FAA AVIATION NEWS

SEPTEMBER 1974

COVER:
Flight to Nowhere
See page 8.
(Bahamas Tourist News Bureau photo)

FAA AVIATION NEWS

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The ELT An Interim Report

A notice to FAA personnel regarding the handling of inadvertent ELT activations has been revised, eliminating the requirement for an FAA flight standards inspector to check the ELT before the aircraft is returned to service. As it now stands, if an ELT is accidentally triggered and the operator cannot be readily located, FAA personnel quiets the ELT in the most practical manner, calling in local law authorities if necessary. A notice is left on the aircraft explaining the action taken and advising that the aircraft may not be flown without a properly operating ELT, except that it can be ferried to a place where repairs or replacement can be made. If subsequent inspection indicates that the ELT is defective, it must be repaired or replaced before the aircraft can be flown (FAR 91.52). If it is the installation only *that is deficient the operator has 30 days to have it corrected.*

An ELT is now, by act of Congress, required equipment on nearly every general aviation airplane, and the pilot who has been obligated to purchase one understandably wants to know how effective the device has proved thus far in saving lives.

The final date on which installation of an ELT was required was June 30, 1974, only a few months ago, but most general aviation pilots installed their ELTs earlier, so that it is already possible to make some preliminary observations about the program's effectiveness.

The first and most important fact to note about the ELT is that it has effectively reduced the time required to locate missing aircraft. Duncan Salmond, chairman of FAA's ELT Coordinating Committee, estimates that to date ELTs have been responsible for saving more than 100 downed pilots and their passengers who would not have been rescued in time to save their lives if the emergency locator signal had not been sent out from their crashed airplane.

In the last year alone FAA estimates that there were 47 downed and missing aircraft located primarily by an ELT signal. Here are four of the most recent ELT-credited saves:

• In March of this year, a Cessna *Cardinal* struck a mountain at 11,000 feet above sea level in the rugged Sangre de Cristo range in New Mexico. The family of four on board who survived the crash huddled shivering near their downed airplane, hidden in dense timber. However, the ELT on board was sending out the emergency locator signal. Search aircraft had to cover several hundred miles of territory, but they picked up the signal and reached the Cessna within five hours. A helicopter landed within a half mile of the wreckage and picked up the survivors. Pickup time was 6:00 p.m., just before the onset of a long night of sub-freezing temperature on the lonely mountain.

• In the same month, a pilot in a Piper *Supercub* crashed during a snowstorm on a flight from Elko to Ely, Nevada, and the pilot was badly injured. Search aircraft were able to pick up the ELT signal, and they spotted the downed Piper from the air. A CAP ground patrol, directed to the wrecked airplane, removed the injured pilot. He was airlifted by helicopter and flown to a hospital in time to recover.

• In July of this year, a commercial airliner flying from Seattle to Tokyo notified the FAA Center in Anchorage that it was flying at 35,000 feet and picking up an ELT signal. The pilot reported that the signal was the loudest over the Wide Bay area in the Alaskan Peninsula. FAA notified the Coast Guard RCC (Rescue Coordinating Center) at Juneau, and a helicopter with a VHF direction-finding unit on board was dispatched from Kodiak. The copter picked up the signal, and followed it to a Fairchild Hiller helicopter stranded on a desolated rock island with a dead engine. The rescue helicopter airlifted five survivors.

• In May of this year, a student pilot in a Cessna 150 crashed in a remote and snowy area of Los Padres National Park in California. He crawled out of his Cessna, but then tumbled some 200 feet down the side of a cliff. He suffered multiple fractures, in the fall, and was unable to move. But his Cessna on the cliff above him was sending out the ELT signal. As he had not filed a flight plan, it was some hours before it became certain he was missing, and no one was sure in which direction he had been heading. Nevertheless search aircraft began their mission, covering thousands of miles of territory, trying to find that needle in the haystack. Finally, they picked up the ELT signal, and zeroed in on the downed aircraft. A hovering helicopter directed ground rescuers, and then dropped first aid equipment and splints. Finally the pilot was winched aboard the helicopter. The search took 41 hours, but they did get the pilot off the frigid mountain and back to a hospital in time to save his life and limbs.

Despite these encouraging reports, FAA is the first to acknowledge that all the bugs have not yet been eliminated from the ELT program. The first serious problem which has surfaced is an extremely high false alarm rate, which is wasteful in terms of useless search and rescue efforts. The second problem is the failure of many ELTs to activate after crash impact.

FAA is attacking the first problem with a widespread pilot educational effort and a careful investigation of the circumstances leading to inadvertent signalling. In the early stages of the ELT program, the percentage of false alarms, or "inadvertent activations" of ELTs received by Search & Rescue Centers has run as high as 96 percent. Many of these activations are due to the pilot's unfamiliarity with the equipment, to careless handling of portable ELTs, or to failure to disarm the ELT after a flight.

Every pilot should take the time to physically locate and inspect the ELT in the aircraft he intends to fly, and to familiarize himself with the three switch positions: *on, arm* and *off*. When the switch is flipped to *arm*, the device will activate on an impact of 5 "g"s sustained over a duration of 11 milliseconds; when it is switched to *on*, it will start transmitting the emergency signal immediately, either in a distress situation or in a test; and when it is *off*, the device is totally deactivated and will not transmit a signal. A pilot should make an ELT check part of his pre-flight work, switching it to the armed position just before takeoff. The ELT should be turned to the *off* position at the end of the flight.

In some cases, a hard landing can trigger the signal. Sometimes the airplane is bumped in the hangar or during maintenance repairs, or some object inside the airplane is thrown against the ELT, activating it. Often the problem occurs with the portable transmitter. (Regulations allow either a fixed or portable ELT, although the portable type must be "affixed" to the aircraft, usually by means of a wall bracket.) Many transient pilots remove their ELT after flight, along with other equipment, to avoid theft. A number of these portable ELTs have been inadvertently activated because the pilot failed to flip the switch to the off position. Sometimes the ELT was activated when thrown in the back of a car, or shoved in a suitcase.

The pilot himself usually has no idea his ELT has been activated and is sending out an emergency signal. The first time he may learn about it is when a search party comes pounding on his door, and he is sheepishly forced to open his dresser drawer to disarm the ELT which was activated the previous night when he carelessly dropped it in there with his socks.

Before the days of ELT this plane crash in a swamp could have gone undiscovered for days.

FAA investigators have identified improper installation and mechanical failure as secondary causes of inadvertent activation of ELTs. False signals have been traced to ELTs fastened to movable upholstery or to panels which vibrate during flight. Whether you use a fixed or portable ELT, make certain it is attached to a solid structure of the aircraft.

Incidentally, the location of the ELT plays a key role in its proper utilization. In the early days of the program it was thought that the tail section of the airplane was the best location for this equipment, from the point of view of survivability upon impact. However, experience has now shown that the cockpit is usually the best place. The cockpit of the modern light plane is the area of strongest built-in survivability—and of course if the ELT is demolished on impact it will not signal.

There is another good reason for locating the ELT in this area, where it is reasonably accessible to the pilot. If he needs a toolbox to get at it, he is more likely to ignore it.

Mechanical failure as a cause of false alarms usually involves the onset of corrosion at the printed circuit board, which has the effect of turning the equipment on.

To make sure that the ELT is functioning properly, the pilot should test it regularly. An ELT test takes only a few seconds and it is quite easy to do. You simply set your radio to the emergency frequency (121.5 MHz) and then you flip the switch on the ELT to the *on* position. If it is working right you will hear the distinctive throbbing wail of the ELT on your receiver.

Note: *The first five minutes of every hour have been reserved for ELT testing, and SAR personnel ignore any signal heard during this period*. Thus, you can test your ELT, say, between 0900 and 0905, or between 1300 and 1305 with no fear that anybody will come rushing to tell you to turn it off.

You might also note that if you hear an ELT signal during the first five minutes of any hour it might well be a test, and you should not notify FAA unless the signal continues past the five minute mark following the hour.

FAA is also concerned with the reverse side of the problem—occasional failure of the ELT to become activated upon impact, although properly armed. One of the most helpful corrective actions, as pointed out earlier in this article, is the location of the equipment in an area of strong survivability, such as the cockpit. Some tail positioned ELTs, even when they survive a crash, may have their antennas snapped off upon impact. There are many cases of ELT signals being picked up despite loss of the antenna, but of course, the range is greatly diminished.

FAA has also conducted a spot check of ELTs in 50 randomly selected airplanes in each of its 10 regions. The check revealed that, in addition to improper installation and undetected corrosion, neglect of battery maintenance is a factor in ELT failures. Regulations for ELTs require that the battery be changed at one half of its shelf life. This means that batteries with a shelf life of one year will have to be exchanged every six months. Longer life lithium batteries, with a shelf life of ten years, need only to be changed every five years. The change date is clearly marked on each ELT, and it should be carefully observed.

Over 100,000 ELTs have been manufactured in the United States, by 14 manufacturers. FAA has been working with the manufacturers to ensure the issuance of service bulletins and in the recall of equipment determined to be defective. In some cases where the design appears to be inadequate, retrofit kits have been made available. In the meantime, accident reports are being studied carefully to build up a base of workable knowledge about ELT performance under varying circumstances. This will enable FAA to improve ELT standards, if necessary, to further reduce the possibility of malfunction.

The primary tools for alerting search and rescue operations are the flight plan and the radio. No one should expect the presence of an ELT on board to act as a substitute for good safety procedures. The ELT was designed to cut down the time required to locate the exact crash site which, without an ELT, can consume hours, or days, even when the flight path or general location is known.

Time is always a key factor for survival in the search for a missing aircraft. At least half of all persons rescued alive from downed aircraft are recovered within the first 12 hours of the crash; another 25 percent are recovered within the next 12 hours. After that, the probability of survival dwindles sharply.

A good example of how the ELT plays a crucial role in saving the lives of crash survivors, even where the locality is known, is the accident that occurred at Oxford, N.C., on May 18, 1974.

A *Cherokee* with three passengers on board had taken off that afternoon on a local VFR flight from Raleigh/Durham Airport. The weather deteriorated rapidly, with strong winds above 30 knots, and by the time the pilot attempted to land he was in thick clouds. He disappeared from the radar screen at a point 24 miles from the Raleigh/Durham VOR, and no further communication with him could be established. The fact that the plane had gone down was confirmed by an ELT signal picked up by a Marine helicopter flying through the area; the copter was low on fuel and could not conduct a search.

Shortly after 7 p.m. the Coast Guard Rescue Coordinating Center (RCC) at Portsmouth, Va., received an emergency call from the control tower at Raleigh/Durham: it had a missing aircraft close by in the area. (Note: The single RCC for all inland aircraft search and rescue is Scott Air Force Base in St. Louis; however, the Coast Guard operates RCCs for all maritime and coastal regions from a number of its bases around the country.)

At 7:23 p.m. a *Hercules* turboprop took off from the Coast Guard Station at Elizabeth City, N.C. about 150 miles from Raleigh/Durham. Twenty minutes later, as darkness set in, a second search and rescue craft, a helicopter equipped with a "Night Sun" (extremely bright searchlight) was also dispatched from Elizabeth City.

The *Hercules* quickly picked up the ELT signal on its homing equipment and zeroed in on it. As the crew endeavored to pinpoint the site, they were handicapped by the driving rains, the heavily wooded hilly terrain—some of the trees towered up over 100 feet, and the night was pitch dark.

When the helicopter arrived, it went down to 500 feet, and began to fly 90 degree intercepts, listening to the ELT signal on its homing device. After a number of runs, the pilot positioned the "Night Sun" on the side of the copter and at 11:30 p.m. sighted the crashed *Cherokee* in the trees.

The copter continued to circle, keeping the area illuminated, while directing ground rescue crews to the site. The ground crews arrived a few minutes later, and by the light of the helicopter they removed the occupants of the *Cherokee*. The pilot was dead, but the three others were alive, although seriously injured. The ground crew drove two of the injured persons to a hospital, but the helicopter made a daring landing between trees and high tension wires a short distance away to lift out the most seriously injured person. All three survived.

Without the presence of the ELT on board, that crashed *Cherokee* undoubtedly could not have been located in the dense woods in the dark and raining night. Rescuers felt that if the three injured survivors had been forced to remain in the woods overnight without medical assistance they all would have perished.

By its nature, the ELT serves as an alerting device in an emergency, and the number of persons or stations "listening" is greater than most persons imagine. All of FAA's 328 flight service stations scattered around the nation, plus some 304 control towers, monitor the MAYDAY frequency constantly, as do all FAA aircraft, CAP and military, and the Coast Guard. Commercial air carriers guard the frequency on a voluntary basis, and all private pilots are urged to do so whenever possible in flight. Whenever you hear that distinctive wail, you should notify the nearest FSS or tower or center.

Just make certain that it is not your own ELT that is wailing away inadvertently. Check it out before you fly—and after. ■

ELT permanently installed in *Baron*, above, sits on shelf just inside of point indicated by pilot. Interior view (upper right) shows attachment to outside antenna. Lower right—portable ELT sits in bracket firmly mounted on fuselage. Mounting on seatback is not advisable.

Famous
Flights

First Around The World

The 1920's was a decade of hectic record-setting flights by all kinds of flyers who generally had one thing in common: a desire to be first at something—as well as rich and famous, if possible. But during the summer of 1924, just half a century ago, a record flight took place based on a direct order from the War Department to its Army Air Service: Fly around the world.

Behind the order was the desire of the Air Service to build up its image in the public mind. There had been numerous efforts to girdle the globe in airplanes flying various national colors, but all had failed for a variety of reasons. The Air Service was determined to leave nothing to chance, and indeed the thoroughness of the support effort expended by the War and Navy Departments did much to reduce the element of danger in the flight.

But it was still a formidable undertaking. In our day, when around-the-world flights are measured in terms of hours, it is difficult to appreciate the task that faced these flyers in 1923, given the limited range, engine reliability and rudimentary instrumentation of the aircraft available in that period. Navigation was primarily a matter of using a compass and a good pair of eyes. The limited service ceilings of current aircraft meant that instead of flying over clouds and fog you had to fly *under* them, even if that called for flying below tree-top level. The rarity of the airplane in most parts of the world meant that repairs en route had to be pretty much a do-it-yourself operation. A friendly reception, if you happened to be forced down somewhere off your route, was by no means assured. A projected journey of some 27,000 miles looked, in that day, at least as long as a journey to the moon did in 1960.

The four Army pilots chosen to command the flotilla of four aircraft that would make the flight all had considerable experience in test flying. Their leader was Major Frederick L. Martin—ironically the only pilot who did not complete the mission. The others were Lieutenants Erik H. Nelson, Lowell H. Smith and Leigh Wade.

The planes chosen for the mission were four Douglas *World Cruisers*, actually converted Navy torpedo planes rigged for wheels or floats. Powered by a 400-horsepower Liberty engine, with a tandem open cockpit, the *Cruisers* weighed about 4,400 lbs. empty and had a payload of 3,000 lbs. Their ceiling was 10,000/7,000 feet, depending on whether the planes were equipped with wheels or pontoons. With a 50-foot wing span and a fuselage measuring 35 feet from prop to tail, the *Cruisers* had a top speed of 100 miles an hour. As part of a campaign to stir public support the planes were named after four U.S. cities—Seattle, Chicago, Boston and New Orleans.

Three of the four aptly named World Cruisers which set off, on order from the War Department, to prove it was possible to fly around the world. *Right*—the two-man crews (pilot plus mechanic) suited up and ready to go, reflect varying moods of confidence and concern as they planned the flight.

The American flight plan differed from all other globe-girdling efforts, which attempted to take advantage of prevailing westerly winds in the northern hemisphere. The *Cruisers* headed west. *Weather*, not distance, was the chief obstacle in the view of the Air Service. No particularly long flights were scheduled; the longest hop (650 miles) was the first segment, from Seattle to Seal Cove, near Prince Rupert, B.C., on the Canadian west coast. By flying over the north Pacific in the spring, at the onset, the Army flyers could hope to avoid the season of heavy fogs over Alaska and still complete the north Atlantic passage—regarded as the most difficult weatherwise—during the favorable weeks of midsummer. They would alternate from wheels to pontoons as conditions required. Navy destroyers would deploy at sea all along their route to offer assistance.

The route was composed of a great circle, from Prince Rupert out over the Aleutian Islands across to Japan, then south along the China Coast and over to Calcutta, through the Middle East to Europe, across the Atlantic via Iceland, Greenland and Labrador, down to Washington, D.C. and finally back to Seattle. The route was divided into seven "divisions," each containing specific stopping-off points as well as emergency or alternate sites, plus a divisional "cache" containing some 480 separate items of maintenance or replacement for the aircraft. The contents of each cache was stowed in such a methodical manner that it was said a pilot could find what he needed in the dark, with the aid of a small flashlight. Even the cache box itself was usable, being of spruce or ashe suitable for airframe repairs.

Trouble was not long in coming once the fleet left the ground at Seattle and headed up the "Inside Passage" to Alaska. Forced to fly close to the ocean surface by thick overcasts, the planes narrowly missed a head-on collision with a steamship as it loomed out of the fog near Vancouver.

Here is how one of the pilots—Leigh Wade—described the flight through snowstorms and fog:

"Our floats were almost on the water most of the time. I flew standing up in the cockpit, braced against the back of the seat with my feet on the rudder bar so I could see over the nose of the plane."

Above—"strange foreign birds" landed on the Yangtze River and churned their way into the harbor at Shanghai as curious boaters milled about. *Below*—after flying more than 20,000 miles, the *Boston* sinks off the British Coast.

Unable to keep each other in sight because of the fog, the pilots often were caught in the prop wash of an invisible team member flying directly ahead of them. On April 30, their luck ran out. The *Seattle*, forced to lag behind the fleet because of needed engine repairs, crashed into a mountainside en route to Dutch Harbor. Miraculously, neither the pilot nor the mechanic were injured, and both were able to hike out of the Alaskan wilderness.

Reduced to a three-plane flight, the *World Cruisers* headed down the Aleutian Island chain to Attu Island. They hoped to land in Paramushiru, Japan, where a friendly welcome was assured, but weather forced them to land in the waters off the Komandorskis Islands, Soviet territory.

The surprised Soviets were friendly enough, but insisted that they had to send a message back to Moscow to find out whether they were to remain friendly. By the time the reply came back—"Njet!"—the weather had cleared and the Americans were ready to take off anyway. From the Komandorskis, the fleet made its way to Japan, bridging the Pacific by air for the first time in history.

From Japan the trio of planes made their way down the China Coast, stopping at Shanghai, Amoy, and Hong Kong. But on the leg to Tourane, Vietnam, the *Chicago* developed serious engine trouble and was forced to land in a river. A replacement engine was available further inland, so the *Cruiser* had to be towed upstream by three Annamite war sampans. Author Lowell Thomas in his book, "The First World Flight" (Houghton Mifflin Co.) said the flyers described the scene this way:

"The war sampans were hitched like tugs to the *Chicago* and the wives of paddlers followed alongside in other sampans, passing water, food and cigarettes to oarsmen during the 10 hour journey."

"In the bow of the leading boat sat a patriarch with a tom-tom, the paddlers dipping to the rhythm of the drum. The chief of the tribe accompanied the party in his royal sampan, his junior wives paddling, while he reclined under a sunshade."

From Tourane, the *Cruisers* flew via Bangkok and Rangoon to Calcutta, bucking sandstorms and 120 degree heat.

Forbidden Freight

In Calcutta, a newspaperman cajoled the crew of the *Boston* into taking him along to chronicle their adventures—at least until the Army officially told them that no stowaways were allowed, which was when the plane arrived in Karachi, 2,000 miles from Calcutta.

In Karachi, the British Royal Air Force encouraged the American flyers to switch from heavy knicker flying togs to shorts, and to wear pith helmets instead of leather. This outfit proved more comfortable except that the Yanks wound up with badly sunburned knees.

From Karachi, the flyers made their way across Iran, Syria, and Turkey, finally reaching Istanbul on July 11. Then they hopscotched through Europe via Bucharest, Budapest, Vienna, Strasbourg, and Paris. At this point fatigue had set in to the point where even Gallic vivacity was lost on them. The flyers shocked the French by falling asleep at the Folies Bergère. London was the next step. There the flyers prepared for the most risky venture of all—the Atlantic crossing.

The trip was to be made from the Orkney Islands to Labrador via Iceland and Greenland—two areas yet to see their first airplane. The Navy strung out destroyers along the route, and stores of gasoline and oil were cached on the two islands. On August 2nd, the crucial stage of the great adventure got underway as the three *Cruisers* headed out over the Atlantic from the northern tip of the British Isles.

This time the *Boston* ran out of luck. An hour and a half after leaving the British Isles, the *Boston's* engine conked out and the plane was forced down at sea. Five hours later, the crew was picked up by a ship, but the plane itself was finished. As the ship's winches lifted the plane from the sea, it broke loose and crashed back down. The *Boston*, after flying more than 20,000 miles around the world, capsized and sank.

Two to go

Now there were only two. For two weeks, the *Chicago* and the *New Orleans* waited for the weather to clear to make the flight from Iceland to Greenland. But soon after takeoff an overcast settled in again and the flight became terrifying. Forced to fly a few feet above the ocean by fog, the two planes had only seconds to dodge massive icebergs looming up out of the sea. For 11 hours this deadly game went on until finally the exhausted airmen landed at Frederiksdal, Greenland.

On the next leg, it was the *Chicago's* turn for trouble. Two hundred miles out from Labrador, both of the *Chicago's* fuel pumps failed and for more than two hours the mechanic kept the plane in the air by working the emergency pump by hand. When the plane landed, he was on the verge of collapse.

A replacement for the ill-fated *Boston* was delivered to Nova Scotia, and the *Boston II* joined the *Chicago* and the *New Orleans* for a tumultuous American welcome. On hand to greet the flyers in Washington, D.C., was President Calvin Coolidge, who was kept waiting for three hours when a rain-storm delayed the flyers. From Washington, the Army flyers headed west for Seattle, arriving back at their starting point on September 28.

The official log book showed a total flying time equivalent to fifteen days, three hours and seven minutes at an average speed of 72 miles an hour. Total elapsed time was nearly six months—no speed record for travelers. What had they accomplished?

They *had* flown around the world, which no man had done before. They had demonstrated that none of the obstacles to international flight could not be overcome by persistence, foresight and courage. Like true pioneers, they had followed the sun. . . . to new horizons. ■

Island Hopping

Your island in the sun may have a few surprises for you.

The smoothness of the air between Palm Beach and Grand Bahama Island is surprising until you realize that without land underneath to absorb the sun's heating rays there may not be anything to trigger the "convection" process, the up-with-the-warm-air-down-with-the-cool-air syndrome that causes so much summertime turbulence. From your comfortable altitude of 9,500 feet you have the island in sight ahead of you before you lose the mainland behind, and soon you begin a gradual descent toward completion of your first overwater experience in a single-engine aircraft.

Ten miles from Grand Bahama, with West End Airport in plain view, you are still at more than 3,000 feet. Knowing the airport is barely above sea level, you advise the control tower you will do a wide 360 degree turn over the ocean to lose altitude. A clipped voice rogers acknowledgment and clears you to land on runway 35, adding that there is no other reported traffic in the area.

As your passengers "Ooh" and "Aah" their first impressions of the Bahamas you complete your circle and set the airplane up for a short field landing. Not that the runway is so short—it is 6,200 feet long—but it spans the entire narrow western neck of the island, and the psychological effect of seeing water off either end of the strip makes you want to get down on the first few feet of concrete—and to get stopped quick. The windsock confirms the crosswind the tower reported, but on final approach, over the water, you find the air still smooth as silk. Everything looks good for a short landing: airspeed on the low side of normal, gear and flaps down. . .

Suddenly, just yards from touchdown on the numbers, things start happening all at once. The nose pitches up—of its own volition—and the airspeed drops rapidly. The screech of the stall warning horn is matched by the passengers' sounds of apprehension. The wings rock precariously, first one up, then the other. This is what you imagine it feels like to fly through a jet's wake, but there are no jets around. You add power, and wrestle with the writhing wheel in an effort to regain control as maps and papers scatter about the cockpit, and finally you get straightened out. You touch down more than halfway along the runway, but you brake to a stop with runway to spare. There is a strained, if relieved, silence in the plane as you taxi to the ramp and get out.

"That," you say apologetically, "is the worst landing I have ever made. I don't know what happened."

But after a chat with some other pilots and a moment of reflection, the mystery is cleared up.

Quite a few of the landing strips in the Caribbean extend right to the shoreline on one (or both) ends, with sandy beaches underneath the close-in final approach. When the sun bears down on the sand it can result in convection turbulence of varying—and unpredictable—degree. If the approach happens to follow a smooth overwater segment it is apt to throw an unprepared pilot for a loop—almost literally—especially if he is making a low, slow approach to avoid a possible overshoot. A large percentage of the accidents and incidents in the islands happen on or near airports with turbulence and/or gusty winds involved, and even though this type of accident does not usually result in fatalities it surely can ruin a holiday.

Your introduction to the Bahamas gives you Island Hopper Lesson Number One: Watch out for turbulence when landing over sand. Keep your airspeed and altitude up to normal. Expect the unexpected.

The Bahama Chain

Thousands of pilots regard the Bahamian Islands as a perfect playground for their personal aircraft—a kind of private pilot Shangri-la. Beginning just over the horizon from the Florida coast, this 750 mile chain stretches south and east in spectacular blue-green waters. There are some 700 full-blown islands in the chain (29 inhabited) and more than 2,000 small islets called "cays" (but pronounced "keys"). The islands are warmed by the Gulf Stream in winter and cooled by trade winds in summer and even during the rainy months (June through October) there is usually some flyable weather every day.

With the closest islands—Bimini and Grand Bahama—only 50 to 60 nautical miles from Florida respectively a pilot can leave the United States and cover most of the 100,000 square mile "sea of islands" without ever being out of sight of land—if the skies are clear. There are about 50 airports spotted through the chain and the Bahamas Ministry of Tourism tries hard to make American pilots welcome. No wonder more than 35,000 flights are made annually between the United States and the Bahamas, and average 150 daily during the "season." A fly-it-yourself vacation is the perfect way to "do" the Bahamas. In fact, it is almost the only way; commercial ships normally put in only at Freeport and Nassau, and commercial air service is available to less than half the airports. Island hopping becomes an ideal place to demonstrate the appeal of small aircraft.

However, island hopping throughout the Caribbean produces many avoidable near-mishaps, like the one described above, plus accidents with more serious consequences. Only partial accident statistics are available, since National Transportation Safety Board and Federal Aviation Administration assist in investigations only when invited to do so by the island government. This generally happens when the plane is registered in the United States and the accident involves a fatality or some other serious factor such as ditching, or when an air taxi or air carrier is involved. NTSB records for the year 1969 through 1973 include 39 accidents (28 to twin-engine aircraft, 11 to singles). Of the 39 there were 13 fatals involving 38 fatalities. By far the majority happened on or near airports during take-off and, to a lesser extent, during landing, go-around or taxi. Other mishaps involved ditching (either because of mechanical failure or fuel exhaustion); flying too low, (mostly for sightseeing or buzzing, but in at least one case during a search mission); and landing off airports (during emergencies or as precautions, or occasionally, just for a lark). The forced landings, whether on water or land, often happen when pilots become disoriented because of poor weather conditions, detouring around clouds, or faulty navigation—or all of the above.

A study of island hopping accidents reveals that almost all of them could be avoided by strict observance of the basic safety rules recommended for all flying, whether over land or water. These precautions have a special significance for overwater flight which sometimes has to be seen or experienced to be believed.

Low flying is a constant temptation when over the fascinating land formations and water scenery of the Caribbean, but it is a serious distraction to pilot responsibility. A case in point involved a pilot who ditched, fortunately with no injuries, but with loss of the aircraft, on a reef near Andros Island. His engine quit when he was several miles from shore at low altitude, circling a shipwreck trying to determine if it was one of the pictured "clues" in a "Flying Treasure Hunt." The pilot and his passenger were so intent on looking outside that he failed to notice the loss of oil pressure in the rented aircraft, and when the engine quit there was barely time for a hurried "mayday" call on the radio before setting the plane down on the water. Fortunately he followed all the ditching rules—gear up, door propped open, touchdown just above stall speed—and the plane neither somersaulted nor cartwheeled, but skidded to a halt and settled slowly into the ocean. The two occupants had time to get free of the aircraft and inflate their life jackets before the plane went down—about three feet. Although several miles from shore they had ditched in waist deep water, *on a reef*. Helicopters from the nearby RCAF base, standing by during the event, came on the scene to pluck the airmen from the wing of their half-submerged airplane.

Risky Rubber-Necking

Altitude represents insurance—especially overwater, when it could mean the difference between a forced landing on land, instead of offshore, or within swimming distance of the coast, rather than on open water. Low level rubber-necking can also distract you to the point where you forget to watch for traffic as well as for danger signs on the instrument panel.

Although perhaps this ditching pilot could not have *prevented* the oil leak that caused the engine failure, there are incidents that occur because pilots fail to make sure that the airplane they are about to use for island hopping is in perfect condition before leaving home, ignoring the fact that a malfunction over the water or on a remote island is not only dangerous, but also expensive and inconvenient. Maintenance is spotty. FAA's current schedule of "Approved Repair Stations" does not list any in the Bahamas. Island mechanics are in short supply (most small airports have none), and those that do work there find it hard to obtain current data such as airworthiness directives, service bulletins and other aids for staying up with approved techniques. Fuel (mostly 100 octane) is readily available, but the price increases as you get farther from the United States and it may be stored in drums. You will need to have your own tiedown stakes and ropes at many small airports.

One new private pilot had his glowing description of the joys of private flying blasted, in a money and time-consuming fiasco at an out-island airport because he did not realize there was no maintenance available there. With 100 hours in his log-book and a second-hand airplane of his own, the young Florida flyer was still excited about the new vistas his airplane afforded him, and was inclined, at times, to brag a little. When friends doubted his word he determined to *show* them: he took them out early one Saturday morning to a nearby island, with snorkel gear on board. (The fact that his engine was a little rough on the runup did not bother him—he had always before found maintenance help available everywhere he stopped.)

The snorkling was all beautiful, as promised, but when they prepared to return one mag drop was too alarming to be ignored, and did not improve after leaning on one mag to burn the carbon off the plugs. The airport had an on-demand fueler and a small customs office, but no mechanic. Long discussions and experimentation yielded no answers to the excessive mag drop, but another pilot, landing to refuel his light twin, was pretty sure the problem was spark plugs. Seeing no alternative, the Florida pilot accepted a ride in the twin back to Nassau, hoping he could somehow bring back help, and leaving his two guests to find a night's lodging on the island. At Nassau he managed to get spark plugs and arrange for a charter flight back to his plane next morning, but he was unable to engage a mechanic.

He returned with the plugs, and installed them. The engine *seemed* okay during the flight back to Florida, but no one in the plane was able to relax. Back at his home airport the pilot immediately put the airplane in the shop, and eventually the mags were replaced. The cost was minor compared to the charter flight and lodging expenses he had incurred in the islands. *Lesson*: Be sure the airplane is in top shape before you go island-flying.

A facility much used in the States but conspicuous by its absence in most of the islands is the old familiar VOR. There are only three in the Bahamas—at Bimini, Freeport and Nassau (the last two have DME). Automatic Direction Finding (ADF) equipment helps—there are about 15 low-frequency non-directional beacons (NDB) scattered about, but that still leaves a lot of airports with no homing facilities. It is a good idea to have current charts (ONC charts cover the area, but, remember, they include no frequencies) and to refresh your ability to read the landmarks on the surface. In island hopping this translates to shapes of islands and cays, lighthouses, sunken ships, ocean depth, underwater reefs and the like.

Cloud buildups can be either ominous, or helpful. Frequently they gather over an island, serving as a signpost that land is ahead. But when cloud accumulations over water have curtains of rain reaching down to the surface they should be avoided—if you cannot *see* under them, do not try to *fly* under them. And when patches of grey scud sweep low across the sea it is high time to do a one-eighty and get on the ground, the sooner the better. Tropical storms have a reputation for sudden violence.

(The second half of this article, spotlighting additional areas of safety concern when flying in the Caribbean, will appear in the October issue.)

The birth of "air" craft. Montgolfier brothers launch first hot-air balloon over Paris in 1783.

Keeping Your Balloon in Shape

In the third century B.C. the principle which makes ballooning possible was discovered by the Greek mathematician, Archimedes: *when a gas less dense than air is enclosed in a container the difference between the density of the gas and the air it displaces causes the container to rise.* The modern hot air balloon operates on the same principle, although it uses heated air instead of the lighter gas, for a very good reason: economics.

To fill a three-passenger balloon with helium, for example, today in the United States would cost about $2,500. Hydrogen for the same balloon (dangerously inflammable) would cost about $800. The bill for propane to heat a comparable hot air balloon flight might come to about $10 or $15. This rapid economic descent, with vastly increased safety, is largely responsible for the return to popularity of the ancient sport of ballooning. Although it has no lateral controls, the modern balloon is recognized and certificated as an aircraft and its operator is required to understand its components as well as be responsible for its safe maintenance.

Starting at the bottom, the first component is the gondola, or basket (so-called usually only if it is made of the traditional lightweight wicker). Aeronauts are such traditionalists that some will trim their aluminum gondolas with wicker for the sake of appearances. Wicker, of course, is a remarkably durable substance for its weight, and has many advantages for ballooning comfort, but it is subject to "embrittling" with age, as well as rot, and it can be damaged by being dragged over rough or stony terrain. Baskets should be checked regularly for signs of damage or loss of resilience, particularly along the floor and at the attachment points for the envelope cables. Aluminum gondolas with plastic liners require less upkeep, but the welds should be looked at after hard use, especially on the bottom.

The propane fuel tanks for the burner are usually stored on the floor of the gondola. These could be dislodged by a hard landing, so they need to be looked at regularly after a flight to make certain they are secure and no leakage has developed at any of the fittings, and that the fuel quantity gauge is still operative. The latter is a particularly important source of information to the pilot, and occasionally gets stepped on or kicked out of commission by an excited passenger in the crowded "cockpit."

Additionally the gondola will also contain a drag rope, for landing; a tether rope for holding down the balloon during launch until enough heat has been generated for lift-off; protective headgear, which many flight manuals designate as required equipment because of the possibility of a jarring landing; heavy leather or asbestos gloves for working around hot burners; a sparker, for re-lighting the burners if they should flame out in flight, plus a cigaret lighter or matches, as backup for the sparker; a portable radio; and some current sectional charts. The latter are useful, not merely for navigation but for identifying radio frequencies along the way. (For flights above 10,000 feet, portable oxygen should be available for all on board.)

The absence of confined storage space in most gondolas makes it essential that necessary equipment be stowed carefully in place after each flight, and checked again before departure.

An abbreviated form of instrument panel is usually located at one upper corner of the gondola. The only required instruments for hot air balloons are a compass, altimeter, rate of climb indicator, fuel quantity gauge and envelope temperature indicator.

Rate of climb or descent is deceptive in a balloon. Because of the gentleness of motion in flight, many aeronauts, especially at altitudes over 1,000 feet, experience little sense of upward or downward motion until a very high rate of vertical movement has been attained, without the help of an instrument.

Another key instrument is the *pyrometer*, which indicates the temperature at the crown of the balloon envelope (the highest point). Without a pyrometer it is possible to build up more heat in the balloon than it can safely withstand.

The old pilot's standby, the magnetic compass, is more useful than some balloonists imagine. The balloon pilot cannot steer by the compass, but it gives him some idea of the direction in which he is traveling, which is not readily apparent under many conditions of weather.

The heart of the balloon is the burner, which shoots a flame up toward the open throat of the balloon. It is usually rigged

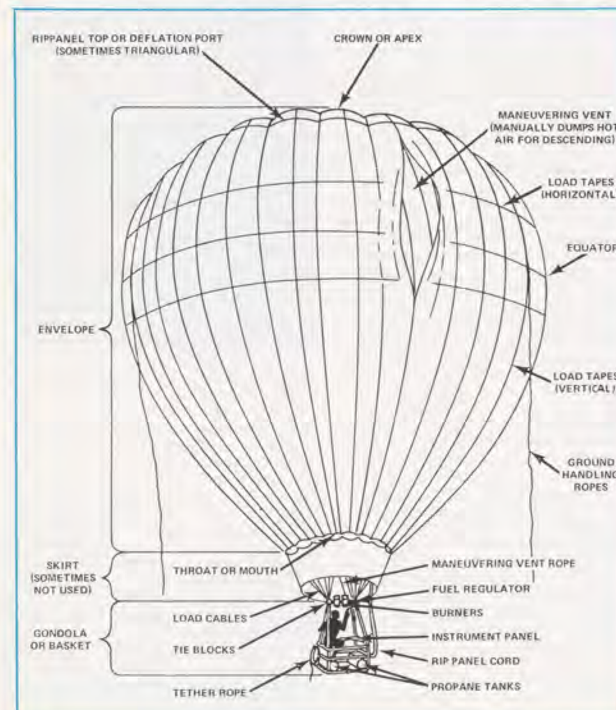
on a brace over the pilot's head, and controlled simply by means of a hand valve. The fuel is liquified propane, which passes first through preheat coils, where it is vaporized. When the rapidly expanding gas is ignited it roars up toward the envelope, producing enough heat to run a hundred normal household furnaces for an hour.

Many balloons have two or more separately functioning burners. Each has a metering valve which gives a fine, low flow of heat for "cruising" at a constant altitude; in addition, each has a blast valve which gives maximum fuel flow only, and is used during flight in short bursts (accompanied by savage roars).

Almost all balloons in use in the United States today use airborne heaters fueled with propane, commonly known as liquified petroleum gas (LPG). At normal atmospheric pressure and temperature, propane is a colorless, *odorless* gas. Propane vapor can be detected (smelled) only by the odor which is artificially added to it by the refiner. Since the type of odor added varies from one refiner to another, it is not possible to identify propane universally in this manner.

At atmospheric pressure, propane boils at minus 42 degrees F. However, when confined in a closed container at normal atmospheric temperatures, liquid propane will vaporize only when the pressure within the container reaches a temperature-dependent level of between 50 (30°F.) and 150 (90°F.) psi. This gives rise to some problems of lack of vaporization when attempting to fly balloons in cold weather. When the ambient temperature is 30 degrees F. or less, and the vapor pressure no more than 50 psi., some makes of hot air balloons cannot be flown without danger of flame-out. The practice of some pilots of warming the propane tanks indoors before a flight is a very unsafe procedure, as an explosive ignition can take place under these circumstances. At present there is no good solution to the problem of vaporization in cold weather except to postpone flying the balloon during this season.

Otherwise, propane appears to be an ideal fuel for this type of flying. It is readily obtainable almost everywhere (no special "aviation type" is required); it is self-fed to the burners without the aid of a pump, under favorable circumstances; and it burns cleanly, without leaving significant deposits or harmful substances on the balloon envelope.



Contamination of propane is rarely encountered in the United States. However, small amounts of water occasionally find their way into propane tanks or fuel lines, and this may cause trouble. If the propane vaporizes at a valve, for example, it is possible that any water present will freeze and form ice within the valve. Usually this brings about loss of effectiveness of the valve-stem seal, and consequent leakage of propane at this point. Once a leak of this type has started it is not likely to stop until the propane supply is turned off and the valve warmed to thaw the ice. Ice anywhere in the system, incidentally, can interfere with the proper functioning of pressure regulators.

If a pilot suspects that water has got into his fuel tanks, he can prevent problems by having a small amount of methanol added to the tanks by his dealer. The methanol acts as an antifreeze, and has no significant effect on the performance of the burners or fuel system.

Propane flows from the tanks to the burners through a combination of flexible hoses, metal lines and metal fittings. Flexible rubber lines are usually used throughout, except in the immediate vicinity of the burners, where the heat might damage the rubber. The metal tubing and fittings are heat resistant but vulnerable to physical damage; careful precautions must be taken to protect them.

In the balloon, you have a series of metal fittings connected together into a fairly long assembly with one end rigidly connected to a tank, burner unit, or relatively unmovable part of the rig. If force is accidentally applied to the free end of such a conglomeration (as from strain on a cable, for example, on landing), the fitting closest to the rigid attachment point is likely to break.

Furthermore, "quick release" fittings which are sometimes used in hot air balloon fuel systems to facilitate connecting and disconnecting fuel lines, have a history of unreliability. Most of the fittings were not designed to carry liquid or vapor propane, or to operate reliably at the extremely low temperatures that can result from propane vaporizing in the line at the fitting. Such fittings can be easily jarred loose if accidentally brushed by the pilot or a passenger during the flight, or by the jostling that often takes place during a landing. A very serious leak can develop if one of these fittings fails to seal.

The LPG standards for propane tanks and fittings are quite high—they must be

(Continued on page 12)

Ballooning (continued)

able to withstand hydrostatic testing up to 1,750 psi. The standard operating pressure for pressure release valves is 375 psi. Fuel systems on sport hot air balloons rarely, if ever, experience pressure greater than 250 psi during flight.

The modern hot air balloon burner is designed to perform three basic functions:

1. Vaporize the liquid propane.
2. Mix the propane vapor with air to form a combustible mixture.
3. Burn the resulting mixture to form a directional flow of very hot gases which enter the open throat of the envelope.

The burner consists of a cylindrical metal "can," open at both ends, the upper section of which is encircled by a coil of fuel line tubing. The liquid propane is preheated in the coil to vaporization; the vapor emerges from a nozzle at the base of the "can." The nozzle separates the vapor into three or more streams, directed upward, which mix turbulently with the ambient air and are ignited by the pilot light.

The result is a tremendous output of heat—the current trend is toward burners that have a maximum output in the range of eight to ten million BTUs per hour. Earlier hot air sport balloons had no more than half this output. The more powerful burners result in somewhat safer balloons, since the greater rate of heat output available makes the balloon much more responsive and maneuverable.

Fuel management problems occur in hot air balloons; as in other types of aircraft they are usually avoidable if good judgment and procedures are used. It is good practice, for example, to burn off both tanks alternately in the course of a flight. In this manner if one tank proves inoperable, the discovery will come at a time when the course of the flight can be safely altered. It is preferable to have only one tank valve open at a time; this will prevent total exhaustion of fuel, in the event the pilot, enraptured by the joy of floating in the sky, forgets about the passage of time.

Veteran balloonists recommend that when preparing to make a tank switch you add a good burst of heat to the envelope. This assures you that, if you become preoccupied with some problem in the switching, you will not be descending inadvertently into an unfriendly terrain.

Balloon pilots sometimes do get forgetful about which tank valves are open, and many of them are not clearly marked. A good procedure for avoiding confusion is to move the handle back half a turn or so after opening it. This allows the pilot to determine quickly if a tank valve is open by simply "twiddling" it. If it turns in both directions, it is open; if it turns in only one direction, it is closed.

Finally, we have the component known as the envelope, the hot air container which is not exactly a balloon in that it is open at the throat at all times. ("Balloon" is a term which refers to the complete apparatus.) The envelope is usually made of high-strength, heat resistant, rip-stop nylon, and it is fastened to the gondola by means of heat resistant steel cables. The envelope is coated internally with a plastic material which helps contain heat. One manufacturer recently tested the heat resistance of his nylon envelope by heating the air in it to 250 degrees F. for a period of 250 hours without any degradation of the fabric.

Above—aids hold the mouth of the partially inflated envelope open while the aeronaut turns on the propane burner to start heating the air. Right, basket assembly is inspected.

The individual strips of the envelope fabric are called "gores." Sewn into the seams of the gores are horizontal and vertical "load tapes" which help the balloon maintain its shape when inflated. Load tapes are usually made of heavy nylon webbing, similar to the material used in seat belts. Some balloons also have a nylon "skirt" or "collar" attached to the open throat of the envelope, to shield the burner from wind gusts or shear.

The envelope has two opening ports—one at the crown, or very top, and one high on the side. The crown contains a deflation port, a large circular piece of fabric which can be separated from the envelope by means of a ripcord. It is used on landing to achieve rapid deflation and prevent the balloon from buffeting on the ground. The side port is a smaller vent, also activated by a ripcord, which allows the pilot to dump hot air and decrease altitude in flight. When the cord is released the vent is closed immediately by pressure from inside the envelope. Both of these venting sections should be checked regularly by the pilot, as they are vital to his control of vertical movement of the aircraft.

Like other aircraft, balloons must have an FAA Airworthiness Certificate. They require inspection from a certificated mechanic, annually or every 100 hours (if they carry passengers for hire); and they must keep a log of inspections and repairs. NOTE: Some manufacturers recommend a 25 hour inspection in addition to the annual inspection.

Homebuilt balloons, which make up about 30 percent of the present balloon "fleet" are not subject to these requirements. However, these must be monitored during construction by an FAA GADO inspector, who will also determine the frequency of inspection required for the completed aircraft in order for it to be airworthy. The inspector may also impose certain limitations on its operation that he feels necessary for safety—he may restrict its flight to open country only, for example.

All required inspections must be carried out by an FAA certified aircraft mechanic, or an appropriately FAA approved repair station. He will inspect the envelope for possible heat damage and test the fabric for strength, for tears, abrasions, and seam separations. The cables will be checked for burns, abrasions or excessive wear. Both vents will be examined carefully, especially the condition of the Velcro fastener which opens them. The burner system will be checked over for leaks, for proper pressure and ignition. The color of the flame will indicate whether a proper mixture of fuel and gases is taking place; the normal flame is blue. The gondola will be inspected for structural integrity.

As with other certificated aircraft, the pilot can legally perform only "preventative maintenance" on the balloon. Normally this would be limited to minor patching of fabric, such as stitching a patch cloth over a hole or tear. After each flight the pilot should take pains to brush the Velcro fasteners at the vents clean, to make certain they are not choked with bits of grass, dirt or other debris accumulated in the landing.

After the flight the envelope is usually folded and placed in a cloth bag, which fits into the gondola for carrying purposes. The balloon should be stored only in a cool dry place, to avoid mildew. The storage area should be free of rats or mice, which sometimes enjoy nibbling at the fabric or wicker.

Finally, special care should be taken in the storage of fuel tanks, even when they are considered empty—there is always some residual propane present. The basement of your house is definitely not recommended. Leakage of propane is always a possibility, and in that case the propane can be ignited by any household equipment with open flames, such as water heater, furnace, etc. The lifting power of propane has been well established. There is no need to test it with your home. ■

(Editor's note: For an introduction to hot air ballooning, see the April 1974 issue of FAA AVIATION NEWS. A subsequent article in the series will discuss ballooning accidents and operating procedures.)

After the flight the aeronaut first packs the envelope into a canvas bag, then into gondola for transporting. Burners at left generate maximum heat output of 4,000,000 BTU/hr.

Pilot BRIEFS

■ DOWN IN THE DUMPS. Determining how—and whether—the dump valve works should be a high-priority item in a pilot's ag-plane familiarization. Prompt dumping can lighten the aircraft enough to enable it to clear a threatening obstacle; or lessen the danger of exposure to toxic chemicals if impact does occur. Different aircraft have different systems, and although rules say that all must be capable of dumping half the hopper load in 45 seconds they are only effective if usable—and used. Several ag-plane accidents in 1974 were needlessly serious because the dump valve mechanism would not work, or because the pilot either forgot to use it, or could not quickly locate the handle in an emergency. Practice until you can instantly locate the dump valve control of any duster you fly.

■ CONTROL CABLES AND BATTERY ACID are poor mixers. Routine inspections of light trainers have disclosed several rudder control cables that were badly corroded. The cables, which had been routed under the battery box, had worn through the box, permitting battery acid to leak into them and the surrounding fuselage structure. Any cables or any other components which are positioned adjacent to the battery should be checked frequently for corrosion and wear against the battery box.

■ QUIET PLEASE. Airplane and helicopter pilots flying VFR are being asked by FAA to help keep down noise levels when flying over noise-sensitive areas such as hospitals, schools, churches, nursing homes, National Parks and outdoor assemblies. Suggested methods of reducing aircraft noise include use of above-minimum altitudes and selective flight paths. Voluntary cooperation may prevent the need for regulations on this subject.

■ FLYING PETS. New rules governing the shipment by air of pets and other animals have been adopted by FAA following recommendations made by the House Committee on Government Operations in a report entitled "Problems in Air Shipment of Domestic Animals" (House Report 93-746, Dec. 21, 1973).

The rules, which apply to shipment of animals in containers in an aircraft's cargo compartment, provide for security of stowage of the container to prevent shifting; protection from crushing or damage by other cargo, and assured adequate ventilation.

■ MAGNETIC ATTRACTION. A new FAA Advisory Circular cautions pilots who carry cargo that might contain magnetic materials (ferrous metals, magnetron tubes, etc.) that such cargo, if not properly packaged, shielded and located, can cause serious navigation errors by affecting the magnetic compass. The circular contains guidelines for determining if magnetic strength of packaged cargo is of an alarming level, and for marking, packaging and loading. If packages cannot be placed at least 15 feet from the magnetic compass a special compass compensation may be required. For free copies of AC 103-5, "Preparation and Loading of Magnetron Tubes and Magnetic Materials for Air Shipments," write DOT Publications Section, TAD-443.1, Washington, D.C. 20590.

Special Classification Proposed for Homebuilt Aircraft

A new special airworthiness certificate classification, "Custom-built", has been proposed by FAA for amateur-built aircraft. These, as well as aircraft used in exhibition and air racing, market surveys, sales demonstration and research (not related to aircraft development), would be separated from the experimental classification. The new special certificates would remain in effect indefinitely, if aircraft were properly maintained and not greatly modified, except those assigned to marketing and sales aircraft, which would have a one-year duration.

Amateur or custom-built aircraft are defined as those whose major portion is fabricated and assembled by persons solely for their own education and recreation, although certain listed components could be purchased ready-manufactured. These include props, wheels, instruments and brakes. An "Owner/Operator" manual would be required for custom-built aircraft, as would placards advising of special status and any restrictions on acrobatic flight.

To receive a special certificate, a custom-built aircraft would have to complete 40 to 60 hours of flight tests, depending on the engine, and would have to pass an FAA safety inspection for hazardous features or characteristics.

Under the proposal, experimental certificates—which would still be revalidated, yearly—would apply only to aircraft actually used in experimental operations such as flight testing of new aircraft designs, operations to show compliance with FARs, and flight training of crew members to qualify them for experimental work. The proposed rule would not be applied retroactively to amateur-built aircraft already certificated as experimental; owners could retain the experimental certificates unless they chose to qualify for a new special certificate. There would be a two-year grace period to accommodate persons presently involved in building and certificating their own airplane under existing regulations.

Comments on the proposal (Notice #74-29) must be received before November 6, 1974 by FAA, AGC-24, Washington, D.C. 20591.

ATIS Evaluated for Small Airports

Tests to evaluate the use of Automatic Terminal Information Service (ATIS) for non-tower general aviation airports are currently underway in the Washington, D.C. area. Information on traffic flow and airport conditions for three northern Virginia airports—Leesburg, Manassas and Woodbridge—is being broadcast regularly over the ARMEL VOR/TAC (113.5) at Dulles Airport during the three-month test which will continue until November 1.

The taped ATIS message is based on periodic reports from personnel at the three airports, and is carried on the air during the hours the airports are attended, from 8 a.m. to 9 p.m. The broadcast is updated by the Washington FSS whenever new data is received. Pilots are advised, however, that information received on UNICOM frequency takes precedence over that on the ATIS frequency.

Two Fuel-Saving Measures Studied

Two new aviation fuel conservation alternatives will be examined by FAA in a follow-on to the seven-point fuel conservation program launched last November. The two new measures, if proven feasible, have the potential for saving some 487,200 gallons of fuel daily. Previous FAA actions, capable of saving an estimated 210,000 gallons per day, included assisting airport sponsors to expedite new runway and taxiway construction and developing optimum descent procedures at airports.

Studies will be conducted at 20 busy commercial airports to learn how much fuel could be saved by towing aircraft to and from runways, and accelerating the installation of instrument landing systems (ILS). During IFR conditions airport operations are slowed and aircraft can use only ILS-equipped runways.

FAA Surveys Hazardous Air Cargo

An FAA survey indicates that only about four percent of passenger flights carry "hazardous" materials and less than two percent carry materials classed as "radio-active." The survey of aircraft departures was conducted by FAA field inspectors from January 1 to April 15, 1974 and included 100 operators and about 400 airports across the United States.

A recent FAA evaluation of air shipment of hazardous materials indicated that shippers' noncompliance with surface transportation as well as FAA regulations is a widespread problem. FAA is strengthening its inspection staff, and scheduling training courses in handling such materials for operators and shippers as well as for FAA inspectors.

BIG BIRD, and the flight engineer. Mrs. Carol Jane Jeffus, the first woman rated as a flight engineer in Alaska, being checked out by Paul S. Donohoe of the FAA District Office at Fairbanks in the cockpit of the huge Alaska International Air Hercules in which she spends 12-hour flying cargo trips along the oil pipeline.

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.

• Three-point Comment

I have three questions. In your June article, "Walking Away From It" you state, "short sleeves or shorts are out" for flying, but isn't that a short sleeve shirt the man in the illustration is wearing? Second, I read from your mag from cover to cover but rarely find an article directly related to my end of aviation—the good old mechanic. A good job by the mechanic is taken for granted but we spend much time and effort to keep astride of new techniques and changes and all we hear is gripes about our charges. Third—I believe safety in aviation could be improved if the Government Printing Office made it simpler and quicker to acquire AD notes, FAR's, aircraft specs and other safety aids.

Jim Robinson
Tifton, Ga.

The sleeves are short, but justified. The photo was taken during a shoulder harness demonstration and the model removed his jacket so that the harness would better show in the picture. Still, you have a point.

For mechanic stories, see "Return From Fletcher's Island" (June 1974), "The Preventor" (July 1974) and our February 1974 cover photo of Claremont, N.H. mechanic Nick Augustinovich.

As for your third question, the Superintendent of Documents (not FAA) has the responsibility for both pricing and distribution of sale items from GPO. We have forwarded your comments on that subject to his office.

• The AIM to Please

I enjoyed the article, "The Good Book," in the May issue. I subscribe to all four Parts of AIM and feel that it is a necessary part of every pilot's library. It disturbs me, however, that the cost of AIM has gotten so high. I'm afraid that many pilots do not subscribe because of the high cost. Nearly half of the subscription rate of $45.50 per year is for Part 3 and 3A. Much of the airport information in Part 2 (Airport Directory) is repeated in Part 3 (Airport/Facility Directory). Could not this duplication be eliminated by combining these two parts and thereby reducing the cost?

Bouldin Frantz
Salem, Va.

FAA is looking at, in the early experimental stages, a new Airport/Facility Directory that would contain an expanded and combined form of the airport information now found in Parts 2 and 3. This new publication could be issued in several geographically separated volumes, allowing pilots to subscribe only to the volumes they need.

We have also considered dropping the airport data from Part 3 and including only communications data and navigation aids similar to the old Airman's Guide format. One factor to be considered, however, is that many subscribers take one, but not both, of Parts 2 and 3.

Every effort is being made to reduce the cost of AIM; over the years a variety of measures have been explored, some of which are still actively under consideration. Some of the suggested plans for keeping costs down, we find, would actually cost more in the long run.

• Cleaner is Safer

Your article on crash survival in June was very informative and interesting. In discussing post-impact fires and protective clothing, you touched on the necessity of having your flying clothing clean in order to prevent infection of burns. There is another very important reason flight apparel should be kept clean. Dirty clothing is much more highly combustable than clean clothing and has a tendency to burst into flame when exposed to high temperatures and flames. The dirt and grease in dirty clothing provides an excellent fuel source and is extremely dangerous.

Steven Morrison
St. Louis, Mo.

• "Bonehead" or Smart?

July Pilot Briefs gave a "Bonehead" award that I cannot agree with. The "Bonehead" took off VFR without a radio. Nothing wrong with that. When weather conditions worsened he landed at the nearest field. That makes sense. He kept his head, hard or otherwise, and saved his tail. A real bonehead would have continued on looking for an uncontrolled field. A real bonehead would have tried to avoid a situation and a suspension at the risk of his life. True, he forgot his license and his medical certificate. That *is* a violation, but certainly not "careless and reckless." There may be other details, but based on what we were told in Pilot Briefs I think "Bonehead" was pretty smart.

Charles R. Ferris
Northridge, Calif.

A key factor in charging the above pilot with "careless and reckless" operation was that unsafe conditions did exist—and were known to the pilot—when the flight began. This should have been indicated in our original "presentation."

• Needed: A Single Index

FAA AVIATION NEWS, AIM Part I, Advisory Circulars and Exam-O-Grams are four of the most often used publications in my office, but I cannot remember everything that is in each one. The publication of a single index covering all four of these excellent sources would be of great assistance to many instructors and pilots. If such an index could be published quarterly it might also be a time and money saver in FAA offices.

Dave Marsh
San Jose, Calif.

We are investigating the feasibility of compiling such a combined index.

• Passing Through the Pattern

Please remind pilots that it is in violation of FAR Part 91.85 to fly through an airport traffic area unless you are landing or taking off. This happens frequently, and recently a twin Cessna flew right over me as I was turning base at Blatter Field at Orrville, Ohio. He was right at pattern altitude (fortunately I wasn't) and seemed to be traveling close to 200 knots. Visibility was only about three miles at the time.

Robert L. Kirk, D.O.
Smithville, Ohio

The term, "airport traffic area," as used in the FARs refers to the area immediately surrounding an airport with an operating control tower. It is generally a circle with a five mile radius, extending up to 3,000 feet above the airport elevation. This does not lessen the importance of all pilots, whether landing at or traversing an airport area, exercising extreme caution in watching for other traffic, particularly at or close to traffic pattern altitude. Many pilots take the precaution of announcing their position on 122.8 at airports where there is no UNICOM.

• Where is "The Memphis Belle"?

Back in June of 1969 you stated in Flight Forum that a copy of the movie, "The Memphis Belle," could be obtained from the U.S.A.F. Film Library at an address in St. Louis. I wrote to that address recently and my letter was returned marked "Moved." Can you give me a current address?

Edward G. Schultz
Bellevue, Wash.

For information on "The Memphis Belle," a color documentary which followed a particular B-17 through 25 missions in World War II, write to U.S.A.F. Film Library, Headquarters Aerospace Audio-visual Service, Norton AFB, Calif. 92409. Phone (714) 382-3218.

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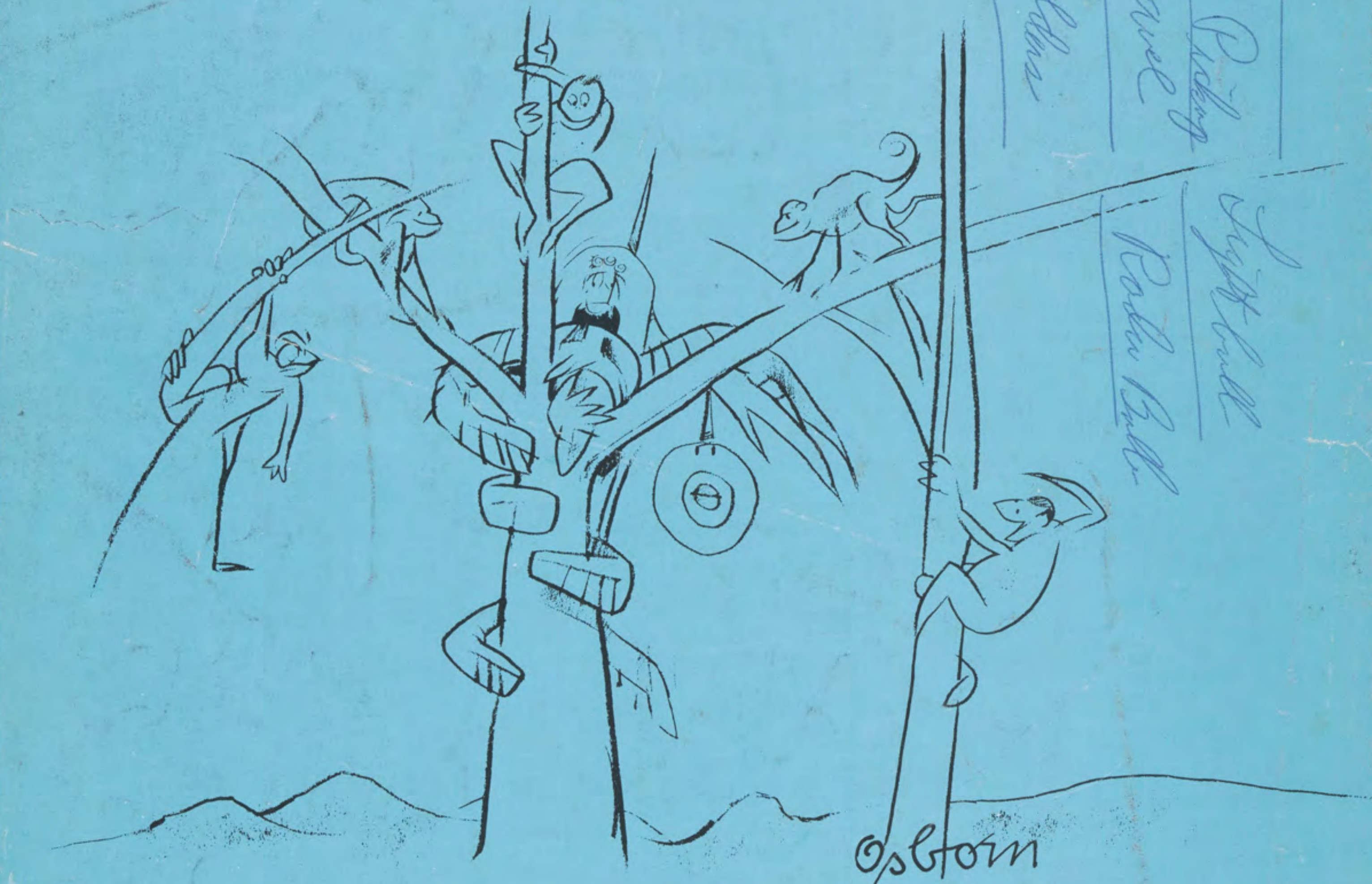

You could be up a tree.

Suggested by Al Barnes
Rocky Mountain Regional Office, Denver, Col.