# FAA | AVIATION NEWS

JANUARY 1963

F E D E R A L   A V I A T I O N   A G E N C Y

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FEDERAL AVIATION AGENCY

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## AIRPORT DEVELOPMENT ESSENTIAL

Progress in improving and expanding the national airport system is marked in a variety of ways. But as the system moves forward, we are constantly reminded of future demands that call for even better efforts to keep aviation's ground base abreast with the rapid growth in flying.

One approach is to increase the utility of present airports. At the top of the scale—the world's busiest field—a new technique has been introduced to increase the capacity of Chicago's O'Hare International Airport. This is the dual landing operation described on page 3. It permits simultaneous landings on parallel runways.

Farther down the size scale is the new public airport which will be built to serve the Grand Canyon tourist area. As outlined on page 5, the local authority, in this case the U. S. Department of Interior, has joined with the State of Arizona and the FAA to develop an airport in an area where air service is needed. This is a pattern that should be emulated across the nation.

The most critical ingredient is recognition of the need by the local authorities. Whether it be the Interior Department or a group of local citizens, the community itself must awaken to its aviation needs and be ready to do something about them if airport development is to be successful.

And then there is another story on page 5 projecting the scope and variety of flying that will be done in this country over the coming years. The general aviation fleet is expected to increase more than 20 percent to 99,000 aircraft, with a nearly 30 percent increase in flying hours. It is clear that airport development must be stepped up to cope with this surging growth, especially in the various fields of general aviation.

The FAA is moving in many ways to contribute to a bigger and better national airport system, and so are many other organizations. The closer they work together, the easier the job will be.

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*COVER: FAA radar controller coordinating a "hand-off" of aircraft about to leave his Center's jurisdiction for an adjacent Center's.*

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# PARALLEL ILS APPROACHES INSTALLED AT CHICAGO O'HARE INT'L AIRPORT

Simultaneous ILS approaches on parallel runways have been instituted at Chicago's O'Hare International Airport in an effort to increase the airport's acceptance rate and thus reduce costly delays. It will serve as a prototype for other large hub airports.

The new procedure is an outgrowth of a nearly two-year test program conducted at O'Hare and at FAA's National Aviation Facilities Experimental Center (NAFEC) in Atlantic City. During fiscal year 1962, O'Hare led all of FAA's 263 towers in total aircraft operations (landings and take-offs) wth 374,000, and in total IFR operations numbering 247,466. It was not unusual to have as many as 120 operations an hour during peak periods.

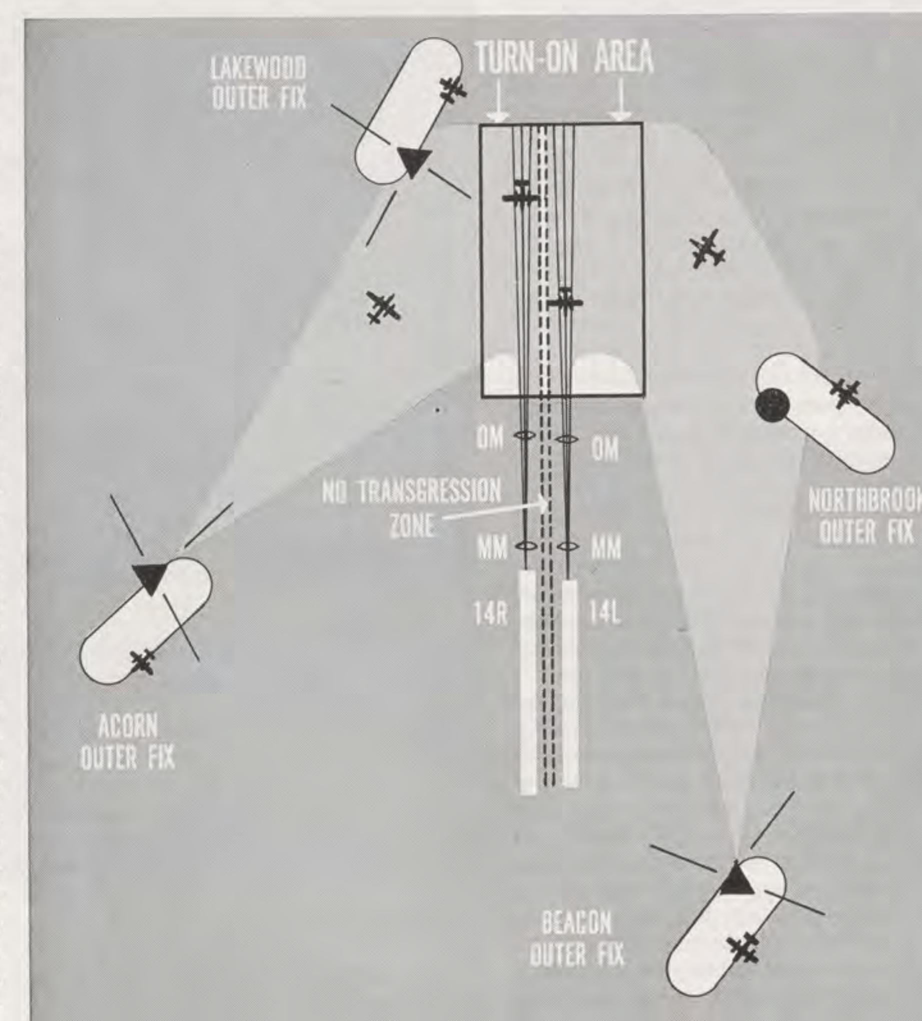
While the separation between O'Hare's dual runways, 14 Left and 14 Right, is 6,510 feet, FAA has set a national standard of a 5,000-ft. minimum between parallel IFR runways for other airports interested in adopting the program (*see* illustration).

Aircraft participating in the parallel ILS approach system are required to operate under IFR procedures regardless of weather. The ATC procedures also must be adapted to the local environment. Aircraft must be equipped with a functioning 75 megacycle marker or airborne direction finder, localizer and glide slope receivers, and have the capability to monitor simultaneously both the assigned air traffic control frequency and the appropriate localizer voice frequency when advised by the approach control facility at the tower.

The use of radar is an integral part of the operation to ensure longitudinal separation between planes on the same localizer course and lateral separation between aircraft on parallel courses. As a minimum, the approach control facility must be equipped with ASR-4 radar for accurate surveillance. Aircraft are radar vectored to one of the two final approach ILS courses from any of four outer feeder fixes. Safety is assured through a "no transgression zone" established between the centerlines of the two ILS courses. This zone is 3,510 feet wide.

At least 1,000 feet of vertical separation or three miles radar separation is given planes being vectored to opposite ILS localizer courses during the turn-on. A minimum of three miles radar separation is maintained between aircraft flying the same localizer course.

FAA recently found (**Aviation News,** July 1962), as a result of a long-range study on terminal delays that most excessive delays—delays exceeding five minutes—occur at major air traffic hubs such as Chicago's O'Hare. The study revealed that of an estimated $363.8 million figured as costs attributed to terminal delays due to all causes, 10 percent was attributed to air traffic control. It was also found that at the nation's busiest 245 airports, airport congestion coupled with multiple arrivals and departures created an average delay of 8.75 minutes. It is just such types of delays that the Chicago O'Hare program is expected to reduce.



# "See and Be Seen" Concept Broadened to Include Comments on Rule Making

FAA has a new policy requiring that contacts and comments on proposed rules be made a matter of public record. It applies to all rules other than airspace assignment and use.

The policy is designed to invite broader public participation in proposed rule making by encouraging consultation between FAA and interested members of the public. It also will provide a system to summarize and docket the results of these consultations.

Under the new policy, the public rules-making docket will contain written summaries of comments and discussions with FAA by interested parties, in addition to their formal written comments. As a result, all persons concerned will have an opportunity to study all other comments on proposals.

Agency headquarters personnel whose duties involve direct participation in the development of rules, or who are in a position to influence such development, will summarize the substance of all contacts in which members of the public furnish information or express views bearing on a proposed rule. The summary then will be placed in the public docket.

It is expected that this procedure will offer the public a broader knowledge of the positions assumed by others, and provide an opportunity for them to express their own views. The new policy applies to procedures beginning with the time that a formal Notice of Proposed Rule Making is published. Contacts prior to that time need not be docketed.

The new policy is one of several steps to encourage and facilitate public participation taken recently as a result of recommendations made in Project Tightrope, a study to improve rule-making and enforcement procedures. Others include opening the docket to the public at all times, providing for an advance notice of proposed rule making so that the public may participate earlier in the rule-making process and speeding up action on proposals awaiting final decision or termination.

# First Boeing 727 Airliner Leaves Factory for Extensive Ground Testing


The rollout of Boeing's new 727 jet airliner, the first three-engine U.S. airplane since the Ford and the Stinson A and U tri-motors, marked another phase of FAA-Boeing cooperation in bringing the new 600-mph, short-to-medium-range jet closer to the day the airplane goes into service.

The new airplane, which will carry 70-114 passengers over distances ranging from 150 to 2,000 miles, is a familiar sight to the Federal Aviation Agency's aeronautical engineers and manufacturing inspectors who specialize in airframes, equipment and powerplants. These men worked—from the drawing boards to the assembly lines—with Boeing engineers and factory workmen to assure the development of an airplane which would meet the government's safety standards. All components were checked for quality of workmanship and conformity to the approved design. As part of the test program, two structurally complete airplanes will be scientifically destroyed on the ground to determine the 727's structural strength and service life expectation.

After extensive ground testing, the airplane will receive its first FAA approval —an Experimental Certificate allowing it to take to the air. This is the beginning of an extensive flight test program which lasts, on an average, about six months.

Four heavily instrumented airplanes will be used—one to confirm earlier estimates of design loads, the others to evaluate flight characteristics and performance as well as the functioning of all systems and equipment under actual operating conditions. Flying will be divided between Boeing and FAA pilots. Towards the end of the flight test program, after full indication of compliance with government regulations, FAA will issue a Provisional Type Certificate permitting The Boeing Company to use the airplane for demonstrations and airline pilots familiarization.

Flight tests end with the issuance of an FAA Type Certificate which indicates that the airplane has met FAA standards of construction and performance.

Two other FAA certificates will be issued before the airplane goes into commercial operations.

A Production Certificate giving the manufacturer the go-ahead to build as many of this particular aircraft as he wishes is issued only after he demonstrates his ability to produce duplicates of this type design.

Finally, each airplane built will be issued an Airworthiness Certificate, the final FAA stamp of approval indicating that the airplane conforms to the Type Certificate and is ready for safe operation in commercial service.

The 727, capable of taking off from 5,000-ft. runways, is powered by Pratt & Whitney JT8D turbofan engines producing 14,000 lbs. of thrust each.



# Continued Growth of General Aviation Forecast

By 1968, the general aviation fleet is expected to climb to 99,000 aircraft flying about 17.1 million hours annually, compared to 81,693 planes flying 13.3 million hours during 1962.

These increases and others are prophesied in a report, **Aviation Forecasts,** published by FAA's Office of Policy Development.

The fiscal year 1963-68 period will be marked by a further shift in general aviation to larger and faster piston engine airplanes and more turbine-powered aircraft. Air carrier activity also is in for substantial growth, according to the forecast, with an increase from 42.5 billion revenue passenger-miles to 62 billion.

Of the 99,000 general aviation aircraft expected to be in the air by 1968, 12,200 are forecast to be multi-engine, 51,400 single-engine four-place or over, and 35,400 coming under the classification of "all other." Included in the over-all total are 475 turbine powered planes and 1,600 rotorcraft.

A breakdown in anticipated hours by type of flying shows that five years from now general aviation will include 6.7 million hours of business flying, 3 million hours of commercial, 2 million hours of instruction and 5.4 million hours of personal flying. During 1962, business flying accounted for 5.5 million hours, commercial 2.4 million, instruction 1.9 million and personal 3.5 million.

Of the 3 million hours of commercial general aviation flying anticipated by 1968, agriculture will account for more than one million hours, 625,000 hours will be industrial flying and air taxi and charter operations will account for 1.3 million hours. Figures for fiscal year 1962 were: 900,000 hours of agricultural flying, 475,000 hours industrial and one million hours of air taxi and charter flying.

Although the airline fleet is expected to show a gradual decline in number of aircraft, a substantial increase in capacity is forecast because of the entry of more jets into service.

By 1968, jets are expected to fly 96 billion seat miles, 85 percent of the total air carrier capacity.


*First single-engine turbine airplane type-certificated by FAA, the Pilatus* Turbo-porter, *was built in Switzerland. Eight-place airplane cruises at 137 mph, has maximum operating altitude of 25,000 ft.*

## NEW RADIO FREQUENCY

An additional radio frequency, 135.9 mc., is now available for general aviation pilots communicating with Flight Service Stations and seeking airport advisories at fields without a tower.

The new frequency, relinquished by the military services, will help relieve radio frequency congestion.

## Grand Canyon to Get New Airport To Serve National Park Visitors

A new public airport for general aviation aircraft and local service airlines will be constructed near Grand Canyon National Park, Arizona.

The airport will be jointly financed by FAA and the Department of the Interior, with FAA allocating $875,572 in Federal Aid Airport Funds and Interior programming $880,000. The Arizona Department of Aeronautics, which will supervise construction and operate the airfield, will announce its funding later.

Located two miles south of the south boundary of Grand Canyon National Park on a 1,093-acre site, the airport will have a single 6,800-ft. paved runway with taxiways and an apron. The strip will be lighted.

The project is tentatively scheduled for completion in 1963.

## Survey of Agricultural Aircraft Operations Conducted by FAA

A survey of agricultural and other special work use of aircraft is currently being conducted by FAA through General Aviation District Offices.

Information from the survey will be used in compiling the 1962 edition of **Aircraft in Agriculture,** a handbook published annually.

Survey questionnaires are being distributed this month with a request that the forms be completed and returned within 10 days. Each operator is asked to complete a brief report on his 1962 activities—data on the number of acres treated, the quantity of material dispensed and the flight hours by type of aircraft. All replies will be treated as confidential.

## Booklet Issued on Surplus Personal Property for Airport Use

FAA has published a guide for State and local agencies interested in acquiring surplus personal property for public airport use.

The booklet describes the steps that may be taken toward the acquisition of surplus property and contains a sample application form and instructions for its completion. Classified as personal property is such equipment as tractors, jeeps, snow plows, sweepers, rollers, mowers, fire trucks, concrete mixers, trucks, boundary lights, and markers, blast fences, wind tees, signal lights and other items.

Since a greater part of all surplus personal property is of military origin, the booklet recommends that those interested keep in touch with Property Disposal Officers at military establishments in order to know in advance what property may be available.

The booklet was prepared by the FAA Airports Service with the cooperation of General Services Administration and the assistance of the National Association of State Aviation Officials. As a result of the joint effort by GSA, NASAO and FAA, the procedures for processing applications have been streamlined and the time for clearing applications has been materially reduced.

Copies of the new booklet, **Federal Surplus Personal Property for Public Airport Purposes,** are available without charge from the FAA Airports Service, Washington, D. C., and from Regional Offices and District Airport Engineer Offices around the country.

## Private Pilot Examinations Made Convenient for Students

In line with FAA policy to improve service to general aviation, Flight Service Stations are joining the General Aviation District Offices (GADOs) in providing facilities and personnel for administering private pilot written examinations.

Expansion of this service is expected to be particularly helpful to student pilots living in areas where are no GADOs. Selected Flight Service Stations are being designated by the various FAA Regional Offices where exams can be taken.

Those interested can obtain the necessary information from the nearest airport, GADO or Flight Service Station.

## EQUIPMENT TESTED TO PROVIDE ALTITUDE DATA


*Radar beacon equipment, designed to provide aircraft altitude information to ground controllers independent of voice radio communications, is under development in a top priority FAA program. Final, operational equipment may indicate altitude in "nixie lights," as shown here on test equipment at FAA's National Aviation Facilities Experimental Center, Atlantic City, N. J. Technician is "interrogating" equipment with light gun. The system is reporting altitude of airplane caught by light gun by displaying numerals "235" at upper right, indicating plane is at 23,500 feet. Further work may develop display system in which aircraft altitudes are shown on face of controller scopes next to radar blips. "Breadboard" gear is in existence now in program aimed at developing altitude beacons for light airplanes as well as larger ones.*

## Air Carrier Malfunction Reports Available to General Aviation

The daily summary of mechanical malfunctions submitted by airlines now is being used by FAA to alert general aviation operators of large aircraft to potentially dangerous incidents.

Previously, distribution of the summary was limited to the FAA's Air Carrier District Offices and the airlines themselves. Now, General Aviation District Offices have been included to keep safety inspectors there abreast of mechanical failures on airline aircraft. The information then is relayed to general aviation operators of the same type aircraft to enable them to take preventive or corrective action.

The airlines are required to file Mechanical Reliability Reports on 19 specified types of mechanical malfunctions. These include: fires during flight where the related fire warning system did not function properly, false fire warnings during flight, fuel or fuel-dumping systems affecting fuel flow or causing hazardous leakage during flight, landing gear extension or retraction or opening or closing of landing gear doors during flight, and brake system components which result in loss of brake actuating force while the airplane is in motion on the ground.

These reports must be submitted to FAA field offices within 24 hours of the incident. They then are transmitted by teletypewriter to the Agency's Washington headquarters where the daily summary is prepared and sent back to the field within minutes after receipt of the last report. Statistical information from the reports also is transmitted to FAA's Aeronautical Center in Oklahoma City for analysis by computers.

The present Mechanical Reliability Report system was put into effect last March to provide fast, accurate and uniform reporting of airline mechanical problems. It includes use of fast teletypewriter communications to eliminate delays in transmitting information. Use of standard reporting procedures is another innovation. Previously, the airlines were required to report only those incidents which they reasonably considered hazardous.

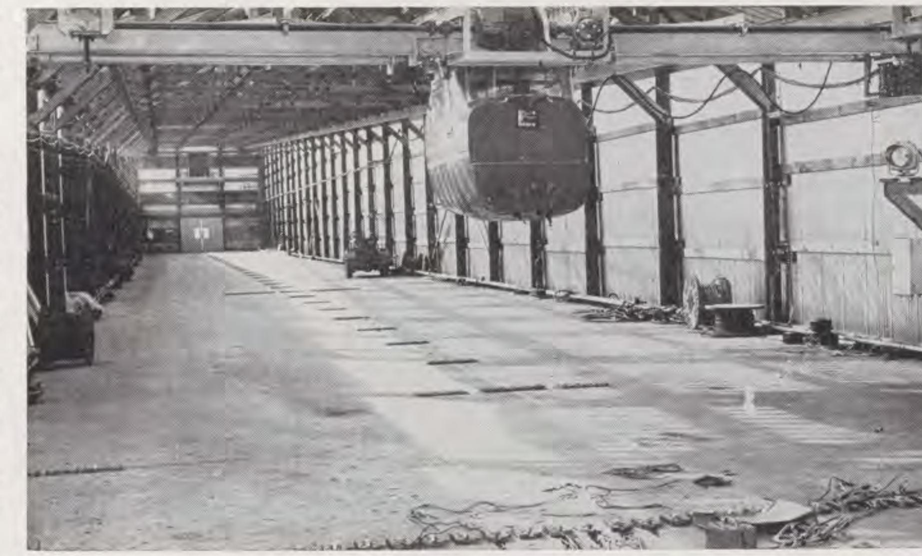
### PUBLICATIONS AVAILABLE

**Amendment 1 to Standard Specifications for Construction of Airports** ..... Free
**Airport Disaster Control Guide** ... Free
**Glossary of Air Traffic Control Terms** ..................... Free

*Available from:*
Inquiry Section, MS-126
Federal Aviation Agency
Washington 25, D. C.



## FAA FOG CHAMBER USED TO STUDY LOW VISIBILITY RUNWAY OPERATIONS



Fog chamber for testing runway lights under low visibility is 800 feet long, 30 feet wide. Picture below was taken before fog had built up to uniform density. Approach and runway lights, dimly seen, are on.

A new fog chamber designed and constructed at Richmond, Calif., for FAA by the University of California has gone into operation to study airport lighting under conditions of low visibility.

The chamber, superior in size and design to any facility previously available, provides a laboratory for conducting lighting research in fog conditions. Work conducted there will aim at constant improvement of lights and lighting standards to increase the safety and efficiency of low visibility operations.

Fog generating equipment in the chamber produces fog—a mixture of compressed air and water—comparable in every way to natural fog. Fogs of widely varying densities are produced from the system, which includes 5,000 feet of pipe and 74 nozzles.

Experimental airport lighting patterns are laid out on the asphalt floor—in effect, a model runway—of the chamber on a ten-to-one scale. A total of 2,850 lighting fixtures have been installed and are connected with more than 200,000 feet of wire and cable.

Overhead, a three-place light-plane cockpit rides under rails in the manner of an aerial tramway. The tramway inclines from the higher, 30-foot end of the chamber toward the lower, 10-foot end.

People riding in this cockpit can simulate aircraft approaches to runways and landings at speeds up to 130 knots. The cockpit can be moved laterally to simulate off-center landings.

The runway threshold is located halfway down the length of the building. At the top of the incline at one end, people in the cockpit will see the runway as if they were in an actual aircraft cockpit on the glidepath 4,000 feet from the threshold. The simulated runway appears to stretch for 4,000 feet past this threshold.

The upper sides and entire top of the chamber are made of heavy translucent plastic, providing natural light for studies of daytime fog conditions.

Now under way in the new facility are tests of runway centerline lighting under varying conditions of visibility and varying simulated approach conditions. These tests will examine the effect of light scatter from approach lights and the relation between candlepower and longitudinal spacing of runway centerline lights as they affect visual range.

Further studies will deal with approach, runway and touchdown zone lights and lighting patterns.

This research activity is being performed under a $155,500 FAA contract by the University of California's Institute of Transportation and Traffic Engineering. The contract included construction of the fog chamber and a test series presently scheduled to March 15, 1963.

Participating with FAA and university personnel in the fog chamber lighting studies will be commercial airline pilots invited to evaluate lighting patterns, spacings and intensities. An advisory committee of jet pilots helped design and plan the test program.

Data will be collected in the fog chamber lighting tests by cameras, photometers and various other measuring equipment.

Over a period of years, previous fog studies have been conducted outdoors either in conditions of natural fog or with artificially generated smoke. Indoors, they have used static simulators; in aircraft flight, by use of cockpit fog simulators. In the last case, films of variable density are placed in front of the pilot. He looks through these screens at actual airport lighting patterns, as if looking through fog.

Valuable information was gained through these methods in the past. But none coupled two essentials for thorough-going low visibility studies that are provided in the new fog chamber—controllable laboratory conditions and the necessary degree of realism.

# ALASKA

## *The Flyingest State*

Up on the nation's northern frontier, where not many years ago sled dogs and river boats provided winter and summer primary transportation, the airplane has really come into its own.

In FAA's Alaskan Region, aviation is a way of life. Because Alaska is a vast area of 586,400 square miles of extremely limited highways, rail and water transportation, flying is the basic means of transportation for a majority of its residents. As a result, FAA plays a vital role in an aerial life line which threads across a region larger than all the territory east of the Mississippi River.

No matter how you figure it—by number of aircraft, number of pilots, number of passengers, amount of cargo—Alaska is the flyingest state in the Union on a per capita basis. The average Alaskan's casual conversation, be he miner, trapper, teacher, clergyman, student or businessman, is as likely to center around what type of aircraft he flies as around the model car he drives. Many a child in interior Alaska rides in an airplane before he does a car—and long before he even sees a train.

The importance of aviation in the 49th State can be illustrated by the fact that in a recent year there were 190 pounds of mail and cargo transported by scheduled air carriers per person in Alaska, compared to 7.6 pounds per person in "the old 48." The annual number of passenger movements in Alaska is two per resident; in the rest of the United States it is one for every 11 residents. In Anchorage, the state's largest city, the figure is the highest of any major U. S. city—6.5 passenger movements per person.

Alaska has 64 aircraft per 10,000 persons, or about one for every 156 residents. Nevada, highest in the "lower" 48, has 16 aircraft per 10,000 persons, or one plane for every 625 persons. New York has only 2.2 for 10,000, or one airplane for every 4,545 residents. One out of every 55 persons in Alaska has a pilot's license.

Anchorage exemplifies the intensity and importance of aviation in Alaska. The city is served by two major civil air-

Even airplanes are shipped by air. *Below*, shorn of its wings, the light plane was loaded into the C-123 to be carried to a distant airport. *Right*, passengers and cargo share cluttered cabin space.


Clergymen serve by air. *Right*, Bishop William J. Gordon, Jr., Alaska's flying Episcopal bishop, and Father Murray Trelease cover vast areas in their planes.


Flying goes on summer and winter in Alaska. *Left*, one of the many lakes in region makes an excellent landing area. *Above*, an operator contemplates the enormous snow shoveling job confronting him.

ports, a float plane base with more traffic than any other in the world, and several small strips and float plane bases. In addition, two military airfields are located there. Twenty-six airlines and 92 air taxi operators, including 14 helicopter operators, fly to and from Anchorage, transporting people and cargo throughout Alaska and to the rest of the world.

As a strategic location on the over-the-pole route from Europe to Asia, Alaska is served by a number of international air carriers; Anchorage itself is host to seven, in addition to numerous intra-state carriers which supply far-flung villages with their only means of transportation.

Although the scheduled and supplemental carriers operate from state-owned Anchorage International Airport, municipally operated Merrill Field itself handles more traffic than many major airports in the nation. In a recent 12-month period, Merrill had 156,744 operations—a greater volume of traffic than handled by the airports of Pittsburgh, Atlanta, Milwaukee, Oklahoma City, Salt Lake City, or Omaha.

It isn't only the centers of population such as Anchorage and Fairbanks in which aviation plays such a dominate role. They are merely the hubs from which aerial lifelines extend throughout the state to the tiniest hamlets, fishing camps and Eskimo villages. Without aviation, Alaska would still be the vast wilderness of the gold rush days.

The mainland of Alaska stretches through four time zones. It is more than 1,500 miles from Point Barrow on the north to the southeastern boundary below Ketchikan. It is about 2,100 miles from the eastern boundary to the tip of the Aleutian Island chain.

This huge area is laced with a network of Federal Airways supported by air navigation facilities and dotted with 366 airports—more than any other state except Texas and California. Many airports are tiny gravel strips but they are the only ties with the outside world for scores of communities.

In this vast land of difficult terrain, safety has a special significance, particularly in winter when temperatures drop to 50 or more below zero. Bone-chilling cold doesn't stop Alaska's air-minded citizens. They simply prepare for it—and continue flying. Skis replace floats and wheels; frozen lakes replace water landing areas and airfields.

But most important is the special attention necessary to keep airplanes flying. Preflight takes on added meaning. From nose cowling to tail, inside and out, aircraft are thoroughly prepared and inspected for cold weather flying.

A veteran Alaskan flier passes on a few of the "do's" and "don't's" of safe cold weather operations in Alaska:

Housewives at a remote FAA station turn out to help unload airborne food.



FAA maintains modern facilities in the bleak, tundra-covered Bethel area.

- Watch for congealed oil in lines and crankcase. Even a crankcase hot to the touch may have oil like butter inside unless the engine has been warmed thoroughly.
- Be sure the crankcase breather is not frozen over.
- Don't set parking brake after taxiing in snow. Snow blown around the brakes may freeze them after parking.
- Remember, skis have no brakes.
- In extreme temperature—40 or 50 below—the engine may freeze in flight unless you have cowl flaps or baffles to reduce the flow of cold air.
- Check for moisture in the fuel system, especially when switching from fall to winter operations.
- On aircraft with fuel tank caps on top of the wing, be sure you have a tight seal. The lift in this area creates a vacuum and the rubber gasket may freeze, preventing a tight seal. The vacuum may pull the bottom of the tank cell upward, forcing the gauge float up with it and resulting in a faulty reading on the gauge.
- Be sure vent lines are not full of blown snow.
- Check for blown snow which may have become packed in tail areas, jamming elevator and rudder controls.
- Beware of whiteouts—the bane of bush pilots. A whiteout may occur when an overcast sky blends with the barren snowcape, making sky and earth indistinguishable.

In a land where the airplane has become a necessity of life for many and a common business tool for most, FAA plays an important role. Charged with the responsibility of promoting aviation safety, ensuring efficient use of airspace, fulfilling national defense requirements and fostering air commerce, FAA performs a vital function affecting everyone.

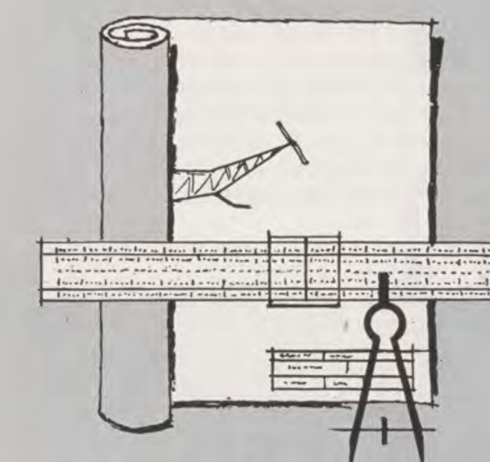
FAA employs nearly 2,000 people in its Alaska Region to control air traffic; construct, maintain, and operate complicated electronic navigation aids and communications systems; inspect aircraft and check airmen proficiency; and assist in the development of airports through the Federal Aid Airport Program.

FAA operates 26 airports as part of a network of 34 stations that provide airways communications, maintain navigation aids, control traffic and offer advisory services. In order to reach some of these stations, many of which are remote navigation facilities, the Agency owns and operates a "fleet" of three sea-going vessels to haul food, cargo and personnel to isolated sites along the coast, fjords and islands.

Alaska also has two Air Route Traffic Control Centers and two International Flight Service Stations. FAA inspectors certify to the safety of the enitre transportation system, including airworthiness of aircraft and parts, competence of airmen and the licensing of pilots, flight schools, ground schools and repair stations.

It is a big job, this task of ensuring the safety, efficiency and progress of aviation in Alaska, but it has to be big to keep abreast of the magnitude and importance of flying in the 49th State.





# FAA Tests Army Helicopters That Meet Civil Needs

Bell D-250 helicopter.

Federal Aviation Agency inspectors have begun type certification tests on three light observation helicopters (LOH)—produced by Bell, Hiller and Hughes—which are competing for an Army contract as off-the-shelf models.

The contract will involve the eventual purchase of some 4,000 machines, a factor that could considerably reduce the unit cost of any commercial models that come out of the program.

Although built for military requirements, these aircraft, which conform to Part 6 specifications, may fulfill a civil aviation need for a relatively low-cost, low-maintenance, high-performance helicopter that would reduce airport congestion and provide transportation within residential and business districts.

In the past, owing to high initial cost and to special military features, military aircraft have been of relatively little practical interest to civil operators. In the new LOH, however, the Army's requirements coincide more closely with civil requirements: a single-engine, 250-hp. turbine-powered craft with a useful load of approximately 1,000 pounds that can cruise at 110 knots at sea level, stay aloft three hours without refueling, and hover at 6,000 feet at 95° F. A helicopter possessing these features, available at a price favored by quantity production, could have significant impact on the future development of air travel. Optimistic observers predict that the sale price could come close to that of a four-place fixed-wing airplane.

Army engineers will be assigned to the FAA Regional Offices in Fort Worth and Los Angeles to coordinate the program. Flight tests will begin early next year. Target date for completion of tests and issuance of type certificates for all three helicopter designs is the fall of 1963.

Under the Civil Air Regulations, the prototype helicopters first will be evaluated for adherence to approved specifications, including review of the design loads, tests of rotors, controls, transmissions and drive systems, and the safety inherent in crash landings. After that, flight tests will determine whether the helicopter performs satisfactorily in the air.

*Top to bottom:* Hughes 369 and Hiller 1100.


# SAFETY FIRST

## *Problems of Icing*

Ice is fine for skaters, but it can be hard on airplanes and even harder on the pilots.

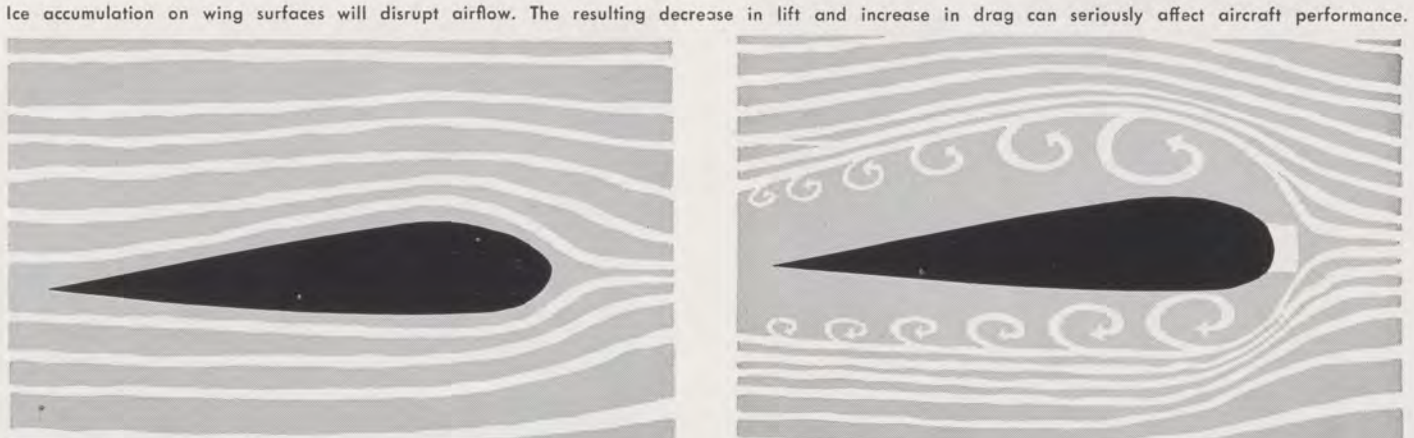
Both external icing and internal carburetor system icing can seriously affect aircraft performance. Failure to detect and combat these conditions results in many accidents and critical incidents every winter.

Ice accumulation can be slow or dangerously rapid, depending upon the moisture content and temperature of the air. External icing is most probable when flying in air with visible moisture (clouds, drizzle, rain or wet snow) and at temperatures from 32 to 20 degrees Fahrenheit. However, it also can occur in temperatures as low as minus 30 degrees.

Ice is particularly hazardous when permitted to accumulate on or in the wing and tail surfaces, propeller, pitot or static air pressure sources and carburetor.

The first sign of wing ice is a thin ribbon along the leading edge which gradually builds forward into the air stream and vertically toward the top and bottom surfaces of the wing. Since the wing is carefully designed to permit a smooth flow of air over its surfaces, any change in the leading edge disrupts the airflow and reduces the available lift while increasing the drag force acting upon the wing.

Ice accumulation on wing surfaces will disrupt airflow. The resulting decrease in lift and increase in drag can seriously affect aircraft performance.



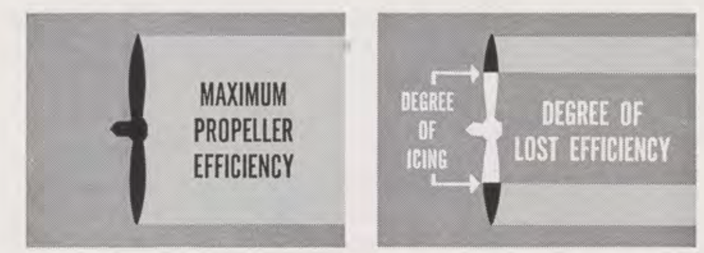


It is not the weight of the ice, however, but the shape that presents the hazard. The blunter the ice formation, the more the airflow is disrupted. The resulting decrease in lift and increase in drag can force an airplane to make an emergency landing.

Pilots also should bear in mind that even a small amount of wing ice will increase the stall speed of light airplanes. This is particularly critical in approach and landing situations.

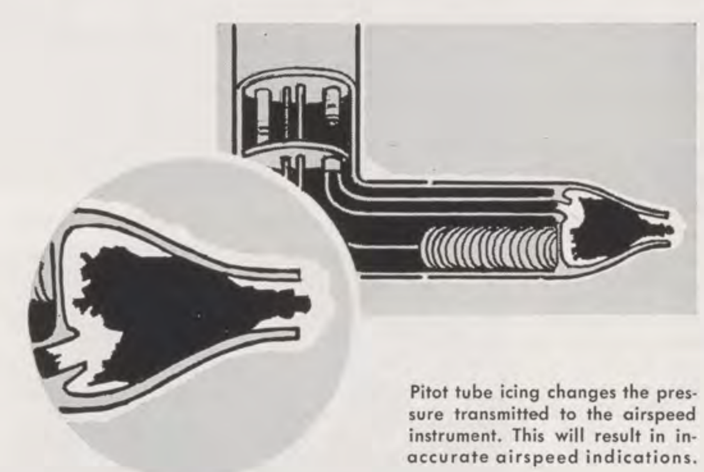
Ice on the tail assembly disrupts the airflow, just as it does on the wings. An early indication of ice on these surfaces may be a tendency of the tail to swing, or possibly a vibration that on some aircraft can become heavy enough to cause structural failure. Ice formation also can jam flight control surfaces on both the wings and tail.

An accumulation of ice on propeller surfaces changes the shape of the blades and sharply reduces propeller efficiency. As ice forms on the propeller, more power goes into overcoming the increased drag of the blades and less into the thrust necessary to maintain flying speed. If this condition is permitted to go unchecked, the results can be disastrous.

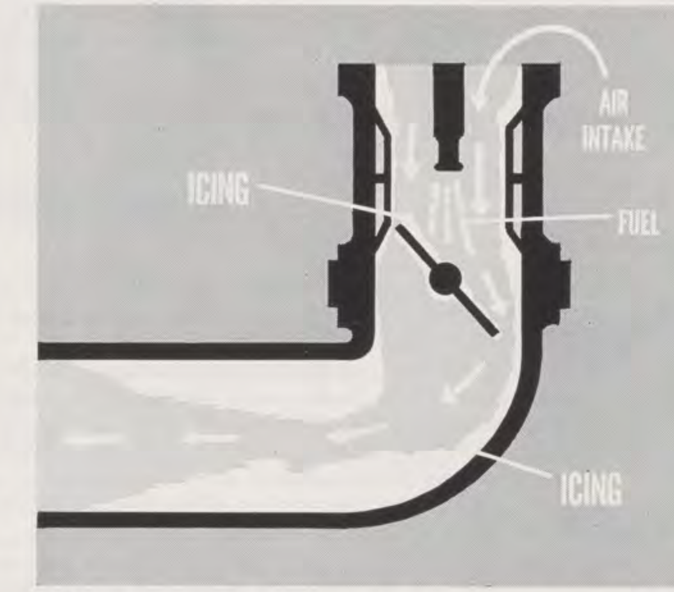



Ice build-up on propeller blades will reduce propeller efficiency. If icing is not controlled, the airplane can lose flying speed with disastrous results.

Freezing of the outside pitot and static air pressure sources will change the pressure transmitted to the airspeed, altitude and rate-of-climb instruments and cause incorrect readings. Outside venturi units, which are not located within the engine's exhaust gases, also are very susceptible to icing and can result in erroneous attitude and direction indications. Either condition can seriously imperil aircraft performance.



Pitot tube icing changes the pressure transmitted to the airspeed instrument. This will result in inaccurate airspeed indications.




Carburetor icing has the same effect as slowly closing the throttle and can result in serious loss of power. It is a frequent cause of icing accidents.

Carburetor icing is an extremely serious problem because it can result in a critical power loss. It has the same effect as slowly closing the throttle—it cuts down the amount of fuel mixture reaching the cylinders.

Unlike external icing, carburetor icing does not depend on visible moisture in the atmosphere or on freezing temperatures. It is most probable at temperatures between 40 and 60 degrees but can occur at temperatures as high as 90 degrees. The temperature range and the degree to which a carburetor is subject to icing depends on its particular design and installation. Pilots should refer to the airplane manufacturer's manual on the operation of the engine for detailed information on coping with carburetor icing.

Proper de-icing equipment and procedures will help pilots to combat icing in critical areas. Temporary protection of external surfaces also may be obtained by application of a commercial anti-ice preparation prior to takeoff.

The best guarantee of safe winter flying, however, is for pilots to avoid conditions conducive to icing whenever possible. The U. S. Weather Bureau's forecasts and reports of icing conditions are invaluable aids here. These conditions are defined by the Weather Bureau as follows:

**Light icing**—an accumulation of ice which can be disposed of by operating de-icing equipment and which presents no serious hazard.

**Moderate icing**—de-icing procedures provide marginal protection. The ice continues to accumulate but not at a rate fast enough to affect the safety of flight unless it continues over an extended period of time.

**Heavy icing**—ice continues to form despite de-icing procedures. It is sufficiently serious to cause marked alteration in speed and altitude and would seriously affect the safety of flight.

Pilots should steer clear of heavy and moderate icing conditions and proceed with caution into areas where light to moderate icing is forecast. If heavy icing is encountered unexpectedly or unavoidably, prompt action should be taken to get into more favorable flying weather. To delay such evasive action is to court disaster.

# Nerve Center for NOTAMS Gets the Word Out Fast

Behind the familiar NOTAMS that pilots depend on lies a nationwide network that collects, evaluates and disseminates aeronautical data vital to the safety of flight.

Across the Potomac River from FAA's headquarters in Washington is the Agency's National Flight Data Center. The NFDC is responsible for disseminating information concerning inoperative navigation aids, radio frequency changes, airport conditions, construction obstacles on airfields and other changes in aeronautical facilities, services or procedures. In short, its job is to get the word to pilots quickly when something happens that could affect flight.

In a spot emergency, a NOTAM—Notice to Airmen—is essential. The condition might first be discovered by an electronics technician, an air traffic facility, airport manager or pilot, who would contact the nearest Flight Service Station, a key link in the system. The Station promptly issues a NOTAM on its local teletype circuit and, depending on the nature of the emergency, broadcasts it by voice to pilots in the immediate area. The information also goes out on the Service A network, appended to the Station's weather report, and is repeated each hour until the condition is corrected.

The Service A network, with some 2,500 outlets throughout the nation, transmits the NOTAM to all points programmed to receive it. All NOTAMS are received by the National Flight Data Center. Here, the acquisition and evaluation section assures the accuracy and validity of the information, correlating it with other flight data for over-all significance. It is then given to the editors of the **Airman's Guide** and the **National Flight Data Digest** if the condition will continue long enough so that issuance in either of these publications is appropriate. At the same time, the information goes to the disseminating section of the NFDC where further distribution is made through established channels via teletype.

An advance information type of NOTAM, such as anticipated runway construction, follows a similar procedure except that the time element eliminates need for much of the immediate teletype alerting process. The Flight Service Station sends the information by mail to the NFDC where it is processed, disseminated to interested users and published in the **Guide** and **Digest.**

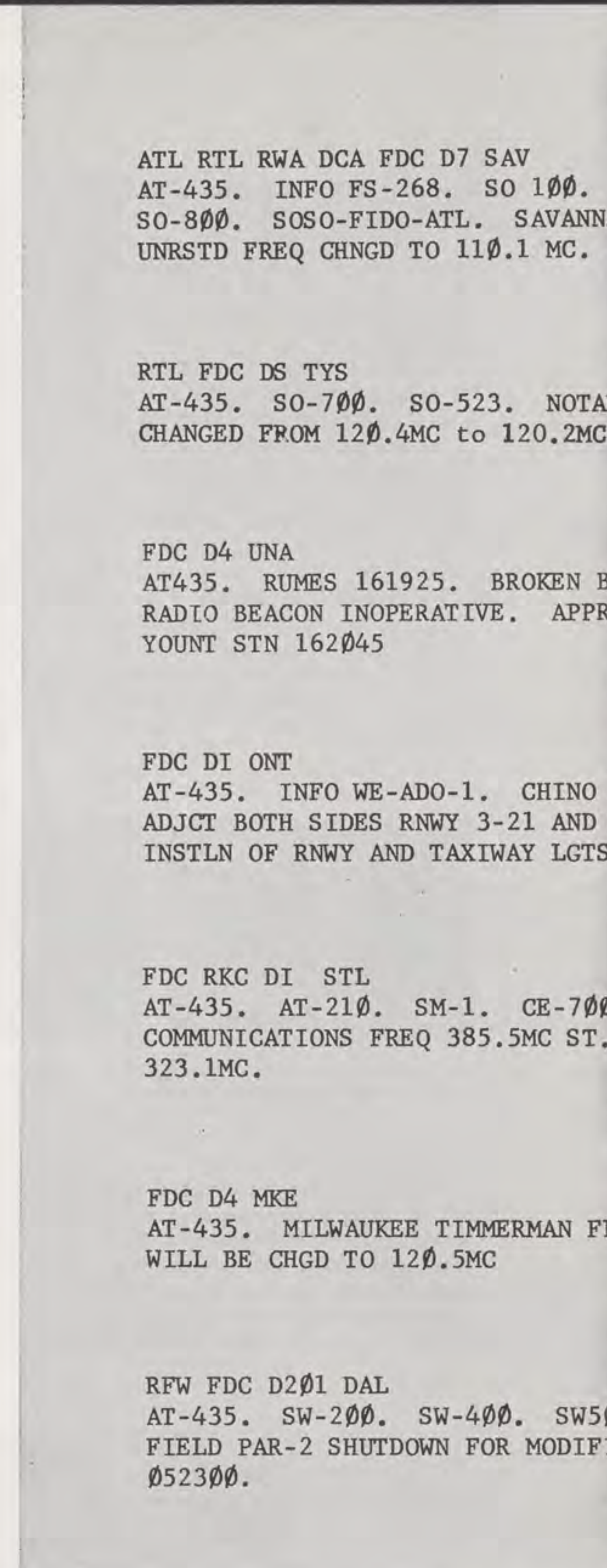
In the National Flight Data Center itself are banks of teletype printers connected to a network of circuits including the 857-word, high-speed Service A (weather network), Area B, International B, "party" tie lines and direct lines to local private, civil and military users including a local NOTAM network. Thirty-five FAA employees are busy every day acquiring, evaluating, processing, editing, publishing, and disseminating this information.

The **Airman's Guide** is published bi-weekly, on alternate Tuesdays, and has a subscription list of 35,000. The **National Flight Data Digest** is issued daily and goes to publishers of aeronautical charts and other interested users. NOTAMS are sent via teletype circuits throughout the nation.

New criteria for NOTAMS now are being developed which will cut down on the number and the amount of information a pilot has to study when he leafs through the familiar yellow messages or scans the **Guide.** But for the FAA people who man the National Flight Data Center, the job will be the same—getting the word to all pilots quickly and accurately.

Subscriptions to the **Airman's Guide** are $7.00 a year and can be obtained from the Superintendent of Documents, Washington 25, D. C.

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High-speed teletype machines speed NOTAMS on their way.

# Letters to the Administrator

FAA

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

## • Class Ratings

Is a certificated pilot holding an airplane single-engine landplane rating and a multi-engine seaplane rating automatically certificated to fly multi-engine landplanes and single-engine seaplanes?

D. S. K.
Brookline, Mass.

*No. Issuance of additional class ratings is predicated on an applicant having made at least five takeoffs and landings in solo flight, or as sole manipulator of the controls when accompanied by a pilot rated for the aircraft for which the class or type rating is sought. The applicant also is required to pass an FAA flight test.*

## • Logging Flight Time

What is the legal definition of a student pilot?

L. E. Tannas, Jr.
St. Paul, Minn.

*We assume that this definition is requested in regard to the logging of flight time prior to obtaining a student pilot's certificate.*

*Part 1 (New) "Definitions and Abbreviations" of the* **Federal Aviation Regulations** *states that "pilot" means a person who holds a pilot certificate. A person need not, however, have a student pilot's certificate in order to receive, and credit toward a pilot's rating, the dual flight instruction requirements of the Regulations, so long as these instructions are given by a certificated flight instructor. A person without an appropriately endorsed student pilot certificate may not, however, solo an aircraft.*

## • Flying Schools

In terms of both quality and cost, is there any difference between a regular flying school and going to a local airport for instruction? Is there any plan sponsored by the government which provides loans to individuals for flying education?

J. A. R.
New York

*Enrollment in an FAA-certificated pilot training school does not necessarily ensure that the cost and quality of training will be more favorable than if the training were given by a non-certificated pilot school. There is assurance, however, that certificated pilot schools have met prescribed standards with respect to equipment, facilities, personnel, and curricula which many non-certificated schools may not be able to satisfy. There are no programs sponsored by the U. S. Government whereby loans may be obtained for pilot training. However, certain veterans are eligible for flight training under the Veterans' Benefits Laws. Additional information may be obtained from the Veterans Administration, Washington 25, D. C.*

## • Vision Requirements

Is it necessary to have perfect vision to qualify for a private pilot's license? Also, is it true that to qualify for a license one must have received blind flying training and be able to fly by instruments? Does a doctor have to be government-approved in order to give pilot examinations? Some people in private flying seem to feel that the government is moving to drive the private flier from the air to make room for the Air Force and the airlines. Will you comment on this please?

Robert Hatch
Duluth, Minn.

*Federal Aviation Regulations provide for the issuance of private pilot certificates to applicants whose vision is no worse than 20/50 in each eye, or whose vision can be corrected to 20/30 or better with glasses, provided there is no serious pathology of the eyes.*

*An applicant for a private pilot certificate is required to demonstrate on his flight test that he is capable of controlling an airplane by reference to instruments, but competence as an instrument pilot is not required. Student pilots who are trained to use their flight instruments from the start have no difficulty in meeting this requirement. The ability to control an airplane by instruments long enough to turn back out of unexpected bad weather has saved the lives of many pilots and their passengers.*

*FAA medical certificates are issued only by designated physicians who are familiar with pilot requirements and medical testing procedures.*

*The statement sometimes heard that FAA seeks to discourage private flying is completely without foundation. General aviation, of which private flying is the basic part, is the largest and most rapidly growing segment of aviation in the United States. FAA maintains services and facilities all over the country for the use of private pilots, and has an active program for the development of many new small airports for the use of general aviation. The present private pilot certificate requirements were developed to prepare pilots for the safe operation of the high performance personal aircraft now common. It is the objective of the FAA to provide pilots with the knowledge and skills necessary to use these airplanes safely and efficiently.*

## • Weather Judgment

Much has been said about the all-important matter of pilots practicing flight safety. I myself have read a great deal regarding this subject, including accident reports where lives were lost because of lack of judgment about weather conditions. I believe the old tried and true rule of "having an out" is being overlooked and maybe understressed.

If many pilots, especially in the private pilot group, would only think of this basic rule and apply it to their own ability and experience, and to the aircraft and equipment they are using, I sincerely believe accidents due to weather could very well be substantially reduced.

In short, all this amounts to is a pilot knowing his own limitations, his aircraft limitations and "having an out" in relation to these limitations.

W. H. J.
Augusta, Ga.

## • Fixed Base Operations

We are interested in starting an air service and would appreciate any information you could give us about any regulations and requirements we would have to meet.

Don F. Catron
Killeen, Texas

*The operation of an air service or fixed-base operation can involve a wide range of activities. We suggest you contact the nearest FAA General Aviation District Office—in your case, the GADO at International Airport, San Antonio. After determining the extent of operations desired, they will advise you of the applicable regulations.*

## • Agricultural Flying

I am interested in any information or lists of publications made available by the FAA concerning agricultural flying.

Lowell L. Hutrich
Baltic, Ohio

*The Federal Aviation Agency does not maintain for distribution a complete list of publications pertinent to agricultural flying. However, the following publications may be obtained directly from the source:*

**Air Applicator Information Series,** *Air Applicator Institute, Ryan Printing, Inc., Portland, Ore.;*

**Concentrated Spray Equipment, Mixture, and Application Methods,** *Dorland Books, Caldwell, N.J.;*

**Handbook on Aerial Application in Agriculture,** *Texas A&M College, College Station, Texas;*

**Aircraft in Agriculture,** *U. S. Department of Agriculture, Washington 25, D. C.*

An invisible but nonetheless serious hazard to light planes—wake turbulence—becomes clear on the next page under the deft pen of cartoonist Robert Osborn, who utilizes his monthly stamping ground with his usual terseness.

FEDERAL AVIATION AGENCY
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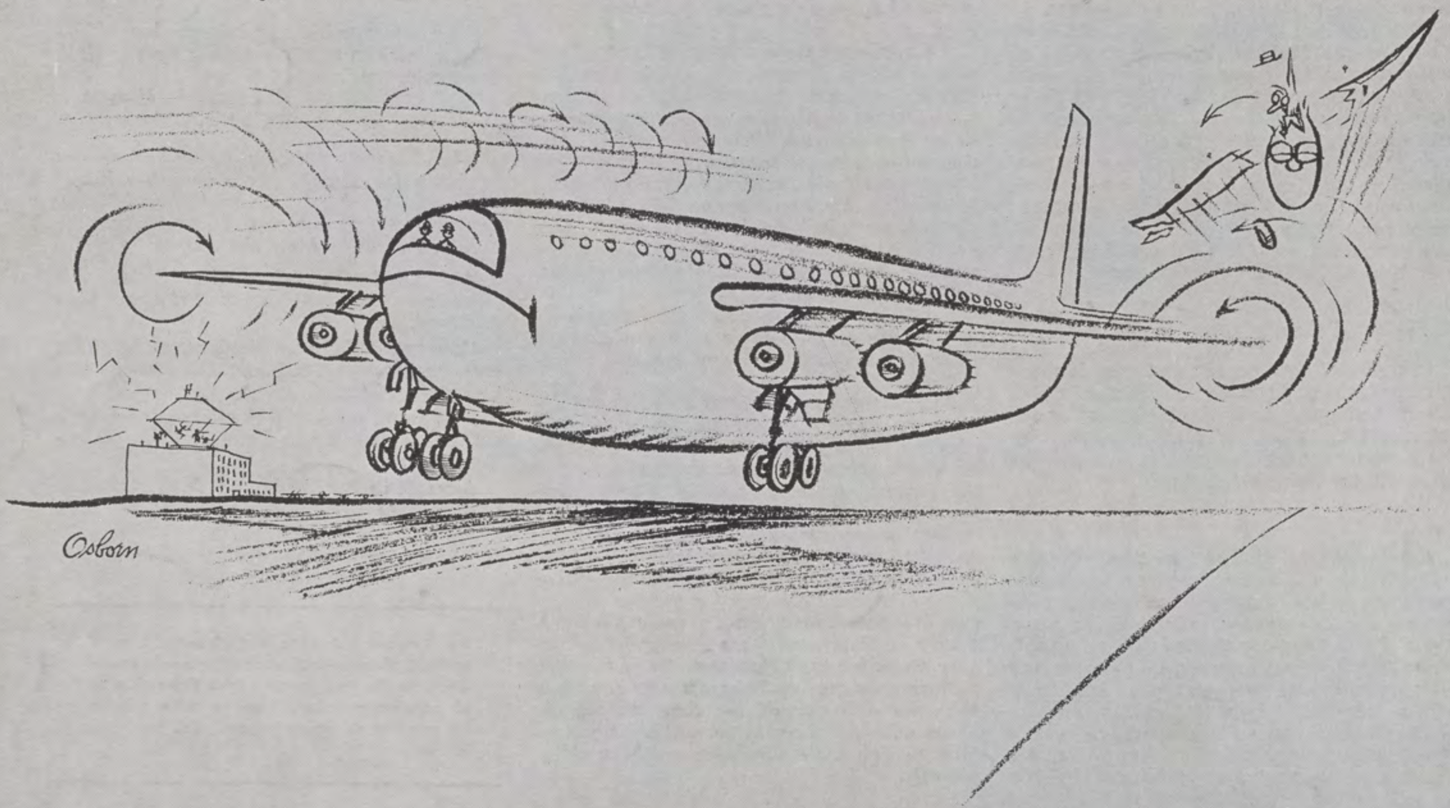
**It's what you can't see—wake turbulence—that hurts . . . .**




**Stay out of the wake following large aircraft**