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Cold Weather Operations, p. 9

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PILOT SURVEY. In an effort to help the *FAA Aviation News* serve your changing needs, the Superintendent of Documents, Government Printing Office, will be sending each subscriber an *FAA Aviation News* readership survey in the near future. The survey will ask about the type of flying you do, your interests, and how the magazine can better provide you with the information you want and need. You will also be asked for your opinions about the magazine's format, style, and article content.

Please take the time to complete the survey and tell us how we can better serve you. You should receive the survey before the end of January.

NOTICE TO AIRMEN. Pilots, especially instrument pilots, may not be getting all the information they need for a safe flight. FAR § 91.103 (old FAR § 91.5), Preflight Action, requires each pilot in command to become familiar with all available information concerning a flight. The problem is many pilots and flight instructors do not realize that when they call a Flight Service Station (FSS) for a Standard Briefing, unless they **SPECIFICALLY ASK** for all *Notices to Airmen* (NOTAM), they will **NOT** receive NOTAM D (Distant) or Flight Data Center (FDC) information that has been printed in the *Notices to Airmen* publication. Printed every 14 days, the *Notices to Airmen* contains such critical flight information as changes in instrument approach procedures (An Instrument Approach Procedure Chart can be published without being authorized for use.); flight restrictions; airport, communications, and navaids information; and aeronautical chart revisions. The information is printed until its expiration, cancellation, or until printed on the proper charts or in the *Airport/Facility Directory* (A/FD). Pilots should review Class II NOTAMs and the A/FD in addition to obtaining a briefing.

The *Airman's Information Manual* (AIM), paragraph 502, discusses FSS preflight briefings. The AIM lists the type of information contained in a Standard Brief and the order its normally given in by a FSS briefer. Pilots should review the differences between a Standard Briefing, an Abbreviated Briefing, and an Outlook Briefing. Paragraph 294 of the AIM discusses the NOTAM system, types of NOTAMs, and the information contained in each.

What's in a Name?
Saying Goodbye to a Name on the Masthead

It is a well-known and accepted fact among magazine editorial staffs that readers seldom pay attention to mastheads, where the editorial staff have their names listed. We editors know no one reads the masthead except the editorial staff when we check it to make sure the typesetter has not misspelled our names. As a result unless one is the editor of the *New Yorker* or *Time*, the editor often remains anonymous or, at the least, overlooked. That does not mean, however, that editors should remain anonymous and relegated to the unread masthead. With this issue of *FAA Aviation News*, one name that has been on our masthead for 25 years is missing, and the name and the person deserve a passage from anonymity.

Lewis David Gelfan first joined the *FAA Aviation News* masthead in 1965. A free-lance writer with a young family, Mr. Gelfan saw the stability in an assured job as a writer for the magazine, which was based in FAA's Public Affairs office. Then, the magazine was a "newsy" publication, reporting on happenings in aviation and the Administrator's speeches. Safety was not its main focus.

While a writer for the magazine, Mr. Gelfan began taking flying lessons and became a licensed pilot. Through that contact with the general aviation community, he came to realize that an FAA magazine should be more than a newsletter for the agency. He was able to convince the editor to include safety articles geared toward general aviation, but, still, they were not the focus of the magazine's purpose. Mr. Gelfan himself became its Editor in 1967 and oversaw *FAA Aviation News'* becoming *FAA General Aviation News* in 1976. (We have come full circle back to *FAA Aviation News*.) Mr. Gelfan relegated those non-safety articles to a single page in the back of the magazine, and once it became part of the Flight Standards Service in 1974, its entire purpose became aviation safety. When the FAA Aviation News Staff combined with the Accident Prevention Staff in 1985 to become the Accident Prevention Program Branch, Mr. Gelfan added accident prevention to the magazine's mission.

Aviation, aviators, FAA administrators, and the magazine's staff have changed over the years, but Mr. Gelfan remained to spirit *FAA Aviation News* through those changes, never losing sight of the fact that the magazine's function was to provide safety information to airmen—pilots and mechanics. More than once he brought a writer (this one included) back down to earth and back to focus on the readership. When his blue pencil crossed out purple prose, it was painful at first, but the result was an article and a magazine that airmen could use to their benefit. "This," he would often say, "is a ***safety*** magazine."

"David Gelfan" may not be a household aviation name like Clyde Cessna or Paul Poberezny, but the contributions of David Gelfan to aviation safety over a period of nearly three decades have their own place in the history of the FAA. In a way, his contributions cannot be measured because there is no way to determine how many lives have been saved by information provided by *FAA Aviation News* with David at the editorial control yoke. David would consider one life saved sufficient and the rest just icing on the cake.

David's young family are grown now and in college, and several years ago, he built himself a retirement home in Washington state with a beautiful view of the mountains. I and his other FAA colleagues and *FAA Aviation News'* readers and subscribers wish him a happy and much-deserved retirement in a place of such beauty.

Lewis David Gelfan's name will be gone from the masthead, but *FAA Aviation News*, his legacy to generations of future airmen, will continue.

Phyllis A. Duncan
Editor, *General Aviation Operations Inspector's Handbook*

Interim Managing Editor,
FAA Aviation News

LORAN C Goes Public

by Dean Chamberlain

The good news is the charts for the first public Loran C instrument approach procedures (IAP) are scheduled for release November 15, 1990. The charts for the new non-precision approaches at six locations will be included in the Instrument Approach Procedure change notice effective that date. There may be more than one Loran C approach for a given location.

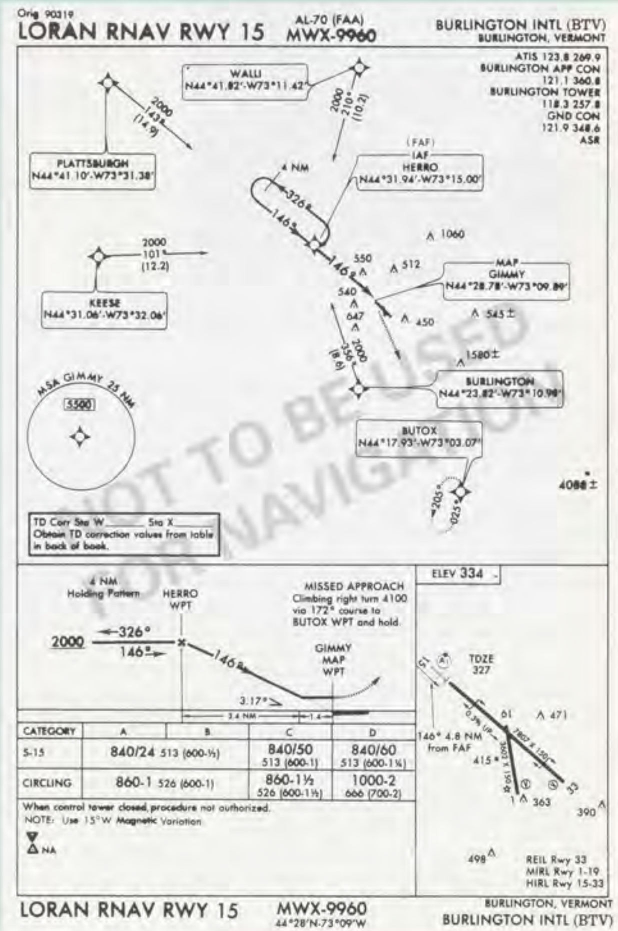
The bad news is there are no FAA-approved IFR approach Loran C receivers available to fly the approaches. One company is currently working with the FAA to certify its receiver for approach use. (In fact, the receiver may have been approved by the time you read this.) Until an IFR Loran C unit is certificated for approach use by the FAA, it is illegal for any pilot to fly one of the new approaches in IFR conditions using a current Loran C unit.

Five of the locations are airports: Burlington International, Burlington, VT; Ohio State University, Columbus, OH; Orlando Executive, Orlando, FL; Lakefront, New Orleans, LA; and Portland International, Portland, OR.

The sixth is a point in space over the Mississippi River Delta about 60 nautical miles southeast of New Orleans, near Venice, LA. This IAP will provide an approach for three landing sites in the area. The Venice approach to a point in space is a good example of the versatility of Loran C and how it can solve unusual problems.

The reason the new approaches cannot yet be used is simple. Of the estimated 100,000 Loran C units installed in the general aviation fleet, most are for VFR use only. About 10 percent of the units are approved for IFR en route and terminal use only. None of the current IFR models are FAA approved for approach use.

The lack of FAA-approved approach units may pose a serious problem to some IFR pilots who, perhaps through ignorance, may try to fly one of the new approaches using an IFR en route and terminal unit. At a recent meeting, Ron Swanda, a General Aviation Manufacturers' Association (GAMA) representative said many of the pilots operating IFR units today mistakenly think their receivers are approved for approach use. He said, "According to a 1988 FAA aviation report, 6,000 pilots said they had approved IFR Loran C receivers for approach use in their aircraft."



The 6,000 pilots were wrong. No unit has been certificated for approach use.

Even when FAA-approved approach units become available, IFR pilots, especially renter pilots, will still have to be cautious. They will have to check either the aircraft's Flight Manual Supplement or FAA Form 337, Major Repair and Alteration, to find out which IFR-level of Loran is installed in the aircraft. Only then will they know if the unit is approved for approach use. Of the three levels of Loran C receivers (VFR only; IFR en route and terminal, and IFR en route, terminal; and approach), only the VFR units must have a placard displayed next to the unit saying "Loran C Not Approved For IFR." There is no requirement to placard which IFR-level unit is installed.

In addition to needing an FAA-approved IFR approach receiver, the unit's installation and the aircraft must also be approved for use by a properly certificated person (as defined in FAR §1.1 could be either a person or organization) for the aircraft to be airworthy. A pilot cannot install any unit, such as a portable, plug-in model and legally fly using Loran C.

Both unit certification and installation approval are needed for several important safety reasons. A brief history of Loran C may explain some of the reasons.

Scheduled for completion in the spring of 1991, the new chains will eliminate the so-called "Mid-continent Gap."

Loran C was developed for maritime navigation, and many of the units installed in aircraft were either designed or built for shipboard use. The system's transmitters and receivers were not designed to warn a pilot quickly of a problem, such as a change in signal accuracy or a problem with the receiver, in the time needed during an IFR approach. Although the upgraded Loran IFR en route and terminal models have a warning system, they and the current Loran C system can take up to 60 seconds to display a warning. That response time is still too slow for instrument approach use in a fast moving aircraft. One of the requirements for an IFR-approach certificated receiver is that it must provide a warning within 10 seconds after receiving an "Aviation Blink" signal (explained below) from the ground-based transmitter. Some pilots may think even a 10-second warning is too slow when they are flying IFR near the ground.

The need for a quick system malfunction warning has been part of the problem of developing a national aviation Loran C system. One of the requirements for upgrading Loran C transmitters for aviation use is the need to provide an automatic "Aviation Blink" warning signal within 10 seconds when a transmitted signal goes out of tolerance. Pilots must be warned quickly if they are receiving inaccurate navigational information. In the past, maritime and aviation enroute and terminal use operators did not need such a fast warning. When a transmitter's signal goes out of tolerance, the required warning signal is manually activated. This system workes fine, but it is too slow for approach use. Flight safety requires a faster warning system which is the reason for the new 10-second warning requirement. Until the automatic "Aviation Blink" is installed in the ground station transmitters, air traffic control will use local monitors to assure that adequate and accurate signals are available throughout the approach.

Since Loran C is a low frequency system, it is subject to static interference. The aircraft alteration to install a Loran receiver system must be done using appropriate techniques to reduce the potential problems of static electricity. The initial aircraft alteration approval also includes the requirement to ensure the total system meets established accuracy standards. To minimize the effects of static electricity, the person altering the aircraft must ensure that proper anti-static techniques such as static wicks, and airframe bonding methods such as bonding cables are installed on the aircraft. The aircraft alteration requires electrostatic skin mapping of the aircraft to aid in antenna location to further minimize any possible static problems. The FAR requires the person who alters the aircraft to install the Loran system to certify the system does not interfere with any other required navigation system in the aircraft. Loran C is not approved as a sole-use navigation system; it is a supplemental system. In case of a Loran failure the aircraft must be equipped to return to the VOR en route system. The failure could involve either the aircraft's receiver or the more serious problem of the failure of a ground-based transmitter.

A transmitter failure could create serious problems for both pilots and air traffic control throughout a wide area if the route being flown was based solely on Loran C. Unlike a VOR or NDB transmitter, whose failure only affects that one unit and route segment, a Loran C transmitter failure could affect a significant portion of the country. All of the airports with Loran C approaches in that area, including probably both the pilot's destination and alternate airports, would lose their instrument approach capability if Loran C was the only procedure available.

A transmitter failure could also create serious problems for air traffic control (ATC) if no other system was available. Imagine a situation where everyone is flying IFR in the clouds with only Loran C on board. Now imagine a transmitter failure. How and where would the pilots land if they lost all of their Loran approaches? Air traffic control could not possibly handle that amount of traffic manually. But with other navigation systems available in the aircraft, a Loran C transmitter failure would not be a serious problem for either a pilot or ATC.

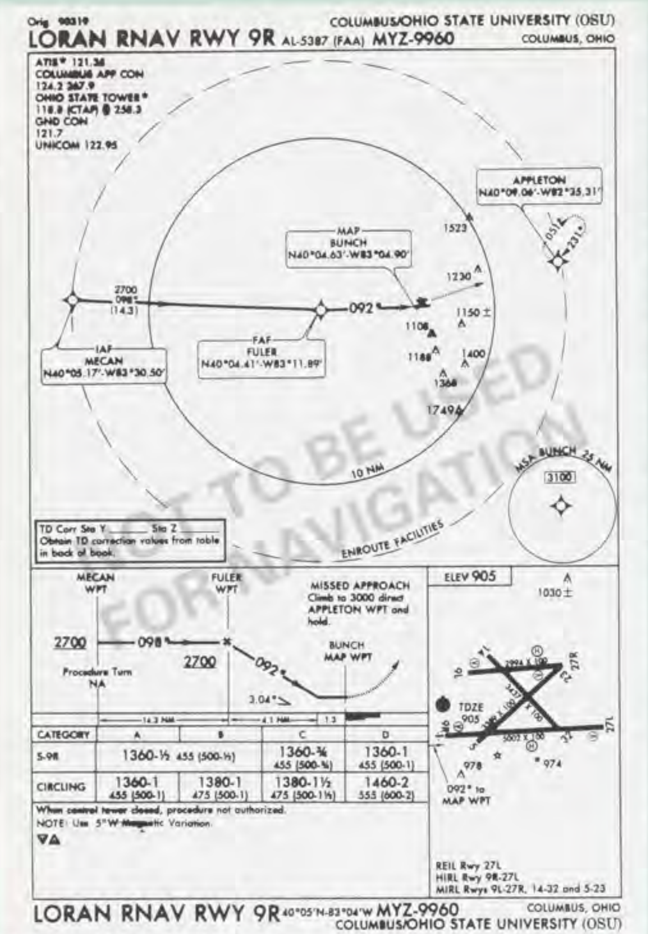
Flying a Loran C approach should be easy for most instrument-rated pilots, especially pilots who now fly RNAV approaches using VOR and distance measuring equipment (DME). Pilots fly the approaches in much the same way. The only difference between the two is Loran C does not require a VORTAC to define a waypoint. This difference also means that since Loran C approaches are independent of any local navaid, Loran approaches could be developed for small, remote airfields that in the past could not justify a VOR or NDB installation or are not close enough to an existing unit for an approach procedure.

There are a few things a pilot must do before flying a Loran C approach. First the

This is Loran C

For pilots not familiar with Loran C, it is a self-contained, earth-based navigation system consisting of widely-separated, ground-based transmitter chains and airborne receivers. The powerful transmitters, a master and normally three secondary transmitters, located many miles apart, form a chain identified by their group repetition interval (GRI), a four-digit number such as the Southeast U.S. chain's 7980. The chains transmit time-dependent, low-frequency, 100-hertz signals, which airborne receivers use to determine the aircraft's position by comparing the time differences between the master and its secondary signals. A receiver with its built-in computer uses the time differences between the widely-spaced transmitter sites' signals to develop intersecting lines of positions (LOP's), with the aircraft located at their intersection. This information is normally displayed as longitude and latitude coordinates.

To navigate, the receiver computes a course from the aircraft's present position to a desired point, called a waypoint, such as a VOR or airport, and computes range and bearing to that point. The receiver constantly updates the information in flight and can provide such additional information as speed, estimated time of arrival, and tracking errors. The pilot then flies from waypoint to waypoint. Many units have the waypoint coordinates for such things as VOR's, intersections, airports and special use airspace built into their memory. The pilot recalls the information as needed. For points not in memory, the pilot manually enters the waypoint's coordinates.



One of the new non-precision LORAN C approaches at Columbus/Ohio State University Airport, OH.

pilot must be very familiar with the Loran unit. An approach is not the place to learn how to operate a unit. Before takeoff, the pilot must verify the operation of the Loran C transmitter chain used for the approach and the operation of the aircraft's receiver. Pilots can check the status of the transmitter chain through the NOTAM system and by following the instructions in paragraph 20 of the *Airman's Information Manual.* AIM lists the telephone numbers pilots can call to check on the status of each chain. A prerecorded message will give the status of the chain and any interference problems the chain may be experiencing. An example of one such reported problem is the interference caused by one of the U.S. Navy's communication transmitters on the East Coast. The AIM has additional information on Loran C and other flight information, including how to file a flight plan when using Loran C for navigational purposes.

Before starting an approach, the pilot must select the *approach mode* on the receiver and input certain approach data into the receiver for the approach. Each Loran approach chart will either have the required information on the chart or in the index if it is a NOS chart. The pilot must enter the Group Repetition Interval (GRI) number for the designated transmitter chain providing navigational information for the approach and any local correction factors, called Time-Differences (TD), for the approach. The GRI identifies which chain was used to certify the approach. The pilot must use the same chain for the approach to ensure good signal coverage and navigational accuracy. The pilot must enter the GRI because some receivers automatically select the chain with the strongest signal being received. The strongest signal may or may not be from the chain designated for the approach. The pilot also enters the TD which corrects for any local variations in signal reception that could affect the accuracy of the approach.

Once cleared for the approach, the pilot will fly the approach like any other non-precision approach with two notable exceptions. The first, instead of navigating from fix to fix, the pilot will fly from waypoint to waypoint. From the initial approach fix waypoint to the final approach fix (FAF) waypoint to the missed approach point (MAP) waypoint, the pilot uses waypoints throughout the approach procedure. At the MAP waypoint, normally at the threshold of the approach runway, the pilot will either land or execute the missed approach procedure to yet another waypoint.

The second exception makes the pilot's job easier because a waypoint, not time, is used for the MAP. The pilot does not have to keep track of time during the approach. Most other non-precision approaches, VOR or NDB, use elapsed time, based upon groundspeed, from the FAF to determine the MAP. By using a waypoint, Loran saves the pilot this extra work during the critical inbound portion of the approach.

Another benefit of Loran C is the constant navigational information it provides to a pilot during an approach. The constant information, such as bearing, range, speed, and time to a designated waypoint, makes a Loran C procedure simpler to fly than any other non-precision approach. The pilot does not have to try to interpret heading and bearing information needed for a NDB procedure or wonder about the aircraft's location during a VOR approach. These benefits should make a Loran approach very easy to fly for the average pilot.

The 10 new approaches at the six sites are the first step in the FAA's program of developing a national Loran C system for pilots. Part of the program includes installing transmitter chains in the mid-continent area of the United States to provide good Loran C signal coverage throughout the country. Scheduled for completion in the spring of 1991, the new chains will eliminate the so-called "Mid-continent Gap." Currently, the FAA is reviewing a list of 500 proposed approaches throughout the nation as requested by the various states. If approved, they will be released for pilot use as soon as the necessary FAA certification work and resources permit. ■

Index of FAA AVIATION NEWS Articles, 1989 - 1990

Editor's Note: For the convenience of our readers, we are providing an index of feature articles in this magazine from January 1989 through December 1990. Many articles are cross-referenced.

You may find bound copies of FAA AVIATION NEWS in most large public or university libraries. Filed copies are also available in some FAA District Offices. Unfortunately, back issues are no longer for sale, so if local resources fail, write to us directly.

by Louise Oertly

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Are You Ready for Winter?

Cold Weather Preparation Tips forPilots and Aircraft

by Dean Chamberlain

Time has run out for those pilots still waiting to winterize their aircraft. Cold weather is here, and snow has fallen in many parts of the country. This winter checklist is dedicated to those procrastinating pilots, from the seasoned pro to the newest student, to help them prepare both their aircraft and themselves for a winter of safe flying. FAAers from some of the coldest areas of the country, including Alaska, helped in preparing the list.

Ron Waterman at the Rapid City, SD, Flight Standards District Office (FSDO) told of one winter problem he has seen involving general aviation pilots. He calls the problem the "big iron" syndrome. He said it describes a typical pilot who formerly flew a small aircraft, such as a Cessna 152, but who now, instrument rated, flies a "big" aircraft, such as a Cessna 182, during winter IFR conditions. The pilot thinks the "big" aircraft can fly in the same weather conditions as the "big iron" aircraft of the airlines. What the pilot does not realize is that the aircraft is not capable of flying in, nor certificated for the same winter weather conditions as the "big iron" planes. One cold winter day while on an IFR cross-country flight, the pilot has to descend through some clouds for an approach. The aircraft picks up ice and crashes. The pilot may have had the skill but not necessarily the aircraft to handle the freezing conditions.

Because cold weather can harm the unwary in many ways, pilots and their aircraft need to be ready for winter's hazards. This list will help the unwary prepare for some of those hazards. Aircraft are easy to prepare for cold weather operations. The problem is preparing pilots to make good, safe, cold weather decisions.

Aircraft Preparation

First, the pilot must decide if the aircraft will be flown during the winter or not. Some aircraft are primarily warm weather aircraft—

ultralights are a good example—and some pilots simply do not like winter flying. If the aircraft is not going to be flown, the owner should follow the manufacturer's special requirements for long-term storage.

Aircraft tied down out in the weather require special attention because of the hazards of ice and snow buildup. The wings and horizontal tail are not designed for the stress of heavy snow and ice loads a winter storm can leave on their upper surfaces. Helicopters also require special attention because of their rotor and control systems' vulnerability to ice and snow.

Pilots flying during the winter season must follow the manufacturer's instructions for servicing and operating their aircraft. The instructions will vary depending upon the type of aircraft, its complexity, and such local environmental conditions as temperature and type of precipitation.

FAR Part 43 allows an owner to do some seasonal preparation work under the preventive maintenance rules. In fact the FAR lists 29 specific things an owner can do. Work not listed must be done by a licensed A&P mechanic. A mechanic should also know about any unique requirements for the local flying area.

Once an aircraft is prepared for cold weather operations, if it is then flown into a warmer area, such as an aircraft from Minnesota being flown to Florida for a mid-winter vacation, the aircraft must be serviced for the warmer operating conditions. The aircraft could be damaged if not properly serviced. An example is removing a winterization kit to prevent possibly overheating the engine and damaging the exhaust valves.

Once the operator has made the decision to fly in the cold and has appropriately prepared the aircraft, each pilot operating it needs to ask the following questions.

Oil and Lubricants: Was the correct grade of engine oil installed? Was the correct grade of lubricant used to grease the aircraft?

Winterization kits: Is a winterization kit needed? Some manufacturers recommend baffles, winter fronts, and oil cooler kits for their aircraft during low temperature operations. If installation approval is not provided by the kit's manufacturer, FAA approval may be needed. If baffles are installed, one source recommends the installation of a cylinder head temperature gauge to avoid overheating the engine. If a kit was installed, was it properly signed off and placarded? Do you know at what ambient temperature it should be removed?

Oil system insulation: Some manufacturers recommend insulating oil lines, oil pressure lines, and the oil tank to prevent oil from congealing and causing damage to the engine and other oil dependent systems. If insulation was installed, is it fireproof and is it the correct type?

Hose clamps, hoses, hydraulic fittings and seals: Have all hoses, fittings, and seals been inspected and replaced if necessary? Were all parts installed to cold weather specifications?

When preheating an engine, use only an approved aircraft preheater and follow the manufacturer's instructions. Remember to preheat the cockpit.

Oil breather: Does your aircraft need a modification? Some aircraft require a system modification, a breather hole, to prevent the tube from freezing. (In cold weather, water vapor, a normal by-product of engine combustion, may freeze in the end of the oil breather tube, blocking the engine crankcase ventilation system. Internal oil pressure can build up to the point where it can rupture an engine-nose-case oil seal and blow engine oil over the windshield, or even blow the oil cap off, with the resulting loss of oil and a damaged engine.) If a modification is required, was the installation FAA approved? Is checking the breather tube part of your preflight inspection? It should be.

Control cables: Did the A&P mechanic check the control cables for proper winter tension? (Colder temperature changes can cause control cables to contract, which can lower the cable's tension and make the flight controls less effective.)

Fuel system: Was the fuel system inspected for water contamination? Water in the system can freeze and prevent an engine start by blocking fuel flow, or worse, it can freeze after takeoff, causing an engine failure in flight. Freezing water can also rupture fuel lines or other components. Another bad situation is an aircraft taking off in the early morning with ice in the fuel tanks. The ice can melt in flight as the temperature gets warmer and stop the engine because of water ingestion. To combat water problems, pilots should use only filtered, pure, water-free fuel and keep the tanks filled to avoid condensation. Pilots should drain the fuel sumps before and after each flight to remove any water in the fuel system. If a fuel additive is used to combat water, is it mixed using the manufacturer's instructions to avoid damage to the aircraft?

There is a fire risk in taking a cold aircraft with full fuel tanks into a warm hanger. As the cold fuel in the tanks becomes warmer, it will expand and possibly overflow from the fuel vent onto the hanger floor causing a potential fire hazard. Care should be taken when servicing a cold aircraft in a hanger because of the increased fire risk. Plus, any fuel which overflows through the fuel-cap vent will flow over the wing possibly removing any wax or other surface protection you may have applied for the winter.

Controllable propellers: Has the aircraft's operating manual been reviewed for the proper cold weather servicing and operation of the controllable pitch propeller/s? Oil-pressure-controlled propellers require special care because of the possibility of the oil congealing. Installation of a recirculating system may be required. One manufacturer recommends cycling the props periodically during flight to flush the cold oil from the hubs to ensure safe operation.

Cabin heaters: There are several types of cabin heaters installed in general aviation aircraft. Combustion heaters should be inspected for safe operation to prevent a possible fire. The heater's fuel flow also needs to be checked, because excessive heater fuel flow reduces flight time since the fuel comes from the aircraft's fuel tanks.

Using hot water to remove frost and ice from the wings is an old trick. Just make sure that the water does not refreeze leaving a film of ice on the airplane or locking the controls.

The most common heating system in light general aviation aircraft is where outside air is heated by passing it through a shroud or covering on the exhaust system before venting the heated air into the cabin. The system must be inspected for exhaust leaks. A leak could let exhaust gases, including carbon monoxide gas, into the cockpit, incapacitating the pilot and passengers. Pilots need to be alert to the signs of carbon monoxide poisoning. Tightness across the forehead, headache, tingling in the fingertips, fingernails possibly turning a bluish tint, a feeling of nausea, a ringing in the ears, and not being able to concentrate are all signs of carbon monoxide poisoning. Because of the risk of carbon monoxide in a closed cockpit, and the fact is it not readily detectable, pilots, if they so desire, can purchase and use one of the carbon monoxide detectors sold at most fixed-based operators. Detectors vary from the small, simple, chemical spot device which changes color when exposed to CO (They react very slowly and are good for about 30 days.) to complex electronic devices (more reliable but require a mechanic to install them).

Another safety tip is to open an outside air vent or the cabin air knob slightly for some fresh air in case there is any carbon monoxide leakage in either type heating system.

Air intakes and filters: Have the alternate air sources and air intake filters been inspected and serviced as required? Snow and ice can block an air intake filter and prevent the engine from developing full power either for takeoff or a go around.

Wheel wells and wheel pants: Do you know the winter operating procedures for your aircraft's landing gear and brakes? Mud and slush can freeze in wheel wells and interfere with the operation of retractable landing gear. Brakes can freeze, locking the wheels. Do you know what to do if you have a problem? Some manufacturers recommend delaying retraction of the landing gear to allow the wheels to spin a moment to throw off any slush on the wheels or brakes to prevent them from freezing. Another suggestion is to spray the torque links and retraction mechanisms with WD-40 or LPS-1 to force any moisture out of the gear. As always, follow the aircraft operating handbook's recommendations. The FAA Accident Prevention Program's "Tips on Winter Flying" pamphlet recommends recycling the gear to clear slush buildup only as an emergency procedure. FAA Advisory Circular, "Cold Weather Operation of Aircraft," AC 91-13C, says simply to avoid those types of surfaces in retractable gear aircraft. It also recommends removing wheel pants on fixed-gear aircraft to prevent slush or mud from freezing in the pants and locking the wheels or adding weight. Owners should check with an A&P mechanic before removing the wheel pants though, as removal may require an A&P to recompute the aircraft's weight and balance data, and a Form 337 may be required. Removal of the wheel pants will also affect aircraft performance, so pilots should review their flight manual for any change in speed, range, performance, or weight and balance.

Batteries: Have you checked the electrical system of your aircraft? Batteries require special care during cold weather. Wet cell batteries should be kept fully charged and if possible removed from the aircraft if the aircraft cannot be kept in a heated hanger. As the temperature drops, a battery's performance and charge decrease, which increases the risk of cold damage and freezing. Freezing can destroy a battery. If an aircraft battery needs charging, do not use the local gas station's high amperage, fast charging battery charger. It can damage an aircraft battery. Aircraft batteries need to be recharged at a low rate for a longer period of time. A good example is a 24-hour charging period at about 1.5 to 2 amps for most lead-acid aircraft batteries. Because of the importance of the battery and its decreased output in cold weather, the aircraft's electrical system should be checked to ensure optimum performance and recharging capacity.

Dry cell batteries, such ELT or portable transceiver batteries, should be checked as per the manufacturer's recommendation.

Finally, do you know the electrical requirements of the deicing equipment installed in your aircraft and what to do in case of an electrical problem?

Fuselage and control surfaces: Have the following been done: Control surfaces checked for freedom of movement and defects? Any damage discovered repaired? All drain holes open? Surfaces cleaned and waxed or covered with the manufacturer's recommended anti-corrosion compound? Hinges serviced with the recommended grade of lubricant? If covers are used to prevent snow or ice from entering the various openings in the fuselage and control surfaces of your aircraft kept outside, have the manufacturer's instructions been followed because some covers can damage windows and other surfaces. Are the wings and other surfaces protected from the heavy stress loads snow or ice can cause? Is an overhead roof available or is the snow and ice simply removed as soon as possible?

Material provided by the Aircraft Owners and Pilots Association (AOPA) identified a relatively new winter danger involving composite aircraft and freezing water. Composite skin damage needs to be repaired immediately to prevent water from penetrating the outer skin and the composite material. If the water freezes, the expanding ice can delaminate the composite material causing structural damage.

Static vents, pitot heat, and alternate static air source: Were the static ports checked to make sure they are open? Was the alternate static air source checked for proper operation? Was the pitot heat checked for proper operation?

Carburetor heat control: Was the carburetor heat system inspected and adjusted as required?

Deice and anti-ice systems: Was the system inspected and serviced as required? Were all of the solution containers filled, if so equipped?

Tires and brakes: Were the tires and brakes inspected and serviced as required. Was the tire pressure checked? Do you know the recommended technique for setting the brakes during freezing conditions? Some manufacturers recommend not setting the parking brakes if there is a chance they can freeze. If your brakes freeze, do you know how to deice them?

Special winter equipment: Special winter equipment such as ski gear should be installed and preflighted as per the manufacturer's instructions.

Fire extinguishers: Because of the increased fire risk during winter operations, fire extinguishers deserve special attention. Did you inspect and service yours as required for cold weather. Is it one of the units not suitable for cold weather use?

Survival gear: Both Alaska and Canada have specific survival gear requirements that must be complied with for aircraft operating within their areas. It is hard to describe a typical survival kit because of different aircraft operations, routes, and conditions flown in. But each aircraft should carry the type of equipment, including food and shelter, that will enable the people on board to survive until rescue. The kit should be designed for the worse case combination of terrain, temperature, precipitation and time needed for rescue for the route of flight.

The rule is to be able to survive the environment after surviving the crash. Many airmen have died from exposure while waiting for help. If the weather is bad enough to cause a crash, it is probably too bad to start a search, so rescue could be delayed while the weather clears.

Pilot Preparation

Once the aircraft is prepared for cold weather operations, the second part of the flight equation is the pilot. The basic question is, "Is the pilot prepared to fly the intended flight and for whatever the weather might bring."

The following questions may help you prepare for a typical winter flight.

- Do you know and understand the aircraft's systems and what procedures are required if the systems malfunction?
- Do you know all of the aircraft's limitations, such as whether or not flight is permitted into known icing conditions?
- Do you know the operational effects of low density altitude on your aircraft and its systems? (Low density altitude can effectively increase the power output of an engine and possibly cause engine damage if proper adjustments are not made.)
- Do you understand winter weather and the risks of freezing conditions?
- Do you know how to get a complete weather briefing?
- Do you know the unique operational requirements for your flight route or area?
- Are you qualified and current in the aircraft?
- Are you medically safe: no cold or flu for example?
- If you are instrument rated, do you know the risks of encountering ice and what must be done when icing is encountered?
- Can you fly your aircraft with ice on it?
- If not IFR rated, are you prepared to turn back if the weather starts to drop below VFR minimums?
- Do you know where to find better weather conditions or warmer temperatures along your route of flight?
- Do you have the fuel to get to those conditions or your alternate airport?
- Can you takeoff or land on a snow or ice covered runway?
- Do you exercise or move your engine, propeller, and flight controls every 10 minutes or so on long flights to make sure they have not frozen?
- Are you prepared for extended night operations?
- Do you carry a working flashlight in case of an electrical failure?
- Are you prepared to survive a crash landing?
- Do you have a survival kit? Do you know how to use it?
- Have you prepared your passengers for a possible accident?
- Have you ensured everyone is properly dressed, including proper winter footwear and hats for the environment over which you will be flying? If the required items are not being worn, are they readily available? In an accident, an injured pilot may not be able or have the time to unpack needed gear stored in the baggage compartment. In one case, a pilot's survival gear sank with his aircraft after a water landing. Fortunately the pilot survived. When asked about cold weather clothes Ron Waterman said, "Pilots need to dress for the cold, even if it is only because the heater quits." Are you prepared if the heater quits? Will you be warm enough to continue the flight or will you have to land to get warm?

These are only a few of the items a pilot must consider when preparing for a winter flight. Winter flying can be safe. But the problems of freezing temperatures, conditions such as ice and snow, and shorter periods of daylight combine to make a pilot's job more demanding and the risks greater during this period of the year. A safe pilot tries to reduce those risks through planning. Proper flight planning and a good preflight are two of the best ways to reduce the risks of winter. Good planning includes:

- Having the latest weather information, including freezing levels
- Having an alternative plan ready if the weather changes
- Having the latest pilot reports, if available
- Allowing extra time to preflight because of the need for a thorough ice and frost check of the aircraft and having time to deice if required
- Avoiding the urge to cut a preflight short because of the cold and your failure to dress warmly
- Reviewing the aircraft's operating handbook for the proper cold weather preflight procedures
- Being aware that an aircraft's controls can freeze while the aircraft is taxiing or waiting for takeoff

(continued on page 16)

To avoid condensation in the fuel tanks, top them after each flight.

Will the Real Roscoe Turner Please Stand Up!

Publicist's Dream or Premier Pilot?

In the history of American aviation the 1930's were the golden age of speed flying. New records were posted and shattered so quickly that the public could hardly keep up with the latest figures or the record setting pilots. However, no one in that hectic decade had any difficulty identifying Colonel Roscoe Turner, a small town Mississippi boy who combined flying skill with imaginative publicity in a manner that engraved his image in the hearts of all America. No one person of this period did more to kindle popular interest in aviation.

Born on September 29, 1895, Turner was eight years old when the Wright brothers made their first flight at Kitty Hawk. His father, a farmer in Corinth, MS, expected his son to follow in his footsteps, but young Roscoe was fascinated with vehicles and speed. An early ambition to be a railroad engineer was squelched by his father as too dangerous, a sore disappointment until he saw his first airplane. From that moment his ambition moved toward a winged career.

World War I gave him the chance to slip away from the conforming pressures of his native Corinth and started him off on a long and zany path through the record books of aviation. When the United States entered the war, Turner signed up as an ambulance driver then wangled a transfer to the balloon corps as an observer. It was still a long way from being a pilot, but he was at last airborne and convinced that this was where he belonged. Life could only be enjoyed as long as it offered him thrills.

Already 23 years old when the war ended, Turner found his training as an auto mechanic not exciting enough. He formed a Flying Circus with a partner and toured the south. By this time, however, the skies of America were thick with daredevils, and Turner concluded that it would take more to draw and please crowds than just dazzling them with breathtaking aerobatics or brushes with death. He practiced until he was one of the best stunt pilots in the business, but he also worked on developing an out-of-the-cockpit reputation that caught the fancy of newspaper reporters and made the Turner name a big draw wherever he went.

He had all the attributes of an idealized stunt pilot. In place of the familiar war-worn leather jackets of other pilots, he sported a sky blue flying jacket, Sam Browne belt, fawn-colored breeches, and riding boots. Jolly and friendly, fond of being surrounded by admiring crowds, he invariably "played to the house." By 1928 Turner had shifted his scene to Hollywood. He now flew movie stars and other celebrities around the country under dramatic or mysterious circumstances and outdid the showiest of his contemporaries by carrying a pet lion cub, the famous Gilmore, in his cockpit. Turner's abounding personality so caught the public eye that Zack Mosely used him as the model for "Smilin' Jack" of comic strip fame. With his lion Gilmore padding behind on a leash, Turner paraded along Hollywood Boulevard, his waxed and pointed moustache gleaming in the sun and his jaunty cap squashed "fifty-mission" style. He was a publicist's dream.

He acquired the rank of colonel in the National Guards of three states. The occasional charge of "phony" did not bother Turner at all. He considered it good advertising.

A flair for publicity was not Turner's only talent, and there was nothing phony about his flying. In a single decade, 1930 to 1939, Turner broke the transcontinental record seven times. He also took part in the mammoth 11,000-mile race from England to Australia in October 1934, placing second. He flew a Boeing 247, an all-metal low-wing aircraft considered by some to be the first modern airliner.

Long distance records were not his only target. The annual Thompson Trophy race (100 miles around pylons 10 miles apart) was the coveted prize for speed kings of the air, and Turner won the trophy three times (the only man to do so) in 1934, 1938, 1939. He also won the Henderson Trophy as America's "No. 1 Speed Pilot" three times in that decade and the International League of Aviators awarded him a gold medal as America's "Premier Pilot."

In 1937 he established a new world speed record of 289.90 mph at Detroit—only to see it bettered a few weeks later in Germany when I.H. Wurster was clocked at an astounding 379.6 mph.

As the decade came to an end and the world drifted toward World War II, the advances in engine and airframe designs gained from speed and distance trials were incorporated into military and commercial aircraft, and the heyday of aerial racing abruptly ended. Not waiting for the cheers to die away, Turner moved on to Indianapolis and founded the Roscoe Turner Aeronautical Corporation, a flight school and sales office at Weir Cook Airport.

With the entry of United States into the war, Turner became an instructor pilot for the Army Air Corps, helping to train more than 3,500 fledgling aviators. In 1952, by an Act of Congress, he was awarded the Distinguished Flying Cross for pioneering in speed flying.

Advancing years failed to slow him down. He continued to fly the newest and fastest military jets until well into his sixties. He died in 1970 after an illness, a few months short of his 75th birthday. Roscoe Turner's unrivaled success as an aerial showman may have overshadowed his flying to the public, but he made a very real contribution to the development of fast and reliable aircraft.

As Shakespeare said, "We shall not look upon his like again." ■

WANTED: MAINTENANCE PROFICIENCY AWARDS IDEAS

FAA is considering initiating an Aviation Technician/Repairman Proficiency Award Program. The program would recognize airframe and powerplant mechanics, all certificated repairmen, and students of Part 147 Aviation Technician Schools for their continuing commitment to recurrent training and professional development.

The proposed program would be patterned after the FAA's Accident Prevention Program's very successful Pilot Proficiency Award Program.

Bill O'Brien, an FAA airworthiness inspector on the Flight Standards Service's General Aviation Staff in Washington, DC, and Rich Mileham, an inspector at the DuPage West Chicago FSDO, would like to develop a similar program to recognize maintenance technicians who complete a specified amount of training and some other requirements by also awarding them a distinctive lapel pin or tie tack and a certificate. They are proposing five phases:

Phase I Requirements—Bronze pin

- 4 hours on-the-job training (OJT), student or instructor, on basic systems of the aircraft being maintained
- Attend 2 FAA/industry training seminars or complete factory course of 8 hours or more

Phase II Requirements—Silver pin

- 6 hours OJT (student or instructor) on basic and advanced systems on aircraft being maintained
- Attend 2 FAA/industry training seminars or complete factory course of 8 hours or more
- Submit at least 2 Malfunction and Defects Reports (M&D) or safety suggestions to FAA

Phase III Requirements— Gold pin

- Same as Phase II, except 8 hours OJT and submit at least 4 M&D's or safety suggestions
- Hold Inspection Authorization (IA), Designated Mechanic Examiner certificate (DME), or pilot's license

Phase IV Requirements—Gold pin with ruby

- Same as Phase III, except 10 hours OJT
- No violations in past year

Phase V Requirements—Gold pin with diamond

- Same as Phase IV, plus
- Become an FAA maintenance safety counselor
- Attend either college level course on management, or college/factory course on electronics, avionics, or electrical system troubleshooting techniques.

All of the training would have to be documented by the company, instructor, factory or school before an award could be made.

If you think this proposal would provide a good way to recognize the professional development of maintenance technicians, send your ideas, comments and logo designs to Bill O'Brien, FAA, AFS-20, 800 Independence Ave. SW, Washington, D.C. 20591. His telephone number is (202) 366-6382.

HIGH SEAS FLIGHT

The FAA has presented an Advance Notice of Proposed Rulemaking (ANPRM) to determine what course of action it should take regarding the problem of FAR Part 91 aircraft operating over the high seas, including the North Atlantic, beyond the range of air traffic service radar and the International Civil Aviation Organization (ICAO) standard navigation aids, such as VOR, VOR/DME, and NDB.

Flights by light aircraft across the North Atlantic have increased dramatically in the past few years. Unfortunately, there has also been a corresponding increase in the number of general aviation fatalities and aircraft lost. Because of the harsh climate, lack of ground-based radio and navigation aids, as well as the immense distances involved, a trans-Atlantic flight is a serious undertaking. While international general aviation flights presently constitute a relatively small percentage of the overall North Atlantic traffic, they account for the vast majority of search and rescue operations, and expenses, incurred by ICAO.

VFR flight in the North Atlantic below an altitude of 5,500 feet is possible, but it is not recommended. Any aircraft crossing the North Atlantic at or above an altitude of 6,000 feet is required to operate on an Instrument Flight Rules (IFR) flight plan. It is extremely unlikely that an aircraft will be able to conduct a flight across the Atlantic and remain in visual meteorological conditions (VMC) for the entire flight. Any aircraft operating within the North Atlantic

Minimum Navigation Performance Specification (MNPS) airspace (altitudes FL 275 to FL 400), must meet ICAO navigation requirements.

Based upon an ICAO study group, the general aviation navigation tracking error rate the MNPS airspace is disproportionately high compared to commercial and military operations. The high volume of commercial traffic and their more accurate navigation equipment enabled the lateral limits of air traffic control separation to be reduced from 120 nautical miles to 60 to more efficiently use the oceanic airspace. However, general aviation aircraft are exceeding the ICAO lateral limits for the routes between the United States and Europe. These tracking errors pose a greater threat both to other aircraft and to the general aviation aircraft. Also, according to the ANPRM, general aviation aircraft cost a disproportionate amount of search and rescue funds because of their poor navigation.

As a result of the ICAO's concern, the FAA released the ANPRM, Docket No. 26327, Notice No. 90-21, in the *Federal Register* requesting public input on the need for a regulation requiring U.S. general aviation aircraft to comply with the ICAO rules. The ANPRM outlines the problem, contains proposed solutions and requests public comment to aid in determining what action FAA should take in the matter.

The cutoff date for public input is January 3, 1991. Interested parties can call William T. Cook, FAA's General Aviation and Commercial Division, (AFS-850) at (202) 267-3840 about the proposal, or they can request a copy of the ANPRM by contacting the FAA Office of Public Affairs, Attn: Public Inquiry Center (APA-430), 800 Independence Ave. SW., Washington, DC 20591. The Center's telephone number is (202) 267-3484.

BACK TO BASICS II VIDEO

The FAA's Accident Prevention Program, as part of its five-year "Back to Basics II" safety campaign, will soon be distributing to its Accident Prevention Program Managers throughout the country copies of the King School's video, "Take-offs and Landing Made Easy." Funded and distributed as a cooperative effort between the FAA's Office of Aviation Safety and the Accident Prevention Program, the video supports the 1990 (second half) "Back to Basics II" program theme, "Take-offs and Landings."

FAA AVIATION NEWS welcomes comments from our readers. Letters may be edited for style and length. No anonymous letters will be used, but names will be withheld on request. Address: FAA AVIATION NEWS, AFS-20, Washington, DC 20591.

• Seattle, Washington, not DC

I was very impressed with the good content of your May/June issue which was sent to my son as a sample. I was also quite amused with the picture of page 15 though. One part of the caption is correct and that is the word "Washington." That picture is of Boeing Field in Seattle, WA, and was taken in 1974 I believe. Boeing Field does not look much different today except there are not as many trees left on Beacon Hill in the background. I remember one of the test flights using this configuration. The 747 only had a nacelle on the pod, and this looks like only a nacelle on the plane although the picture is too fuzzy to really tell. Also notice the older style engines on the 747. They have the "sucker doors" on the nose cowls to increase airflow during high power settings. The newer versions of the 747 have eliminated this nose cowl setup.

Richard Welsh
Issaquah, WA

You are correct on the location and that it was a flight test which lead to certification of the Boeing 747 to transport a spare engine in commercial service when necessary. The fifth engine is between the inboard engine and the left side of the fuselage. Although similar in appearance to the regular engine, the blades of the turbofan section at the front of the engine were removed for shipment. Thanks for your input.

• NTSB RESPONSE

An answer in the May-June 1990 "Instrument Corner" may have implied that a National Transportation Safety Board (NTSB) ruling could modify a Federal Aviation Regulation (FAR). An NTSB ruling cannot change any provision of the FAR.

The answer was in response to a question about how low can a pilot descend while practicing instrument approaches. The answer referred to an NTSB ruling involving a pilot's descent below 500 feet AGL without the intent to land during a practice instrument approach in apparent violation of FAR §91.119 (old FAR §91.79). The answer said, according to an NTSB ruling, a pilot could descend below 500 feet AGL if the purpose was to improve landing skills. The answer should not have referred to the NTSB ruling. The correct answer should have been, "When practicing instrument approaches, a pilot must comply with the appropriate ATC procedures contained in the Airman's Information Manual (AIM), paragraph 244, 245 and others, and the applicable FAR."

Practice instrument approaches are considered to be instrument approaches made by either a VFR aircraft not on an IFR flight plan or an aircraft on an IFR flight plan. Before initiating a practice instrument approach, the pilot should contact the appropriate approach control facility having control authority for the particular approach to be used. Practice instrument approach procedures may be terminated as touch-and-go landings, low approaches, missed approaches, stop-and-go, and full stop landings at controlled airports as approved, or in accordance with local operating practices at uncontrolled airports.

• Runway Headings

How in the world can the FAA deal with such insignificant trivia as the "Brief," "CORRECT HEADING," referring to the May 3, 1990, AIM change? ATC requires IFR traffic to maintain assigned headings within 10 degrees. Runway headings can't differ from runway numbers by more than four degrees or the runway will be renumbered!

Where would a pilot find the real runway heading? It's not in the Airport Facility Directory. It's not on the NOS instrument charts. Jeppesen publishes it on the their instrument charts, when known.

All that the AIM really needs to say is, "Fly runway heading and don't correct for wind drift." Then, maybe, someone would know what was expected. It's important to train people in all that is necessary to become safe pilots and it helps if the FAA does not supply us with gibberish.

William R. Mortens
Bolton, CT

A number of pilots have written about this AIM definition change, "Runway Heading is the magnetic direction that corresponds with the runway centerline, not the painted numbers." When cleared by ATC to "fly or maintain runway heading," pilots are expected to fly or maintain the heading that corresponds with the extended centerline of the departure runway until otherwise instructed. No drift correction shall be made.

Runway direction can differ up to 5 degrees from the painted magnetic numbers because runways are marked to the nearest 10 degrees magnetic with 5 degrees marked either way. The intent of the definition change is to keep everyone flying in the same direction by using the same reference—the magnetic heading of the runway centerline. This way, when lined up on the centerline for takeoff, a pilot has only to note the compass or DG and fly that heading without correcting for wind.

INSTRUMENT CORNER

• Student IFR Time

As a CFIA, may I give the instrument instruction required by FAR §61.107(a)(6) for the private pilot certificate in either simulated or ACTUAL instrument conditions, though I have yet to earn a CFII rating?

Specifically, local weather conditions at our airport, on occasion, require an IFR to VFR conditions-on-top departure. During this time, while in actual instrument conditions, am I allowed to let my student fly the aircraft?

If this IS permissible, may the student then log as actual instrument time that time while he is flying the aircraft in the clouds?

David Miller
Tujunga, CA

The holder of a flight instructor certificate with an airplane rating (CFIA) may give the instruction (control and maneuvering an airplane solely by reference to instruments) required by FAR §61.107 (a)(6) to a student pilot. The instruction may be given in either simulated or actual instrument conditions. However, if given in actual instrument conditions, the flight instructor must hold an instrument rating on his or her pilot certificate and meet the appropriate currency requirements for operating under instrument conditions. The student pilot may log the time as instruction received under actual instrument conditions. It should be noted that the above instruction may not be credited as instrument instruction required under FAR §61.65 (c) for an instrument rating.

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Cold Weather

(continued from page 12)

- Remembering that deicing an aircraft does not guarantee the aircraft is ice free
- Remembering that if an aircraft is taken into a warm hanger to deice, then taken back outside, new precipitation falling on the now warm aircraft can melt and later freeze while the plane is taxiing or preparing for takeoff
- Remembering to always check the flight controls on the runway just before takeoff for freedom of movement because they could have frozen while the aircraft was taxiing to the runway or waiting to takeoff
- Following the instructions when using a preheater
- Preheating the cockpit to reduce wear on the instruments and avionics equipment
- Avoiding the dangerous practice of using an automobile's exhaust heat to warm an engine or cockpit. Carbon monoxide and other harmful gases can buildup in the cockpit plus the gases can damage the aircraft.

If everything has been checked by the book, the safest route in terms of survival planned, and the aircraft and pilot are both ready to fly, the single most important thing a pilot can do for a safe flight is to file a flight plan. (If it is a VFR flight plan, the pilot must activate the plan on takeoff and close it after landing.) A flight plan is a pilot's best assurance help will be available if an otherwise perfect flight fails to arrive at its destination. When time is critical, an activated flight plan is a pilot's best hope for rescue.

There are many excellent sources of information on cold weather operations and survival, including the instructions in each aircraft's operating manual. But for a simple and practical guide, airmen can review the FAA Advisory Circular (AC) 91-13C, "Cold Weather Operation of Aircraft." Pilots can request the AC by writing to Department Of Transportation, Utilization and Storage Section M443.2, Washington, DC 20590. The Accident Prevention Program's "Tips on Winter Flying" pamphlet FAA-P-8740-24, is also a good source. It is available from your local FAA district office or by writing to the Accident Prevention Program Branch, AFS-20, 800 Independence Ave., S.W., Washington, DC 20591.

Have a safe and enjoyable winter flying season. ■