FAA general aviation NEWS

NOVEMBER-DECEMBER 1979

A DOT / FAA FLIGHT OPERATIONS SAFETY PUBLICATION

In this issue:

FAA GENERAL AVIATION NEWS

DEPARTMENT OF TRANSPORTATION/ FEDERAL AVIATION ADMINISTRATION

NOVEMBER-DECEMBER 1979
Volume 18, Number 6

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FAA GENERAL AVIATION NEWS is published by Flight Operations, AFO-807, Federal Aviation Administration, Department of Transportation, Washington, D.C. 20591, in the interest of flight safety. The magazine is designed to promote safety in the air by calling the attention of general aviation airmen to current technical, regulatory and procedural matters affecting the safe operation of aircraft. Use of funds for printing FAA GENERAL AVIATION NEWS was approved by the Office of Management and Budget through August 31, 1980. All printed materials contained herein are advisory or informational in nature and should not be construed as having regulatory effect. The FAA does not officially endorse any goods, services, materials or products of manufacturers that may be mentioned. ***Certain details of accidents described herein are altered to protect the privacy of those involved.***

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BRIEFS

THOUGHTS FOR AN ELT-LESS WINTER. Many general aviation pilots who, in previous winters felt secure while flying over sparsely populated areas with an operational Emergency Locator Transmitter on board will be without that insurance this winter. Airworthiness Directive 79-18-05 ordered the removal of lithium sulfide battery-powered ELT's from U.S. airplanes until new batteries could be manufactured and approved. To compensate, file an accurate flight plan and maintain frequent communication with Air Traffic Service when flying over desolate terrain.

PROPPIN' WITHOUT CHOPPIN'. Pulling a prop through by hand to get oil into a cold engine is an acceptable practice only if a pilot is certain that his magnetos are grounded (ignition "off") and the airplane is immobilized by tie-downs (chocks can be jumped). Remember that a switch in the "off" position does not invariably mean the magnetos are grounded. Several years ago FAA was obliged to issue an Airworthiness Directive (76-07-12) ordering a special inspection —and if necessary replacement—of one manufacturer's ignition switches commonly used in light aircraft. In fact, a number of the replaced switches were also found to be defective. Rely on the tie.

DE-ICING IS NOT ENOUGH. The crash of a commuter airline Nord 262 in Clarksburg, WV last February 12 was caused by the pilot's decision to take off with a thin layer of snow on the recently de-iced wings, according to NTSB investigators. At least some of the snow was apparently frozen on the airplane's ailerons and led to wingtip stalling, with loss of aileron effectiveness once the aircraft was out of ground effect. The plane went out of control and crashed inverted, with loss of two lives; 23 survived. At sub or near freezing temperatures, assume all snow seen on the wings is frozen in place and will not blow off during takeoff. Clean the wing before takeoff!

CALCULATORS CAN ALSO DETRACT. Tests conducted by the Canadian Department of Communications proved electronic calculators can interfere with ADF radio compasses. Radio compasses became paralyzed when a calculator was passed within three feet of the loop antenna, and varying degrees of bearing needle deviation were shown. Interference was greatest when the ADF signal was weakest, usually at a long distance from the station. The electronic math aids produce interference in the 200 to 250 kHz range, near the lower end of the 190 to 1750 kHz ADF band. Interference will occur as long as the calculator is turned on, even if no computations are worked.

Spin Awareness

Not so merry-go-rounds

What are the chances that you will someday find yourself in the cockpit of an airplane that is spinning dizzily toward the ground, at an altitude that would allow time for a safe recovery if you knew how to carry out the correct procedure?

Pretty low. Spin accidents in general aviation have been averaging about 140 per year in recent years, according to the National Transportation Safety Board, but fewer than five percent of these spins developed high enough above the ground to allow for a normal recovery. Of course that is only part of the picture, since we have no data concerning the number of pilots who were able to pull out safely from an inadvertent spin and continue happily on their way. Chances are this number is not high either, because pilots who are able to extricate themselves safely from an unintentional spin are usually pretty savvy about avoiding it in the first place.

We do know for a certainty that spins which culminate in an accident are more likely to cause fatalities than any other category of accident cause. In 1977, the latest year for which figures are complete, there were 147 spin accidents; 121 or 82% of these were fatal, with 206 fatalities. The proportions are typical for recent years. *No other category of accident—even mid-air collisions—has as high a rate of fatal accidents.*

As with stall awareness (see September/October issue of FAA GENERAL AVIATION NEWS), *spin awareness* requires a habit of constant alertness toward the conditions of flight. Inadvertent stalls and spins most often occur when the pilot is either busy with cockpit duties—as in landing or takeoff—or when his attention is drawn away from the airplane because of other interests (crop dusting, search and rescue, forest or pipeline patrol, aerial photography, sightseeing, buzzing, etc.). Inflight mechanical problems or difficulties with weather also can be distractions which lead to loss of control. Spin recovery skills are little help when a pilot allows an airplane to enter a spin at an altitude too low to effect a recovery. An ounce of prevention here is worth many pounds of cure.

Pilots who wish to gain some experience in spin maneuvers are advised to begin with several hours of dual instruction from a certificated instructor, preferably one who has special experience in spin training. All pilots can benefit from a basic understanding of spin aerodynamics. A spin is often a confusing maneuver, with many unpredictable aspects that vary according to make and model, cabin loading, and other conditions, but the basic procedure for entry and recovery is fairly standard.

What is a spin? Theoretically, a spin can be described as a rapidly descending maneuver in which the airplane rotates about its vertical axis with unequally stalled wings. From the pilot's point of view the event is apt to be experienced in much more exciting terms.

All spins are preceded by a stall, but under some circumstances there may be little or no buffeting and the aircraft may appear to move directly from a yawing turn into a spin as the nose and one wing drops down.

Rotation speed builds up and the flight path becomes nearly vertical. At the completion of the first turn the nose may come back up and then pitch down again. By the end of the second turn the spin may be fully developed, as the rolling, pitching and turning motions become somewhat repeatable and stabilized from turn to turn. Airspeed is approximately stall speed, with the stall warning horn and lights signalling intermittently. Descent rate is significant, ranging from approximately 5,000 to 8,000 fpm in light single-engine planes. Stress load is minimal and not likely to cause damage even to an aircraft that is not designed for spinning (although stress damage can occur during recovery with excessive "G" loads). The pilot may become dizzy or disoriented, especially if he stares at his spiralling wingtips.

Recovery from the spin involves arresting the rotation with rudder, breaking the stall by reducing the angle of attack on the wings and pulling out of the dive smoothly and positively without inducing excessive load factors on wings or tail assembly of the airplane.

Many aircraft will stop spinning if the pilot simply reduces power to idle and takes his hands and feet off the controls. However, unless the pilot promptly resumes control, the airplane may continue in a spiral descent.

A spiral dive, incidentally, is often confused with a spin, and it is important to be able to distinguish between the two. In a spin the aircraft remains stalled, with little or no aileron response, and a fairly stabilized airspeed and attitude. In a steep spiral the aircraft is not stalled; the bank angle may steepen; and the airspeed may build up excessively in a short time. One clue is in the airspeed indicator; in a spin it will not read much above stall speed. Recovery procedures are not alike, and if inappropriately applied could worsen the situation. Subjective impressions are not reliable.

Basic Spin Recovery

1. Reduce throttle to idle and neutralize ailerons.
2. Apply and hold full rudder opposite to the direction of spin. If unable to determine direction of rotation, refer to turn indicator. **Disregard ball indicator**—it will not be reliable.
3. As rudder pedal reaches the stop, move control wheel briskly forward to break the stall. Full down elevator may be required.
4. Hold these inputs until rotation stops (may require a full turn or longer).
5. As rotation stops, neutralize controls and smoothly recover from resulting dive. Retract flaps before exceeding flap extension speed.

This is the basic procedure for most light, single-engine aircraft, and it also applies to most light twins. With some twins, if normal procedures do not result in recovery, power from the engine in the down wing can be used to stop rotation, but if the wrong throttle is advanced the results could work against recovery. Airplane spin characteristics vary broadly, so defer always to the recommendations of your manufacturer.

Caution: The principles outlined above are for general understanding, and are NOT intended as guidelines for self-instruction in spin recovery practice. No one should deliberately spin an aircraft without prior dual instruction.

Note: since an aircraft spins around its center of gravity, aircraft loading affects recovery. In general, the farther forward the center of gravity (within allowed limits), the more responsive the rudder will be in stopping rotation. An excessively aft C.G. will reduce the effectivenesss of the rudder and make it more difficult (perhaps impossible) to recover. That is why many aircraft are placarded against spins with passengers in the rear seats. Even in a (side by side) two-seater, when recovery is sluggish, pushing the pilot seats as far forward as they can go may help.

The rudder is the key control surface, both in spin entry and recovery. The dominant cause of the inadvertent spin is exceeding the critical angle of attack for a given stall speed while executing a turn with excessive or insufficient rudder—*an uncoordinated turn*. In a sense, the lack of coordination could also be ascribed to insufficient or excessive aileron, but when the airplane approaches stall speed the ailerons may be nearly or completely unresponsive—at a stage where the rudder is still fairly effective. The spin normally goes in the direction indicated by the rudder; i.e., holding left rudder will normally give you a rotation to the left, right rudder will normally give you a rotation to the right, regardless of which wing tip is raised.

In a skidded turn (to the left, for example) it seems natural to expect that if a stall and spin develop, the rotation will be with the rudder, since the left aileron and rudder are being held. But in a slip, with opposite aileron held against the rudder, it comes as a surprise to some pilots to find that if a spin develops the wing will usually roll over against the held aileron.

It is also important to remember that in an uncoordinated maneuver such as a slip, pitot/static instruments, notably altimeter and airspeed, are unreliable (because of the uneven distribution of air pressure over the fuselage). Unless the pilot is very attentive to the feel of the controls he may not realize he has exceeded the critical angle of attack until he hears the stall warning horn, and by that time it may be too late to avoid a stall and possible a spin.

The slip, incidentally, is a maneuver which historically developed as a means of burning off excessive altitude during an approach to land without turning or going around, in airplanes without wingflaps. Some pilots and instructors now advise against its use at low altitudes, because of the possibility that with insufficient airspeed a stall and spin could result. S-turns are considered by some as a better way of losing altitude; if they do not suffice, a go-around is likely to be a safer maneuver than a slip close to the ground, where unexpected turbulence could easily convert the slip into a deadly spin.

Remember, *rudder pressure* initiates the spin rotation, *rudder pressure* sustains it, and *opposite rudder pressure* is the primary means of arresting the rotation. (Some airplanes will stop rotating if the rudder pressure is simply released, some will not.) All other control inputs are likely to worsen the situation. Pushing the control wheel forward, for example, before applying appropriate rudder pressure, may prolong recovery because of increased blanketing of the rudder, or lead to an inverted spin. (Recovery from an inverted spin, which requires reversed use of rudder and elevator, would be extremely difficult and confusing for a non-aerobatic pilot.)

The length of time required for the rudder to stop the turn will depend upon the design of the tail and the angle of the attack. In a spin attitude, the horizontal stabilizer may blanket the rudder to some extent, depending on design because of the near-vertical movement of air. No matter how close he is to the ground, the pilot must resist panic impulses to pull back on the control wheel before the rotation and the stall have been overcome. Care must be taken as soon as rotation stops to neutralize the rudder, in order to prevent a possible spin in the opposite direction, or recovering inverted.

The only certain method of breaking out of the stall is reducing the wing angle of attack and recovering to level flight smoothly and positively as the airspeed builds up. If the ground is already very close, the outcome may be in doubt, to say the least, but the pilot has no alternative. Unless he reduces the angle of attack with down elevator at this point, the airplane may immediately stall and possibly spin again. He must trade off altitude for control. If an impact cannot be prevented the less control the pilot has, the poorer his chances of survival. Attempting to increase airspeed by opening the throttle prematurely is likely to pull the nose up excessively and bring about an accelerated stall.

Avoiding that sinking, spinning feeling at a low altitude is a matter of constant control—and of maintaining airspeed and attitude appropriate to the maneuver being carried out. Specialized pilot training and study, however helpful, do not eradicate the tendency of an airplane to stall and spin under favorable conditions. Furthermore, an airplane which recovered easily from a spin under one set of circumstances may resist recovery strongly under other circumstances. A slight modification of the airfoil (from icing, for example, or dried mud), a small change in the configuration—even an uncalculated change in density altitude over high terrain could affect recovery time, with serious consequences.

Perhaps some day a spinproof aircraft will be designed. Meanwhile, expect them all to be potential dervishes. Don't turn them on. ■

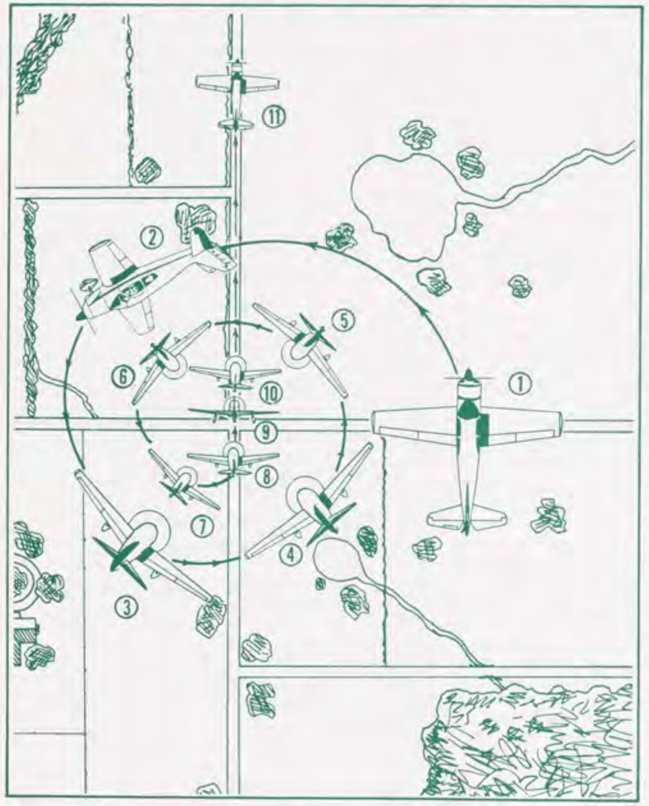


Figure 1. The first two turns of a spin and recovery as seen from above. The apparent tightening of the spin is due to perspective. (1) The area is cleared, the airplane is lined up with a road and the power is reduced. The nose is raised to stall attitude and, as the stall is approached, left rudder and full up elevator are used. Some airplanes may require opposite aileron at the entry; others may need a burst of power (then reduced to idle) at this point. (2) The airplane is the transient condition; some airplanes may move over to a slightly inverted position during this phase. (3) The spin is developing.

(4) The rudder and elevators are held in the full deflected position. (5) Note that the path of the airplane is quite different from the spiral in that the airplane is flying a helix angle and is *also* rolling and yawing about its center of gravity. (6) The recovery may be started here or at (7), depending on the airplane being used. (8) The rotation has stopped and at this instant the airplane is in a straight stalled condition. (9) The nose is lowered to break the stall. (10) The pull-out is started. (11) The airplane is brought back to straight and level cruising flight. Be sure the recovery is complete at least 1,500 feet above the surface.

Figures 1 and 3 reprinted by permission from THE FLIGHT INSTRUCTOR'S MANUAL by William K. Kershner © 1974 by the Iowa State University Press, Ames, Iowa 50010.

Figure 2. Rudder effect.

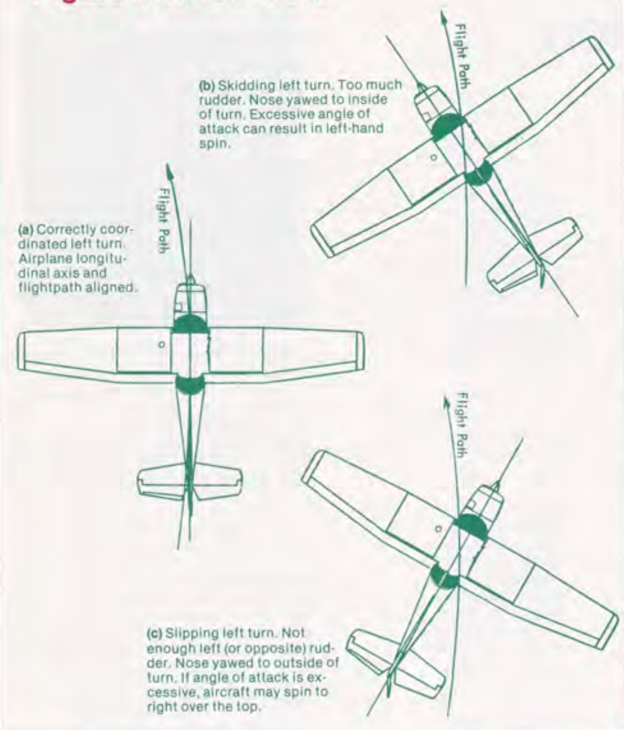
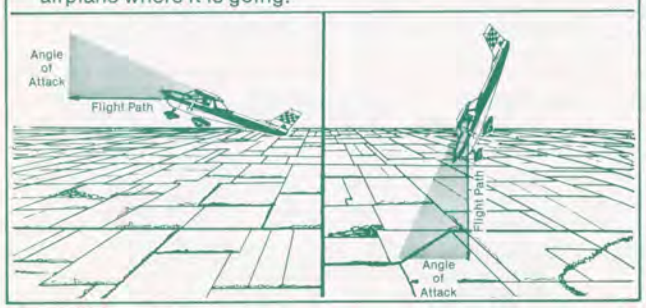


Figure 3. Angles of attack in the normal power-off stall and in a spin. To recover from either, you have to point the airplane where it is going.



(**NOTE:** The editor acknowledges with thanks the assistance of Mr. Sammy Mason, Sr., a veteran test pilot and author of a forthcoming book on spins; and the advice of Mr. James Bowman, spin expert at the Langley Research Center.)

Federal Aviation Regulations

Current Status

			Price		
Part	**SUBSCRIPTIONS** Title	ID Code Letters	Domestic	Additional for Foreign Handling	Changes Issued To Date
1	Definitions and Abbreviations	FA001	$13.00	$3.25	6
21	Certification Procedures for Products and Parts	FA021	18.00	4.50	14
23	Airworthiness Standards: Normal, Airplanes Utility, and Acrobatic Category	FA023	12.00	3.00	10
25	Airworthiness Standards: Transport Category Airplanes	FA025	22.00	5.50	10
33	Airworthiness Standards: Aircraft Engines	FA033	10.00	2.50	3
36	Noise Standards: Aircraft Type and Airworthiness Certification	FA036	17.00	4.25	12
37	Technical Standard Order Authorizations	FA037	13.00	3.25	8
63	Certification: Flight Crewmembers Other Than Pilots	FA063	6.00	1.50	3
91	General Operating and Flight Rules	FA091	26.00	6.50	34
93	Special Air Traffic Rules and Airport Traffic Patterns	FA093	14.00	3.50	8
103*	Part Revoked as of 7/1/76				
121	Certification and Operations: Domestic, Flag, and Supplemental Air Carriers and Commercial Operators of Large Aircraft	FA121	19.00	4.75	33
123	Certification and Operations: Air Travel Clubs Using Large Airplanes	FA123	10.00	2.50	7
135	Air Taxi Operators and Commercial Operators	FA135	14.00	3.50	2
139	Certification and Operations: Land Airports Serving CAB-Certificated Air Carriers	FA139	10.00	2.50	5

* The regulation for the transportation of hazardous material by air is set forth in Part 175—Carriage by Aircraft, effective July 1, 1976, published in 41 F.R. 16106, 4/15/76. This Part is issued by the Materials Transportation Bureau, Department of Transportation. For information concerning hazardous material regulations, contact the Materials Transportation Bureau, Department of Transportation, Washington, D.C. 20590.

FAA publishes the Federal Aviation Regulations to make readily available to the aviation community the regulatory requirements placed upon them. If you are a subscriber, and do not have the latest Change, contact the Service Section, GPO, Washington, DC 20402. The more frequently amended Parts are sold on subscription; Changes to these rules are sent out gratis to subscribers.

Less active Parts are sold on a single sale basis. Changes to single sale Parts will be sold separately as issued. The changes listed here for single sale Parts are only the latest Change, or those that have been issued since June 1, 1978, when the last Status of the FARs was published in FAA GENERAL AVIATION NEWS. FARs (and Changes) may be purchased from the Superintendent of Documents, GPO, Washington, DC 20402.

NOTICE: Prices shown here are those in effect as of November 1, 1979, and are subject to change without notice.

A complete listing of available Changes to the FARs is published in Advisory Circular 00-44. To obtain a copy write to DOT Distribution Unit, M-443.1, Washington, DC 20590.

SINGLE SALE

Part	Title	Stock Number	Price[1]	Change	Stock Number	Price[1]
11	General Rule-Making Procedures	SN 050-007-00236-0	$1.30	11-6	SN 050-007-00453-2	$ .90
				7	SN 050-007-00467-2	1.00
13	Enforcement Procedures	SN 050-007-00230-1	.70	13-3	SN 050-007-00428-1	1.10
				27-7	SN 050-007-00451-1	.90
27	Airworthiness Standards: Normal Category Rotorcraft	SN 050-007-00244-1	2.10	8	SN 050-007-00451-1	1.70
				9	SN 050-007-00458-3	.70
				29-8	SN 050-007-00446-0	.90
29	Airworthiness Standards: Transport Category Rotorcraft	SN 050-007-00245-9	1.70	9	SN 050-007-00455-9	2.40
				10	SN 050-007-00459-1	.70
31	Airworthiness Standards: Manned Free Balloons	SN 050-007-00246-7	.80	31-1	SN 050-007-00361-7	.65
35	Airworthiness Standards: Propellers	SN 050-007-00247-5	.80	35-2	SN 050-007-00369-2	1.10
39	Airworthiness Directives[2]	SN 050-007-00229-7	.35			
43	Maintenance, Preventive Maintenance, Rebuilding and Alteration	SN 050-007-00311-1	1.80	43-1	SN 050-007-00430-3	1.00
45	Identification and Registration Marking	SN 050-007-00231-9	.65	45-3	SN 050-007-00485-1	1.00
47	Aircraft Registration	SN 050-007-00312-9	.70	47-3	SN 050-007-00457-5	.70
49	Recording of Aircraft Titles and Security Documents	SN 050-007-00232-7	.50	49-1	SN 050-007-00336-6	.40
61	Certification: Pilots and Flight Instructors	SN 050-007-00313-7	2.90	61-3	SN 050-007-00432-0	.90
65	Certification: Airmen Other Than Flight Crewmembers	SN 050-007-00314-5	1.25	65-2	SN 050-007-00433-8	.90
				3	SN 050-007-00489-3	1.25
67	Medical Standards and Certification	SN 050-007-00248-3	.50	67-1	SN 050-007-00341-2	.40
71	Designation of Federal Airways, Area Low Routes, Controlled Airspace, and Reporting Points[3]	SN 050-007-00273-4	.85	71-1	SN 050-007-00290-4	.35
73	Special Use Airspace[3]	SN 050-007-00274-2	.40	73-2	SN 050-007-00402-8	.70
75	Establishment of Jet Routes and Area High Routes[3]	SN 050-007-00275-1	.40	75-1	SN 050-007-00326-9	.40
77	Objects Affecting Navigable Airspace	SN 050-007-00276-9	1.10			
95	IFR Altitudes[3]	SN 050-007-00277-7	.50	95-1	SN 050-007-00285-8	.35
97	Standard Instrument Approach Procedures[4]	SN 050-007-00278-5	.45	97-1	SN 050-007-00471-1	.70
99	Security Control of Air Traffic	SN 050-007-00224-6	.70	99-1	SN 050-007-00324-2	.40
101	Moored Balloons, Kites, Unmanned Rockets, and Unmanned Free Balloons	SN 050-007-00223-8	.65	101-1	SN 050-007-00242-4	.50
105	Parachute Jumping	SN 050-007-00315-3	.55	105-2	SN 050-007-00431-1	1.00
107	Airport Security—Revision of Part	SN 050-007-00468-1	1.30			
127	Certification and Operations of Scheduled Air Carriers with Helicopters	SN 050-007-00316-1	2.40	127-4	SN 050-007-00434-6	1.20
				5	SN 050-007-00442-7	.70
				6	SN 050-007-00452-4	.90
				7	SN 050-007-00462-1	.80
129	Operations of Foreign Air Carriers	SN 050-007-00228-9	.45	129-5	SN 050-007-00439-7	.70
133	Rotorcraft External-Load Operations	SN 050-007-00318-8	.55	133-4	SN 050-007-00450-8	.80
135	Air Taxi Operators and Commercial Operators of Small Aircraft[5]	SN 050-007-00319-6	2.50	10	SN 050-007-00441-9	.70
				135-9	SN 050-007-00572-5	.90
137	Agricultural Aircraft Operations	SN 050-007-00258-1	.50	137-3	SN 050-007-00435-4	.90
				4	SN 050-007-00440-1	.60
				5	SN 050-007-00451-6	.80
141	Pilot Schools	SN 050-007-00322-6	1.15			
143	Ground Instructors	SN 050-007-00249-1	.45			
145	Repair Stations	SN 050-007-00220-3	.85	145-3	SN 050-007-00436-2	.90
147	Aviation Maintenance Technician Schools	SN 050-007-00250-5	.65	147-2	SN 050-007-00437-1	.90
149	Parachute Lofts	SN 050-007-00221-1	.50			
151	Federal Aid to Airports	SN 050-007-00261-1	1.55			
152	Airport Aid Program	SN 050-007-00323-4	1.35	152-6	SN 050-007-00411-7	.85
153	Acquisition of U.S. Land for Public Airports	SN 050-007-00262-9	.50			
154	Acquisition of U.S. Land for Public Airports Under the Airport and Airway Development Act of 1970	SN 050-007-00269-6	.40	154-1	SN 050-007-00388-9	.70
155	Release of Airport Property from Surplus Property Disposal Restrictions	SN 050-007-00270-0	.40			
157	Notice of Construction, Alteration, Activation, and Deactivation of Airports	SN 050-007-00279-3	.80			
159	National Capital Airports	SN 050-007-00268-8	1.00	159-2	SN 050-007-00414-1	.75
169	Expenditure of Federal Funds for Nonmilitary Airports or Air Navigational Facilities Thereon	SN 050-007-00280-7	.35			
171	Non-Federal Navigation Facilities	SN 050-007-00281-5	1.10	171-1	SN 050-007-00297-1	.65
183	Representatives of the Administrator	SN 050-007-00233-5	.45	183-2	SN 050-007-00398-6	.70
185	Testimony by Employees and Production of Records in Legal Proceedings, and Service of Legal Process and Pleadings	SN 050-007-00237-8	.80			
187	Fees	SN 050-007-00234-3	.40			
189	Use of Federal Aviation Administration Communications System	SN 050-007-00235-1	.40			
191	Withholding Security Information from Disclosure Under the Air Transportation Security Act of 1974	SN 050-007-00359-5	.40			

[1] Add 25% for foreign handling.

[2] Due to their length, complexity, and frequency of issuance, individual Airworthiness Directives are published separately in the Federal Register. Copies of Airworthiness Directives that have been issued are for sale in summary form by DOT/FAA, the consigned agent for the Superintendent of Documents, Order from: DOT/FAA, Aeronautical Center, Atten: AAC–23, P.O. Box 25461, Oklahoma City, Okla. 73125. (Vol. I—AD's for Small Aircraft is $12.50 plus $3.15 additional for foreign handling, Vol. II—AD's for Large Aircraft is $10.75 plus $2.70 additional for foreign handling.)

[3] Due to their length, complexity, and frequency of issuance, individual airspace designations, airways descriptions, restricted areas, jet route descriptions, and en-route IFR altitudes are not included in the publication of these basic Parts. Such descriptions are published in the Federal Register and depicted on appropriate aeronautical charts. Aeronautical charts can be obtained from the U.S. Department of Commerce, Distribution Division (C–44), National Ocean Survey, NOAA, Riverdale, Maryland 20840.

[4] Standard Instrument Approach Procedures are published in the Federal Register by reference to FAA documents which are available for examination in the Rules Dockets (AGC–24) and the National Flight Data Center, FAA Headquarters, Washington, D.C., and at the appropriate FAA Regional Offices and Flight Inspection District Offices. These Instrument Approach Procedures Charts can be obtained from the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Distribution Division (C–44), National Ocean Survey, Riverdale, Maryland 20840.

[5] See Revised Part 135, effective December 1, 1978, sold on subscription service, Appendix 2, Page 1. Part 135, Published November 1974, may still be used by certain operators until December 1, 1970.

POST CRASH SURVIVAL

What the pilot can do until rescue arrives

At 7:45 on the evening of December 4, 1978, a commuter airlines *Twin Otter* with turbulence and icing problems crashed into a snow-covered saddle known as Buffalo Pass at the 10,539 ft. level of the Rocky Mountains, about eight miles east of Steamboat Springs, Col. There were 22 persons on board: two crewmembers, 19 adult passengers and one infant. The captain was rendered unconscious on impact, with fatal injuries to the head. The copilot was trapped in the wreckage of the cockpit. The wings separated from the fuselage, which rolled over on its right side. All the passengers received injuries of varying severity: eight had broken backs (one died subsequently), five had broken limbs or bones.

The crash occurred in the dark, without warning to the passengers who were unaware of the inflight problems or the captain's efforts to return to his point of origin. Snow was falling and the temperature on the ground was expected to drop well below the freezing point before dawn.

What is remarkable about this accident is not the fact that two persons died, but that 20 survived—a fact attributed in large part to the presence of mind of a 20-year old passenger, Jon F. W. Pratt, a geological draftsman from Estes Park, Col. Momentarily stunned but not seriously injured by the crash (cut on his forehead, sprained wrist, and battered nose) he took charge of the situation and carried out the actions that were possible and appropriate to survival, pending the arrival of rescuers.

Jon Pratt had been sitting in an aft seat just opposite the passenger door, which was now above him. Looking forward, (the cabin lights remained on for several hours) all he could see was a jumble of bodies, broken seats and scattered personal belongings. The cockpit windshield was broken out and snow was blowing in heavily. There was no sign of life from either of the two crewmembers. Injured passengers were moaning and beginning to cry for help, and the infant was screaming.

Pratt's first instinct was to get out of the wreckage, which he was able to do, pushing open the door with the aid of another passenger. There was no sign of fire, thanks in large part to the heavy mantle of snow which cushioned the crash. But now he quickly realized the snow and the cold was their main enemy. From his experience as an Eagle Scout and from winter camping with his family he knew that stranded persons in the high mountains are found, sooner or later, but their survival depends initially on the conservation of body heat, and the avoidance of panic and desperation. It was already pitch dark outside, with a near-blizzard raging and no sign of any inhabitation. The wrecked plane would have to be their refuge for the night, Pratt realized, as it was unlikely rescuers could penetrate the storm in the dark. The snow under foot was at least ten feet deep and he had no idea where they were, other than in the mountains near the timberline elevation. To survive this night, warmth was essential—warmth and reassurance.

He knew there were many serious injuries, but given the turmoil inside the cabin there was little he could hope to provide in the way of individual medical assistance. He set about doing what could be done.

With the aid of another passenger he was able to make his way into the baggage pod, which had separated from the fuselage, and obtained outdoor clothing and sleeping bags from the luggage, which he distributed among the passengers. He also removed several cabin seats and lined the floor with heavy garments. Several of the badly injured, who were flailing about uncontrollably, were removed to a "sick bay" in the baggage compartment where they were protected by a ring of empty luggage, and cared for by the least injured passengers. Bleeding of severe wounds was controlled by makeshift compresses.

Pratt then attempted to extricate the now conscious copilot. He was unsuccessful, despite hours of digging out snow with his bare hands, largely because of the furious blasts of wind. To minimize the injured man's exposure to cold, a shelter of empty luggage was placed over him (the copilot received moderate to severe frostbite but survived and later recovered and returned to flying). Baggage was also used to block off the shattered windshield and other holes in the fuselage. Other than that, there was little that could be done for the injured, in the darkness and in the absence of medical sup-

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DETACH ENVELOPE HERE ⬆ ENCLOSE LETTER WITH CHECK OR MONEY ORDER (DO NOT SEND CASH) plies, except to comfort them and assure them that rescue was at hand.

As indeed it was. Alerted by Air Traffic Service and guided by the *Otter*'s ELT, more than 50 persons were combing the mountainside for the downed airplane, on skis and in snowmobiles all through the night. Just before dawn Jon Pratt heard the sound of engines nearby. Getting out of the aircraft he saw the lights of snowmobiles circling through the area. Fearing they would not see the snow-covered plane, Pratt yelled and waved until he got their attention. A paramedic team was soon attending to the injured, prior to removal to a hospital. Most of the passengers, including the infant, were able to continue their journey within a few days and arrived home in time for Christmas. Jon Pratt was later given an award by the Air Line Pilots Association for his role in preserving the lives of many helpless passengers and the copilot.

How many amongst us, pilots and otherwise, would have known exactly what to do—and what not to do—under such circumstances? How many of us have faced the fact that whenever we set out on a flight, especially over open country or mountains, a crash is a possibility—a very slim one, but possible none the less—and done something about it?

The pilot of a general aviation aircraft is not required to have survival training, or even to carry one iota of medical supplies on board. The FARs hold the pilot-in-command responsible for the operation of an aircraft, but they do not specify any actions he must take after an accident in tending to the needs of injured passengers. He can rush off and save his own skin if he wishes. But he does have a moral obligation to those who literally place their life in his hands, by flying with him, to make a minimal advance preparation for postcrash survival.

Practically speaking, not many pilots can be persuaded to prepare themselves fully for an accident followed by an extended period of isolation in the wilderness. In these days of highly sophisticated electronic surveillance and specialized rescue vehicles (helicopters, snowmobiles, for example), such an experience becomes less and less likely—although still conceivable. Nowadays it is more likely that the time between a forced landing and rescue is in the order of 12 to 24 hours. But these few hours—even the first few minutes, or seconds—can be very critical in terms of survival, especially if the impact is severe and the environment hostile. Any crash can be a frightening experience, and injured persons can easily slip into a state of shock and helplessness, or rush off in a panic and become lost in dense woods or deep snow . . . unless a responsible person takes charge.

The pilot is the most suitable person to assume this role. He is respected by his passengers for the knowledge and skill which enables him to fly the aircraft; and normally they are also willing to extend that respect to his guidance in matters of postcrash survival. Any pilot can merit that respect by giving the subject a few hours of earnest attention and by investing a few dollars.

The easiest investment any pilot can make in postcrash survival costs no money at all and only a few minutes of his time. Before each takeoff he can spend a few minutes discussing the possibility of an emergency landing with his non-pilot passengers, showing them how to unlock the doors or push out the windows, and explaining the urgency of *getting out of the cabin at once*, because of the danger of fire. Fire is always an immediate danger in any crash or hard landing, as most pilots understand, whenever there is rupture of fuel lines or tanks and a source of ignition, such as sparks from the friction of impact.

However some pilots do not realize that there is a secondary potential threat of fire breaking out as a result of sparks from damaged electrical components. (Even when the master switch has been turned off, the battery terminals could be shorted during impact.) The outbreak of such fires can be delayed several minutes, pending the vaporization of spilled fuel. So the fact that fire does not occur initially is no reason for believing the danger is past; the downed aircraft should be evacuated to a safe distance until it can be determined that there is no fuel spillage or electrical arcing.

Although only about eight percent of aircraft accidents result in a fire, the fatality rate in such fires—from asphyxiation as well as from burns—is so high that no one should take any chances, or wait for instructions.

Passengers should also be told about the rescue function of the Emergency Locator Transmitter, if there is an operating ELT on board, and shown how to use the panel radio to call in a MAYDAY (in the event the pilot is incapacitated during a crash). The advantages of staying near the wreckage should be stressed, and the location of any survival equipment on board pointed out.

The second major contribution a thoughtful pilot can make to postcraft survival does take some time and effort but still involves very little expense: *he can see that he is prepared to render first aid effectively*.

For example, he can take a Red Cross course in first aid, followed up if possible by the contemporary CPR (cardio-pulmonary resuscitation) training. This does not license you to function as a doctor or medical expert, but it does give you a basis on how to proceed in an emergency when you may be hours away from medically trained assistance. Persons with arterial bleeding, or without heartbeat, or who are not breathing, need IMMEDIATE help—their survival may require appropriate action to be commenced within seconds and continued for several hours or longer. In some cases simultaneous, or alternating, actions are needed to restore heartbeat or breathing. CPR-trained persons are taught how to do this and given adequate practice. In a critical condition, it is unlikely that persons without this experience—and occasional recurrent training—could carry out the procedures effectively. Remember: the life you could save could be someone in your own family.

One of the very important things that Red Cross courses teach is what NOT to do, what kind of conditions to leave alone, in order to avoid worsening already bad injuries. Crash victims quite often become hysterical, which creates such a state of tension that an untrained person could find himself at a loss as to what to do first.

In many cases there is little a pilot can or need do for injured passengers other than to keep them as comfortable as possible, warm, and reassured. But these actions are far from insignificant. When injured persons are emotionally upset—as a crash victim may well be—they are likely to cause themselves further injury. Injured persons seek reassurance from someone who seems competent to deal with the situation, and they are easily frightened if the pilot or some crew member is not able to carry out that role.

In some accidents the primary concern of the first-aid trained pilot will have to focus on the conservation of bodily heat, espe-

Rocky Mountain Ranger Station at Grizzly Pass served as base camp for survivors of the midwinter crash and overnight ordeal.

cially when many persons are immobilized in wintry conditions by injuries—as Jon Pratt realized very properly at Buffalo Pass. The human body can exist only as long as internal temperatures remain within a fairly narrow range. Unconsciousness and death can result from steady drainage of body heat without actual freezing of any local area (hypothermia).

Wind and dampness, of course, cause an accelerated drainage of body warmth—which is one good reason why the shelter of the downed aircraft should not be abandoned in an unfamiliar environment, particularly in winter, unless it is totally useless. Caution: do not build a fire close to or within the aircraft, no matter how cold the temperature: fuel vaporization may continue to take place for many hours, without being readily discernible. Provide warmth by heating rocks or even earth—any object which can be transported safely into the cabin.

Pack the area with every available scrap of dry clothing, and keep those passengers who are quiescent lying down in close body contact. If you have no warm clothing or gloves, insist on everyone clapping hands energetically once an hour, and watch each others faces for signs of frostbite (dull, whitish pallor, loss of feeling). Make sure everyone has some kind of headgear; body heat loss can be as much as 50% greater with the head uncovered. Avoid drinking melted snow until it has been thawed to near-body temperature. DO NOT DRINK ANYTHING ALCOHOLIC, it is not a stimulant, contrary to popular belief, and will have a weakening effect on injured or chilled persons. Hot coffee or even plain heated water will help keep body temperature within safe limits.

The third contribution the conscientious pilot can make toward post-crash survival consists of the survival equipment he keeps on board the aircraft. This includes sources of warmth and light as well as medical supplies.

There are many excellent first aid and survival kits on the market, some designed especially for small aircraft. If you have had Red Cross training you will know how to make up your own. Remember that the world's best first-aid kit is totally useless if it cannot be retrieved from a downed aircraft. Accessibility of location is a key factor. One solution is to have several kits on board, stowed in various sections of the aircraft (these locations should be pointed out in your pre-takeoff passenger briefing).

One rather ingenious solution to the question of how to make certain of getting the first-aid/survival kit out of the aircraft is suggested in New Zealand's *Flight Safety Magazine*. The materials are all contained within the barrel of a pen (with cartridge filler and spring removed), or the barrel of a penlight flashlight, which is clipped to the pocket of a shirt for positive accessibility. (Several could be handed out to passengers.) This mini-marvel kit contains matches, water purification tablets, a magnetized needle, (for a compass), safety pins, a knife, a candle, thread, wire, and foil. The matches and tablets are waterproofed by sealing with wax in a plastic straw; the magnetized needle is suspended from thread and its north-seeking end identified; the safety pins will help keep makeshift bandages in place; the knife consists of a narrow single-edge razor blade (injector type); the candle is a birthday miniature that could give you extra minutes of sorely needed light; the wire can be used with the foil to form a water utensil; and the foil can be used for signalling.

Above: A mini survival kit that can be carried in the pocket like a pen. *Below:* Crash survivor wrapped in a space-age, ultra light thermal blanket which folds to the size of a cigarette packet. Material reflects sunlight and radar signals.

Another suggested item is a blanket which can be rolled to fit inside a cigarette packet. One type is the "Super Insulation Rescue Sheet," made of highly reflectorized polyester foil, with a gold colored outer surface, which can paint a good radar as well as solar reflection to contact rescue aircraft while you are snugly wrapped inside.

Keeping the anticipated time between the emergency landing and rescue to a minimum is part of the pilot's responsibility toward the well-being of his passengers. With this in mind, he should make certain that he has a functioning radio on board, apart from the panel radios. If his ELT is inoperative, because of the problems with lithium sulfide batteries, he could wear a portable CB radio on his belt, preferably one with the maximum 5-watt power output.

Pilots who have been flying for years without any mishap whatsoever may smile at the idea of first-aid training or pre-takeoff preparations for an accident they never expect to happen. But the accident files of general aviation show conclusively that the unexpected does occasionally happen, even to the best of pilots. If you one day should find yourself unable to administer to the critical needs of a passenger or family member, for lack of materials which could have been contained in a pen barrel clipped to your pocket, you might find it difficult to smile for quite some time. ■

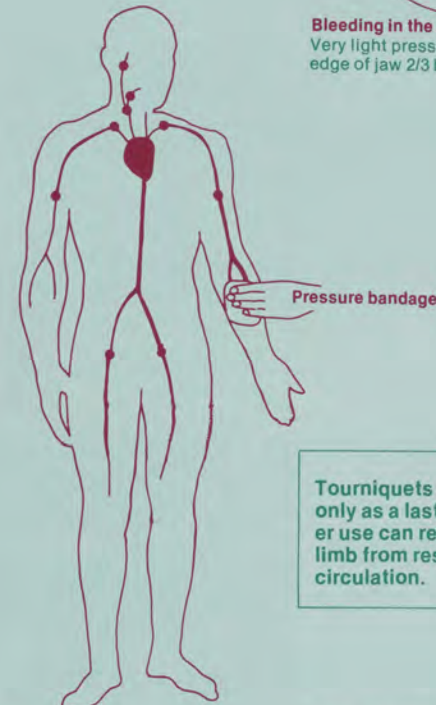
Severe structural damage can produce delayed ignition of fuel vapors from sparks given off by shorted electrical components or by broken power lines struck by aircraft. This *Aztec* twin crashed in the White Mountains of New Hampshire after striking high tension wires.

How to Stop Bleeding

Bleeding in scalp above the ear
Light pressure in front of the ear.

Bleeding in the cheek
Very light pressure in notch under edge of jaw 2/3 back from tip of chin.

Arterial Bleeding is a life-threatening situation and must be stopped by the fastest means possible. The Red Cross recommends pressure on the wound or effective arterial pressure points to stop flow of blood until natural clotting processes take over.



Tourniquets should be used only as a last resort. Improper use can result in loss of a limb from restricted circulation.

Bleeding in the lower arm
Strong pressure on the inside of arm halfway between shoulder and elbow.

Bleeding in the arm
Firm pressure behind the middle of collar bone—push artery against rib.

Bleeding below the knee
Strong pressure in groin with thumb —push artery against pelvic bone.

Drawings from *Flight Safety*, a publication of New Zealand's Ministry of Transport.

Over the Top

The First Commercial Transpolar Flight

Leif Viking, renamed *Royal Viking* for the first transpolar commercial flight, at Los Angeles with its crew after opening the Arctic for air travel. Early polar flights required a flightcrew of 12, double the present complement.

The polar route was later extended to Tokyo with a stop at Anchorage.

The search for a Northwest Passage through Canada to the Pacific Ocean is one of the storied quests of history, with such celebrated navigators as Leif Erickson, who explored Greenland in the 11th century, and Henry Hudson who sailed as far north as the Hudson Bay in 1610, leading the way. But the ice and snow and bitter cold and endless miles of barren tundra always proved an unsurmountable barrier and the fabled waterway was never found. It was not until 25 years ago, on November 15, 1954, that commercial travel over the Arctic became a reality, and by that time the vessel, manned by the descendants of sea-faring Vikings, had sprouted wings.

On that date the *Helge Viking*, a Scandinavian Airlines System DC-6B took off from Copenhagen, Denmark. At the same moment, a sister plane, the *Royal Viking*, departed Los Angeles—both following the same newly established air route over Canada and Greenland. The aircraft carried a distinguished passenger list of Scandinavian royalty and political figures, whose willingness to embark on this pioneering flight caught the public imagination.

In the public mind, the far north country still held connotations of hardship and terror. The sufferings of many early Arctic explorers, traveling by land, sea, and air, had been well-documented in the press. Consequently, the possibility of a forced landing in a desolate, snowy wasteland lent an aura of adventure to the new SAS polar route that excited worldwide interest.

Preparations for the new route had begun in 1952 when SAS took delivery of its first DC-6B. SAS hoped that with the new plane and using a transpolar route the flight time from Los Angeles to Copenhagen could be cut from 36 hours (via Chicago, New York, and Prestwick, Scotland) to less than 24 via Edmonton (Alberta) and Greenland. The original route, flown by a DC-4, was 6,396 miles; the new route was 5,100 miles.

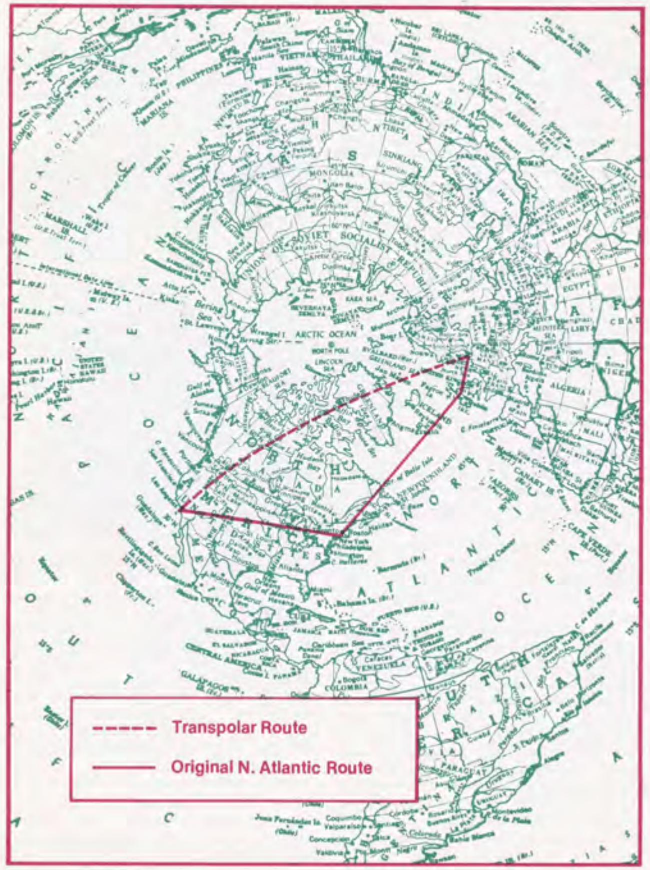
The problems of polar navigation were two-fold. Flying would be done too close to magnetic north for the magnetic compass to be used as a directional instrument or for resetting the directional gyro. Additionally, since all meridians in the northern hemisphere converge at true north (some 1,000 miles "north" of magnetic north), flying a northerly latitude would mean crossing a meridian so frequently that it would be necessary to recalculate the heading almost constantly, if they flew in reference to a standard chart. At least two full-time navigators, one who did nothing but take sextant readings and the other who computed wind correction angles, ground speed, and true heading for the adjusted course, would be required.

The Grid System—substituting for the meridians converging at the Pole a simple set of parallel lines—vastly simplified navigation over the Arctic.

These problems were resolved by the use of a "polar grid" a newly developed system for polar flight. In this system, lines of longitude were overlaid by lines drawn parallel to the Prime (Greenwich) Meridian forming a rectangular grid projection, on which the course was drawn. Aircraft position was determined by periodic celestial observations which established the grid track and the necessary gyro changes.

Navigation problems were also eased by the development of a Polar Path Gyroscopic Compass, whose 23,000-rpm spin rate minimized "drift," or precession, which normally accelerates in the northern latitudes. The PPG compass was subject to only about 1° of drift per hour (compared to as much as 20-30° on a conventional directional gyro at polar latitudes).

But the airplanes themselves were also a problem. Although the route was planned for no overnight stops, weather in Greenland often forced unplanned delays, and there was always the possibility of a forced landing en route. Anticipated sub-zero temperatures on the ground in the Arctic necessitated redesigning the hull, especially insulation of the water and oil system. Even so, water would have to be drained out of the aircraft for an overnight stay and protective covers placed on the engines.



In preparation for an emergency landing in the Arctic, everything needed for the protection of passengers had to be a mandatory part of aircraft equipment. Clothing, sleeping bags, snow shoes, rafts, traps, fishing tackle, guns, food—even an Eskimo dictionary—were routine items. All crewmembers would have to undergo Arctic survival training.

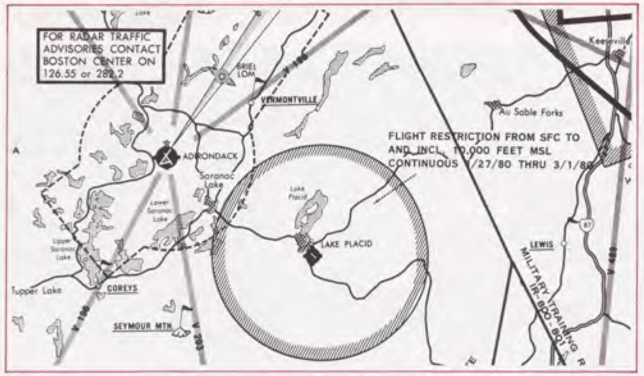
The lack of sufficient radio stations was another worry for SAS. Canada could not be expected to build radio and navigational aids in the wilderness for another country's airline, and it was questionable whether existing military and meteorological stations would be sufficient to track the polar flight from Copenhagen.

The two *Vikings* departed on the announced date, tracking reciprocal courses that would eventually bring them within 65 miles of each other (they established radio but not visual contact). For the first time travelers had a view of the top of the world from the shirtsleeve comfort of a warm, airborne seat. Although Greenland was plagued with seemingly incessant bad weather, the inaugural flights did not encounter cloud tops at any point above 10,000 feet, and at their 20,000-foot cruising altitude, turbulence and icing were nonexistent—as were the other legendary terrors of the Polar lands.

The air at 20,000 feet was not much colder than air temperatures for that altitude at more southern climates; the cabin environment remained pleasant with stereo music, and the engines functioned normally. Refueling stops at Edmonton and Thule were without incident, and both aircraft landed at their destinations on schedule—the *Royal Viking* from Los Angeles arriving about three hours ahead of the *Helge*, thanks to prevailing westerlies.

Although greeted and feted by enthusiastic crowds upon their arrival, the Polar passengers had little of interest to tell about their flight, which had been almost disappointedly devoid of excitement. There were no heroics, no frightening episodes, no memorable tales to tell: All had gone according to plan. The mythical barriers to Polar commercial flight had subsided without a struggle.

In the decades that followed, route facilities were improved, and larger and faster aircraft continued to reduce travel time. Today's 747's fly nonstop from the West Coast to Denmark in less than 16 hours, with inertial navigation systems replacing the navigator. But like their Viking forebears, the SAS crews know how to keep watch on the stars. ■



AN OLYMPIC EFFORT. Anticipating some 6,000 daily air commuters to the 1980 Winter Olympic Games, FAA will establish temporary flight restrictions around Lake Placid Airport from January 27 to March 1, 1980, including all airspace within an 8½-mile radius up to 10,000 feet MSL. Placid will be closed except for helicopters associated with the Olympic Games. See the Special VFR Terminal Area Chart for nearby Adirondack Airport at Saranac Lake and contact the FSS for details. Above chart not to be used for navigational purposes.

INCREASED COMMUTER PAYLOADS ALLOWED BY NEW REGULATION

Air taxis and commuter airlines using aircraft smaller than transport category may now be approved for higher payloads, in conformance with the recently enacted Special Federal Aviation Regulation 41.

The new rule will enable propeller-driven, "normal" category airplanes (12,500 lbs. or less) with a passenger-seating capacity configuration of between 10 and 19 seats to be re-certificated for a higher gross take-off weight. SFAR 41 operators must conform to additional airworthiness provisions, but these requirements are less extensive and costly than those required for the larger transport category aircraft.

SFAR 41 is the third phase of a three-part effort to improve the safety of commuter airlines. Recently revised Part 135 brought commuter operation rules on a par with scheduled air carriers. A forthcoming "Light Transport" Airplane Airworthiness Review will seek to establish separate airworthiness standards for multi-engine airplanes with a maximum gross weight of 35,000 pounds and a passenger capacity of 30 or more.

AIRSPACE PROPOSALS DROPPED

Proposals offered by FAA to lower the floor of positive control airspace from 18,000 feet to 12,500 feet or 10,000 feet (depending on location) have been withdrawn in response to public comments opposing the plan.

INSTRUCTOR, MECHANIC AWARDS

A 35,000-hour flight instructor from Tennessee who has flown over 5,000 check rides and a Spokane mechanic with a widespread reputation for Beechcraft maintenance have been named Outstanding Flight Instructor and Aviation Mechanic, respectively.

The national awards were presented to Mrs. Evelyn Johnson, the flight instructor, and Mr. Donald Summers, the mechanic, in a ceremony in Washington, DC on October 23, 1979. In addition to their awards, both received several thousand dollars in cash and gifts from representatives of the aviation industry.

HANDY PUBLICATIONS GUIDE

Pilots who have suffered frustration when trying to locate an urgently needed government publication will be happy to learn that help is at hand.

The recently revised "Guide to Federal Aviation Administration Publications" clearly defines the "system" of distribution for articles, books, pamphlets, and reports written by FAA and other government agencies on aviation safety and technical matters.

The guide tell's what kind of material is available from each distribution agency, complete addresses, telephone numbers, stock numbers, and procedures to follow for obtaining an order. The 78-page booklet also describes the content of both regulatory and non-regulatory publications. Order blanks and instructions for ordering from the three principle distributors—the Department of Transportation Publication Section, the National Technical Information Service, and the Superintendent of Documents—are provided.

The guide is free upon request sent to: Department of Transportation Publication Section, M-443.1, Washington, DC, 20590.

HIGHER STANDARDS PROPOSED FOR LARGE G.A. AIRCRAFT

Some 1,200 large piston and jet aircraft in the general aviation fleet will have to operate under higher standards of maintenance and safety if the proposed new Federal Aviation Regulation Part 125 is enacted.

Part 125 is intended principally to eliminate unsafe operations where large aircraft, including air carrier "discards," operate in the same maintenance environment and flight conditions as small general aviation aircraft. Under these circumstances air safety has been jeopardized by unscrupulous individuals circumventing the law.

Airplanes carrying 20 or more passengers or a 5,000-pound payload and operated by private operators, air travel clubs, and all foreign operators of U.S.-registered airplanes would be affected by Part 125. When operating outside the U.S., however, only the inspection rules of 125 apply.

Operators of certain large airplanes will be excluded from the new rule. They will continue to operate under Part 91, Subpart D. Among the excluded airplanes are *Learjet* 23/24/25/35/36, *Cessna* 500/501/550, *Grumman* G-73, *Falcon* 10/20, *North American* 265, *Jet Commander*, *Hansa* HFB 320, and *DH-125*.

Linking airplane maintenance to size rather than use, Part 125 would require private operators of these large airplanes to hold an FAA operating certificate. Especially affected will be 275 airplane leasing companies and aviation service firms which operate more than half of the 1,200 airplanes involved.

Under the new regulations, the operator would have to give evidence of qualified management to assure an adequate safety level. Duty time limits for flight crews, flight and maintenance operating manuals, appropriate airworthiness certificates and approved procedures will also be required. Minimum Equipment Lists must be followed, and airborne weather radar would become required flight equipment.

FAA-approved engine overhaul procedures would be established by the operator, and inspection intervals adhered to. Pilots must have certain qualifications, including at least a commercial certificate with an instrument rating, appropriate category and class ratings, and an appropriate type rating, and periodic proficiency instrument checks would be required for anyone acting as pilot-in-command. Maintenance defects and malfunctions must be reported to FAA.

The Notice of Proposed Rulemaking was published in the November 1, 1979 *Federal Register*, and comments will be accepted for the usual 60-day period. Comments should be sent to FAA, ATTN: Rules Docket (AGC-24), 800 Independence Ave., S.W., Washington, DC, 20591.

FAA GENERAL AVIATION NEWS welcomes comments from our readers. No anonymous letters will be used, but names will be withheld on request. Address: FAA GENERAL AVIATION NEWS, AFS-807, Washington, D.C. 20591.

• Propeller Spinner Ice

I have never seen the following problem, which I have experienced, in any publication. One day my plane, which has a variable pitch propeller with weights, was left outside in blowing snow. Evidently, snow filled the spinner. When the airplane was moved into a warm hangar to be de-iced, the snow in the spinner melted, but apparently some water remained in the spinner. After the airplane was airborne and had climbed to a freezing altitude, that water froze inside the spinner and kept the weights from moving. The propeller speed could not be reduced. I had to land, warm up the spinner, and blow the water out. Does this happen often?

George Risk
Kimball, NB

No, because the turning of the prop will usually blow the snow out. Packed snow that doesn't entirely melt during the de-icing can cause this problem. Using an engine cover will prevent the snow from entering the spinner. Or placing the prop perpendicular to the ground will allow the water to drain out the spinner openings when the snow melts.

• Low-Time Aircraft

In September of 1978 I purchased a Bonanza V35B which was one year old and had only 31 hours on it. I thought this was a fine buy as the airplane had so few hours on it. It performed very well in test flights, but as time went by various problems began to develop with the avionics and engine oil consumption. The engine was examined and found to have rust in the cylinders apparently because the plane had been flown so little. The avionics problems seemed to be similarly caused. Fortunately, I had made this purchase through a reputable dealer and they completely absorbed the cost of redoing the engine. Now it's like new.

When we are told that a plane should be flown regularly I know what they mean. A low-time airplane purchase should be approached with great caution.

John F. Russo
Toms River, NJ

AMEN!

• Numbering Instead of Naming

Instrument flying is simple, that is, until I get a fast-talking guy who says "youse" when I say "y'all." This losing battle occurs mainly in terminal areas under pressure when a controller clears me to some "Indian-named" intersection, fix, etc., and I can't match it up with any name on the chart. My only hope is to get FAA to go to numbers and get rid of those crazy names. This could be done by changing the fixes from lettered symbols to Roman numerals. Of course, we'd all have to brush up on Roman numerals, but that is far easier than learning American Indian dialects.

Bob Swinnie
Andrews, SC

Your suggestion is interesting, but Roman numerals lengthen very rapidly as you move up the numerical scale. They are difficult for most persons to read, and this could easily lead to a serious error. Air traffic control has done its best to prevent confusion with fix and intersection names, and controllers will report any fix/name a pilot indicates he has trouble understanding. If warranted, the name will be changed. Controllers are trained to enunciate clearly, but regional pronunciations are sometimes noticeable.

• Tach Time or Hobbs Time?

In the article "Logging Time" in the March/April issue, one paragraph states about student pilots, "He's got to have 40 hours, including 20 hours of solo, *on the tach* before he can apply for the private certificate." To my knowledge, nothing in the FAR's connects flight time to tach time.

A. H. Findley
San Diego, CA

"Flight time" is defined in FAR Part 1 as "The time from the moment the aircraft first moves under its own power for the purpose of flight until the moment it comes to rest at the next point of landing (block-to-block time)." Flight time is sometimes loosely measured by the tachometer, which not only measures revolutions per minute but keeps a cumulative log of total revolutions on the engine and converts this data to hours of engine turnover at maximum power. This data is important in engine maintenance but does not always correspond to flight hours. Measuring flight time from the Hobbs Meter is a more accurate way of determining actual flight time.

The Hobbs Meter measures time in one of four ways: 1) electrically, by timing the period when the master switch is on; 2) dynamically, by air pressure from an air inlet when the aircraft is moving; 3) by oil pressure when it rises into the green area; or 4) by a tripping mechanism when the gear is lowered and retracted.

• Density Altitude in the Cabin?

I know that in an unpressurized aircraft like mine the pressure altitude in the cabin is about the same as the ambient pressure altitude. But what about density altitude in the cabin, which has to be greater. For example, with a pressure altitude of 12,500 feet the D.A. is approximately 16,500 feet when the cabin temperature is +25°C (+77°F). My question: Does density altitude influence the human need for supplemental oxygen? Personally, I tend to keep the cabin on the cool side because this seems to keep me more alert, and it also lowers the density altitude.

John G. Lawton
Buffalo, NY

Keeping the cabin temperature cool is fine if it helps keep you alert. However, the human body responds to the actual pressure altitude, not the density altitude, which affects only the aircraft performance.

• Texas and the Rockies

I especially enjoyed "Appalachian Scud Running" (July/August 1979), but I would like to point out an error in the article. On page 8, first paragraph, you state that Mt. Mitchell, at 6,684 feet is the highest point east of the Rocky Mountains. If you will check an El Paso Sectional, latitude 31°55', longitude 104°50' you will find Guadalupe Mountains National Park has at least three peaks higher than Mt. Mitchell, the highest being Guadalupe Peak at 8,751 feet. Also, the Chinati Mountains at 7,721 feet, Mt. Livermore, at 8,382 feet, Eagle Peak at 7,484 feet, Black Mountain at 7,550 feet, etc., all located in west Texas. And Texas is east of the Rocky Mountains, isn't it?

Barry McCollom
Kerrville, TX

Most of Texas is well east of the Rockies, but the areas you mention in west Texas are considered part of the Rocky Mountain Range, just as the elevated plateaus of Kentucky are part of the Appalachians. Perhaps we need to write an article on the Texas Rockies?

• Logging Instrument Time

Regarding recent IFR experience, FAR 61.57(e) states that in order to act as pilot-in-command under IFR, the pilot must have logged at least six hours of instrument time and six instrument approaches, within the last six months. The FAR's inform us an instrument instructor may log as instrument time only the time he acts as instrument instructor in actual IFR conditions. My question then is, can an instrument instructor also take credit for the instrument approaches completed under actual IFR and log them towards his recent IFR experience requirements?

David B. Goodwin
York, ME

Affirmative. FAR 61.51(c)(4) states "an instrument flight instructor may log as instrument time that time during which he acts as instrument flight instructor in actual instrument conditions." This would include any instrument approaches completed.

INSTRUMENT CORNER

• Visibility and Landing

Can an aircraft operating under FAR Part 91 conduct an instrument approach and—if at the missed approach point the runway is in sight—land if the visibility minimum is one mile, even though the prevailing visibility is reported as ½-mile?

Stephen Pohowsky
Dover AFB, DE

Affirmative. An aircraft operating solely under FAR Part 91 is not prohibited from beginning an instrument approach when the reported visibility is less than the prescribed minima. If, upon arrival at the missed approach point at the authorized MDA or DH, the approach threshold, approach lights, or other markings are clearly visible, a normal approach to the runway and landing may be conducted. "Prevailing" visibility does not necessarily represent that which a pilot may have at a given vantage point.

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