, is placed into the moving airstream, the flow of air will separate around the nose of the object so that the local velocity at the nose is zero. At the zero velocity point, the *total* pressure can be measured; it is the sum of the *dynamic* pressure, or ram air, added to the ambient *static* pressure.

How the Instrument Works

The *total* pressure measured by the pitot head is transmitted through the pitot system plumbing to one side of a differential pressure measuring instrument (such as an airspeed indicator). The ambient static pressure, which is measured at static pressure, which is measured at static ports located in areas not significantly influenced by the airstream, is transmitted to the opposite side of the instrument. The instrument, in effect, subtracts the ambient static pressure from the total pressure and displays the difference as increments of airspeed.

It may help to visualize the instrument as a kind of closed cylinder with a diaphragm in the center, separating the total pressure side from the static pressure side. It is apparent that such an instrument's readout would not be affected by changes in altitude, under normal circumstances, because of the presence of static air on both sides of the diaphragm. However, if the air in one side—say the total pressure side, which is linked to the pitot tube head—were to become sealed off by reason of icing over the inlet ports, then the instrument would function like an altimeter. As the altitude increased, the pressure on the static side would lessen, transmitting an apparent increase is dynamic pressure—in terms of airspeed. This explains why the pitot-iced 727, on the verge of a stall at 24,800 feet, still was indicating over 400 knots of airspeed.

This also explains the confusion of the flight crew at that point, given their failure to consider the possibility of an error in the airspeed readout, and their fatal delay in recovering the airplane. Actually the loss of control came as a climax to a series of misjudgments arising from a very elementary mistake—a sequential interruption of the pretakeoff checklist reading, when the engine anti-ice item was skipped over. This disruption apparently led to taking off without pitot heat being turned on, which in turn led to pitot icing, to airspeed errors, to excessive pitch, to mistaking stick-shaker vibration for Mach buffet, etc.

Interruption of checklist duties is a notorious cause of aircraft accidents. The only safe procedure, when this occurs, it to go over the list again from the beginning, item by item.

A second mistake on the part of the jet's flight crew was the decision to accept as factual a condition of flight which, according to the book, *was impossible to achieve* (as regards airspeed and climb rate). The only safe procedure under these circumstances would have been to stabilize the aircraft, with the cooperation of Air Traffic Control, in level flight and to check out the panel until the mystery was cleared up.

A third major mistake contributing to the fatal crash was the failure of the flight crew to use the displayed attitude information. A glance at the artificial horizon, for example, should have indicated that the nose up attitude was about 25 degrees higher than normal—at the top of the ascent a nose up attitude of nearly 30 degrees was achieved. Experienced pilots should have realized that at such an angle a continued increase in airspeed was out of the question, even if influenced by an extreme updraft.

Lack of awareness of this extreme attitude, the Safety Board concluded, contributed to the confusion of the pilots to the extent that even after they had perceived that they were in a stall, they were fatally slow in executing proper stall recovery procedures.

Pitot head icing can happen to any type of aircraft, air carrier or general aviation, jet or *cub*. It is especially prevalent in winter, but may occur at any season. Aircraft can experience pitot icing on the ground, as a result of freezing rain or snowmelt—it has occurred to aircraft that were washed down prior to an unexpected freeze. It may also occur during takeoff, as a result of slush or mud on the runway. Pilots should be prepared to recognize a faulty airspeed reading, and to cope with it in flight.

(The second part of this article, in the March issue, will discuss the prevention of pitot tube blockage in small aircraft, inflight detection, and aircraft handling without reliable airspeed indication.)

Survival in the Snow

How long would you last above the timberline on Mt. Hood?

Mt. Hood, in northwestern Oregon, looks like one of those picturesque Christmas cards as you fly over it on a winter day—long stretches of glistening snow, frozen icicles hanging from the trees, fantastic windblown sculpture and nobody around for miles to mar the beauty of that peaceful winter scene. A beautiful sight from the air as you fly past, in the shirt-sleeve environment of your heated aircraft cabin.

But supposing you suddenly found yourself down there, as a result of a forced landing in zero-ish weather. Would you survive?

The odds *against* crash survival, in general, go up as the temperature descends. The National Transportation Safety Board noted snowy weather as a cause factor in 262 accidents during the period of 1970-1974. More than half—155—were fatal accidents, with 350 persons dead, and 76 seriously injured. In winter conditions weather at the crash site can be a more serious threat to survival than the impact itself.

The ELT has reduced—but not eliminated—the time required for search and rescue. If an airplane goes down at night or early evening it may not be possible to begin the air search until daylight. There have been cases when search and rescue teams knew exactly where a downed aircraft was located but still could not reach it for a number of days because of severe storms and winds or turbulence in the area.

The capability of enduring hours or even days in a snow-bound environment is something winter pilots—especially those bound for ski resorts in the mountains—must consider before setting out. The following is an account of a pilot who, except for a combination of exceptionally fortunate circumstances, would not have lived to tell his tale. This particular incident occurred before the use of ELT's was required.

The 26-year-old pilot was flying solo in a Mooney Mark 21 on a business trip from Salt Lake City to Portland, Ore., some 640 miles. On that chilly first day of March he departed Salt Lake City at 1:45 p.m. The weather was VFR on departure, and he activated a VFR flight plan to Oregon International Airport at Portland.

An AIRMET (Special weather report for light aircraft) issued that morning had warned that the mountains in Washington and Oregon would be mostly obscured, with occasional icing above 3,000 feet and occasional moderate turbulence. As a precaution, the Mooney pilot asked Salt Lake Departure Control for Radar Following Service to Oregon, but the Salt Lake tower was obliged to terminate the service at a point when the aircraft was only 40 miles away from the airport.

The pilot had no difficulty maintaining VFR as he crossed from northern Utah and Nevada into Oregon, but now between him and Portland lay the majestic Cascade Mountains, with peaks in the 10,000 to 12,000-foot range. He had to climb continuously to stay clear of clouds, and ultimately reached 14,500 feet, where he was experiencing strong headwinds. By this time he was significantly behind schedule and beginning to run low on fuel—one tank had already run dry—leaving him an estimated reserve of 25 minutes after reaching Oregon International (Portland) Airport. To cushion this reserve, at a point which he calculated to be 90 miles east of Portland he reduced power to set up a descent rate of 300 feet per minute.

Ninety miles east of Portland would have placed the Mooney somewhere east of the Deschutes River, which meant that Mount Hood (11,245 feet) still had to be flown over or circumnavigated. It was now after 6:00 p.m. on that winter evening and beginning to get quite dark, with ominous, towering cloud formations all over the area.

A deceptively soft cloud layer overlying a very hard mountain, disguised by snow cover.

At 7:10 p.m. local time Portland Approach Control was contacted by the Mooney pilot, who then gave his position as 45 DME miles east of the airport. Approach Control was unable to make radar contact, presumably because of the close proximity of Mt. Hood to the aircraft. The pilot indicated that he was on a direct course from the Kimberly VOR—which would bring him very close to the mountain. Portland Approach Control gave him the altimeter setting and suggested he contact Seattle Center, whose radar might be able to pick him up.

The pilot called Seattle Center and gave his transponder code, his DME reading and the radial from Newburg VORTAC. He reported his altitude as 7,500 and descending.

". . . Mooney two eight four Xray, you should be close to Mt. Hood. Can you see the mountain?"

"Negative on the mountain. I've never flown this way before."

Because of the proximity of Mt. Hood which he could not see surrounded by clouds and darkness, the pilot decided to climb back out above the weather. He started a right climbing turn, found himself in heavy turbulence, and inadvertently penetrated a dense cloud formation. That was the last thing he remembered before he lost consciousness.

What appeared to be a cloud was in fact the snow-coverel side of Mt. Hood, which the aircraft struck at the 7,300-foot level under full power. The unexpected impact normally would have precluded survival, and the wintry conditions at that isolated point on the cloud-enveloped mountain, at the onset of night, virtually ruled out the possibility of any effective rescue effort for at least 10 hours. But luck played a dominant hand that tipped the odds in the pilot's favor.

He was saved from immediate destruction by the heavy mantle of snow on the mountain, and by the fact that his aircraft happened to strike the slope at a shallow angle, and then skipped along over a ridge of soft snow which slowed it down until it finally flipped over and buried itself in a deep pocket of fresh snow. It was the pilot's good fortune to have impacted above the tree line, at an angle which offered no solid resistance to the airplane.

As it was, the final impact did crush in the forward section of the Moony's cabin, but here again luck spared the pilot from serious injury. A short time before the crash he had released his seatbelt in order to reach back for a new chart in his flight bag, and he had neglected to refasten the belt. Such an act can normally be expected to greatly increase the odds against crash survival. But by a bizarre stroke of luck on impact he was thrown into the rear of the cabin, which remained structurally intact. He was knocked out by a blow to his head, and was to remain unconscious for nearly 12 hours, with no protective clothing, while the ambient temperature skidded down to zero.

Remarkably enough, daybreak the next morning found the pilot still alive. The mass of snow around the wreckage had insulated him from the worst effects of the subfreezing weather, and although he suffered severe frostbite on his hands and feet, he recovered consciousness when sunlight filtered through the snow cover in the early morning.

There was no winter weather protective gear at all on board the airplane, which was based in southern California, but the pilot had a suitcase with a change of street clothing, and he clothed himself as warmly as possible before venturing out of the cabin. The intense cold enveloped him at once, and he sank in the snow to his waist at his first step. His head ached and he was confused about his actual situation, as he re-

The pilot walked away. Deep snow, a shallow impact angle plus much luck saved his life.
Photo courtesy of "The Oregonian"

membered nothing of the previous night beyond his decision to commence a climbing turn.

Some distance down the slope, where the timberline began, he saw what he thought was a hut of some sort, and he floundered through the snow in that direction. After a tiring descent of perhaps a quarter mile he found himself on a ledge that offered no way down. He sat down on a stone outcropping to rest. It was deathly still on the mountain, and he sensed the numbness extending through his body. Death was not far away. He did not even have a match in his pocket.

But once again luck was in his favor. Although Mt. Hood had been hidden by clouds more or less continuously for a month preceding the accident, that particular morning dawned bright and clear, which meant that search and rescue aircraft, alerted during the night by the Seattle Center, were able to launch a rescue effort at first light. In less than an hour of searching a Civil Air Patrol plane spotted the pilot's tracks in the snow and a few minutes later they located the pilot, who was waving a jacket frantically overhead.

It was not possible to land even a helicopter with safety on the ledge where he stood, but a rescue team was parachuted down from an Air Force Reserve search aircraft to administer first aid and to prepare the injured flyer to be hoisted on board a helicopter. In less than an hour he was in the emergency room of Willamette Falls Hospital in Oregon City, being treated for severe frostbite, facial cuts and bruises and a broken ankle. He had also lost a few teeth, but he could still manage a grin, because he was very lucky to be alive, and he knew it. Mt. Hood is the site of numerous winter crashes, and very few pilots have walked away from them.

Experienced pilots who fly around mountains in winter know better than to rely on luck, which can be very fickle. Winter flying can be just as safe as flying in any other season, provided that the pilot recognizes the need for adopting special practices appropriate to the weather. In the subfreezing weather of mountains in winter, time-to-rescue is a critical factor, and one which the pilot can influence by means of flight procedures, and by adequate preplanning.

PREFLIGHT PREPARATIONS. If you are going to fly into mountain resorts in winter you should make it a standard practice to carry a survival kit on board on all flights. This can be a commercially prepared item, or something you put together yourself. It need not weigh more than a few pounds altogether, and you may never use it in a hundred years—but if you do go down in winter it could spell the difference between life and death. Some essential components of a winter survival kit are:

Shelter. A high-visibility plastic tube tent, with emergency space blankets (these fold into a space no bigger than a deck of cards).

Food. High-energy dehydrated food, enough to last at least three days per person.

First Aid. A *complete* first aid kit.

Warmth. An all-weather fire starter kit. (Matches alone are not good enough.)

Signalling. Heliographic mirror, aluminum foil, aerial flares.

Outdoor living. A strong knife, a good compass, cable saw, tin pot (to melt snow in for drinking water).

Equipment of this kind that is designed for minimal weight can be bought at outdoor or camping stores. Get the best you can afford, keep it handy to the airplane, and inspect it regularly.

One item frequently overlooked is clothing. Outdoor gear is not as comfortable to fly in as casual clothes, especially if you begin your journey in a warm climate, but it may be the most effective form of cold weather flying insurance you can have. Many experienced north country pilots invariably wear boots, wool trousers and shirt and a parka when they fly in the winter. They know that if they lose the airplane in a crash landing—it could sink in a frozen lake, or burn—they might have only the clothes on their back to protect them. Properly designed clothes will help the wearer retain some body warmth *even after immersion*. Frostbite is not only an extremely painful affliction but it can also lead to loss of fingers or toes or even limbs. Get yourself a winter flying outfit, and insist that any passengers you fly with over cold country be properly clad before they come on board. Consider how long the pilot of the Mooney who crashed on Mt. Hood would have survived if he had been thrown clear of the plane.

INFLIGHT. Radio your position the moment you suspect you are in difficulty. There may not be time for another transmission. Sure, you have an ELT but if you go down in the mountains the high terrain may sharply limit the effective signalling area of your transmitter and delay rescue efforts. In the Mt. Hood accident above, for example, the fact that the pilot had given the Seattle Center his DME distance and radial bearing just before the crash, was of enormous help in pinpointing the site of the accident, enabling search aircraft to arrive at the scene within 45 minutes after they were finally able to take off.

ON THE GROUND. A key element in winter survival is your mental attitude. Finding yourself alone in a snow-covered wilderness after a crash can be a terrifying experience. Panic and fear can immobilize you, preventing you from doing all you can to stay alive. If you use your ingenuity and all available resources, you can endure for days, or even for weeks as some people have managed to do.

Even when you are surrounded by snow, water for drinking can be a problem. You can fast for days or even weeks without food if you are in fairly good physical condition, but you can not last long without water. It is important to melt snow before drinking it because the air in the snow will increase your thirst and the sharp coldness might give you stomach cramps.

Frostbite is a constant danger in a subfreezing situation. Hands and feet can easily become frostbitten, but so too can the nose or ears or cheeks. A numb feeling and a grayish white appearance are telltale signs of oncoming frostbite. If part of your face becomes frostbitten you should remove a glove and cover the frostbitten part with your bare hand. If your hand becomes frostbitten, put it under your armpit next to the skin. But do not use friction or rubbing on the affected area; this could damage the tissues. A simple skier's face mask will protect the entire face, so keep one in the pocket of your parka.

The decision whether to stay near the downed aircraft or try to walk to safety has to be based on actual circumstances. If the person knows his position, and also knows the direction out, and has reason to believe that rescue will be delayed, then he could well decide to hike out, using his compass. However, he should always proceed carefully, making sure he can find his way back to the airplane for shelter if necessary. Generally speaking, it is usually wiser to remain near the aircraft than to wander around in unfamiliar country.

Signalling the air rescue party is important. A white-winged aircraft buried in the snow is pretty hard to spot from the air—even with a fully functioning ELT. Fires—as well as heliographic mirrors and flares—are excellent ways to signal overflying aircraft. It also helps to distort the white landscape as much as possible by laying out trees or bushes, or debris from the crash, in some obviously man-made pattern.

For the airman down in the snow, the beauty of all that gleaming wintry landscape unmarred by human hands quickly passes out of mind. Enjoy it from a safe altitude—and with the peace of mind that comes from knowing that you are well prepared, if necessary, to deal with Mother Nature in one of her chilly, unforgiving moods.

THE FULL TREATMENT

Alaskan law requires every aircraft that flies within the state between October 15 and April 1 to carry on board as a minimum the following survival gear:

1. Food for each occupant sufficient to sustain life for two weeks
2. One axe or hatchet
3. One first aid kit
4. One pistol, revolver, shotgun or rifle, and ammunition for same
5. One small gill net, and an assortment of tackle such as hooks, flies, lines, sinkers, etc.
6. One knife
7. Two small boxes of matches
8. Two small signaling devices such as colored smoke bombs, railroad fuses, or Very pistol shells, in sealed metal containers
9. One pair of snow shoes
10. One sleeping bag
11. One wool blanket for each occupant over four years of age.

Famous
Flights

Frederick Marriott
and his steam-driven airship

Aviation was in its infancy in America in the mid 19th century, a period when improvements in other forms of transportation and communication were exciting the nation. In 1844 the country witnessed the formal opening of Morse's telegraph line, which spanned the United States by 1861. The first successful trans-Atlantic cable flickered into use in 1866. While clipper ships were making record-breaking runs from coast-to-coast around the Horn, the tracks of the Union Pacific and the Central Pacific Railroads were leapfrogging across the western frontier, where pony express riders still carried the mail over hundreds of miles of open land.

One little-known competitor in this race against time was an English expatriate living in California named Frederick Marriott, who was determined to link the East Coast with the West by an aerial transportation system. From a barn near the San Jose and San Francisco Railroad yards, Marriott had begun work in 1868 on a flying machine that was to have the characteristics of both airplanes and dirigibles. Its purpose was to provide efficient, rapid transportation from California to the East Coast. Marriott believed his invention would eventually attain a speed of 100 miles per hour under favorable conditions, while, as he wrote, "the railroad dragged its heavy burdens of freight" at a maximum of 30 miles per hour.

Alternate means of travel at the time included wagon trains, stage coaches or ships. But travel by covered wagon was slow and hazardous; a journey from St. Louis to California in the mid 19th century took an average of four and a half months. Stage coaches were faster, but service was irregular, the journey was arduous, and space limited. By ship the voyage from New York to California involved either a two-month trip around South America or an interrupted voyage involving a struggle across the Isthmus of Panama's jungles and re-embarkation on the other side.

Marriott's goal was a vehicle that would be immune to the obstacles that plagued land-bound and sea-faring transportation systems. He boasted that with his newly invented airship . . . "No savages in war paint shall interrupt its passage over and across our continent . . . No underground railways will be needed to accommodate the crowded thoroughfare of Broadway, no circuitous passage to find a narrow isthmus between continents, no waiting for trade winds; no necessity of lying becalmed under tropical suns; no extortions from huge corporations who monopolize the great routes of travel. No tax for crossing New Jersey; no states under tribute to railway companies."

In May 1869, before the dream could get off the ground, the golden spike symbolizing the linking up of rail services from coast to coast was driven into the ground. Marriott's strange, cigar-shaped, semi-rigid aircraft, the *Avitor Hermes Jr.*, flew for the first time a month later. The occasion was so joyous, though, for the inventor and his small group of friends who wildly applauded the short circular flight that Marriott was undaunted by the threat of competition.

"Man rises superior to his accidents when for his inventive genius he ceases to crawl upon the earth, and masters the realms of the upper air," the indefatigable inventor wrote of the first flight of his airship. His *Avitor* was never to carry passengers through the air across the country, but it had the distinction of being the first lighter-than-air flying machine able to rise and propel itself through the air with the possibility of completely controlling its own course. This steam-driven aircraft flew in the United States 34 years before the Wright brothers' success.

Newspaper Founder

Frederick Marriott inherited from his father, a publisher of one of the leading newspapers in Somerset County, England, an interest in communications that was to last his lifetime. He was born near London in 1805. By the age of 27 he had originated his own successful *Weekly Chronicle*, which later developed into the World famous *Illustrated London News*. By 1842 Frederick Marriott was considered one of the most astute and successful publishers in London.

He was restless, however, an adventurer, an "inveterate and over-sanguine schemer," in the words of a contemporary relative—forever pursuing new horizons. In 1842 Marriott sold his newspaper interests and joined W. H. Henson's "Aerial Steam Carriage Company." A fascination with aviation that was always to remain with him was born from his association with two aeronautical pioneers, Henson and John Stringfellow. Henson is credited with engineering the monoplane, and Stringfellow was the inventor of the first engine-driven model airplane to fly.

Marriott, acting essentially as press agent, stayed with the company only a year, when he again felt a need to change careers. In 1848 he set sail for the gold fields of California, seeking to replenish his depleted fortune.

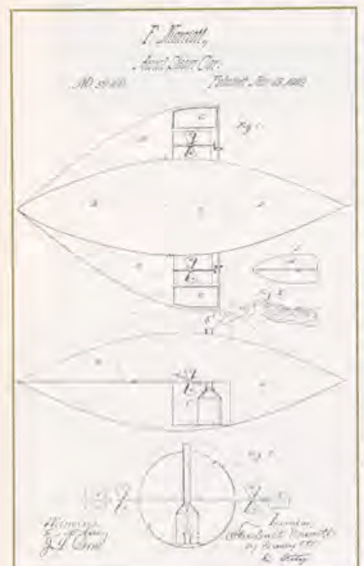
Marriott was luckless in his search for yellow metal but he found the city of San Francisco a goldmine of business and financial opportunities. He became a successful banker, realtor, and, in 1856, founder and editor of the very popular *San Francisco Newsletter*. Everyone in the world wanted to hear news of California, but communication was difficult because of its location and the limited means of transporting letters at the time. Also, busy citizens had little time for letter writing. The *San Francisco Newsletter* solved the problem with several pages of news and one blank page for letter writing—the whole easily sent by mail.

Marriott founded other publications in California, but none exceeded his *Newsletter* in popularity, controversy, size, or influence. He was fearless in his attacks on what he considered to be social and political injustices. He faced, imperturbably, threats of lawsuits, assault, and murder. One admirer commented, "The calculus has not yet been invented that can deal with the number and variety of 'difficulties' he has survived. He seems to bear a charmed life." Marriott's boldness, energy, and literary skill were admired by such writers of the era as the young Mark Twain.

Despite the overwhelming distinction it won for him, the *San Francisco Newsletter* was never as important to Marriott as was the aeronautical invention that had occupied his thoughts since he left England. He frequently philosophized on the possibility of flight in his paper, and in one issue of the *Newsletter* he stated that he had developed a design for an aerial machine after laboring for 18 years on the problem. In his mind the most practical means of solving California's serious need for transportation and communication with the rest of the United States was through the air.

In 1867, with the financial backing of a group of San Francisco businessmen, Marriott formed the "California Aerial Steam Navigation Company," to build "aerial machines and provide the public with rapid air transportation."

Original patent drawings of *Avitar* show laterally mounted propellers, interior boiler room and stack protruding over top of airship.



On July 3, 1869, the *Newsletter* proudly announced that on the previous day a successful public flight of a steam-powered aircraft had been achieved. The site for the historic event was a racetrack in Shell Mound Park, across the bay from San Francisco. Marriott wrote:

"The morning was beautiful and still—scarcely a breath of air stirring. The gasometer (bag) was fully inflated at 15 minutes past 6 o'clock, and was floated out of the building and across the racetrack to the open space in the center. In six minutes steam was got up, and the rudder set to give a slight curve to the course of the vessel.

"With the first turn of the propellers she rose slowly into the air, gradually increasing her speed until the rate of 5 miles per hour (sic) was attained. The position of the rudder caused her to describe a great circle, around which she passed twice, occupying about 5 minutes each time. Lines had been fastened to both bow and stern, which were held by two men who followed her track, and had sufficient ado to keep up with her at a dog trot. She retraced her flight to the point of departure, when, being duly guided, she entered the building, the fires were drawn, and the first flight of a vessel for aerial navigation was accomplished. The appearance of the vessel in the air was really beautiful."

Shape of the Monster

Witnesses agreed that in the air the *Avitor* was indeed a graceful, obedient, creature, despite the fact that in its "hangar" the machine had appeared awkward, cumbersome, even ludicrous. One dubious observer of the tethered *Avitor* before its flight remarked that "the shape of the monster was between a fish and a plump bird." Wings attached lengthwise along the gas bag were intended, like the wings of a bird, to give balance and support in flight. Two propellers, mounted at each side to the rear of the wings, were driven by a small steam engine in a compartment attached to the belly of the aircraft. A combination rudder and elevator at one extreme of the vessel resembled a double tail of a fish; it consisted of four planes at right angles and was controlled by cords connected to a steering wheel in the engine room. Marriott's rudder and elevator combination, termed "flats," is still used substantially as he designed it by today's airships.

The *Avitor* frame was 37 feet long, 11 feet from top to bottom, and 8 feet in width. Of semi-rigid construction, it was built of light wood, cane, and wire. Marriott's gas bag was covered with fine muslin and filled with hydrogen. For propulsion he chose a propeller and rejected the idea of flapping wings, long the downfall of many former inventors. He solved the problem of power versus weight, which had baffled his predecessors, by using hydrogen to lighten the load to be carried aloft by a small but powerful steam engine. Control surface designs were borrowed freely from the work of Sir George Cayley, early 19th century "Father of Aerodynamics (see FAA AVIATION NEWS, October 1972). No doubt, the familiarity with aircraft Marriott had absorbed from his early partnership in England with Henson and Stringfellow also contributed to the effectiveness of his design.

The next successful flight of an airship (Reynard and Krebs, in France) did not take place until 15 years later. The French dirigible was very similar to the *Avitor*. Some 25 years later Marriott's methods of bracing and shaping the gas bag and attaching a fixed carriage under the frame were subsequently adopted and used successfully by Count Ferdinand von Zeppelin in the construction of his many dirigibles.

After the triumph at Shell Mound Park, sensational and exaggerated accounts of the *Avitor's* flight appeared throughout Europe and the United States. The *Avitor* was moved into a pavillion on the grounds of the Mechanics Fair in San Francisco for a public viewing, and thousands paid to watch the airship navigate itself around the pavillion on short daily flights. On one such rendezvous the hydrogen-filled airship crashed into a burning gaslight fixture in the hall, exploded, and was destroyed by the ensuing fire that burned down half the pavillion. It had been on exhibit only a week.

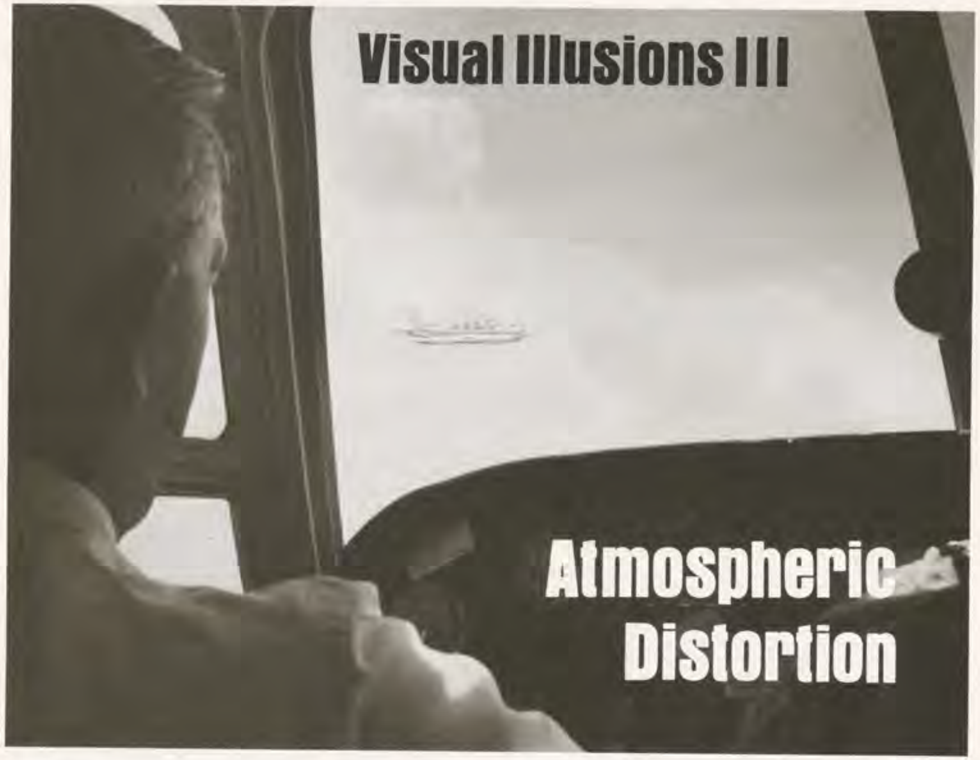
The "Aerial Steam Navigation Company" immediately announced plans for a larger and more powerful airship. But the company foundered from lack of funds and public interest, which had declined sharply after the destruction of the *Avitor*. Many believed that since the airship did not carry passengers on its first flights, it had no practical use and its producers deserved no support. The shrill whistle of steam locomotives now moving people relatively rapidly across the country, sounded the *Avitor* II's death knell.

Marriott now turned his attention completely to the development of heavier-than-air machines, and despite criticism that he was wasting his time, Marriott persisted. In 1875, at the age of 70, still cherubic and starry-eyed, the inventor saw the completion of a model of his first "Aerial Carriage," a triplane designed to carry four passengers. But when he attempted to patent his work, the Patent Office refused him on the grounds that such a flying machine was impossible and absurd.

He died in 1884, aged 79. Flambouyant and quixotic as he undoubtably was, nevertheless Frederick Marriott had the true eye of a visionary. Before the decade was over, his "impossible dream" had become a reality and airships were carrying passengers in regular, scheduled flights over Europe.

(Prepared by Stephen Straight and Ellen Rose.)

Visual Illusions III



Atmospheric Distortion

(Third in a series of articles on "visual illusions" that may be contributing factors in approach and landing accidents. The articles are based on a paper by Douglas E. Busby, M.D., of FAA's Civil Aeromedical Institute.)

When an experienced pilot winds up in a ditch short of the runway he was aiming at, everyone wants to know why, and sometimes no one has the answer—including the pilot. No instrument malfunction, no radio or cockpit distraction, no traffic problems, no drugs, no illness, no fatigue, no unseemly haste to get down, just a normal routine non-precision approach to an unfamiliar airport with a good two miles of visibility in haze. *He had the airport plainly in view. So how came he into the ditch?*

The answer to this embarrassing puzzle may be found in the pilot's accommodation to the change in atmospheric conditions, as he descended from bright sunlight into a layer of reduced visibility—caused by haze or fog. Haze is not a form of moisture, by the way. It is defined by the Weather Service as a concentration of salt particles or other dry particles not readily classified as dust or other phenomena. Haze exhibits varying degrees of visibility, depending upon its density, as is well known.

What is less well known is the fact that objects seen through haze often appear to be *farther away than their actual location.* [This is because excessive haze (or dust or smoke) in the atmosphere blurs outlines and reduces the perceived color intensity of distant objects.] A pilot who is unfamiliar with this phenomenon may imagine that he is too high in his approach, and steepen his glide angle, which could result in landing short.

Fog, which is a ground-based cloud, can be much denser than haze. A very marked illusion of a different order can be experienced by the pilot whose approach to a landing takes him down from sunlit skies into a patch of fog. The sudden reduction in visual range may lead the pilot to imagine that the nose of the aircraft has pitched up involuntarily, and if he is unfamiliar with the illusion he may "compensate" by steepening his glide angle excessively.

Patchy fog at the end of runways has precipitated a number of landing accidents. Typical was the fatal crash of a twin turbo prop at Kanawha (County Airport, Charleston, West Va.) several years ago. On this particular summer evening a layer of dense fog estimated to be 150 feet thick was obscuring the threshold and approximately one-half of the approach light system for the runway. Outside of the fog patch VFR conditions prevailed. The commuter was making a localizer (no glide slope) approach to Runway 23. Shortly after passing the middle marker inbound the aircraft entered haze and fog with a very abrupt reduction in visibility, to the extent that the pilot apparently had difficulty obtaining visual guidance from the approach lights, descended too low, and crashed into a hillside about 250 feet short of the runway.

Information obtained subsequently from the Flight Data Recorder indicated that prior to encountering dense fog the descent rate of the aircraft was normal (625 feet per minute) and the flight path was slightly higher than normal. After penetration, the descent rate steepened to 2,000 feet per minute and continued at this rate until impact.

Atmospheric conditions can also produce errors in judging the distance of nearby (airborne) aircraft. A small aircraft relatively close by may be mistaken for a large aircraft a considerable or safe distance away, when viewed through haze.

Haze usually occurs near the surface in layers only a few thousand feet thick, but may sometimes extend as high as 15,000 feet. Visibility in haze is deceptive. While horizontal visibility on top may be quite good, downward visibility from above the haze is apt to be poor, especially on a slant. And it is always worse when looking toward the sun near the horizon.

When skies are clear above haze, it tends to dissipate during the day, but the visibility improvement is slower than the clearing of fog. The latter evaporates with heat, but haze must be dispersed by air currents, or by convective updrafts. Ground fog may combine with haze at night; in the morning the haze condition may linger long after the fog has cleared away. Visibility in haze that is trapped under a cloud layer will tend to improve little, if any, during the day.

Since haze/fog conditions appear to be increasingly prevalent in our skies, it is important that all pilots understand the illusionary effects of atmospheric pollution on vision, as a potential cause of landing accidents or midair collisions.

(For a discussion of the problems of scanning in haze, see "Hazy Daze," in the July 1975 issue of FAA AVIATION NEWS.)

Even the simplest Visual Approach Slope Indicator (such as three-board daylight VASI below) can help keep your final approach steady when fog suddenly distorts your forward perspective. Keeping the boards in line assures a proper slope. Photo plane approach was slightly low; center board appears low.

BRIEFS

CHECK AND BALANCE. Airplane owners and mechanics are warned that after control surfaces are repaired or repainted they must be checked for balance by a properly certified person. Furthermore, repairing or balancing must be entered in the airplane records. In one reported incident when an elevator could not be balanced in accordance with manufacturer's prescribed procedures the problem was discovered to be five uneven coats of paint. The only solution was to strip the old paint from the surface, then repaint and rebalance.

FLIGHT TEST GUIDES UPDATED. The FAA Flight Test Guides for Private and Commercial Certificates are now available in updated form. Purpose of the guides is to assist applicants and instructors in preparing for flight tests under FAR Part 61 Revised. Both guides cover pilot operations, procedures and maneuvers relevant to the airplane category with single- and multi-engine land or sea class ratings. Suggested flight test checklists are included in each case. The booklets are available from Superintendent of Documents, GPO, Washington, D.C. 20402. Price for the Flight Test Guide for Private Pilot, Airplane (AC 61-54A) is $1.35; for Commercial Pilot, Airplane (AC-61-55A)$1.10.

Also recently revised is FAA's "Airline Transport Pilot (Airplane) Written Test Guide," a useful comprehensive booklet for anyone interested in an ATP certificate. The guide includes a section on problems in planning and conducting airline transport operations—an essential part of the examination. Write to GPO for FAA's Advisory Circular 61-18D. The price is $2.05.

SOUND OFF NOW. In response to complaints that vital Government publications are often delivered tardily or not at all, FAA has set up a monitoring system to help aviation users obtain essential safety material promptly. The program will cover required or vital publications such as the Federal Aviation Regulations, Airman's Information Manual, safety-related Advisory Circulars and FAA AVIATION NEWS magazine. Persons who have difficulty in getting such publications should report the problems to their nearest FAA office, which will forward the complaint for investigation.

AD SUMMARY. The 1976 Summary of Airworthiness Directives (with bi-weekly supplemental service) will soon be published replacing the 1974 edition. Orders should not be placed for the new Summary until the price is established, since processing can not be made with incorrect payment. Those persons with an immediate need for ADs can still purchase the 1974 Summary, but will not receive bi-weekly service after April 1976, unless they also purchase the 1976 edition.

CAPITAL NOTE. The Washington D.C. Flight Service Station moved this month from Washington National Airport to new expanded quarters at Leesburg, Va. adjacent to the Washington Air Route Traffic Control Center. Automated equipment scheduled for installation early next year will aid specialists in giving faster, more comprehensive weather briefings before and during flight.

TRYING IT ON FOR SIZE. E. E. "Buck" Hilbert, antique airplane buff and United Airline DC-8 pilot, sits in the cockpit of a *Swallow* biplane he is having restored as William B. Hazelton, a fellow antiquer, looks on. Hilbert plans to fly the airplane from Pasco, Wash., to Boise, Idaho on April 6, 1976, exactly 50 years after a similar aircraft flew the same route for Varney Air Lines (a predecessor of United) on a mail run that marked the first United States permanent scheduled air service. Hilbert traveled over much of the nation gathering airplane parts, including an authentic Wright *Whirlwind* J-4 engine, for which he traded an equally valuable antique *OXX*-6 engine. The original *Swallow* is one of the aircraft pictured on a new postage stamp which honors 50 years of commercial aviation.

Anonymity Assured in Reporting Unsafe Incidents

FAA's nationwide Aviation Safety Reporting Program to gather full information on circumstances or events jeopardizing flight safety will undergo a change on April 15. Starting on that date all reports of actual or potential safety hazards observed by pilots, controllers or others should be reported directly to the National Aeronautics and Space Administration. NASA will not divulge the identities of any persons involved—with two exceptions.

The exceptions are reports involving criminal offenses, in which case the Justice Department will be notified; and aircraft accident reports, which will be forwarded to the National Transportation Safety Board for investigation.

By providing an opportunity for all persons concerned with air safety to report potentially hazardous incidents without fear of penalizing themselves or others, FAA hopes to obtain a more accurate picture of the occurrence of such incidents than has been possible in the past, when no such waiver of disciplinary action or anonymity was possible. It is believed that the actual number of serious near-accidents occurring throughout the nation is many times higher than the number currently reported. Statistical data received through the new reporting system will enable FAA to focus attention on areas of potential hazard, and to take steps to improve the situation before anyone gets hurt. The program is particularly designed to identify situations in which safety is jeopardized or safety regulations broken without the knowledge or intent of the participant.

To insure waiver of possible FAA disciplinary action, persons involved in an incident must file a report to NASA within five days.

The Reporting Program will not provide waiver of disciplinary action for certain illegal actions, such as reckless operation, gross negligence or willful misconduct, if the incidents are brought directly to the attention of FAA via sources other than the NASA-monitored Reporting Program. For example, intentional buzzing could result in a complaint being filed with the local FAA District Office. In these circumstances the incident would be investigated by FAA and, if appropriate, enforcement action would be initiated.

Pre-addressed forms for reporting unsafe incidents anonymously to NASA will be available at FAA field facilities. Additional details about the Reporting Program will be found in a new FAA Advisory Circular, "Aviation Safety Reporting Program" (AC 00-46A), available free from the DOT/FAA Distribution Unit, TAD 443.1, Washington, D.C. 20590.

NOTICE

The December 1975 issue of this magazine was combined with the enlarged issue of January 1976. Following a nationwide survey of reader interests, the name has been changed to FAA GENERAL AVIATION NEWS and the scope of the magazine has been enlarged to cover the needs of all general aviation airmen.

Fewer Fatal Accidents in 1975

The fatal accident rate for general aviation in 1975 was the lowest on record (back to 1946) according to preliminary figures released by the National Transportation Safety Board. The 1975 rate was 0.158 fatal accidents per million aircraft miles flown, as compared to 0.180 in 1974. Rate of fatal accidents per 100,000 hours flown was 2.01 in 1975, 2.24 in 1974. The *number* of fatal accidents also dropped: in 1975 there were 662 fatal accidents (with 1,325 fatalities) compared to 729 (1,438 fatalities) the previous year. The total number of accidents (of all kinds) increased slightly in 1975; 4,575 compared to 4,425 the previous year.

Air carriers also logged a safe year: only three fatal accidents, the fewest in any year on record. There were 124 air carrier fatalities in 1975 compared to 467 in 1974.

In air taxi flying there was an across-the-board improvement in accident reduction over the past year.

Pilot School Directory Updated

A list of Pilot Schools currently certificated under Federal Aviation Regulations Part 141 has been published as a booklet by FAA. The publication lists separately the schools certificated under the recently revised (Part 141) rules and those certificated under the old rules (for an explanation of these rule changes and how they affect training, see "The New Look in Pilot Schools," FAA AVIATION NEWS, July 1974). Codes are used to indicate the type of certificate held by the schools and also the various courses of study offered by each.

Copies of AC 140-2J, "List of Certificated Pilot Schools," are available free from DOT/FAA Distribution Unit, TAD 443.1, Washington, D.C. 20590. Questions about individual schools should be directed to the school in question at the address given in the booklet.

All Centers Have "Conflict Alert"

FAA's Air Route Traffic Control Centers throughout the nation are now using a "conflict alert system" to call attention to potential air traffic problems.

The computerized alerting system projects what the flight paths of aircraft being tracked on radar will be in the next two minutes. When projected flight paths appear closer than the required horizontal or vertical minimums, the data tags identifying the aircraft on the radar screen start to blink and the words "conflict alert" appear on the display. The controller then has ample time to alter aircraft courses and avoid the danger of a collision.

Although the alert system is now used at or above 18,000 feet, experiments are under way for a program which would alert controllers to potential conflicts of aircraft at any altitude down to the ground.

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.

• An Open and Closed Cabin

Your article on Eddie Stinson describes the JL-6 as "open cockpit" but the photograph indicates a fully enclosed cabin. Later you describe the "new Stinson R with retractable landing gear," yet the picture shows a beautiful set of wheel pants. Minor details in editing perhaps, but yet it detracts from the credence of your excellent publication.

Val Jacobsen
Walnut, Calif.

Although the JL-6 had a fully enclosed passenger cabin, the pilot did sit up front in an open cockpit (look at photo carefully). As for the Stinson R, according to "Jane's All the World Aircraft, 1932 Edition" the original model that appeared in the photograph had fixed gear. Later versions (the "new" Stinson R referred to in the article) were equipped with retractable gear and were officially named Stinson R1 and R3.

• Wrong Number

On page 15 of the January 1976 issue of AVIATION NEWS you picture an NY-2 biplane and caption it, "Vintage of 1907." I find that 1907 date hard to believe. I flew NY-1's and NY-2's at Pensacola, Fla., Naval Air Station in 1928. They had recently been introduced as the successor to the JN-1, the Curtiss *Jenny*. I imagine that the date should have been 1927.

Cdr. A. R. Boileau, USN Ret.
San Diego, Calif.

Yes, 1907 was a typographical error. Thank you for the assist.

• Percentage of What?

In the November article on aviation gasoline there is a chart indicating "Relationship of lead content in fuel to fouling of sparkplugs." The caption says "Fouling Time%"—but % of what? That's puzzling. Also, the bottom scale is marked in cc., per gallon but the test speaks of the lead content in ml. I'm not sure of the relationship of cc. to ml.

E. J. Fencl
Homestead, Fla.

Cubic centimeters (cc.) and milliliters (ml.) are the same as far as lead content in gasoline is concerned. The petroleum industry formerly used cc., but has now settled on ml.

The "percentage" reference was a comparison between the plug cleaning intervals specified by the spark plug manufacturer and the actual number of hours of use (in laboratory tests) before the plugs needed cleaning (for lead fouling). For example, assume the manufacturer recommended cleaning plugs every 100 hours when using gasoline with 4 ml. of lead per gallon. Tests showed that cutting the lead content to 3 ml. allowed the plugs to go 160 hours or 60% beyond the norm. Conversely, when the lead content was increased to nearly 5 ml. per gallon, the length of the interval between cleaning was only about 40% of the norm.

• Identifying the Author

I have been a satisfied subscriber to FAA AVIATION NEWS for some years and if I was not so lazy I would have written long before to compliment you on the excellent historical articles, "Famous Flyers," which are a very important and enjoyable part of every issue. (Well, there has been an occasional issue without an historical article, but please don't do it again.) These little biographical sketches are well-written and interesting, and, so far as I have been able to judge, rate a straight A for accuracy (a quality by no means common in aviation history).

I do have one question though: why must the authors of these excellent tales remain anonymous? Surely they deserve a byline at least.

Bartlett Gould
Newburyport, Mass.

Most of the articles in FAA AVIATION NEWS are joint efforts by members of the staff, with assistance from FAA specialists in the various fields. We're all just doing our job, and we are glad to know you appreciate it.

• A New Subscriber's Reason

I am a student pilot and have read only one rather battered issue of your magazine (April 1975), but I am sold. Shortly after reading it I flew in a *Cherokee* and I noticed a funny odor when I turned on cabin heat. Suspected a leaky exhaust system, and landed as soon as I could. Had I not read the article "The Intruder" I might not have been so concerned and ignored the problem.

Thank you and I look forward to being a regular reader.

John K. Higley
Wayland, Mass.

• Weakest Link

My curiosity was piqued by your article, "The Weakest Link" in the November issue. Why didn't someone notice the overheating via the cylinder head temperature gauges sometime during the shakedown flight to Tallahassee? I enjoy your magazine very much. Thank you for the good articles.

Blaine B. Quick
La Jolla, Calif.

Neither the pilot of the shakedown flight nor the pilot who had the accident mentioned noticing a high cylinder head temperature reading. It is true that generally speaking engine problems result in elevated head temperatures. However, in some circumstances the temperature elevation may be only slightly above normal—not out of the green. There are other times when the head temperature rises so rapidly that there is little time for action between the time it registers on the gauge and the time you feel it or hear it in the engine and have a full-blown emergency on your hands.

The lesson here is that if you have a cylinder head temperature gauge (and not all aircraft do) it is wise to monitor it often, and carefully, but do not assume that this instrument alone will always give you clear advance warning of all kinds of impending engine difficulties.

• Pilot Controlled Airport Lights

In the October 1975 issue of FAA AVIATION NEWS, an article appeared on pilot controlled airport lighting system. Would you advise where more detailed information can be obtained on the system and/or an Advisory Circular covering same?

Joseph A. Marina,
Airport Director
Orange County Airport,
Montgomery, N.Y.

Information on radio-controlled airport lighting is contained in FAA Advisory Circular 150/5340-14B, "Economy Approach Lighting Aids," which is available free from DOT/FAA Distribution Unit, Washington, D.C. 20590. A new advisory circular now in preparation will contain more detailed and current specifications for such systems but since neither the AC number nor the date of publication is available we suggest you keep in touch with your FAA Airport District Office. Incidentally, in matters pertaining to airports, the District Office will generally be able to give you the quickest answer.

• What Is An Emergency?

The Flight Forum of the November AVIATION NEWS has the FAA saying that use of 121.5 MHz to establish contact is an abuse of the system. Not so, especially in the circumstances described.

The FSS Rules say that 121.5 MHz can be used for establishing contact by aircraft in distress, emergency or when lost. Loss of communications, especially in deteriorating weather, can be an emergency, even though the pilot is not in distress. Use of 121.5 to establish contact is permissible. Once contact is established, the pilot should then change to the regular frequency given by the ground station, if possible.

Victor J. Kayne
Washington, D. C.

Our response was to a generalized statement that, "If you want a quick response, use 121.5 MHz." There are situations where inability to make radio contact may constitute a genuine emergency, but these would have to be judged on a one-to-one basis rather than across-th-board. It is the responsibility of the pilot-in-command to decide what constitutes an emergency situation for him and for his flight.

• N-Number Request

Would it be possible to find out the N-Number of the aircraft in the background view of the tower in the November issue of FAA AVIATION NEWS Flight Forum? Also, do you know what the airport is? Thank you kindly.

Gene E. Clark
Nampa, Idaho

The aircraft registration number is N3122S. The airport was not identified on the photograph.

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