FAA AVIATION NEWS

OCTOBER 1966

COVER

Mountain flying need be no more hazardous than other kinds, if pilots follow the tips on pages 8 and 9 "Mountain Flying Is Safe . . . if" which can assure happy landings every time out.

FAA AVIATION NEWS

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William F. McKee, *Administrator*
David D. Thomas, *Deputy Administrator*

Charles G. Warnick, *Director*, Office of Information Services;
Donald R. Foxvog, *Editor*; Abner B. Cohen, *Art Director*

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Disorientation

The terse language of the CAB report fixed the "probable cause" of the accident as "pilot vertigo during an instrument approach resulting in a loss of control."

The early evening fall flight between two airports south of the Mason-Dixon had been uneventful. The pilot, carrying three passengers, had a commercial license and an instrument rating. He had 226 total hours (eight in the type of plane he was flying) and 22 night hours.

Approaching his destination airport he was given radar approach control assistance and at 8:34 p.m. reported over the ILS outer marker and was cleared for a landing. The airport weather observation, taken less than 10 minutes before, reported a broken ceiling of 7,500 feet and 12 miles visibility.

About a minute after passing the outer marker the pilot asked that the approach light intensity be increased. He was told there would be a slight delay, but he did not acknowledge. Almost immediately control tower personnel noted a bright fire south of the airport. It was the inbound plane. All four aboard perished.

Investigation indicated the plane struck the ground two miles inbound of the outer marker and approximately on the ILS localizer course. Evidence showed the aircraft had crashed in a wings-level, 70-degree *nosedown inverted attitude.*

How did the investigators arrive at *vertigo* as the probable cause? They deduced from the pilot's request to increase the intensity of the approach lights that he was making a transition from instrument to visual reference. Under conditions of limited visibility or loss of visual horizon reference in darkness and rain, such a situation would be highly conducive to vertigo.

Vertigo is often and erroneously used interchangeably with disorientation. Vertigo, plainly and simply, means dizziness, giddiness and nausea. Disorientation, which can result in vertigo, is a more complex sequence of events which develop when the normal senses of orientation—sight, hearing and muscular—lose their familiar frame of reference. Once allowed to start, disorientation takes complete control in seconds and further confuses the senses and muscles as new impulses are recorded by the brain. The only remedy for disorientation is reestablishment of a natural frame of reference —or use of an artificial one which the pilot *has trained himself to believe in.*

These artificial references are the flight instruments, particularly those pertaining to aircraft attitude—the turn and bank indicator and the artificial horizon.

Why disorientation occurs is no great mystery. Man's original specifications called for little more than the ability to run and walk upright, and to be able to swim with passable proficiency. His orientation senses — visual, vestibular (inner ear), and proprioceptive (impulses from muscles, tendons and other tissues) were not made to function properly in the artificial environment represented by a plane in flight.

However, if the visual sense is provided with reference points such as the earth's horizon, there is no problem. The visual sense overrides the other senses involved in orientation. When these visual reference points are obscured, disorientation develops. Since the vestibular and proprioceptive senses *confuse the force of acceleration with the force of gravity, false sensations result and orientation illusions develop.* It is very difficult for the pilot to convince himself that these false sensations and illusions are wrong—instead, he has a tendency to think that the instruments are wrong.

From this it can be seen that it is not unreasonable for a pilot, deprived of a natural reference point, or losing confidence in the dependability of his artificial references—his flight instruments—to unwittingly place himself in an inverted position.

In this case, the sensation of gravity on the body (G-force) gives no clue as to the body's position in relation to the ground. Centrifugal force, buffeting and acceleration serve to keep pilot and passengers "nailed" down in their seats. The sequence of events takes place so rapidly there is no time for the brain to sort out, put into rational order and transmit corrective instructions to the muscles. The proprioceptive nerves are sending messages to the brain which must be contradicted in milli-seconds as new "information" clamors for attention. Disorientation soon becomes complete and catastrophic.

What is the cure? *Training!* Rigorous training under the most competent instructor available is the only remedy to forestall the dangers of disorientation. Once a firm understanding of the techniques of instrument flying is gained it must be followed up with frequent practice flights to keep proficiency polished.

A *pretty good* instrument pilot should content himself with flying when the weather is pretty good. When the weather is beyond his ability—he should stay on the ground.

you've got it coming to you

Something for nothing often turns out to be highly overpriced. A notable exception to this hardnosed fact of life is the quality and variety of dependable weather information available to pilots for the asking. Nothing to spend but a little time buys lifesaving dividends in safety. It's free: You've got it coming to you.

More than 4,000 flight service specialists, in some 330 flight service stations, are trained weather briefers. This number is augmented by full-time weather experts at the handful of places where the Weather Bureau maintains offices in or adjacent to flight service stations.

FAA weather briefers get their training on-the-job through courses prepared by the Weather Bureau in cooperation with the FAA Academy at Oklahoma City. Quality control is maintained by the Weather Bureau. End-of-lesson exams are supervised by the FAA but the final examinations covering the course and certification is handled by the Weather Bureau.

Knowing what to ask for and how to ask for it is at least as important as asking for a weather briefing in the first place. When getting a weather briefing, either face-to-face with elbows on the counter and weather maps on display, or over the phone, the whole business can be transacted faster and more accurately by telling the briefer:

- That you are a pilot. Many requests for weather information are not related to aviation. Also, airline passengers often inquire about flying weather, as do gardeners, farmers and picnickers.
- The type of aircraft you are planning to fly. Light single engine, high performance multiengine and jets each present different briefing problems.
- Your destination.
- Your estimated departure time.
- Whether or not you can go IFR.

With this much to start with the briefer can get to the job at hand with the minimum amount of lost motion and a consequent saving of your time and his. As he makes his run-down on the weather picture make sure that you are getting all that you asked for—and need, if the briefing is to be considered complete. He should provide you with:

- Weather synopsis—positions of lows, fronts, ridges, etc.
- Current weather conditions.
- Forecast weather conditions.
- Alternate routes, if necessary.
- Hazardous weather information.
- Forecast winds aloft.

If you don't get all this information, ask for it—but not until he has finished his presentation. The above is a logical sequence suggested by the Weather Bureau, but each briefer develops his own style. By adroit questioning you can get a tailor-made view of the weather.

If facsimile charts are available, you should, as a minimum, see the following items:

- The surface weather chart and the surface prognostic chart for present and forecast positions of highs, lows, fronts and squall lines.
- The weather depiction chart to see the general areas where ceilings and visibilities have been poor, and to relate these areas to the major features on the surface weather chart.
- The radar summary chart for a display of weather hazards that might not be available otherwise. The chart locates and describes intensities of thunderstorm areas and includes current severe weather forecasts.
- Winds aloft charts or constant pressure charts for a knowledge of the current general wind flow for altitudes of concern.
- Latest aviation weather reports, radar observations and pilot reports for your route to bring you an up-to-date picture of current weather conditions.
- Area forecasts covering all of your proposed route.
- Terminal forecasts for your destination and at least *one* alternate.
- Winds aloft forecasts for the expected wind conditions over your route and at the altitudes you expect to fly. The best altitudes and routes in most cases are determined by expected wind conditions.
- Any in-flight weather advisories in effect for the routes and altitudes you expect to fly.

If weather was a stable, orderly natural phenomenon, a competent briefing of what to expect en route would be a foolproof ticket to your destination. However, the fickle nature of weather makes it mandatory to have an alternate plan in mind "just in case."

Considering the fluidity of the natural forces that go into making up a "block of weather," and the fact that there are seldom enough observations to describe the weather in detail over every portion of an air route, it is not surprising that pilots sometime run into weather that is different from the forecast.

That's why it is important to know not only the weather from the point of departure to destination, but also the weather on both sides of the route. It is important to know the *direction* of reported thunderstorms, for example. If the storm should advance faster than predicted, the pilot will know which direction to turn to avoid it. Turning in the wrong direction would only hasten the encounter.

An "alternate action" may be more than a change of course. It may be a change of altitude to avoid icing or turbulence, a 180 degree turn or a landing at the first suitable airport to await improvement in the weather.

Weather service is free. Use it—you've got it coming to you.

Flight service specialist points out leading edge of cold front to pilot.

Area weather is recorded (left) for continuous rebroadcast to pilot (right) in flight service stations.

Facsimile printer gives wide variety of weather data at scheduled times. Advanced printers are now available which both derive information and print it out via computer.

Dr. and Mrs. Jules Beckwitt and their three daughters.

FLORIDA PILOT

Makes Successful Wheels-Up Landing

The 43-year-old Marathon, Fla., optometrist, piloting a light twin with his wife and three children aboard, was in a tough spot. His left gear was half retracted and his nose wheel was askew.

Below, at Miami International Airport, crash-rescue equipment stood by. Above, Dr. Jules Beckwitt and his family calmly reviewed emergency procedures and prepared for the worst.

The drama began when Dr. Beckwitt, a pilot for 15 years with 1,700 flying hours, noticed something wrong when he attempted a landing at Tamiami Airport after a flight from the Florida Keys. When he felt the landing gear buckle he immediately applied power and took to the air again.

The tower confirmed his suspicions about his damaged landing gear and advised him to take his two-engine craft to Miami International Airport where crash crews were available.

The radio message was intercepted by a Federal Aviation Agency DC-3, based at Orlando, but in the vicinity on a routine navaid flight inspection.

FAA pilot Leander M. Green, copilot Don R. Castanien and flight inspection electronic technician Arver D. Hoover flew beneath the light plane and confirmed the tower's diagnosis.

For two hours the FAA plane circled about the stricken craft feeding advice to Dr. Beckwitt. The final instructions were to shut off fuel and electrical power on impact to prevent a spark.

"Go in with the nose high, but for Pete's sake, don't stall," FAA pilot Green told the optometrist. With his fuel almost exhausted the doctor greased the plane in at nearly 70 m.p.h. The left gear collapsed, the plane fell on the wing, skidded 400 feet on the grass and ground-looped. The Beckwitts were out of the plane in seconds.

During the two-hour ordeal, Mrs. Beckwitt and the two older girls tried to keep up the spirits of seven-year-old Julie-Ann. They practiced crash procedures, placing pillows over their faces and unsnapping safety belts.

Grateful for FAA assistance, the Beckwitt family is now in the market for a new plane.

Disabled Landing Gear Doesn't Spell Disaster

If you ever have landing gear trouble, there's one place to turn first—to your aircraft owner's handbook which spells out recommended emergency procedures. Know how *your* system operates.

Beyond that, it is dangerous to make specific recommendations on what a pilot should do because of the many variables in the types of landing systems, the aircraft design and the complicated factors involved with one, two or three gear up, down or part way. What may be right for one plane may be wrong for another. Manufacturers of similar type aircraft make different recommendations even for comparable models.

In an emergency situation, even if you know your system, have your manual available and have time to use it, you may not be certain of the position of your gear. If you are near an FAA tower, ask the controllers. Frequently, they can spot your problem and advise you accordingly. If you're beyond the range of a tower, but can contact an FAA flight service station or utilize a UNICOM, you can arrange to have someone observe your plane as you fly by.

After you learn the extent of your problem, what then? Back to the handbook. But if it's locked back in the luggage compartment, check back with the FAA tower, flight service station or UNICOM. Controllers, for example, often will be able to find a fixed base operator, dealer, mechanic or pilot who is familiar with the type of aircraft you are flying and they will invite him to the tower to advise you. Other times another aircraft can provide assistance. (But watch out; there's at least one mid-air collision on record where the helping plane crashed into the distressed aircraft.)

If the gear still refuses to operate properly, despite all the suggestions you get from the handbook and from the qualified adviser brought to the tower, give thought to what you should do for a gear-up landing.

First, head for an airport that has good fire-fighting equipment. If you've planned your trip so that you have an extra hour's worth of fuel, you'll have a better chance to get there. But if you're not close enough to reach an airport with first class fire-fighting equipment, take the next best alternative. It is better to have several men with hand fire extinguishers waiting at a small airport in a jeep than to have no help at all.

What do you do before landing?

- Secure or jettison all loose objects. In this connection, manufacturers of some modern aircraft advise *not* opening doors while in flight because this will affect performance. Others advise pilots to release the latch during flare out so they will not be trapped inside in case of fire. (Know *your* plane.)
- Burn your fuel down to the lowest practicable point (to assure power) to minimize the dangers of a severe fire.
- Tighten safety belts and shoulder harnesses. Other occupants should use what they can (blankets, soft baggage, etc.) to protect themselves.
- When your landing is assured and your flare accomplished, turn off your master switch and ignition switch to minimize the chance of fire.
- Be prepared to open your belt and harness and get out of the plane as soon as possible.

Experts have other suggestions on a gear-up landing, such as setting flaps and moving the center of gravity to the most aft practicable point. But these suggestions are not true for every make and model. If you are ever faced with a gear-up landing, you will be grateful for every minute you took to learn what should be done in the plane you fly.

THE

Face Is Familiar

Something new in aeronautical charts is being test flown by several thousand pilots in the Eastern states. What they report to the FAA's Flight Information Advisory Committee (FIAC) could result in sweeping changes in depicting the familiar face of the whole United States.

Adoption of the new charts will make it possible for the VFR pilot to fly from coast to coast, and from Canada to Mexico, using only 11 instead of the 43 scale 1:1,000,000 charts now necessary. For the sectional charts with a 1:500,000 scale the new system will substitute 37 charts to do the job now requiring 87 charts. One of the minor, but most welcome, innovations is the new style accordion fold that is almost guaranteed to eliminate "thumb-itis" and frustration in the tight confines of a cockpit.

The experimental 1:1,000,000 chart went out to several thousand users, accompanied by a comment sheet and a self-addressed envelope. The responses were not long in coming . . . and by the bagful. More than 97 per cent approved the chart and almost every reply had something laudatory to say, a development the chartmakers did not expect.

A major departure from tradition in the experimental chart is front/back printing to provide maximum coverage with a minimum number of sheets. Each chart of the series overlaps the adjacent chart, thereby providing easy transition from one chart to the next. Printing to the paper edge eliminates the need for cutting or folding border areas when matching or plotting. Precision printing of the chart provides foolproof transition from one side to the other.

Border space is provided to show useful information pertinent to individual chart areas, such as special use airspace data, tower frequencies, legends and so forth. New, for the first time in aeronautical charts, are enlarged insets of metropolitan areas. Featured in these are approximations of familiar landmarks drawn in sufficient detail to provide instant recognition. In one of the experimental maps, the visual approach chart for the Washington, D. C., local area shows the famed Masonic National Memorial to the south; the Washington Monument, the Capitol and the municipal stadium to the north and Andrews Air Force Base to the east. Keeping up with the times, one of the new symbols identifies drive-in movies.

Topography is shown on the charts by shading and tints to accentuate elevations of the terrain, along with contour lines and a liberal selection of spot elevations. The highest terrain elevation for each side of the chart is also shown. Folded into a neat packet 5 by 10 inches, the chart is easy to handle and store.

Charts of the contiguous 48 states will be produced in 1967 for several different areas for comment and suggested improvement. The full series will be completed by 1970.

Sixteen sectional charts covering Alaska are already in production. Fourteen of these will be printed front/back and two on one side only. All will be on the 1:500,000 scale. The first of the Alaska charts will be in the hands of pilots late in 1966 and the series will be completed in 1967.

No changes are contemplated in the charts for Hawaii.

All new or revised charts will be made available through already established distribution points, i.e., fixed base operators, pilot training schools, and the like.

Portion of 1:500,000 VFR chart of Washington, D. C. area (left) shows considerable detail. Inset of same area (below) at edge of chart expands view of ground reference points.

Photography by Downie and Associates

Tunnel Meadows Airport tucked away in the mountains.

mountain flying is safe...if

Flying the high country can be safe and enjoyable. Mountain flying accidents that do occur can often be attributed to what is referred to as "the stimulus of the occasion."

Idaho's Director of Aeronautics, Chet Moulton, whose state takes in some of the world's most rugged terrain, has found that every accident which does not involve structural or mechanical failure is "carefully caused" by poor judgment and inaccurate pilot decisions.

"Often," says Moulton, "the main factor is a determination to get home because of an emergency, attend a party, keep a business appointment, have a date with the 'best girl' or any other stimulus which results in a pilot's desire to reach his destination regardless of winds, weather or temperatures."

Attempts to sneak across mountain terrain under the weather often prove fatal. "Clouds full of rocks" may await those who take off unmindful of the weather.

Skilled mountain pilots depend on a thorough FAA weather briefing before departure. They take advantage of pilot reports and do not hesitate to telephone ahead for weather information when in doubt. They are also masters of the 180 degree turn when conditions begin to deteriorate, since weather which cannot be forecast or reported can develop rapidly in the mountains. And skilled pilots know that VFR night flights in mountains under thunderstorm conditions constitute just another form of Russian roulette.

Safe mountain flying requires a thorough familiarity with all the ramifications of density altitude (*FAA Aviation News,* July 1966). Thin air at high altitudes requires longer landing and takeoff runs, and this is accentuated by temperature increases.

Unfamiliarity with density altitude is considered the cause of four out of the five fatal accidents which occurred at Fish Lake, a 2,900-foot emergency dirt strip at the 5,800-foot level of the Idaho mountains. Takeoffs were in the middle of the day when high temperatures raised density altitude to around 8,000 or 9,000 feet. All the aircraft were relatively low-powered, with fixed-pitch props and all were loaded to gross weight.

Pilots can gain this lesson from these and other mountain accidents: *Know thoroughly the effect temperature and altitude have on your plane's performance.* Aircraft handbooks carefully set out performance under different weights, altitudes and temperature, as well as proper speed and configuration.

Bill Woods of Boise, Idaho, one of the nation's fine bush pilots, considers it a basic rule that no pilot fly into mountain country unless he has had at least 150 hours and is proficient in stalls and slow flight. Experienced pilots like Woods have a wealth of information; checking with them is a good insurance policy.

When planning to land at a mountain airstrip, get thoroughly familiar with the field—its altitude, length, surrounding terrain and obstructions. Many mountain fields are "one-way"—a landing must be made on the first attempt since the terrain prevents a go-around.

To operate safely from such fields, pilots must be proficient at short field landings and takeoffs. They must be sure they can set their planes down on a 50-foot spot, not just once in a while but every time. On landing at most short mountain fields, power approaches are required: A downdraft encountered during a power-off approach can be disastrous. Touchdown must be accomplished near the end of the runway, where power should be cut and a full-stall landing accomplished.

Filing a flight plan (including the exact route, altitude and destination) is vital. The plane should be equipped with an emergency survival kit and pilot and passengers should stay with the plane in the event of a forced landing.

Mountain flying skill calls for an ability to cope with downdrafts. Maintaining sufficient flying speed is paramount. Attempts to outclimb downdrafts can cause stalls and loss of control. "Ground cushions" of air usually lie at the base of downdrafts—but don't count on it.

One way to avoid turbulence is to plan mountain flights in early morning hours. As a general rule, air begins to get bad about 10 a.m., grows steadily worse until 4 p.m., then gradually improves until dark. Ridges should be crossed with plenty of altitude and approached at an angle so a turn is feasible if downdrafts are encountered.

Wind conditions aloft deserve the pilot's careful attention. Winds over 20 knots, especially during hot afternoons, create severe turbulence and strong up and down drafts. Remember that over mountain passes, winds usually take on greater velocity.

Flying up mountain canyons is not habit forming. Low ceilings, updrafts, downdrafts and canyon dead-ends are your enemies here. Wires and cables are

Do's and Don'ts of Mountain Flying

DO file a flight plan.

DO plan your trip near a highway, airway, railroad or through a valley; there are more checkpoints, it is easier to navigate and, if trouble develops, you are closer to help. Take "dog-legs" if by doing so you can avoid higher terrain. Allow yourself an extra half hour if your destination is in mountainous territory.

DO fly equipped with an emergency survival kit. In the event of a forced landing, stay with the plane.

DO believe your compass. With proper correction for variation, deviation and wind, you can rely on it to get you out of trouble. But watch for compass irregularities in areas of local magnetic disturbance.

DO keep in mind that the actual horizon is near the base of the mountain. The mistake of using the summit of the peaks as the horizon will result in the aircraft being placed in an attitude of constant climb and may inadvertently lead to a stall. (When you begin your letdown in the mountains, you won't have a horizon. Watch your airspeed and altimeter.)

DO remember that frost, ice or snow adhering to aircraft surfaces interferes with lift and must be removed before takeoff.

DO keep your plane as light as possible. Eliminate needless gear: no aircraft performs at its best at full gross weight.

DO insist on visibility as well as ceiling when flying in mountainous areas. Snow and rain can quickly reduce forward visibility to zero. Darkness often blends in perfectly with the color of mountains which may appear to be just another dark section of sky.

DO be familiar with the airport you are going to. In advance of the flight, review available charts and maps for altitude, length of runway and obstructions.

DO check with experienced mountain pilots before traversing strange mountain terrain if at all possible. A good insurance policy is dual instruction from a flight instructor with mountain flying experience.

DO be familiar with your aircraft's high altitude performance as set forth in the aircraft owner's handbook.

DO start early to avoid terrific up and down drafts, turbulence and winds that usually increase as the day progresses.

DO carry enough fuel to make your complete round trip plus 50 per cent more. You will need extra fuel more times than not.

DO maintain your flying speed in downdrafts.

DO know the effect of carburetor heat usage on mixture control settings when flying at high altitude.

DO remember that spotting landmarks may be difficult since a mountain shown as 8,000 or 9,000 feet on the charts may appear as a small knoll if the peak rises out of surrounding terrain having an elevation of 4,000 to 5,000 feet.

DO see the FAA film "Density Altitude."

DON'T get out of sight of the field on your approach if at all possible. Another plane may be taking off. If this is necessary due to terrain, circle the field until pilots on the field definitely know you are going to land.

DON'T fly into mountain areas or land on mountain strips in an unfamiliar aircraft.

DON'T fly into mountain country unless qualified.

DON'T cross a ridge at low level with low air speed. If it is found necessary to cross a ridge with little clearance, fly parallel to the ridge to gain airspeed, then turn and cross quickly. Gain altitude for crossing a ridge at considerable distance from the ridge.

DON'T fly closer than necessary to cliffs or rugged areas; Dangerous turbulence may exist.

DON'T fly below 2,000 feet above the terrain and be sure to fly higher if a strong wind is blowing.

DON'T be lulled into complacency by a weather report giving the ceiling at 1,500 to 2,000 feet. The reporting station may be surrounded by mountains 2,000 to 5,000 feet higher than the station.

DON'T fly if winds aloft exceed 35 miles per hour.

DON'T fly in doubtful or bad weather.

DON'T operate into or out of high mountainous terrain with a schedule. Give yourself plenty of time; weather must take precedence over any schedule.

DON'T fly up a canyon to clear a mountain. The canyon grade may exceed the aircraft's maximum rate of climb. Watch for wires, cables, downdrafts, updrafts, low ceilings and canyon dead-ends.

DON'T drag into mountain fields with a low approach. A downdraft under such conditions could be disastrous.

DON'T take low performance airplanes into mountain landing strips. Each thousand feet of altitude above sea level can increase your takeoff run by as much as 25 per cent and your landing speed by two per cent.

DON'T take off from a mountain field if the air is bad or if you have a tail wind. Wait it out. Few of these fields are long enough to land once you have left the ground.

mountain flying . . .

often strung across canyons. And in many cases, canyon terrain climbs faster than the plane's performance capability.

Despite such bugaboos and the fact that mountain flying requires greater pilot skill, it also offers greater rewards. For the pilot who takes the time and effort to prepare himself and become familiar with common sense rules applying to this type of flight, a beautiful, wilderness world seldom seen by city dwellers opens up. The extra precautions required for safe mountain flying, pilots will find, are worthwhile.

By Cliff Cernick.

Mount Whitney as seen through the windshield of a Cessna 180.

Amundsen: THE Airborne VIKING

Photo credit: Norsk Teknisk Museum, Oslo, courtesy of The Smithsonian Institution.

Norge takes off from Spitzbergen for the North Pole and Alaska in 1926.

The year the Wright Brothers introduced the world to powered flight at Kitty Hawk, Roald Amundsen found what others had sought for centuries—the Northwest Passage to the Pacific. Later, this determined Norwegian explorer made plans to be the first man to set foot at the North Pole. Although Robert E. Peary beat him to the Pole in April 1909, Amundsen continued his preparations. But when he sailed from Norway in June 1910, his secret destination was the South Pole instead of the North Pole. After setting up a base on the Ross Sea in 1911, Amundsen and four companions made an amazing journey by dog sled to become the first human beings to reach the South Pole. The harrowing trek across the ice almost ended disastrously when supplies were exhausted and the explorers were obliged to eat their dogs.

After this grueling experience, Amundsen was quick to see that an explorer could cover polar terrain by air in minutes instead of the weeks it would take on ice. In 1912, Amundsen learned to fly in Oslo at the age of 40 and became the first licensed pilot in Norway. He later converted a steamship into an "aircraft carrier" so it could carry a Farman biplane. But his plan to explore the Far North by airplane was blocked in 1914 when World War I began.

War's end found Amundsen living in Seattle planning another Arctic expedition. This time he acquired two planes to be carried aboard the *Maud*—a Junkers J13 which had great range and a Curtis-Oriole named *Kristina* which made the first ski-plane flight over the Arctic in 1923.

Later, Amundsen met Lincoln Ellsworth, son of an American multimillionaire, and persuaded him to finance the first flight over the North Pole. With foresight, Amundsen arranged for three-man crews in each of two six-passenger Dornier flying boats so that one plane could carry back the entire expedition if the other got into trouble. The planes took off May 21, 1925, and the wisdom of Amundsen's plan became clear when the expedition became lost while short of the Pole and with half the fuel used up. One plane was forced to land in slush; the other in an ice-bound lake, and neither had enough open water to take off. The world thought the Amundsen party had perished. But after a 26-day struggle on the Arctic ice, the six half-starved men moved some 500 tons of snow to build a runway. When they returned to King's Bay, Spitzbergen, in a single plane it was as if they had returned from the dead. Congratulatory messages came from the kings of Norway and Great Britain and from other world-famous persons.

Less than a year later Amundsen was back in Spitzbergen for a new attempt at the North Pole. This time he received financial support from the Norwegian Government and, again, from Ellsworth to make the effort in an Italian-built semi-rigid airship named *Norge* (Norway). Amundsen engaged the designer of the airship, Italian Colonel (later General) Umberto Nobile, to command the craft. Ellsworth was to be an observer and Hjalmer Riiser-Larsen, who later became commander-in-chief of the Norwegian Armed Forces, was the navigator. After the 348-foot *Norge* completed the 4,500 mile trip from Rome to Spitzbergen, it needed an overhaul. A broken crankshaft had to be changed and minor repairs were made to the dirigible itself.

Meanwhile, Richard E. Byrd arrived in Spitzbergen with his Fokker monoplane and managed to take to the air and complete a round-trip flight to the Pole before Amundsen could get airborne (*FAA Aviation News*, May 1966). Though certainly disappointed to be beaten to the North Pole again, Amundsen was convinced that his plan to fly over the Pole and continue on to the other side of the Polar Basin would have greater value in that it would prove or disprove the existence of unmapped land in that virgin part of the world.

After waiting for Byrd's return and offering immediate congratulations, the Amundsen expedition was launched on May 11, 1926. While the flight to the Pole was somewhat uneventful, the *Norge* later ran into tremendous difficulties from the ice that weighted down the ship, blocked carburetor intakes, and cut off communications by forming on the antenna. Chunks of ice broke off and struck the propeller so frequently and violently that the men thought it would shatter. Ice chunks also ripped holes in the outer skin. Gales held the *Norge* to a standstill from time to time, and toward the end of the flight, pitched the airship so violently that Nobile abandoned his plans to land at Nome, and selected as his destination the tiny coastal community of Teller, Alaska, with 45 Eskimos and 12 whites.

When the men saw the *Norge* settling down, with anchors dragging over the ice, they ran up and pulled down on the ropes. Nobile released the gas and the first trans-Polar flight bounced to an ungainly finish. The *Norge* never flew again. Amundsen declared that this flight marked the end of his career as an explorer.

But two years later, while in Oslo attending a reception, Amundsen received word that Nobile, then attempting a flight to the North Pole in the airship *Italia*, was lost in the Arctic wilderness. He hurriedly arranged for an aircraft and crew and flew off to find Nobile.

Nobile was eventually rescued and went on to build dirigibles for the Soviet Union and to serve as a Communist deputy in the Italian constituent assembly. But Amundsen flew into the Northern skies and disappeared; he was never seen again. If Viking lore is true, that an adventurer must be killed in action to enter Valhalla, Amundsen is surely flying there today.

By Donald R. Foxvog

FATAL ACCIDENT RATE DROPS AS GENERAL AVIATION ACTIVITY CLIMBS

General aviation pilots last year flew a record 2.6 billion miles in 16.7 million hours with 95,442 aircraft, while achieving the lowest fatal accident rate in history, according to recent FAA figures.

The study, "Selected General Aviation Statistics," reported an eight per cent increase in the number of active general aviation aircraft during 1965—the largest yearly increase since 1954. Miles and hours flown increased over the previous year's record by 382 million and one million, respectively.

Preliminary figures show an increase in the number of fatal accidents—from 504 to 516—although the yearly rate per million miles flown dropped from .23 to .20. Fatal general aviation accidents in 1955 totaled 384 with an accident rate of .32 per million miles flown. The 1946 rate was 0.79.

Manufacturers produced 12,646 civil aircraft in 1965. Of these, 12,053 were general aviation fixed wing aircraft valued at $380 million and 290 rotorcraft valued at $15.7 million.

More than one-half of the general aviation fleet are single engine aircraft seating four or more persons. Single engine aircraft seating from one to three people make up one-third of the fleet.

The study forecasts that turbine powered general aviation aircraft, which increased from 306 in 1964 to 574 in 1965, will reach 1,900 by 1970. Rotorcraft increased from 306 to 1,503. The remainder of the general aviation fleet includes 771 gliders, 36 balloons and two blimps.

Business flying continued to be the busiest segment of general aviation operations, its 21,650 aircraft accounting for nearly one-half (1.2 billion) the general aviation miles and more than one-third (5.9 million) the flight hours.

Flying for pleasure and personal transportation was the second busiest segment of general aviation with 51,093 aircraft, more than one-half the entire general aviation fleet. These aircraft flew 512.5 million miles in four million hours.

Commercial flying, the third busiest segment, includes air taxi operations, aerial application, and the use of aircraft for specialized industrial work such as pipeline patrol, advertising and photography. In 1965, a total of 11,355 aircraft were flown 461.2 million miles in commercial operations. They compiled 3.3 million flight hours.

The 8,034 aircraft used for flight instruction flew the same number of hours (3.3 million) as those used for commercial purposes and covered an estimated 358.7 million miles.

While the supply lasts, free copies of FAA's "Selected General Aviation Statistics" are available from FAA, HQ-438, Washington, D.C. 20553.

BANKERS TAKE THE HIGH ROAD TO BEAT TRAFFIC

From heliport atop bank's main office, 'copter begins its tour of branches.

Swooping down (above) on a branch bank, crew of the Citizens & Southern National Bank, Atlanta, readies the hook for a nonstop pickup. Bank employees (right) demonstrate custom made hook. Bag is suspended from fixture on the ground to reduce hazard. No cash is transferred this way.

The Citizens & Southern National Bank in Atlanta has found the answer to the rush hour traffic snarl. Fly.

The roof of C&S's main office in midtown Atlanta was converted into a heliport earlier this year and now serves as the hub for operations. Regular flights are made from the bank's downtown perch to 30 branches, affiliates and correspondent banks scattered widely throughout the Atlanta metropolitan area. While the helicopter (a Brantly 305) actually lands at some stops, at others it hovers low while a bank employee aboard the aircraft reaches down with a specially made pole and lifts a pouch off a post designed for this purpose.

Some 257,000 checks, drafts and pieces of mail (no cash) are picked up and brought to the main office each day. Convinced that their operation is the first of its kind in the nation, bank officials are pleased with the speedy service which has allowed an increase in the bank's level of lendable funds by getting usable assets to the bank more promptly.

FAA Study Shows Time Is Money; Airport Delays Cost $63 Million

Delays at major U. S. airports amounting to about 335,000 hours cost the nation's aircraft operators an estimated $63.6 million in 1965, according to a study released by the Federal Aviation Agency.

Air traffic control delays accounted for approximately one-third of the total. The remainder were caused by airport limitations, including ground congestion and construction, and by weather conditions which restricted or closed airports.

General aviation operators incurred 55.3 per cent of the delay time and 29.2 per cent of the costs. Airlines were delayed 38.9 per cent of the total delay time and incurred 64.7 per cent of the costs. Military aviation experienced 5.8 per cent of the delay time and 6.1 per cent of the costs.

The FAA estimates are based on data supplied by a major U.S. trunk airline for 47 of the airports it serves and FAA airport activity statistics at 292 airports served by FAA air traffic control towers. The frequency and cost of delays were highest at large metropolitan airports.

A limited number of free copies of FAA's "Staff Study—Estimated Cost of Delay at FAA Tower Airports, C. Y. 1965" are available to the public. Requests should be addressed to the Federal Aviation Agency, Issuance Desk, HQ-438, Washington, D.C. 20553.

YOUTH CELEBRATES 16th BIRTHDAY BY SOLOING 14 DIFFERENT PLANES

Kirk Douglas McQuown, a young man with a future in the skies, got off to an auspicious start in his aviation career by soloing 14 different models of aircraft on his 16th birthday. Now, at the advanced age of 17, he has accumulated more than 300 hours of solo and dual flight instruction time.

A P-38 flight manual provided the initial incentive for Kirk. A gift from an uncle who was a fighter pilot in World War II, the manual proved fascinating reading. Then, of course, there was that trip to the Hawthorne, Calif., Airport to see the plane itself.

At Hawthorne, Kirk met Mrs. Rex Rose who, with her husband, operates an FAA approved flight school and air taxi service. They soon worked out a deal—one hour of flight instruction for pulling weeds. A second hour for washing airplanes.

Mrs. Jean P. Rose, who with her husband, Rex, operates a flying school, presents Kirk McQuown with his private license. She took the youth under wing when he was 12; taught him to fly.

Kirk kept at it. He soloed a glider in 1963 at age 14 and on his 16th birthday he had a field day flying Cessnas (140, 150, 170, 172, 175, 182), Pipers (*Colt* and *Cherokee* 140, 150, 180, 235), Champions (AEA-7, Citaborea) and an Aeronca Tri-Champ.

On his 17th birthday, he passed his private pilot flight test and was issued a private pilot certificate by Mrs. Rose, an FAA flight examiner.

Young McQuown is looking forward to the day he can take his commercial flight test—hopefully on his 18th birthday next year. And in back of his mind is the fact that he has been approached by one major airline to sign a contract. His ambition is to be an airline pilot.

CAN HAZARDS BE DESIGNED OUT OF COCKPITS? FAA SEEKS THE ANSWER

More than 10,000 physicians and scientists have viewed this display showing the results of a cockpit delethalization study conducted by FAA.

The left panel (below) shows what can happen to a crash victim in a standard cockpit where a conventional seat belt provides inadequate restraint. The wreckage used in the display came from a crash in which the pilot was killed.

The central panel (not shown) presents a life-sized illustration of the human skeleton showing the points where critical injuries may occur—head, skull, face, chest, heart, lungs, spine and pelvis. In addition, the legs may be severely injured. Also in the center is a continuous-run color motion picture.

The results of FAA's research on making a cockpit more crashworthy are presented on the right. Important areas include a crushable instrument panel, collapsible control column and both a strong seat belt and shoulder harness. The stronger seat is made of aluminum with plastic foam fill.

The exhibit was in Las Vegas for the Aerospace Medical Association convention last spring and again in September for the Flying Physicians Association convention. It will return to Las Vegas for the American Medical Association convention in November and is scheduled to go to Washington, D. C. for an FAA aviation medical examiner seminar in December.

BRIEFS

• HUNDREDS OF NEW AIR MARKERS are available to pilots this fall as the result of efforts made in various states. The Ohio State Jaycees and the Ohio Chapter of the 99s are currently promoting a state-wide project to paint the names of communities on roofs of tall buildings. Specifications call for yellow letters 10 feet high with an arrow and the distance to the nearest airport. The Iowa State Aeronautics Commission airmarked 150 communities this past summer to bring the Hawkeye total to 1,183 out of a possible 1,223 incorporated towns and cities. Georgia's State Aviation Division put in 250 airmarkers this year.

• AVIATION RANKED AS ONE OF THE TOP CAREER choices for boys (along with engineering, law, architecture and professional sports) in a recent study of 400,000 American teenagers by a private research firm.

• THE NUMBER OF STUDENTS WHO LEARNED TO FLY increased 42 per cent during the first five months of 1966 over a comparable period last year, according to a study made by the Cessna Aircraft Co.

• PRESIDENT JOHNSON commended Administrator William F. McKee for "the excellent work" which he and his associates at the Federal Aviation Agency have been doing "in reducing costs and manpower while absorbing additional workload and improving service to the public."

• WORLD'S BUSIEST TOWER, Chicago's O'Hare, shattered earlier record by handling 1,907 arrivals and takeoffs during one 24-hour period this summer before the airline strike. O'Hare had been averaging 1,700 aircraft daily.

• FAA—WHAT IT IS, WHAT IT DOES, a new eight-page publication describing the activities of the Agency in simple language, is available free from FAA HQ-438, Washington, D. C. 20553, with a self-addressed mailing label.

• 90-SECOND EMERGENCY EVACUATION is goal of safety rule proposed by FAA to improve the chances of survival in landing and takeoff crashes in air transport planes. Agency will consider comments received by Sept. 30 to proposed "Crashworthiness and Passenger Evacuation Standards and Operating Rules."

Proposal Would Speed Issuance Of Student Pilot Certificates

A two-part rule change to provide student pilot applicants with instant licenses and to drop the parental consent requirement for minors is now under consideration by the FAA.

Under the proposed amendment to Part 61 of the Federal Aviation Regulations, the medical certificate issued by FAA-designated aviation medical examiners would be combined with a student pilot certificate.

Present rules require an applicant first to obtain a medical certificate from an aviation medical examiner and then later apply for a student pilot certificate at an FAA general aviation district office or through a designated pilot examiner.

The change would speed up certification by eliminating travel and correspondence by the applicant and administrative work by FAA.

The second change would alter FAR Part 61.61, which now requires an applicant under 21 years to obtain the consent of a parent, guardian or, in the case of a married woman, her husband. The minimum age requirement of 16 years would remain unchanged.

In support of the change, the FAA stated that the consent requirement imposes an unnecessary burden on young applicants and serves no realistic safety purpose.

It was further noted that persons under 21 can get married, are inducted into the armed services, can exercise property rights and are permitted to obtain automobile drivers licenses without parental consent.

The Agency is considering comments on the proposed rule change (Docket No. 7534; Notice 66-30) submitted to the FAA, Office of General Counsel, Rules Docket by Sept. 19.

Airman Test Change Rescinded

The FAA has rescinded recent rule changes which would have permitted airmen, beginning Aug. 15, to take written examinations without first showing qualifying experience as a prerequisite.

The cancellation of the new rule has the effect of reinstating previous rules which require applicants for certificates and ratings for mechanics, airline transport pilots, flight engineers, navigators, junior grade tower operators, dispatchers and senior and master parachute riggers to show aeronautical qualifying experience as a prerequisite for taking written examinations.

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.

• Wants Safety Stories

I have only recently received my private license and have just subscribed to your excellent publication. I have cut out for permanent storage your article on "Thunderstorms" in the June 1966 issue. Do you have an index of other safety articles that have appeared in back issues? I would like very much to have available the many helpful safety articles previously published.

Salt Lake City

We carry safety articles in every issue. Inasmuch as you have been receiving the magazine since June, here is a list of some articles that appeared in earlier issues:

** May 1966—Every Plane Has a Personality of Its Own; Don't Let Your Engine Die of Thirst (reprints will be available free from FAA regional public affairs officers in Anchorage, Atlanta, Fort Worth, Honolulu, Kansas City, Los Angeles and New York).*

** April 1966—Spruce Up for Spring (aircraft maintenance); You Can Get There from Here—All It Takes Is a Little Planning; Survive Sea Landing; The Stall Barrier.*

** March 1966—Eyeing the Problems of Night Flying.*

** February 1966—What's the Flap All About.*

** January 1966 — Torque — the Other Force in Flight.*

** December 1965—Winter Maintenance.*

** November 1965—Damaged Props Spell Danger.*

** March thru October 1965—Eight part series on "Rules of the Road."*

Single copies of back issues are sold for 15 cents each by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

• Sweet 16

Why is it that you can get a student pilot certificate for a glider at age 14, but for a student pilot certificate for any other aircraft you must be 16 years old? In a way, I feel that the age to fly other aircraft should be the same as for the glider. I feel this way because a glider does not have an engine and so if you were coming in for a landing and you didn't have everything just right, like your altitude, you may land up in some bushes. In an airplane with an engine, you could give it more gas and fly around the pattern again. While a glider doesn't go as far, I think in the distance you do go in a glider you can run into just as much trouble, if not more, than during a longer trip with an airplane with an engine.

I think that if a person is able to pass the check ride he should be able to get a license no matter what age he is, although I feel that 14 gives a person enough time to learn enough to handle the airplane safely.

Kent, Ohio

Minimum age requirements, whether they be for drivers' licenses, voting, or pilot certificates, are established to provide that the applicant concerned has the maturity of judgment and sense of responsibility necessary to use safely the privileges he seeks. While calendar age is only one way to measure an applicant's level of maturity, we have no other practical test to apply.

We agree that a younger student may learn to handle an airplane as competently as he does a glider, but the potential hazard to people and property is much greater with airplanes than it is with gliders.

There is no regulation which prevents a student under 16 years of age from receiving flight instruction in an airplane from a certificated flight instructor, even though he will not be authorized to solo until he can qualify for an unrestricted student pilot certificate.

• Permission to Reprint

We are deeply interested in the article "Water, Water Everywhere" which appeared in *FAA Aviation News*.

The solar still could be very usefully adapted to conditions in Saudi Arabia and would be a real asset in some areas if our employees knew about it. We request permission to reproduce this fine article for publication in our various house organs which are printed in both Arabic and English. Please address your reply via air mail since delivery to Saudi Arabia requires three to four months via surface mail.

Charles Homewood
Arabian American Oil Co.
Dhahran, Saudi Arabia

Request granted; we sent our permission air mail the day we received your letter. Publications may reprint material from FAA Aviation News *without asking our permission. However, we do appreciate a credit line and single copies of the publication using our material.*

• Just a Pleasant Ride

The letter headed "Instructor Sounds Off" in *FAA Aviation News* touched a tender spot with me. The matter concerning adequate pay for flight instruction has been with us since Orville yelled "contact" to Wilbur, and looks as though it always will.

But where the letter touched me deeply was the typical approach that flight instructor took toward the final flight test for his students. This is good, solid evidence that the vast majority of our country's flight instructors are teaching their students to pass an exam rather than teaching them to become pilots! This is totally backwards! In the process of converting a nonpilot into a pilot, neither the written nor the flight exams represent a proper goal.

Never, at any time, do I hold out the written and flight tests as goals to my students. The goal is to become a pilot, capable of flying himself and his family safely from point to point. Oh, sure, I tell the student that along the way the FAA will have him fill out the answers to some very simple questions. (They *will* be simple for him when I tell him he's ready to take the written.) And I tell him that he'll also take a pleasant airplane ride with an FAA inspector or a designee, but it will be no more than that. If he has managed to keep me happy, it is a cinch he'll make the check pilot happy.

Tom Baxter
Van Nuys, Calif.

• More on Buying Used Aircraft

"How to Buy Used Aircraft" in the June *FAA Aviation News* is very informative and will be most beneficial to anyone interested in buying a used aircraft.

I would like to point out that the present address of the FAA Aircraft Registry is P.O. Box 25082, Oklahoma City, Okla., 73125. Records on file here contain not only lien or title information, but also such airworthiness data as inspection reports, major repairs and alteration reports, duplicate certificates of airworthiness and applications for airworthiness certificates. These records also reveal the condition of aircraft and the state of maintenance.

Individuals applying for an aircraft registration should submit two new FAA forms—Application for Aircraft Registration, 8050-1, and Aircraft Bill of Sale 8050-2 (or its equivalent) with the $5 registration fee.

When the proof of ownership submitted with the application is a contract of conditional sale, an additional $5 is required for recording the lien evidenced by the contract.

Pending receipt of the aircraft registration certificate, the aircraft may be operated no more than 30 days, during which time the pink copy of the application must be carried in the aircraft.

Jay H. Moody
FAA, Oklahoma City

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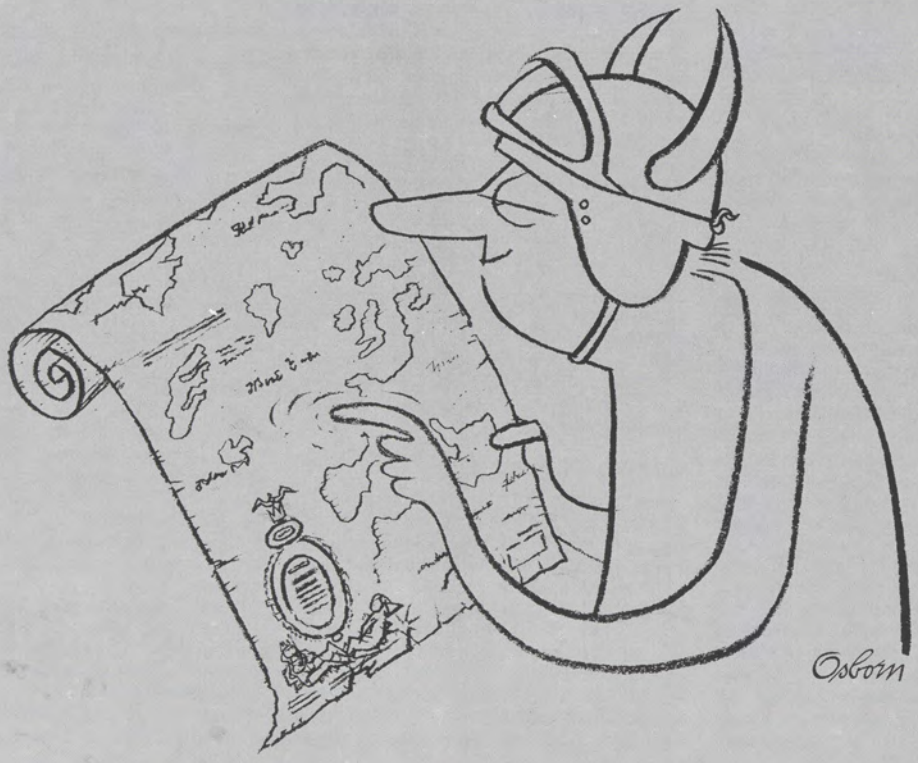

Use modern charts or come to grief