FAA | AVIATION NEWS

APRIL 1963

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

FAA | AVIATION NEWS
FEDERAL AVIATION AGENCY

VOL. 1, NO. 12 APRIL 1963

RECOGNIZING THE AVIATION MECHANIC

It is surprising that many people, when they think of aviation, begin and end their thoughts with the man at the controls, the pilot. Occasionally, they may reflect on the aircraft itself.

But there is an important figure in the realm of flight who has not been given enough attention—the aviation mechanic. Nearly 120,000 aviation mechanics have earned FAA's Airframe & Powerplant Certificate. Their training and skill are obviously critical to the safety of flight.

The weight of the aviation mechanic's responsibilities can not be overdrawn. Most recent figures available from the Civil Aeronautics Board on general aviation accidents make this starkly clear. In 1959, there were 130 accidents, including seven fatal ones, in which inadequate maintenance was a causal factor. In 1960, there were 141 accidents with seven fatal. And in 1961, despite the fact that total accidents decreased from 4,793 to 4,625, the number of accidents in which maintenance was a factor *increased* to 158 with 13 of them fatal.

If aviation is to make progress the aviation mechanic must get his due: Recognition when a job is done well; insistence on improvement when a job fails to meet high standards.

FAA Administrator Halaby stated recently: "We feel that a great deal more can be done to instill professional pride in the skill of the aviation mechanic. We also need to update some of our educational material and licensing requirements—to make them more responsive to our present jet age rather than the old fabric-and-dope age."

In the months to come the FAA will hold meetings around the country, seeking ideas on how to upgrade the skills of aviation mechanics. Moreover, we want to see awards and recognition for outstanding maintenance skill that compare with the kinds of awards given to pilots and other crew members.

It is time that the importance of the aviation mechanic's role in the developing national aviation system is more widely understood.

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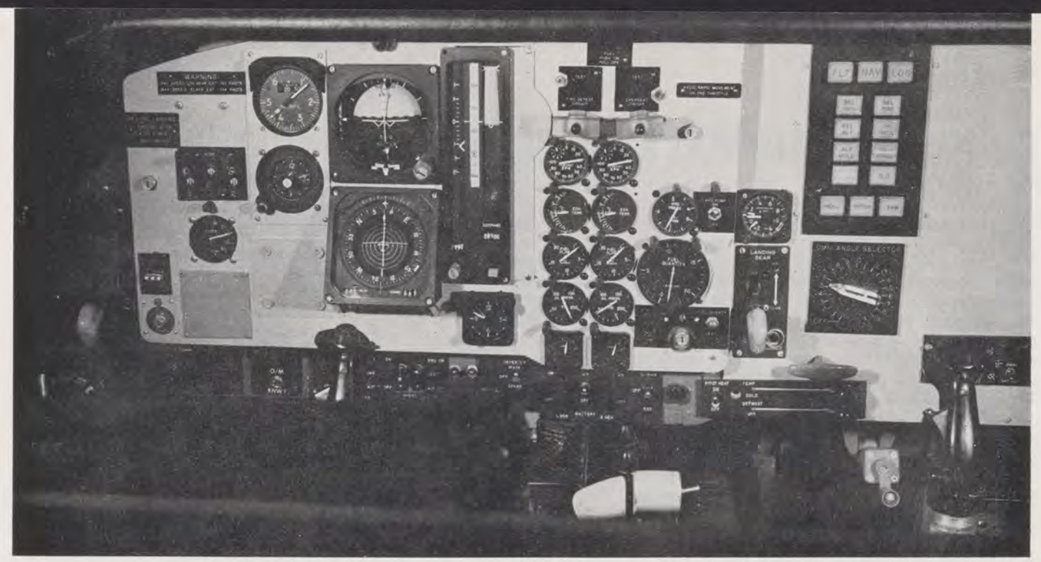
COVER: *Jack Harris, FAA electronics maintenance technician, ground checks the accuracy of the course radiated by VOR located atop mountain near Montebellow, Va.*

FAA AVIATION NEWS is published monthly by the Office of Information Services, Federal Aviation Agency, Washington 25, D.C., in the interest of aviation safety and to acquaint readers with the policies and programs of the Agency. Use of funds for printing this publication approved by the Director of the Bureau of the Budget February 1, 1963. Subscription rates: U.S. $1.50 a year, foreign $2.00 a year, single copies 15 cents. Send check or money order (no stamps) and change of address notices to Superintendent of Documents, Government Printing Office, Washington 25, D.C.



FLIGHT CONTROLS AND AIR TRAFFIC STUDIED IN SST PROGRAM

Representative pilots of six major airlines are taking part in an FAA flight test program to study flight controls for a supersonic transport airplane. In the initial phase of the program, launched earlier this year, the air carrier pilots have performed up to four hours of instrument flying a day in Air Force T-39 jets at the Instrument Pilots Flight School, Randolph Air Force Base, Texas.

Under test are flight control instruments and concepts that have been undergoing extensive simulation study work in a jet simulator (*above*) at the Air Force Aeronautical Systems Division, Wright-Patterson AFB, Ohio. Eight FAA contractors have produced test hardware in this program to date.

This flight control work is part of the government-industry supersonic transport research program headed by FAA with the co-participation of the Department of Defense and the National Aeronautics and Space Administration. The flight control-pilot factors part of the program includes studies and tests of flight controls, cockpit display, navigation and approach aids, communications, stability augmentation and piloting techniques.

FAA, NASA and Air Force pilots will join the air carrier pilots in further phases of the continuing flight test program. Pilots taking part thus far have been from American Airlines, United Air Lines, Pan American World Airways, Continental Airlines, Eastern Airlines and Trans World Airlines.

While this work moves forward, FAA and NASA are laying plans for a joint study of supersonic transport operations within existing and future air traffic environments. This study will mate flight simulation capabilities at NASA's Langley Research Center, Va., and the air traffic simulation capabilities of FAA's National Aviation Facilities Experimental Center (NAFEC), Atlantic City, N. J.

The air traffic program will examine both (1) air traffic control system requirements to handle a supersonic transport plane, and (2) the constraints placed on supersonic transport design and operating techniques by air traffic control systems.

FAA personnel will begin an air traffic simulation study of supersonic transport operations in May at NAFEC, as part of over-all air traffic simulation activity in support of the Agency's top priority program to improve and modernize the nation's airways to meet current and future needs. Data collected in these six to eight weeks of simulation will be the starting point when a new supersonic transport flight simulator being constructed at Langley is ready for operation late in the year.

Linked to the NAFEC air traffic simulator by land line, this flight simulator will then perform the role of the SST in further SST-air traffic studies. This simulator will be a four-crewmember flight cab patterned after the flight compartment in a subsonic jet airliner. It will be fully equipped with test instrumentation and equipment.

A four-man crew—in most instances NASA or FAA test pilots—will "fly" the flight simulator under various test conditions as if it were an actual supersonic transport. Experienced air traffic personnel at the NAFEC facility will "control" the SST, also as if it were an actual plane in the system, much as they do aircraft simulated electronically by target generators in other air traffic study effort.

Telephone lines will provide simulated radio links between the "flight crew" at Langley and air traffic controllers at NAFEC. A data transmission system, operating over land lines between Langley Research Center and the Atlantic City center, will provide the FAA air traffic control simulation personnel with aircraft position, altitude and radar beacon information in line with the aircraft's simulated operations.

T-39 used in supersonic transport study.

FAA MAY EASE INSTRUMENT RATING REQUIREMENTS

A new rule which would have the effect of making all private pilots eligible to train for an instrument rating has been proposed by the FAA.

The proposal would drop the present requirement that private pilots must meet the flight time requisites for a commercial pilot certificate in order to qualify for an instrument ticket.

Applicants still would be required to log a total of 40 hours of instrument time, however. They also would have to pass current practical and written examinations which would insure that they meet minimum levels of skill and knowledge.

The FAA also wants to assure better use of the trainee's time while he is logging his 40 hours on instruments. The Agency proposes to increase the number of hours of instrument flight instruction from 10 to 15 hours and require the performance of certain additional flight maneuvers and instrument approach procedures. Included would be a cross-country trip of at least 200 miles under an approved IFR flight plan, with use of VHF navigational facilities required for at least one leg of the trip.

Comments on the proposed rule changes (Draft Release 63-6) will be accepted until April 29 at the Dockets Section, FAA, Washington 25, D. C.

At present, applicants for an instrument rating must meet the flight time requirements for a commercial pilot certificate. This was established at a time when many private pilots were restricted in their flying activity to short trips because of the operational limitations of most general aviation aircraft.

Today, however, many general aviation aircraft have capabilities that equal or exceed those of some old transport type aircraft and compare favorably with several of the current transport types. This is particularly true with regard to the controls, accessories, instruments and radio installations. This has permitted the modern private pilot to acquire a depth of experience not available to his predecessors.

Moreover, there has been a general upgrading of the requirements for a private pilot certificate. For example, FAA now requires all newly-certificated pilots to have at least limited instrument flight capability. There also is FAA's Blue Seal program designed to encourage all private pilots to attain this same limited capability.

In view of these considerations, the FAA believes private pilots today are better able to qualify for an instrument rating than in the past, and it is no longer necessary for them to meet the flight time requirements for a commercial certificate.

ANNUAL REPORT, AIR TRAFFIC BOOKLETS READY

A summary of the activities and accomplishments of the Federal Aviation Agency for fiscal year 1962 have been published in the Agency's *Fourth Annual Report* to the President and the Congress.

The report, which covers activities from July 1, 1961 through June 30, 1962, is on sale from the Superintendent of Documents, Washington 25, D. C., at 40 cents per copy.

Divided into five major chapters, the report covers Aviation Safety, Airspace and Air Traffic Management, National Defense, Civil Aeronautics and Air Commerce, and Administration. In addition, it contains appendixes on accidents and accident rates for both U. S. air carriers and general aviation, a glossary of FAA terms, and a list of members of various advisory committees and task forces which have been working with the Agency.

Among the highlights discussed are legislation to prevent aircraft hijacking and other crimes, rules codification, aeromedical research, Project Beacon and Project Horizon, Design for the National Airspace Utilization System, area positive control, the flight information program, joint FAA-Defense use of facilities, airport development, aircraft development, and Agency reorganization.

Another publication for sale by the Superintendent of Documents is the latest edition of *FAA Air Traffic Activity* covering calendar year 1962. Available at $1 per copy, the publication lists latest figures on aircraft operations at various airports throughout the nation, and other breakdowns of air traffic activity.

Figures show Chicago's O'Hare airport in first place in total aircraft operations with 417,380 for the year. Los Angeles remains in second place with 344,033 and Van Nuys jumped from fifth to third place with 320,994.

Boost Flight Training Standards, Veteran Airline Pilot Advocates

A veteran airline pilot has recommended improved general aviation training standards in a report to FAA Administrator N. E. Halaby.

Trans World Airlines Captain Robert N. Buck, concluding a month-long study of bad-weather flight operations as a consultant to FAA (*FAA Aviation News,* March 1963), wrote to Halaby:

"General aviation pilots get in trouble because they were not taught all the facts of life when they learned to fly. The instructor rating and the necessary things an instructor must teach need overhauling. To teach a man to fly isn't enough. He should know how and where to get weather information and the instructor should satisfy himself that the student knows these things before he is turned out on his own. We have a sore need for better education processes."

Further important benefits would result, Buck noted, if a greater number of pilots realized "the useful things FAA provides" in the way of flight publications and material on various facets of aviation.

"There's too much stuff around which the pilots never know about," he said.

On the problem of weather, a matter of concern to all pilots, the TWA pilot declared, "The accident potential while landing during bad weather is great. Tolerances at 200 feet when going 140 miles an hour are not very tolerant and the margin for error is not only small, but almost completely unforgiving. This means that landing during bad weather demands the best equipment and the best techniques."

Buck called for continuing improvement in airport runway lighting, weather reporting and forecasting, air traffic control, instrument-flight equipment both in the aircraft and on the ground, cockpit displays, training, and development of an operational all-weather landing system.

He suggested, in addition, a safety survey of the nation's airports. The survey, Buck wrote, "could be made by a team established to review airports with the folowing in mind: (1) lighting needs, (2) displaced thresholds, short runway conditions, etc., (3) condition of airport regarding obstructions, construction, old construction that's never been fixed, etc., (4) any other item that affects safety."

Buck recommended that the survey team membership include the Air Transport Association, the Air Line Pilots' Association, and general aviation as well as FAA officials.

Basic Flight Information Publications Slated for Major Overhaul

Plans are underway to combine the *Airman's Guide,* the *Flight Information Manual* and other flight information publications into a single, streamlined, loose-leaf volume for easy use by pilots.

The new publication, the *Airman's Information Manual,* is part of an FAA project to improve its flight information program, including charts and Notices To Airmen (NOTAMs). Although the project is still in a proposal stage, general aviation organizations and the military services have indicated approval. Additional user comments are now being sought by the Agency.

At present a pilot may have to carry a number of bulky publications, some of which contain considerable unnecessary information. Current publications include the *Flight Information Manual,* the *Airman's Guide,* a *Directory of Airports and Seaplane Bases* and an *International Flight Informational Manual.*

In the proposed *Airman's Information Manual,* only operational information needed by pilots will be included. Desirable features of the *Guide* and the *Flight Information Manual* will be retained, but information of an administrative, legal or other non-operational nature will be eliminated. Material will be kept current by monthly replacements, revisions and supplements.

The redesigned publication will be sectioned into five parts: 1. Basic Flight Manual, which explains the use of facilities; 2. ATC Operational Procedures—procedures for operating an aircraft in the Federal Airways System; 3. Flight Data, containing all operational data not included in other parts; 3A. Special Use Airspace Notices; 4. Airport/Facility Directory, terminal data published by geographic areas—the Northeast, Northwest, Southeast and Southwest areas of the United States. A fifth part of the publication, the International Flight Information Manual, will be available for those requiring this information.

The new flight information program is divided into three parts: publications—the preflight planning phase; charts—the enroute phase; and the NOTAM system—the vehicle which ties the entire program together by giving pilots rapid information on status of facilities, airspace use, obstructions, airport conditions, etc.

As much enroute data as possible will be published on charts, rather than in the manual. In addition, FAA is developing a new chart specially designed for general aviation. Whereas World Aeronautical Charts are scaled 1:1,000,000 inches and sectional charts are 1:500,000 inches, the new chart would be based on 1:728,632 inches, or the equivalent of one inch to 10 nautical miles. The NOTAM system, third element of the information program, also will be improved. NOTAM summaries will be issued at least once a day and transmitted to users via a Teletype and mail distribution system. Information of a NOTAM nature, in which the time element permits, will be included in the manual.

In another step to increase service to pilots, the Agency last month launched a condensed version of the *Airman's Guide for Alaska* which includes information applicable only to operations in Alaska. It is issued with each set of Alaskan Enroute Charts. Individual copies for VFR use with other charts may be obtained by request to FAA, Attention AT-435, Washington 25, D. C. Similar *Guides* will be published later for Hawaii and the Caribbean-Central America area.

It's back to school again for FAA personnel, this time at Boeing's "College of Jet Knowledge", where courses in flight operation and maintenance are given on the new 727 now undergoing certification. FAA students here include specialists in air carrier operations, flight instruction and maintenance.

Improved Anticollision Lighting System for Aircraft Proposed

A new aircraft anticollision light system making it easier to determine the direction of aircraft in flight has been proposed by FAA.

The proposed display would follow the color code currently prescribed for aircraft running lights—green to the right side, red to the left and white to the rear—but would use high intensity lights flashing at least 40 times a minute at these locations. This arrangement would greatly increase the range at which an airplane's direction could be detected and consequently improve collision avoidance capability. Lighting fixtures could be located on wing tips and tail in much the same manner as running lights.

The present anticollision light system consists of one or more high-intensity flashing red lights usually located on the aircraft fuselage or vertical stabilizer.

The proposed regulation would take effect January 1, 1965, and would not be retroactive. All aircraft type certificated or manufactured after that date would be required to have the proposed system. Aircraft type certificated before then could have either the proposed display or the present one.

Installation of supplementary lights also would be prohibited after January 1, 1965. FAA believes that the present exterior lighting system has been diluted—and in many cases overwhelmed—by the addition of supplementary lights.

Comments on the proposed rule (Draft Release 63-7) will be accepted until May 29 at the Dockets Section, FAA, Washington 25, D. C.

Comments Sought on Adequacy Of Rules at Non-Tower Airports

In an unprecedented issuance of an "Advance" Notice of Proposed Rule-making, FAA is seeking comment on the need to establish nation-wide standardized traffic flight procedures at airports where there are no towers to furnish control services.

Approximately, 6,500 of the more than 7,000 airports in the United States have no towers.

This new rule-making policy is exercised where there is insufficient background information on which to base standard rule-making action, or where early comment would be helpful in deciding upon a course of action involving complex subjects.

Present operating rules at uncontrolled airports cover only communications procedures, direction of turns when landing, and compliance with local traffic patterns upon take-off. The adequacy of these provisions alone to assure safety is something that FAA wants to determine after reviewing pilots' comments.

Under standardized procedures, added factors to be considered include mandatory use of such traffic pattern components as upwind, cross-wind, downwind and base legs and final approach, procedures for entering the traffic pattern, altitudes and speeds to be maintained in the traffic pattern, wind components, use of specific runways, enroute operations, straight-in approaches, and right-of-way.

Abdul Ahmed Razak, a civil aviation officer of the Somali Republic, reviews aircraft records of surplus military DC-3s which were rehabilitated at FAA's Aeronautical Center and are slated for transfer to the new nation under a grant provided by the Agency for International Development.

Rules providing for standardized traffic pattern procedures at airports equipped with Federally-operated towers have been in effect since December 26, 1961. Such rules are considered essential for the safe handling of the relatively heavier volumes of traffic at these busier airports.

Comments on the Advance Notice (Draft Release 63-8; Reg. Docket No. 1620) should be submitted in duplicate to FAA's Docket Section, 1711 New York Ave., N. W., Washington 25, D. C. before May 2, 1963.

BOOK REVIEW

The Electra Story *by Robert J. Serling, with an introduction by FAA Administrator N. E. Halaby.*

Within the space of six short months the broken fuselages of two Lockheed Electras cast doubts on the industry-government engineering and certification process which gave birth to the turbo-prop airliner. Even some within the aviation community, men who appreciated the meticulous designing and testing that goes into any new aircraft, wondered what had gone wrong. But those who believed in the inherit integrity of the Electra—FAA Administrator E. R. Quesada, pilots who flew the airplane and engineers—refused to be stampeded into grounding the airplane.

Before the fatal flaw was detected—a combination of weakened engine nacelle and whirl mode—the sinews of American aviation were severely tested. In their quest for the answer, Lockheed test pilots, sometimes with FAA and CAB technicians aboard, conducted hair-raising experimental flights that "not only braved destruction but actually sought it."

The intense rivalry among manufacturers was forgotten as both Douglas and Boeing pitched in to help with the six-month-long testing that would restore public confidence—the "pillar supporting all civil aviation."

After some $2.5 million in test costs, plus another $25 million in modification expenses, public confidence was restored in the Electra. "The success of this effort," wrote Administrator Halaby in the introduction, "is a testament to the vitality of American aviation, its unity in crisis. It also extends the promise that our civil air fleet will continue in a position of world leadership."

Pilots Endorse Continuation of Atlanta Terminal Radar Service

Pilots and industry representatives who met February 16 in the FAA Southern Region's new headquarters building in Atlanta agreed that the air traffic experiment being conducted in the Atlanta Airport area should be continued but that some changes should be made.

The experiment (*FAA Aviation News*, August 1962), which began last November on a voluntary basis, is to determine the feasibility of providing effective radar separation for all aircraft, both VFR and IFR, flying in the Atlanta terminal area. In addition to providing positive radar separation of aircraft, the test also was designed to offer pilots more efficient landing sequencing as well as evaluating techniques for separating controlled from uncontrolled airplanes.

At the meeting, pilots were invited by FAA's Air Traffic Service Director, David D. Thomas, and FAA Southern Region Assistant Administrator, Arvin O. Basnight, to voice their opinions and ideas about the experimental program which, until the meeting, had been called Terminal Area Positive Separation (TAPS).

While the consensus was clearly in favor of continuing the test program, many constructive suggestions to improve the experiment were made by attending pilots.

Among the suggestions which already have been adopted is a change in the procedures to permit airport traffic controllers to apply visual separation between VFR aircraft and between VFR and IFR aircraft under certain circumstances. As an example, when a pilot reports having his traffic in sight and advises that he will maintain his own separation through visual observation, it will not be necessary for him to be confined to standard radar separation. With the varying speeds of different classes of aircraft, this will help shorten the "elephant train" to the approach end of the runway.

At the pilots' request, the FAA Atlanta test program has been renamed "Terminal Radar Service."

Assistant Administrator Basnight, in expressing appreciation for the interest demonstrated by the attending pilots and industry spokesmen, said, "In the environment of such cooperative and enthusiastic expression of user opinions and constructive suggestions as have been evident at this meeting, we feel that positive results can be achieved for the advancement of air safety in the airspace surrounding major terminal areas."

IT HAPPENS EVERY SPRING

The robin has no monopoly on spring.

Across the nation, flocks of general aviation pilots are gradually thawing out after one of the worst winters on record and taking to the air in increasing numbers.

But the advent of warmer weather does not in itself guarantee smooth, trouble-free flying. Spring has its own set of operational problems requiring special handling for safety's sake.

Icing, for example, is still a danger. This is particularly true of carburetor icing which does not depend on freezing temperatures. In fact, it is most probable between 40 and 60 degrees and can even occur at temperatures up to 90 degrees. Carburetor icing varies with model and installation, however, and pilots should refer to their aircraft manuals for detailed information on coping with this phenomenon.

Spring rains can create another serious operational problem by turning the sod air strip into a reasonable facsimile of an Irish peat bog. Mud collected on takeoffs can freeze at higher altitudes and cause retractable landing gear to stick in the up position. It also can build up inside the wheel pants and unbalance or jam wheels on landing.

Pilots operating from sod strips should be on guard against accumulations of mud and inspect landing gear before every takeoff and after every landing. They also should actuate the gear a few times after taking off from a sloppy field to shake loose any mud and moisture which might have been picked up.

The aircraft fuselage also should be kept clean of lumps of dried mud that can later absorb moisture and lead to corrosion, rot and decay.

Special care should be given aircraft which have been relatively inactive during the winter months to insure their airworthiness. They should be given a complete mechanical check and the entire fuselage, both inside and out, inspected for corrosion or other damage.

One possible source of fuselage damage—especially at some smaller fields—are rats. It is not uncommon for them to chew off material from fabric-covered aircraft and carry it away for their nests. Rats also will build their nests inside aircraft which have been tied down or hangared for long periods of time. Moreover, their excretions can cause serious structural damage. Rats also have been known to chew through electrical cable insulation.

Other steps to follow for safe warm weather operation include:

- Remove winter shields on engine cooling openings. If this is not done, the engine can become dangerously overheated.
- Change oil to proper viscosity. This is particularly important on older aircraft.
- Check idle RPM and reset for spring operation. Engines will idle faster in warm weather than they will during the winter.
- Drain fuel tanks completely to eliminate moisture and foreign material, and then flush with clean gasoline. To help prevent condensation, keep tanks full when not flying.
- Check fuel tank vents regularly for bugs and other foreign matter which can block the vent lines and seriously affect fuel flow.
- If aircraft has diaphragm fuel pump, check to make sure diaphragm has not dried out during inactive winter months. Pump will not function properly if this condition exists.
- Be sure brakes are operating properly. Mud in discs or linings can jam or grind the brakes.

SAFETY FIRST

Proper Preflight

Failure to preflight properly is a factor in more than 200 general aviation accidents each year.

According to figures from the Civil Aeronautics Board, inadequate preflight preparation was a causal factor in 764 general aviation accidents for the three-year period 1959 through 1961. The figure for 1959 was 202, for 1960 it was 290, and during 1961 CAB records show 272 accidents were at least partially the result of failure to preflight properly. These statistics do not include crop control accidents.

Among the major causes of poor preflighting are lack of concentration, reluctance to acknowledge the need for a checklist, carelessness bred by familiarity with the aircraft, and haste.

Many pilots tend to let distractions or interruptions disturb their preflight procedures. Some feel that using a checklist in the presence of other persons may give the impression they are not as skilled and professional as they should be. Many accidents are caused by pilots who become careless in their preflight simply because they have been flying the aircraft for many hours. This is the old "familiarity breeds contempt" error. Plain haste is also a major contributor—the rush through a preflight by a pilot anxious to get to his destination, or because passengers are urging him to get started.

These are the pilots who miss something on the preflight that can kill them in the air. They are the ones who become preflight accident statistics.

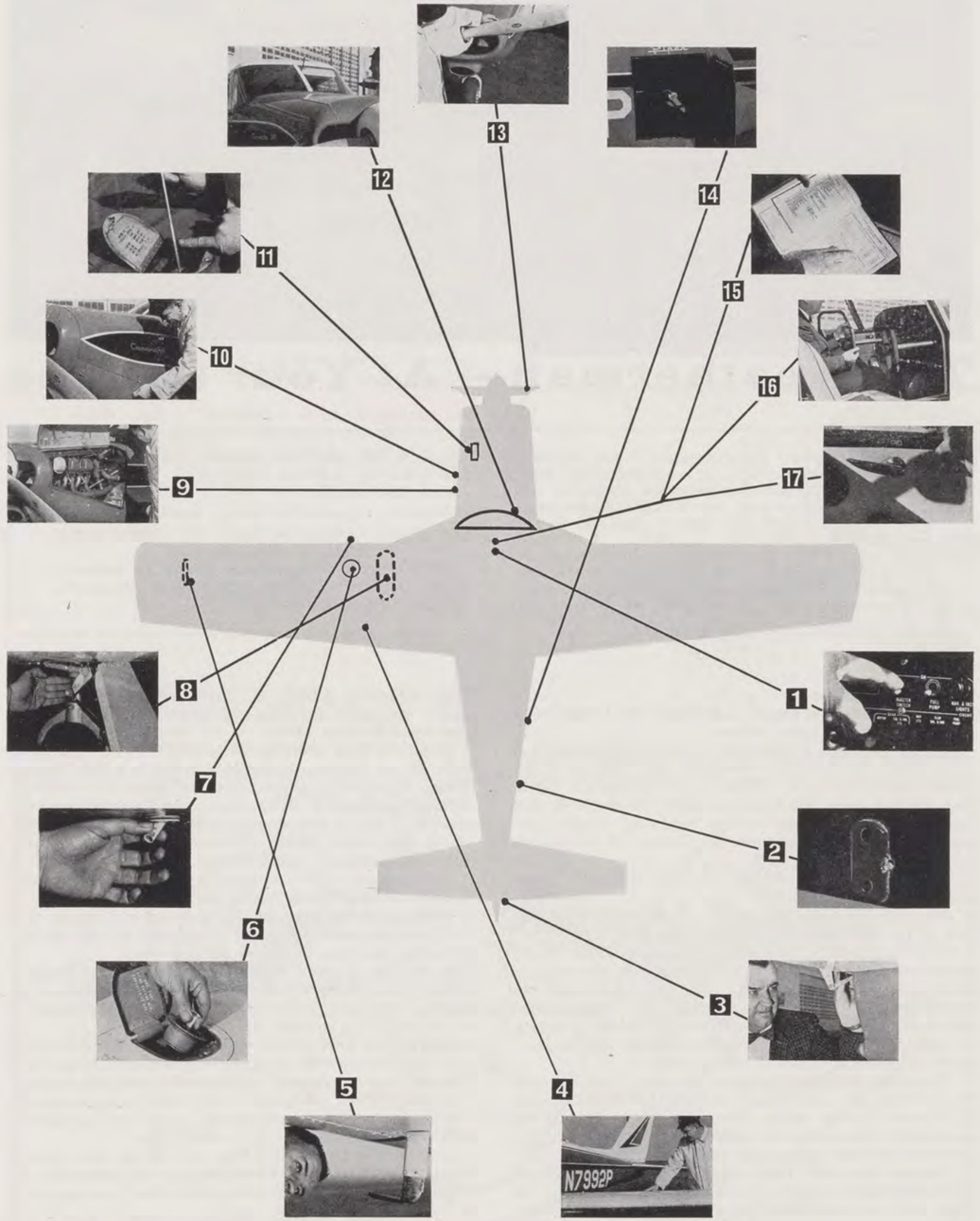
Good preflight techniques can substantially reduce accidents. And good techniques are simple. All they require is common sense, a little time, thorough application, and the *Aircraft Owners Handbook* for the plane involved.

The accompanying illustrations show a proper preflight. Although the checks primarily indicate only one side of the aircraft, many of the steps are equally applicable to the opposite side also.

Preflight procedures are basically the same for all aircraft. Individual differences will be found in the handbook for each model. Use your handbook, follow the instructions step by step, and a major source of potential accidents can be eliminated.

KEY TO PREFLIGHT WALKAROUND, OPPOSITE PAGE

1. Switches off
2. Static vents clean
3. Control surfaces and mechanisms undamaged
4. Surfaces free of ice, snow or frost
5. Pitot tube open
6. Ample fuel, caps secure
7. Fuel vents open
8. Shock struts inflated properly; tires inflated and no excess wear
9. No fuel or oil leaks
10. Cowling and inspection covers secure
11. Engine oil at proper level
12. Windshield clean and free of defects
13. Prop free of dangerous nicks. Ground area under prop free of stones
14. Baggage and tow-bar stowed and secured properly
15. Required papers in order and in aircraft
16. Controls operating normally and switches in proper position
17. Door closed and locked and fuel strainer drained



The Weatherman -- At Your Service

With this story FAA Aviation News *begins a series of monthly articles on a subject about which there is considerable ignorance and occasional profanity. Year after year weather has caused problems for pilots; year after year it continues to be a major cause of accidents.*

As the performance characteristics of airplanes continue to improve, with pilots flying higher and faster and ranging more widely, they are encountering more and more varied weather conditions. Consequently, the need for weather information—and the ability to use this information properly—becomes more critical.

Weather information can be made available to pilots, but only they can acquire the training needed to make use of it.

We hope that these articles, written by meteorologists of the U. S. Weather Bureau at the invitation of FAA, will help.

What is the weather?

It is many things to people as diverse as the farmer, commuter, picnicker or Little Leaguer.

When a pilot asks a forecaster, "What is the weather?", it could mean the difference between a safe flight or a disastrous one. To the pilot, weather is any atmospheric condition that can cause him trouble in flight. To the VFR pilot especially, it means low clouds, fog, dust, smoke, precipitation or haze which reduce the distance of the horizon and thus vitally affect his flight.

To the meteorologist, weather is the state of the atmosphere and its short-term variations.

But weather is more than that—it is the cause of 38 percent of the fatal accidents involving light aircraft.

However you define it, weather is governed largely by the movement of great masses of air with different properties of temperature, moisture and wind. These air masses appear on surface weather charts as *highs* because they are associated with high pressure centers. Areas in which maximum mixing of these different air masses is taking place are labelled *lows,* since this occurs in centers of low pressure.

The greatly simplified versions of weather maps that appear on television and in newspapers are based upon charts drawn in Weather Bureau offices and plotted from information gathered by observations all over the world by rockets, radar, satellites and more conventional instruments.

Analysts then draw lines, called isobars, connecting the points of equal barometric pressure. The isobars outline the highs and lows and reveal pressure patterns. Lines on the maps separating different air masses are called *fronts.* Together with highs and lows, the fronts are the outstanding features of the map.

Highs are areas where the barometric pressure is relatively high. In the Northern Hemisphere, winds in a high pressure system flow spirally outward from the center in a clockwise direction. Although a high-pressure system usually brings fair weather, it may be accompanied by cloudiness or precipitation on its outer edges. Highs moving down from Canada have turbulence and gusty surface winds.

Lows, or areas of low barometric pressure in the Northern Hemisphere, have winds flowing spirally toward the center in a counterclockwise direction. The approach and passage of a low pressure system frequently is attended by bad weather, including cloudiness, storms or shifting winds.

A pilot flying into a high pressure area without changing his altimeter setting will be higher than the instrument indicates. Conversely, a pilot flying into a low pressure area will be lower than his altimeter indicates.

The general movement of weather in the middle latitudes is from west to east with the pressure systems and fronts being carried along and showing a progressive day-to-day eastward movement. When this general circulation brings air masses with distinctly different properties in contact with one another, they refuse to mix freely and a front is born.

A cold front is the leading edge of a cold air mass advancing into an area occupied by warmer air. It appears on the weather map as a line with triangular symbols pointing in the direction of the front's movement.

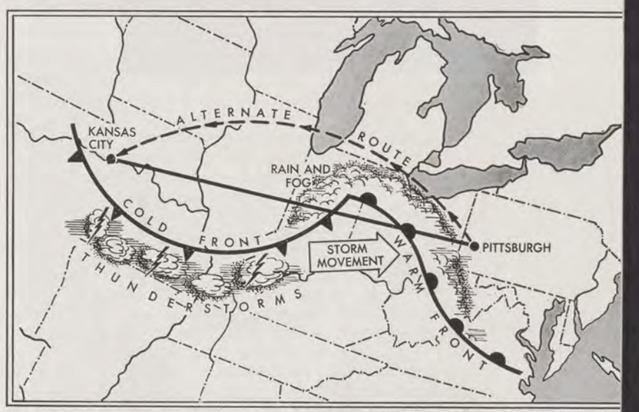
A warm front is one in which the warm air replaces relatively cold air. It is shown on the map as a heavy line with semicircular symbols on the side toward which the front is moving. Warm fronts generally move at slightly less than half the speed of cold fronts.

Most of the substantial changes in weather occur in the areas where two air masses meet. In general, the greater the difference in temperature between two air masses, the more vigorous the weather distribution will be. When warm air meets colder air, the lighter warm air must flow over the cold. As it rises and cools, its moisture may condense, forming clouds and rain or snow.

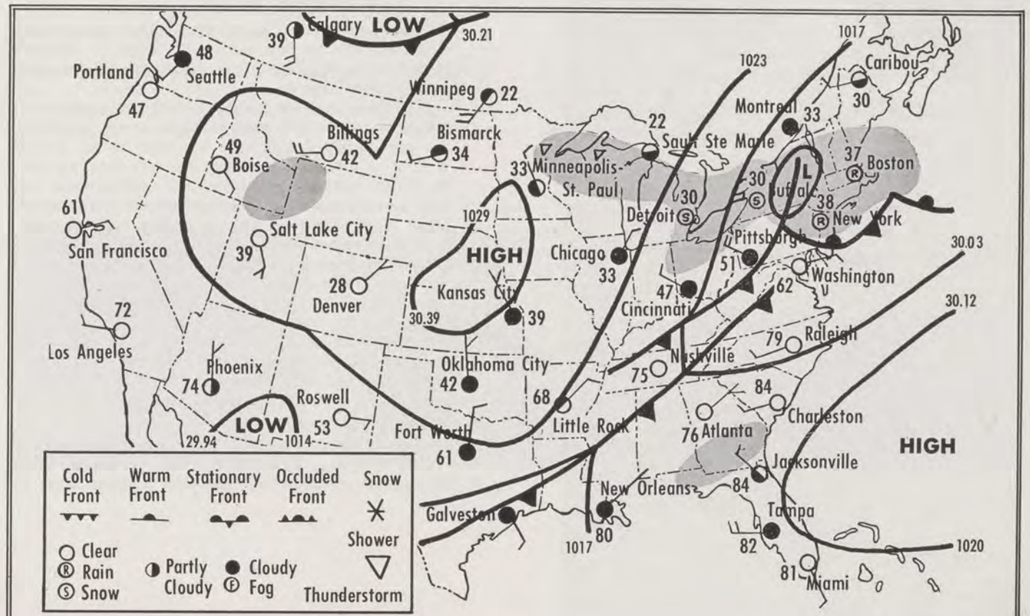
Fronts may bring little weather activity, or they may mean severe disturbances, depending primarily upon the contrast in temperature and moisture between the cold and warm air of the two masses. The zone of weather activity associated with a cold front normally is narrow with corresponding rapid changes. In contrast, the area of activity associated with a warm front is broad with a gradual change of weather both in time and distance. Either frontal system can create hazards to flying.

The weather map on television or in the newspaper, and the forecast by a commercial radio station can assist a pilot in knowing his weather. However, before he takes off he will be doing himself a great service to get a more definitive weather briefing—either directly from the Weather Bureau forecaster, or through his FAA facilities.

Weather Bureau analysts (above) prepare upper air charts. Below, meteorologist briefs private pilot on turbulence and speed of winds he may encounter.



A pilot can plan an alternate route *(right)* to avoid bad weather by proper use of weather reports *(below)* and forecasts. It should be borne in mind, however, that any weather map is a historical document which shows conditions that existed in the past.



Flying With a Cold Nothing To Sniff at

"Just a cold" spells aching miseries in anybody's language. But where other folks can doctor themselves with any one or all of the pills, capsules, gargles and sprays on the market until the whole thing blows over, matters are not simple for pilots.

Where an airman is concerned, a cold is not just a cold. It is something that can interfere with his ability to perform his job and, as such, it can be a threat to his safety and the safety of his aircraft.

Aside from the hazards of self-medication, a cold can have two effects at altitude:

- A cold can close up your ear ducts or Eustachian tubes and make it impossible for you to clear your ears. This in turn can lead to considerable pain, inflammation of the middle ear and, in rare cases, in-flight rupture of the ear drum. It can also cause vertigo.
- A cold increases the possibility of an incapacitating sinus block in flight.

When tempted to "doctor" your cold or sinus trouble and then fly, the best advice is "Don't." Ordinary remedies can produce effects which can be dangerous to a pilot at altitude.

Antihistamines, for instance, which are contained in tablets, capsules and even in some cough medicines, are particularly dangerous. Response to an average dose of an antihistaminic drug can vary from no effect at all to marked drowsiness, reduced alertness and even mental depression. Antihistamines can adversely affect depth perception and equilibrium and can reduce perceptual motor skills such as eye-hand coordination.

Cold compounds which contain quinine can produce ringing of the ears and dizziness. Certain nose drops contain drugs which primarily constrict the blood vessels within the nose, increase blood pressure and pulse rate and even cause the "jitters." Some nose drops can produce uncoordination and visual disturbances. Sulfa drugs and analgesics or pain killers such as aspirin are thought by some persons to lower resistance to hypoxia.

Condensed from APPROACH, The Naval Aviation Safety Review.

Medical Examiner's Career Spans Aviation History

Dr. Eugene Osmun Barr, one of 5,100 Aviation Medical Examiners.

One fall day more than a half a century ago, a small boy stood fascinated on the parade ground at Fort Myer, Va., as a tall man wearing a cap released bits of paper and watched them flutter to the ground.

Wilbur Wright explained that when the paper fell within a radius of three feet of where he stood, the wind velocity would permit the demonstration flight of the airplane piloted by his brother Orville. Spectators included Members of Congress and the Army Signal Service, who would observe the performance of the airplane for which a $25,000 contract had been awarded.

A short time later that afternoon in 1908 the awed lad and the adults watched as the plane took off to meet Army specifications for an aircraft which "could average 40 miles an hour, carry two men, fly 10 miles non-stop, and cover 125 miles without having to refuel."

Today, aviation and the little boy have both grown up. The boy is Dr. Eugene Osmun Barr, Washington, D. C. surgeon, aviator, author and one of more than 5,100 FAA Aviation Medical Examiners—private physicians who approve the physical qualifications of every pilot who takes to the air.

Dr. Barr exemplifies this hard-working group of physicians, many of whom are also pilots, former pilots or doctors with a special interest in aviation. They periodically attend a three-day seminar sponsored by FAA to keep them abreast of current problems and advances in medical aviation science.

From that day at Fort Myer, young "Oz" Barr's enthusiasm for flying grew and it wasn't surprising that he signed up with the Aviation Section of the Army's Signal Corps in World War I. After receiving his commission at Gerstner Field, La., he became one of four men sent to Mineola, Long Island, to learn to fly the new Italian Caproni bomber, a multi-engine airplane with an 89-foot wing span.

Lieut. Barr was one of aviation's early medical guinea pigs. A volunteer, he became the first person to be tested in a primitive spirometer that measured the capacity of man's respiratory system in an "alien", i.e. flight environment. The spirometer looked like a large milk can set on a frame with lights, motors, foot pedals and enlarger. The subject entered the chamber and breathed until he lost consciousness from lack of oxygen. This established at what altitude he could safely fly. Before the war ended, Lieut. Barr became the first to pilot a radio-equipped plane. At the close of the war he began his medical studies and was graduated from the University of Virginia in 1924.

In addition to a medical career, Dr. Barr is the author of a number of publications, including *Flying Men and Medicine,* one of the first non-technical books on aviation medicine.

Dr. Barr is working on another book covering firsts in aviation, thus continuing a life-long interest in aviation.

"Oz" Barr was a little boy when he saw this Wright brothers airplane *(left)* perform. Center, Lt. Barr as a World War I pilot and the Caproni bomber he flew.

One of FAA's test evaluations of new procedure to speed evacuation from crashed aircraft. Top right, Telescape device and "passengers" in action. Top left, stewardess begins escape procedure by positioning Telescape and starting to extend tube. Above, she completes the job. Below, child starts the journey to safety followed by adult. Stewardess leaves last.

THIS WAY OUT...

A device to speed the evacuation of passengers and crew from crashed aircraft is being evaluated at FAA's Aeronautical Center in Oklahoma City.

The so-called "Telescape" is a telescoping metal tube that is carried near the aircraft's door and extended to the ground in time of need by compressed air or CO_2.

In recent tests, 25 people escaped from an aircraft in 90.3 seconds. Individual times ranged from 1.88 to 4.52 seconds. Average escape time was 3.6 seconds. Similar tests with a non-inflatable slide took an average of 4.5 seconds.

The Telescape was developed by Harry Turnpaugh of FAA's Flight Standards Service, but research revealed that a patent for a similar device was issued several years ago to Curtiss-Wright. The subject was not fully developed however, and Curtiss-Wright gave FAA permission to make and test a prototype.

Development and evaluation of the Telescape are being conducted by FAA's Flight Standards Service and the Civil Aeromedical Research Institute (CARI). Both adults and children have been used in the tests.

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.

• *Pilot Refresher Course*

The government should make available to all private pilots a refresher standardization course, flown in government planes, at government expense, and with government instructors. The course should include safe approaches and landings; cross-country flying using various radio aids; basic instrument and radio navigation; acrobatics; and ground instruction. For airplanes the government could use scores of T-34s now in storage and for instructors the government could use former Air Force flight instructors who have been terminated from service. Why spend millions on the latest aids and have a bunch of uninformed pilots trying to use them?

Bernard Farley
Lemon Grove, Calif.

We agree that a requalification course would have great value to the safety and efficiency of private pilots. For this reason the FAA has for the past two years actively encouraged the development and conduct of pilot requalification courses by state aeronautics commissions, national aviation organizations and other private agencies. The FAA has no appropriation available for the conduct or underwriting of flight training for the public.

• *Air Taxi License*

How does one apply for an air taxi license? I have a commercial license with more than 2,000 hours, a Bonanza, all required maintenance and all bulletins complied with. I log about 200 hours a year in business and pleasure flying and now wish to fly some charter for people who require air taxi service.

Betty McNabb
Albany, Ga.

The regulations governing air taxi operations are listed in Appendix B of Civil Aeronautics Manual 42, *which may be obtained for $2 from the Superintendent of Documents, Washington 25, D. C. It is suggested that you contact your nearest FAA General Aviation District Office to discuss your proposed operation and the procedures to be followed for certification as an air taxi operator.*

• *Airborne Radar*

I read recently of a television-type aid to air traffic control which delivers a picture instead of a radar-type blip. This instrument also has an information-storing feature.

In the past, however, I have been impressed with the idea of an airborne radar, homed in on a traffic controller's radar and giving the controller a complete account at all times of the aircraft's actions. The airborne radar, connected to the automatic pilot, would override the pilot on landings in case of error in his judgment.

E.R.B.
Boston

The equipment referred to in the newspaper article is probably Raytheon's bright display unit which utilizes scan conversion, a variation of television-type equipment. It provides a display with the capability of displaying alpha-numeric data supplied by the radar beacon system.

The use of airborne radar for air traffic control purposes dates back to 1946 when a system known as Teleran was investigated. Various other systems have been evaluated since then, but none has proved satisfactory for a variety of reasons. Our present efforts in this direction are based on the use of the radar beacon system, as recommended by the President's Project Beacon Task Force. This system incorporates an airborne transponder with information automatically fed to ground-based radar displays in the form of alpha-numerics.

• *Blue Seal Program*

Kindly provide us with all available information on your Blue Seal program. We are working along the same line and are eager to learn more about it.

Bjorn Lindskog
Royal Swedish Aero Club
Stockholm, Sweden

Pilot certificate requirements were amended in 1959 to require training and proficiency in the control of airplanes by reference to flight instruments as prerequisites for the issuance of private and commercial pilot certificates. As a result, all pilots who have been originally issued these certificates since May 16, 1960 have fulfilled this requirement.

The purpose of this training is twofold: to increase piloting proficiency by inculcating the habit of using flight instruments even under VFR conditions; and to provide a pilot with emergency capability to get out of inadvertently encountered IFR weather. Since the regulation requiring this training was not retroactive, there are at least 200,000 certificated pilots in this country who have not received instrument flight familiarization and who are not required to obtain such training.

To encourage these pilots to obtain instrument training voluntarily, the Blue Seal program was instituted. Those who complete the training receive a distinctive pilot certificate with a Blue Seal imprinted. These certificates convey no additional privilege, but serve only as evidence of qualification which may add a certain prestige to their holders.

• *Pilot Ratings*

For a number of years I have held a commercial license issued on the basis of my multi-engine military flight record. Based on more than adequate single-engine time, and the concept that one must be fairly competent in single-engine aircraft before he can be rated in multi-engine aircraft, I hope the FAA can issue both single and multi-engine ratings. This will obviate my having to meet all the requirements for a single-engine rating based on an FAA examination and the necessary prerequisite instruction time.

Ernest T. Salzer
Phoenixville, Penn.

The regulations governing issuance of ratings to military pilots provide that ratings will be issued for each category, class and, if appropriate, type of military aircraft which the applicant has flown ten or more hours as pilot-in-command within twelve months preceding the date of application. A statement of recent flight time as pilot-in-command is required on each application for a pilot certificate on the basis of military competence.

We assume that the rating you now hold was based on the recent pilot experience shown on your application or its attached certificate of military pilot status. In the event you still are active as a reserve military pilot, you may qualify for additional aircraft ratings on the basis of your recent pilot-in-command experience in military aircraft. If you do not meet recent experience qualification requirements in military aircraft, you may obtain a single-engine rating by demonstrating your commercial pilot competence in a single-engine airplane to a Federal Aviation Agency inspector or a designated pilot examiner.

Although we realize that most multi-engine pilots had their original training and pilot experience on single-engine airplanes, we do not consider qualification as a multi-engine pilot to be evidence of current qualifications in single-engine airplanes. Active airline pilots often seek transition training and checkouts before flying single-engine equipment, even though their single-engine ratings are still valid.

Change of Address Notices

Subscribers to *FAA Aviation News* are requested to send change of address notices directly to the Superintendent of Documents, Washington 25, D.C., and enclose the mailing label from the magazine to facilitate processing their request.

This month, in his usual space on the next page, cartoonist Robert Osborn examines a pilot's attitude—both aeronautical and psychological—and finds them both wanting.

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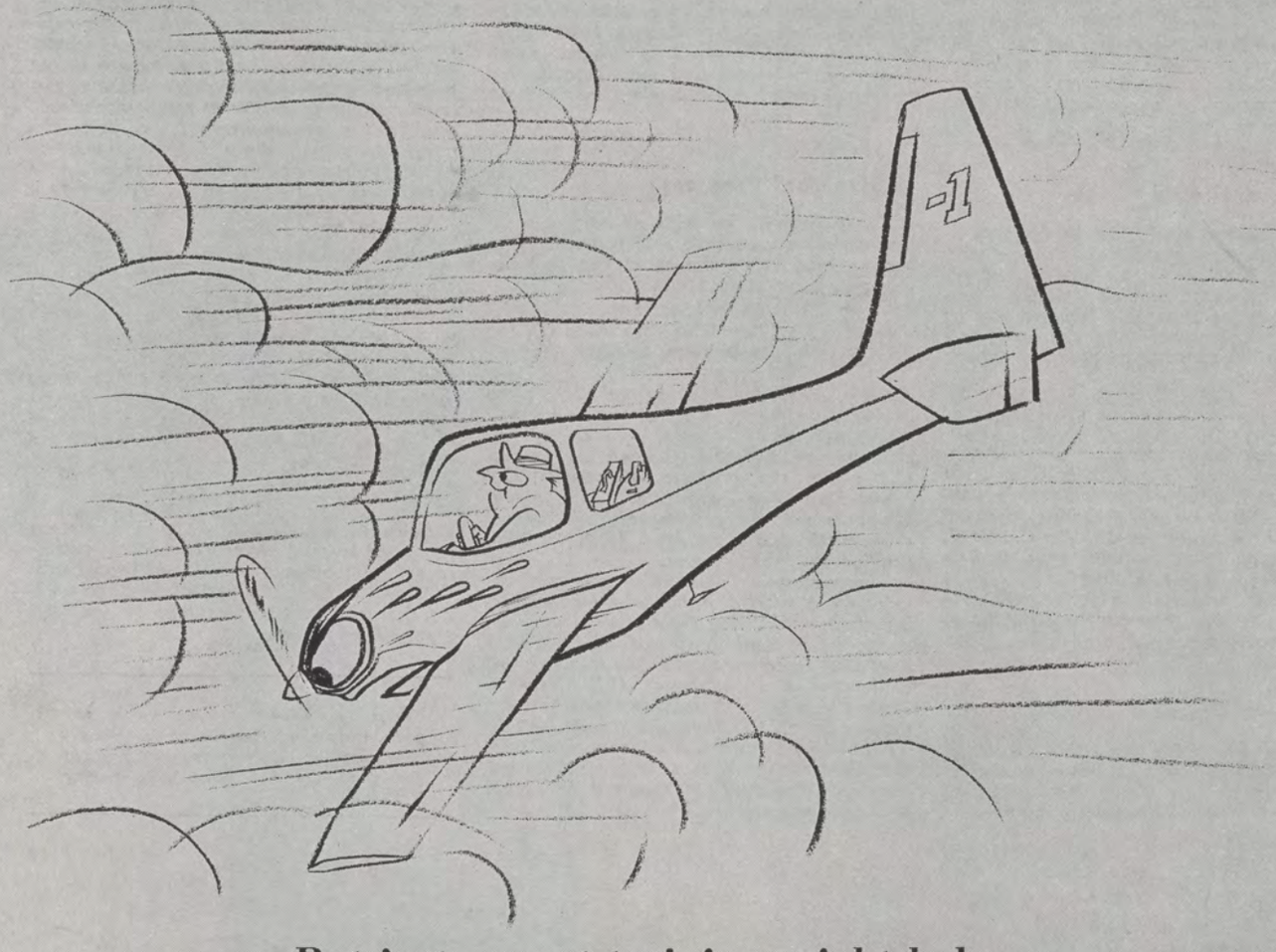
Molt's *attitude* leaves much to be desired . . .



But instrument training might help.