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March-April 1991

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Roger M. Baker, Jr., *Manager, Accident Prevention Program Branch*
Phyllis A. Duncan, *Editor*
Louise Oertly and Dean Chamberlain, *Associate Editors*

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FAA Aviation NEWS

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March-April 1991

Volume 30, Number 2

Features

Departments

On the cover:
This Piper ***Aerostar*** *flies high over mountainous terrain.*

The FAA Aviation News Staff dedicates this issue to Associate Editor:
Gy.Sgt. Dean Chamberlain
recalled to active duty in the United States Marine Corps in support of Operation Desert Storm.

Aircraft Owners and Pilots Association

by Dean Chamberlain,
Associate Editor

The FAA is unique. Under the Federal Aviation Act of 1958, Congress gave the then Federal Aviation Agency (renamed the Federal Aviation Administration in 1967) the statutory requirement of ensuring both the safe and efficient use of the nation's airspace and the task of promoting civil aeronautics and air commerce in the United States and abroad.

One way the FAA fulfills its two, at times seemingly contradictory, obligations is by working with the various aviation groups not just in the regulatory process, where it reviews their comments, but also in the promotion of aviation and aviation safety.

The following three installments are the first in a series of articles highlighting the various safety services that aviation membership organizations provide for their members and the general public's benefit. The first article is about the Aircraft Owners and Pilots Association (AOPA) and its new president, Phil Boyer. The second is about the AOPA Air Safety Foundation (ASF), a sister organization collocated with AOPA. The final installment in this issue is an edited reprint of an ASF safety article published with permission of ASF.

The article, Stress and The Pilot, *written by Donald D. Engen, President, AOPA Air Safety Foundation, was printed in the* Flight Instructors' Safety Report, *a free ASF safety mailout sent to all flight instructors. (CFI's who do not receive the report can contact ASF about receiving a copy.) The article is typical of the type of safety information the AOPA Air Safety Foundation produces.* FAA Aviation News *thanks ASF for permission to reprint the article in the interest of aviation safety.*
—Editor

In May 1939 five Philadelphia businessmen founded the Aircraft Owners and Pilots Association, or AOPA, as it is more commonly known. According to AOPA history, these businessmen, "... recognized the need for an organization which could effectively and professionally work to make flying safer, less expensive, more useful and more fun." Since then, AOPA has grown into a national organization of more than 300,000 general aviation pilots and aircraft owners, nearly 50% of the U.S. certificated pilots.

Headquartered at the airport in Frederick, Maryland, AOPA has the largest individual membership of any of the aviation membership organizations. As the largest membership group, AOPA is very active in representing its members' general aviation interests both to the FAA and to government officials at the federal, state, and local levels. In addition to its legislative and regulatory activities, AOPA provides a wide range of services including many safety orientated services to its members.

One of the most important of those services is the extensive amount of safety information available to members either through AOPA or the AOPA Air Safety Foundation. (See page 5.)

To serve its many members, AOPA is organized into specialized divisions and departments. The following is a representative list of the divisions and some of the services each provides.

The *Publications* division keeps AOPA members informed of current general aviation news through the Association's monthly magazine, *AOPA PILOT*. The division also publishes the AOPA's *Aviation USA* which contains such useful flight safety information as airport diagrams, services available, airport telephone numbers, weather and flight information telephone numbers, information on Federal Aviation Regulations, plus other types of flight information most pilots would find useful.

The *Membership Services* division handles questions ranging from technical aeronautical subjects to membership questions. The division's toll-free telephone lines handle more than 100,000 member calls a year. The toll-free number (1-800-872-2672) provides a no-cost means for members to call their Association and talk to either an Aviation and Technical specialist about an aviation question or to a Membership specialist about questions regarding the caller's membership.

Within the *Membership Services* division, the *Flight Operations* department provides some of the most essential airman services for both domestic and international flight operations. In many cases AOPA has assumed services that FAA and other government agencies were forced to drop because of budget restraints or workload intensity. To AOPA's credit, it took on these responsibilities and offers most of them free of charge to members. To ensure pilots have the latest charts, AOPA sells both National Oceanic Service (NOS) and Jeppesen charts, either on an individual basis or by subscription. AOPA also provides its members with flight planning assistance, which includes suggested routes for flight planning purposes for pilots flying through the western mountain area, navigational information, safety tips, and other such services that provide for a safe and enjoyable flight.

For the international traveller, AOPA offers flight planning guides to such "nearby" areas as Canada, Mexico, the Bahamas, and "over the big water" to Europe. The guides consolidate important information on required charts, insurance, government forms, customs, fuel availability, local area information, tourist information, and special flight requirements for the area. Each country guide also outlines the specific operating rules for its particular country. Although many of the various countries' operating rules are similar to U.S. rules, there are significant differences, which pilots must be aware of in order to complete their flights safely and within the country's regulations as well as the FAR. Each guide also indicates the specific safety/survival equipment required for the country. Examples include the survival equipment required in aircraft when flying in the designated Sparsely Settled Area of Canada and the life-jacket requirement when flying to the Bahamas. Each guide provides a wealth of good, practical information a pilot needs for a safe, enjoyable flight outside of the United States and for returning home.

Although not as well-known as AOPA's charting or flight assistance services, AOPA offers several airworthiness services which can help members quickly identify airworthiness directives (AD) applicable to their aircraft, for both airframes and engines. Since AD compliance appears frequently among FAA airworthiness related enforcement cases, this service can save pilots a civil penalty and the embarrassment of saying, "But I didn't know ..." Associated with this service is a summary of Service Difficulty Reports (SDR), which AOPA also

AOPA President Phil Boyer

sells to members to enable them to spot safety trends or problems from malfunction and defect reports in FAA databanks. These services are provided by AOPA's Aircraft and Airmen Records department located in Oklahoma City. The location gives the AOPA staff quick access to the public airman and aircraft records at the FAA's Mike Monroney Aeronautical Center in Oklahoma City.

To serve the needs of both AOPA's staff members and its membership, AOPA's *Library/Research* section serves as an aeronautical information resource center for groups. Although not a lending library, AOPA members can use the section during the hours of 9 a.m. to 4 p.m. each workday. The staff asks that members who want to use the section to please call in advance. The staff will then ensure adequate work space is arranged for the member's use.

The *Aviation Sales* department sells aviation charts, including both Jeppesen and NOS charts, aviation books, and pilot/owner listings based upon FAA information available from Oklahoma City.

Two other divisions also support AOPA members' aviation interests either directly or indirectly. The *Communications* division explains AOPA's policy positions to the news media and the public both through the release of information and responding to queries. The division manages AOPA's speakers bureau and has a wide selection of material available for members and other supporters of general aviation to use in informing the public about general aviation.

The *Government and Technical Affairs* division develops AOPA's policies on various technical aviation matters and works with the various government agencies on those issues.

According to AOPA, "While service to its members remains its primary consideration, AOPA aggressively pursues total public acceptance of general aviation. AOPA believes that public recognition of the social, cultural, and economic benefits of general aviation must be realized if aviation is to grow and continue to serve the needs of all people."

And that is a service to us all.

Boyer Q&A's

On January 1, 1991, Phil Boyer became the third President of AOPA following the retirement of John L. Baker who had served as president for 14 years. Before becoming AOPA President, Boyer, 50, was Senior Vice President, Development, for Capital Cities/ABC Video Enterprises, Inc.. He is probably best known within the aviation community as the developer and publisher of ABC's quarterly video magazine, *Wide World of Flying*. He is well qualified for the job. He has been flying for more than 23 years and is a 3,000-hour private pilot with both instrument and multi-engine ratings.

Former AOPA President Baker said of his successor, "Phil Boyer is uniquely qualified to lead AOPA into the 21st Century and take on the challenges that lie ahead in the changing aviation environment. Phil is committed to continuing AOPA's mission of service to and representation of its members."

As part of the AOPA story, *FAA Aviation News* asked Boyer what he thought of his new job as President of AOPA, and how he views the working relationship between AOPA and FAA.

Q. What did you think when you were selected to become the next President of AOPA?

A. Obviously, after a 32-year career in broadcasting with all the friends and business associates that brings, both my wife and I were awed by the thought of a completely changed lifestyle. Personally, however, I was very proud to become the head of an association I had known as a member for the past 23 years. I look at this change as an opportunity to "pay back" aviation for much of the joy I've had in flying small aircraft over the last quarter century.

Q. What do you see as the future for AOPA?

A. No great change in direction, but perhaps a change in tone. There is no question that we will face continuing challenges to airports, airspace, technology, and regulations in the coming years. AOPA will continue its fight to ensure the viability of a great American resource: general aviation.

Q. Former President Baker has been quoted as saying general aviation faces significant challenges in the 1990's. What do you think are the most significant challenges facing general aviation and AOPA at the start of your presidency? And what do you plan to do about them?

A. Most of the challenges that John Baker refers to for the '90's can be summed up in two words: cost and complexity. We face the challenge of a world built upon the microprocessor chip that is changing at an accelerated pace. No one can watch television, record on a home VCR, use their answering machine, send or receive a FAX, etc., without realizing that the computer generation is here. As this technology works its way into the cockpit and into ground installations for the betterment of all of aviation, we must ensure that the general aviation pilot and aircraft owner has access to this equipment at a reasonable price. TCAS is an example of the use of sophisticated technology without regard to its applicability to small aircraft. Therefore, today's generation of boxes is priced well beyond the means of a typical g.a. aircraft owner. On the other hand, we must ensure that the complexity of flying is kept to a minimum whether it be airspace, airports, aircraft, and airmen certification, etc.

Q. What do you think is the future role of general aviation in America?

A. I like to use a familiar phrase, "connecting the dots." This probably best describes the future of general aviation in America. General aviation will continue to be the primary means of air travel, connecting the almost 15,000 airports and heliports nationwide. Less than 400 airports are served by scheduled airlines. General aviation use will continue to grow for law enforcement, medical transportation, emergency services, etc., and the small plane will provide the training ground for those who will fly our commercial airliners of the future. As the demands of business, computerized centralization, and the need for lower cost means of distribution continue to grow, the businessperson will find use of his or her own aircraft, or flying by charter, an efficient means of attaining those goals.

(Continued on page 10.)

AOPA
Air Safety Foundation

AOPA Air Safety Foundation President Donald D. Engen

"The Air Safety Foundation's only goal is promoting flying safety. We are not competing against any other organization," said Donald D. Engen, President, AOPA Air Safety Foundation, retired Navy Vice Admiral, and former Administrator of the Federal Aviation Administration when asked what is the purpose of the Air Safety Foundation.

The AOPA Air Safety Foundation (ASF) was founded in 1950 by the Aircraft Owners and Pilots Association (AOPA) as a separate organization to promote aviation safety through training and education. Since then, the Air Safety Foundation has expanded its efforts to serve all segments of the aviation community and not just support the needs of AOPA's 300,000 members. Today, the Air Safety Foundation is involved in many phases of aviation safety.

The ASF is probably best known for its pilot training programs and free safety seminars. One of its most popular training programs is its FAA-approved Flight Instructor Refresher Course. ASF recertifies about 25 percent of the flight instructors in the United States annually.

In addition to its flight instructor recertification courses, ASF conducts flight training clinics throughout the country. Each clinic is designed to make the participants better and hence safer pilots through training and education.

ASF's clinic program includes courses in ARSA/TCA Operations for pilots not familiar with the two types of airspace; Instrument Pilot Refresher and Instrument Procedures Courses for IFR pilots and those working on instrument ratings; and both a Mountain Flying and Spin Training Course for pilots desiring such specialized training. One of ASF's more unique safety courses is its Pinch-Hitter Course for non-pilots. The Pinch-Hitter Course teaches the non-pilot, typically a spouse, how to control and land an aircraft safely if the pilot in command ever becomes incapacitated. The course teaches the non-pilot basic aircraft control, navigation, radio communication, and how to land an aircraft.

ASF also conducts ground school courses for the various FAA written tests as part of its airmen training program. These three-day Pilot Ground Schools offer preparation for the Private, Commercial, Instrument, and Instrument Instructor written exams.

The ASF program most airmen are probably familiar with is its free Aviation Safety Seminars held throughout the country. The seminars feature such safety programs as Single Pilot IFR, Instrument Procedures Refresher, Weather, Flight Planning and the Pilot, and other pilot-oriented topics. Many of the seminars are cooperative efforts with the local FAA Accident Prevention Program. During 1991, ASF has scheduled about 180 such safety seminars. ASF sends a notice to airmen when a seminar is being held in their local area.

Although many airmen may know the ASF conducts safety seminars, many may not be familiar with its many other safety activities. ASF produces many different types of audio/visual safety products, such as books, pamphlets, audio tapes, and video tapes on aviation safety. It also reproduces FAA materials-advisory circulars, issue papers, and even articles from *FAA Aviation News*. (*FAA Aviation News* also prints material produced by ASF; see page 6.) All are available for purchase through the Foundation, and many of the pamphlets are given out free at the safety seminars. Current safety pamphlets include *Avoiding the Stall/Spin Accident, Weather, Flight Planning and the Pilot*, and others on safe airport operations and communication. A new on going safety project is ASF's publication of a four-part reference book series called, *The Pilot's Manual*. The first two volumes have been published, *Flight Training* and *Instrument Flying*. The other two books in the series, *The Airplane* and *Navigation, Meteorology & Regulations* should be released during 1991.

ASF also produces its own audio/visual safety material to supplement its safety programs. The Foundation's most recent video production is a three-part training system for making Go/No-Go weather decisions. ASF is in the final production stages of a new video produced for the FAA on safe pilot operations at non-towered airports. The video, based on an ASF pamphlet, *Pilot Operations at Non-towered Airports*, will be used in FAA's Accident Prevention Program. ASF's role in the production is representative of its close working relationship with the FAA in their mutual goal of accident prevention.

ASF has been a active participant in and sponsor of the FAA's national Accident Prevention Program since the program's start in 1971. Many of ASF's safety seminars are co-sponsored by the local FAA district office.

As ASF President Engen wrote in one of ASF's publications, ASF is dedicated to helping reduce the aviation accident rate. He said the 10-year goal is a 50 percent reduction in the accident rate of 8.95 accidents per 100,000 flying hours in 1985 to a 1995 rate of 4.5 accidents per 100,000 flying hours. He noted the rate had been 16.0 per 100,000 flying hours in 1976.

As part of its ongoing accident prevention program, ASF has built and is managing an aviation accident database to direct its safety programs. Based upon National Transportation Safety Board reports, the new database gives ASF the means to do trend analysis and other types of statistical surveys of aviation accidents. ASF then disseminates the information, develops new training programs, or modifies current programs to combat the accident trend. The database allows ASF to detect accident trends quickly and, through its courses, to discuss preventive measures to counter the trend.

One product of the new database is the new *Safety Update*, A Weekly Look at General Aviation Aircraft Accidents. The report, available by subscription, is a tabulation of NTSB preliminary accident information for the week. The report includes both a weekly type of flight versus phase of operation summation, a year to date summation, and a narrative summary of each reported accident for the week. An in-depth examination of accident causes and contributing factors gleaned from nearly 18,000 accidents will be available this spring.

The ASF programs, products, and services listed are only a small portion of the safety related work ASF does. ASF works closely with the FAA and other government agencies as well as the aviation community to find ways to prevent aviation accidents. For more information on ASF's accident prevention programs, please call the AOPA Air Safety Foundation in Frederick, Maryland, at (301) 695-2171.

STRESS and the PILOT

Getting to know yourself and how to react to stress

by Donald D. Engen, President
AOPA Air Safety Foundation

Reprinted courtesy of the AOPA Air Safety Foundation

Introduction

Pilots come in all sizes, shapes, and ages. We come from different family backgrounds, different economic situations and have varying flight experiences. No two of us are exactly alike. Yet, we face the same challenges in the air. We takeoff, fly, and land. Regardless of whether we are flying a homebuilt, a Piper or Beech, a Lear or Gulfstream, or a B767, we must address the same challenges in flight.

Some of us are more psychologically resilient and less susceptible to stress than others. But, each of us faces stress to a degree. Each of us will cope in differing ways. In that ability to cope lies an almost secret key to individual pilot safety and accident prevention.

Understanding stress and its potential impact can be difficult. Recognizing stress is even more difficult because as we mature in the process of gaining experience, we build defense mechanisms that alter our ability to admit to ourselves that the pressures of life or specific situations are indeed stressful. Our reactions to various forms of stress are also based on the physiological and psychological characteristics with which we are born. What can be stressful at one point in our lives may not be stressful later.

Background

The image we hold of ourselves can be one of supreme ability, and we believe that we can cope with even the most demanding situation. Is this a correct image? Are we as good as we think? True, we train and fly in a demanding environment, and we should have confidence and take pride in ourselves to the extent that we are professional in what we do. Only you or I know how good we really are. If we do not critically analyze and measure that opinion of ourselves, we could be an accident waiting for a place to happen!

We do not prevent accidents by creating a fear of flying in the pilot. To do so is wasteful and creates more stress than might normally be expected. Flight training provides knowledge and understanding of the airplane and the environment in which we fly. These are the pilot's balance to stress, and they help combat unwanted fear.

The size of the airplane can have little to do with the effect of stress on the pilot. True, more things might go wrong in a bigger, more complex airplane, but the pilot of the fixed-pitch, rag-covered airplane and the pilot of the supersonic jet must each deal with stress levels in his or her everyday flying life. Also, the pilot's view of aviation risk changes as a function of experience measured in total flying time. This is true regardless of the complexity of the aircraft flown. Reaction times required to deal successfully with events may be vastly different between airplanes, but the effect of stress *brought into the cockpit by the pilot*, regardless of the complexity of the airplane, can be the same.

The difference between one pilot and another in coping with stress is in the degree of stress "experience" and how each individual reacts to pressure. There can be no set answer, and we are not trying to say that all stress is bad. Some flight-related stress can be very beneficial to our attentiveness. Large amounts of family- or business-related stress will have differing effects on different pilots. There is a stress level for each one of us where personal caution flags should go "up," where you or I should think whether or not that stress could inhibit our normal healthy ability to think, to react, or to fly an airplane.

The combination of life-style and flight stress can lead to forgetfulness, lack of recognition of developing cues, lack of attentive focus, and, in the worst of all cases, an accident. These two types of stress need to be understood to be recognized. Learning to leave *life-style stress* out of the cockpit is key to long term survival. Learning to acknowledge the need to place stress cues in the preflight decision making process can prevent accidents.

Life-style Stress

Critical life events or unsettling personal experiences create stress that relate to you and your immediate family. A serious disagreement with your spouse, the severe illness of a child, or a major financial crisis are examples of life-style stress. Stress can also be generated by failure to succeed at key personal endeavors. Already being late or the rush to get somewhere on time can create stress. Dissatisfaction or concern in the workplace can be carried into the cockpit in the form of stress.

Positive events cause stress, too: an upcoming marriage, a new job, a new baby. One study made in 1982 found that of those pilots who had accidents, a significantly higher percentage were experiencing life-style stress at the time of the accident.

Flying Stress

Stress while flying stems from the man-machine interface. How comfortable do you feel flying your airplane? Is this a first flight in a new type, and are you well checked out or are you "winging it?" Have you just had a disagreement with the FBO over hangar fees, or with an Air Traffic Controller, an Automated Flight Service Station specialist, or a Flight Standards District Office inspector? Has another aircraft cut you out of the pattern or another pilot been discourteous? If you are flying in a FAR Part 135 or 121 flight operation, are you disgruntled? Are you making a flight that you did not want to make? An instrument approach to minimums or lengthy ATC delays can create stress. Flight stress can come from lack of ability to cope with or control our flying environment. A Near Mid Air Collision (NMAC) can provide enough stress to warp our decisions for a whole day.

Ironically, accidents can be caused by lack of stress, i.e., by complacency. A certain amount of stress can help sharpen our focus on the task at hand and is healthy.

Magnitude of Stress

How much stress, then, is too much? How much is too little? There is no definitive answer to this, but we can identify the kinds of things that are stress-related and provide arbitrary relative values derived from opinions of experienced pilots. By identifying our own stress-related life events, we can then recognize how those events could be stressful to us. By adding the values assigned, you can begin to find a stress range for yourself. With some subjective reasoning, you should be able to decide if stress is a large enough factor in your life to warrant accommodation on your part. At a minimum, being aware that there can be stress in others helps us see it in ourselves.

Stress for one is not necessarily stress for another, as pointed out earlier. A pilot who feels compelled to be on time for an appointment or to make the return flight to his or her airport can be trained that the flight should be delayed or cancelled. The mature pilot knows that the need to keep an appointment does not merit the risk of killing oneself. Also, stress can be subjugated through experience and knowledge. As your piloting skills increase, you can achieve flight over increasingly difficult conditions. However, there is a point where even the most accomplished pilot can be affected by stress and should make a no-go decision. This is a matter of judgement, and the hazard of modification of good judgement by stress should always remain a very real concern.

An accident is the culmination of a series of events, each of which has reduced the pilot's choices or flexibility by some amount. Then, there is one final event and the pilot has no choices left, and the accident occurs. However, before the accident occurs, those single events leading to that accident are masked by lack of recognition or attention. As over 76 percent of all general aviation accidents are human error-related, stress—even the lack of stress—can be key factors in human error. We need to understand this process of events in order to apply good reasoning to our flying decisions, particularly where stress could be a factor in what you or I decide.

Measurement of Stress

We have provided the questions in Figure 1 to help you identify and understand typical life-style stressful situations. If you answer "yes" to a question, assign the full value as your score for that question. You can give partial values, if desired. After completing these questions and adding the score, if your score for Group A, Life-Style Stress, is in the range of 50 to 70, you could be strongly susceptible to stress-related decision impairment.

We have provided the questions in Group B to help you understand typical stressful situations in flight. Score this group as you did for Group A, and come up with a total. If your score of answers to Group B questions is in the range of 50 to 70, the next flight decision you make could be influenced by stress, and you should be fully alert to this fact.

Some scores in Group B are not necessarily additive to those in Group A. As an example, experiencing an airplane system malfunction could erase life-style stress as you focus sharply on the problem at hand. Conversely, flight stress created by a disagreement with an employer, a controller, or a copilot could be additive to life-style stress. The relationships are not abundantly clear, and more investigation needs to be done in this area.

Group A type stress can be protracted and chronic and can affect our reasoning powers. It produces mindsets and attitudes that preoccupy us. Our decision making ability can be altered and can affect the flight we are about to make or are making. We can carry them with us for relatively long periods of time. They can hang in the background of our minds and alter our reasoning process in subtle ways.

Group B questions relate to the flight we are making or are about to make. Flight stress is usually immediate and short term and can lead us to overlook the next or developing challenge. Our attention is focused elsewhere. We are prone to forget one or more items on our mental checklist. Each of us is susceptible to these stresses; yet, it is also from these flight situations that we learn what not to do. We learn to cope, which enhances our stress tolerance over time. Even the most experienced pilot can become stressed at times. Even he or she can make a resulting bad decision or forget to do something.

There can be an interrelation between the two types of stress. Live-style stress carried into the cockpit creates a more acute atmosphere into which flight stress items may be introduced.

Some stress can be beneficial, and there is a danger of too little stress. As we prepare to take off or do a difficult or demanding maneuver or task, we need to focus all of our attention on the task at hand. The proper amount of stress creates the necessary attention and stimulates our thought processes to complete a maneuver successfully. It is not this stress that we are focusing on. We are examining the unwanted stress, the excess baggage that should have been left behind or, if encountered while flying, filtered from succeeding decisions. If we cannot separate ourselves from this unwanted stress, then we should keep our two feet firmly planted on the ground until we do overcome it.

Knowledge and experience overcome stress to a large degree but never all of it. You cannot have knowledge and experience without having had to deal with stress in large doses. Many have not learned this, or perhaps their opportunity was cut too short. That is why this article was written—so that we might learn from what has gone before. Our collective safety strength lies in the fact that we study these accidents so that we do not do the same thing.

Conclusion

Every pilot experiences stress. It is a product of flying as it is a product of any other demanding pursuit. One person's stress can be another person's motivation. When life-style stress levels increase or compound, we need to be alert to the fact that we could be moving into the "gray zone" of decision making. Here nothing is black or white. We can move into this "gray zone" so subtly that it is not apparent to us. Being aware that this can happen keeps us alert in our decision process and can prevent stress overload. The absolute measurement of stress is not as important as recognizing its presence so that we can be alert to the associated reasoning dangers. We should learn to use our newly honed perception of stress as a valued personal flying decision-making tool. ■

MEASUREMENT OF STRESS

GROUP A—LIFE-STYLE STRESS*

1.	Have you had a death in your immediate family?	50
2.	Do you suspect your business partner is cheating you?	40
3.	Is there a serious life-threatening health problem in your family?	37
4.	Are you experiencing uncertainty about your spouse and the possibility of an extramarital affair?	36
5.	Have you had insufficient rest between flights or had lack of sleep over the past few nights?	34
6.	Are you experiencing difficulties with your children?	33
7.	Is your wife due for child delivery shortly?	32
8.	Have you recently had a serious disagreement with your spouse?	31
9.	Are you recently recovering from substance abuse?	30
10.	Are you having serious financial problems?	29
11.	Are you facing the threat of court or government action relating directly to you?	29
12.	Are you about to or have you made a recent important health related decision?	28
13.	Are you concerned about your current employment?	26
14.	Is your child being married next week?	25
15.	Have you very recently moved to a new location?	23

*Table and values are derived from Professional Pilot Self Readiness: A Study of Air Carrier Pilot Stressful Life Events.

GROUP B—FLIGHT STRESS*

1.	Have you had a serious disagreement with someone who is flying with you in your aircraft?	50
2.	Are you experiencing system (engine, control, fuel, electrical, hydraulic, communication) malfunction?	50-30
3.	Have you had a NMAC this or last flight?	47
4.	Are you concerned about deteriorating weather on this flight?	45
5.	Have you had a serious disagreement with ATC or FSS personnel?	43
6.	Has another pilot caused you delay or inconvenience in the airport traffic pattern?	40
7.	Have you been denied entry into an airspace you feel you have a right to enter?	32
8.	Have you had to "go around" because of tower instructions or because of another pilot?	32
9.	Have you been "violated" on this flight for an infringement relating to the FAR?	31
10.	Has the FBO overcharged you?	28
11.	Are you transitioning to a more complex aircraft that you intend to fly at this time?	28
12.	Have you just now almost had an accident because of what you did or did not do?	25
13.	Are you flying VFR in a high density traffic area (TCA, major airport, busy non-towered airport)?	24
14.	Have you had frequent or lengthy ATC routing changes?	23
15.	Have you been given what you feel is an unreasonable request by ATC?	20

*Table and values are taken from interviews with experienced pilots.

SINGLE

vs

TWIN

–Which is Safer?

Spring has sprung (in most of the country, that is), and it is the time when a pilot's fancy turns to doing more flying in the balmy air. Spring is the time when new plants sprout, new animals are born; so perhaps you have considered having your certificate "grow" a new rating. Perhaps that new rating you are considering is a multiengine class rating. You have heard other pilots remarking that it only takes a few hours to earn, and there is no requirement for a written test. Why not? A few hours in the air in a "real" airplane, and you walk away with an authorization to fly airplanes with more than one engine. Besides, everyone knows two engines are better than one—right?

—Editor

According to an old saying, "There is safety in numbers." If the saying is true, if one engine is safe, are two engines twice as safe? The following short, simple, single-versus-twin-engine pilot test may help you decide. The test is designed to test your knowledge of safe operating procedures for one and two engine light general aviation aircraft. Depending on your number of correct answers, you may be: a passenger, a student pilot, a pilot, or an aircraft survivor. Match the following questions with their correct answers. The correct order is given at the end of the article.

Questions:

1. When are two engines better than one?
2. Why have two engines?
3. When is one engine better than two?

Answers:

a. When you crash.
b. So you can pick the spot for an emergency landing.
c. When one quits.
d. I don't know/I don't care.

Score based on the number of correct matches:

0 = passenger; 1 = student pilot; 2 = pilot; 3 = survivor.

The questions are variations of the single engine versus the light-twin-engine aircraft controversy pilots have argued about since Orville Wright made his first flight in a single-engine, twin-prop aircraft. Each question contains an important safety message for pilots of both single and light-twin-engine airplanes.

Although two engines provide a twin-engine aircraft a degree of safety through redundancy, that safety factor can be offset by the pilot's lack of knowledge about light twin operating characteristics. Misconceptions about "two are better than one" have caused many pilots grief. The reason is simple. Most light twins (for the purpose of this article, those under 6,000 pounds gross weight and/or with a stall speed of 61 knots or less) lose about 80 percent or more of their power when an engine fails, rather than the 50 percent one would expect. That 80 percent or more power loss is why, under certain conditions, a light twin may only have enough power after an engine failure for the pilot to pick a spot for an emergency landing. The aircraft may not have enough power to hold altitude or fly safely on only one engine.

The problem is some twin pilots may decide to risk continued flight when the safest decision may be a controlled emergency landing in a place of their choosing rather than risk an out of control crash. Single-engine pilots do not have the same type of problem. Their decision process is simple. They lose an engine; they land!

Since an engine failure can ruin any pilot's day, the following is a review of some practical takeoff safety tips for those pilots who may not have flown much during the winter. Maybe some of the ideas will help some pilot prevent an engine-out emergency or at least minimize the risks of one. The survival key for both single and light-twin-engine pilots is their flight planning before the engine starts, not after it stops.

As in any article discussing flying ideas and safety tips, the pilot operating manual is the authoritative guide for the safe operation of a specific model of aircraft.

According to the latest available National Transportation Safety Board (NTSB) general aviation safety report, *Annual Review of Aircraft Accident Data for General Aviation Calendar Year 1987*, the two most dangerous first phases of flight during the period 1982 to 1987 were takeoff and landing. Landing was the most dangerous accounting for about 25 percent of the accidents, and takeoff was second at about 20 percent. This article will focus on takeoff techniques with special emphasis on twin-engine operations, since *FAA Aviation News* recently published a story on landings titled "The Stabilized Landing Approach." (May-June 1990).

The first flight planning step for any flight is a review of the aircraft's performance data. The data provide takeoff, en route performance, and landing information needed by the pilot in deciding if the flight can be flown safely. When reviewing and using the performance information, each pilot should use very conservative estimates for the takeoff distance and climb performances listed in the operating manual. The average pilot and your basic used aircraft may not be able to match the handbook's performance information.

After reviewing the performance data and computing weight and balance information, each pilot must decide if it is safe to takeoff, fly en route, and land at the destination airport after considering such environmental factors as density altitude, wind direction, obstacles, and runway conditions such as length, slope, and type of surface at both the departure and destination airports. The information will also help satisfy the requirements of FAR § 91.103, Preflight action, which states in part, "Each pilot in command shall, before beginning a flight, become

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familiar with all available information concerning that flight." The FAR then lists specific aircraft performance, airport, and runway requirements.

In addition to the normal flight planning requirements, a twin pilot must also determine if a safe flight can still be made after losing an engine. In many cases after losing an engine, a light-twin-engine aircraft cannot, or should not, continue the flight because of the loss of power and such adverse environmental conditions as high density altitude, high terrain, or IFR minimum enroute altitude requirements that can often exceed the aircraft's single engine capabilities.

As part of each preflight planning session, every pilot should also determine the minimum runway length needed for takeoff. In some cases, such as high density altitude, the minimum length needed may almost equal or exceed field length. A safe pilot may decide this is an unacceptable risk. If the runway length is adequate, the horizontal distance needed to climb to a safe maneuvering altitude, not just the distance to clear the standard FAA 50-foot tree at the end of the runway, should also be calculated. Under some conditions, such as high density altitude or airport elevation, some aircraft cannot climb fast enough or high enough to avoid some of the obstacles near some airports around the country.

Because density altitude is one of the most important factors in determining an aircraft's performance and ability to fly, it should be calculated before each flight to ensure adequate aircraft performance. High density altitude can reduce an aircraft's capability below acceptable safe limits. It can also destroy what little single-engine capability a twin aircraft may have. But how many pilots routinely compute density altitude (DA) or even remember what information is needed to compute it? (DA is pressure altitude corrected for non-standard temperature using either a flight computer or chart. Pressure altitude is the altitude read on an altimeter when 29.92" is set in the altimeter setting (Kollsman) window.)

After computing density altitude and runway takeoff distance, another important flight planning item each pilot should (as some operations require) compute is the aircraft's accelerate-stop (A/S) distance. A simple definition of the term is that distance needed to accelerate an aircraft to rotation speed, for the aircraft to lose power at that moment, and then for the pilot to be able to stop the aircraft on the remaining length of runway based upon airport conditions and aircraft load. The A/S decision point is what separates single-engine pilots from multiengine pilots. UP to A/S, each type of aircraft can stop on the runway. After A/S and up to a certain altitude a single-engine aircraft is off the runway and into something, be it grass, fences, trees, or houses. However, a twin pilot *may* be able to continue the takeoff and return for a safe landing. The key word is *may*. For, like their single-engine counterparts, sometimes the safest decision twin-engine pilots can make is to execute a controlled, survivable landing off the runway in a place of their choosing rather than risk trying to go around in an aircraft that can not safely fly. The only way to know if your aircraft can safely takeoff with only one engine operating is by understanding your flight manual and your own operating techniques and aircraft. Some flight manuals provide detailed performance information that can be used to compute continued takeoff capabilities with only one engine operating. Just be sure you have read and understand all of the small print that explains the specific conditions that apply. If your manual does not list the information, maybe your aircraft is not capable of continuing a takeoff with only one engine operating.

The A/S point is arguably the most critical decision point in the twin pilot's GO/NO-GO decision process. The number of decisions a twin pilot has to make at the A/S and later during the takeoff procedure, such as making sure Vmca, minimum controllable airspeed, plus a suggested safety factor of at least five knots or the manufacturer's recommended speed is reached before rotation, knowing Vx and Vy for both single engine and normal two-engine operations, and being able to control and fly the aircraft with only one engine operating are what make flying twin-engine aircraft so complex.

Understanding and calculating A/S distances are not enough. Pilots should prepare themselves for possible takeoff emergencies by reviewing their aircraft's emergency procedures. One good review technique is the "what if" scenario. Pilots can prepare for any possibility by asking such "what if" questions as, "What if I lose an engine" and then reviewing the correct procedure and options. Valuable time can be saved during an emergency if the pilot has memorized the important emergency checklist steps as part of the initial aircraft checkout. Once the emergency situation is under control, the pilot can then review the complete checklist to make sure every item is done.

After reviewing all the flight planning steps and going out to the aircraft, the best way for any pilot to avoid or minimize an engine problem on takeoff is a careful preflight and ground check using a checklist.

And the ground check does not stop with only an engine runup. Every pilot should check to see if their aircraft is developing full power early in the takeoff roll. By detecting a power problem early in the takeoff roll, the pilot can abort the takeoff before passing the critical A/S point. The power check is done in two easy steps. First, the pilot checks the aircraft's instruments for proper indications. Obviously this means the pilot must know the aircraft's normal indications. Then the pilot cross-checks the instrument readings against an "outside" reference. The check is made by comparing how much time or distance the aircraft normally needs to accelerate to rotation speed to the current takeoff roll. If after the normal amount of elapsed time or distance is used (distance can be measured by runway distance markers, a tree, brush, or some other point along the runway) and the required airspeed is not obtained, the pilot should abort the takeoff and find out why. The time to abort a takeoff is before the aircraft runs out of runway, not after it runs off the runway or into the trees. The importance of aborting a takeoff when something is not right cannot be over emphasized. Lives have been lost when takeoffs were not aborted.

A well publicized case of an aircraft not producing enough power to takeoff and fly was the Air Florida B-737 crash at Washington National Airport on January 13, 1982. After liftoff, the aircraft hit a bridge near the airport and crashed into the Potomac River. Seventy passengers and four people on the bridge were killed in the accident. The National Transportation Safety Board's report listed as one of the probable causes of the accident the "... captain's failure to reject the takeoff during the early stage when his attention was called to anomalous engine instrument readings." (Editor's note: Snow and ice were major factors in the accident.)

As the example shows, not only is it important to be able to determine if an aircraft is developing enough power to take off and fly, it is equally important to know how much distance is needed to stop it safely. This is why an aircraft's accelerate-stop distance is so important. This distance is what separates the single-engine pilot's limited choices from the twin-engine pilot's options.

A single-engine pilot has few choices after passing the A/S point and having an engine failure. In most cases, the only choice is selecting what not to hit. This is where prior planning is important. A safe pilot, either from being familiar with the local area, or having reviewed the airport environment before landing, should know the best emergency landing spots straight ahead (making only slight turns to avoid obstacles) off the end of the active runway, considering such things as, powerlines, obstacles, trees, open areas, houses, fences, roads, and the location of high population sites, such as schools, near the airport. The safe pilot will then have a plan ready in the event of any type of emergency.

Like their single-engine counterparts, twin-engine pilots can also make a controlled emergency landing straight ahead. Unlike their single-engine counterparts, twin-engine pilots *may* be able to continue their takeoff on one engine and return for a safe landing.

The key word is *may*.

The problem is most light general aviation twins are not required to hold or gain altitude with only one engine operating. And that one operating engine may not be producing even the limited performance listed in the aircraft's operating manual since engine performance decreases over time. (This is the basis for the saying about being able to pick the spot where you want to crash.) Because of a twin's limited performance with only one engine operating, its pilot must also use the correct single-engine techniques to fly the aircraft to have any chance at all for a safe flight. Anything less than perfect technique can result in loss of altitude, control, or both.

No matter how well both twin- and single-engine pilots do their flight planning and preflight their well maintained aircraft, accidents will continue to occur during takeoff. Engines will fail. Pilots will lose control. Accidents will happen. To reduce those risks both during takeoff and later phases of flight, pilots must understand their operating environment; their aircraft's performance and operating systems; and their own flight skills and abilities when deciding on a safe or survivable course of action when confronted with an emergency. In some cases, a wise pilot may decide to either delay the flight, reduce the aircraft's load, or modify the route of flight to avoid or minimize the risks of a takeoff or en route engine out emergency, even if the aircraft does have two engines. Because they know there may be times when even two engines are not enough insurance for a safe flight.

But, whether you fly a single, or twin-engine aircraft, hopefully, this article has provided you with some interesting safety ideas to think about. Regardless of the number of engines on your aircraft, the best insurance policy you can buy for a safe 1991 flying season is a thorough flight review with your local certificated flight instructor (CFI). A flight review is especially important if you have not flown recently, or if you are not current in type. (The CFI must also be current in the aircraft used for the checkout.) In addition to ensuring a safer pilot, the checkout could also meet the pilot's requirement for a biennial flight review and/or the flight portion of the pilot's next set of "Wings." ("Wings" is the FAA's Accident Prevention Program's Pilot Proficiency Award Program.) One of the things you may want to discuss with the instructor is how to calculate your own accelerate/stop distance. If you have access to a long runway, with your aircraft at gross weight and using your normal takeoff technique, accelerate to rotation speed and then abort the takeoff and stop. The total distance from your start point to where you stopped is your rough A/S distance. To add an element of surprise to the test, have the instructor pull the power at rotation speed and note the distance. The distance should increase by several hundred feet because of your normal reaction delay. Once you have an estimate of your personal A/S distance, always add some distance for the unknown. Remember that rolling takeoffs add distance to A/S distances. Always leave yourself an out.

If you are flying a twin, after you have determined your own A/S distance, take advantage of the instructor's presence by testing you and your aircraft's ability to execute a single-engine go-around. Simulate a single-engine go-around at a safe altitude and see if your aircraft and skill will allow a successful go-around. Some aircraft are not capable of making a safe single-engine go-around. One FAA safety pamphlet says a single-engine go-around may be impossible unless you have several hundred feet of extra altitude above the terrain and an airspeed above Vyse. The situation is particularly critical if you lose the engine during a normal go-around.

The moral of the story? Listening to a lot of hangar flying about light twins is not what sharpens your edge in flying them. The only way to minimize the risks in any kind of flying is to learn, learn some more, and learn again. Flying multi's is fun and challenging, but never, ever take that extra engine for granted.

And it does feel so good to see these words on your certificate: Airplane—Multi-engine Land. ■

The following sources provided ideas and information for this article: Mr. George Lutz of Springfield, VA; the FAA's Accident Prevention Program's pamphlets titled, "Planning Your Takeoff" and "Flying Light Twins Safely;" the FAA Flight Training Handbook; *and the NTSB Aircraft Accident Report NTSB-AAR-82-8.*

Correct quiz answers: 1c, 2b, 3a.

(Continued from page 4)

Q. How do you view the working relationship between AOPA and the FAA?

A. A solid working relationship between AOPA and the FAA is critical, in these changing times, to ensure the future viability of general aviation. We will never agree on all subjects or all rulemaking. However, reasonable people, seeking reasonable solutions in a business-like fashion, should be able to achieve optimum results on both sides. This philosophy has served me well during my 32-year career in business. Presenting the views and facts affecting well over 300,000 AOPA "users" of the system in a clear and concise manner will be of utmost importance under my leadership. FAA Administrator James Busey has instituted a "kinder and gentler" FAA in the area of field enforcement. At the same time, he has not compromised safety nor any other rules or regulations that predated this policy. Taking his lead, you may see a different AOPA, but an association still aggressively intent on serving the interests of its diverse membership.

Q. Are there any changes you would like to see made in the working relationship, and if there are, why do you think they should be made?

A. There are probably positive changes to be made on both sides, and I've just outlined those I intend to implement here at AOPA. On the other hand, it would be premature for me, with only two weeks on the job, to critique a "working relationship" we have yet to establish. In my attempt to begin this relationship, even though I've only been in office for a short time, I've already held meetings with Admiral Busey and DOT Secretary Sam Skinner. In addition, I visited the Oklahoma City Mike Monroney Aeronautical Center and met the senior management there.

Q. Since *FAA Aviation News* is a safety magazine, what do you think is the biggest safety issue facing general aviation. What do you propose to do about it? What do you think the FAA should do about it?

A. There is no question that great attention is paid to our pilot training, that the regulations for devices inside the planes we fly and high use air space have been established, but in my opinion the least understood and discussed part of flying is WEATHER. As a pilot transitions from training aircraft to a more complex and retractable single, through a light twin, and into a turboprop . . . the decisions required of that pilot become more difficult, not less difficult. The weather decisions faced by that pilot also become more difficult rather than less difficult. AOPA will continue its efforts, both through the Association and the AOPA Air Safety Foundation, to provide weather and safety education for the pilot through the various communications devices we now employ (*AOPA Pilot* magazine, safety seminars, periodic bulletins, pilot meetings, etc.) and with unique new ways (video seminars, national pilot meetings by satellite, etc.).

I believe the FAA should augment the current automated flight service station system with AOPA's proposals for additional auxiliary stations, with weather dissemination devices readily available to the pilot. This would include the funding of more state programs, like those in Virginia, Wisconsin, and six other states, along with plain language decoding of age-old weather shorthand. Once again, we live in a computerized era, so this shorthand can be easily placed in a readable form understandable even to a novice pilot. FAA should also keep up its fine job of weather education through its Accident Prevention Program, but provide more up-dated and "real world" scenarios dealing with weather.

Q. What advice can you offer to the pilots who will read this article about their future in aviation?

A. I think pilots reading any article are upbeat. One look at our recent AOPA Convention in Palm Springs, where we were beset with the Persian Gulf crisis, rising fuel prices, inadequate handling of aircraft flying into the airport, etc., still yielded a vibrant, excited, and forward-looking group of more than 5,000 pilots who obviously saw a bright future for their use of general aviation aircraft. The manufacturers exhibiting in the halls and on the ramp—albeit very few new airplanes—were nonetheless praising the interest shown and money actually spent on their products. This is not a "downbeat" situation. All of us who fly, including the many AOPA members within FAA, share a unique bond. We speak a common language, we have very similar goals, and we all know the personal fulfillment and utility that general aviation provides. ■

Seaplanes in the Wind

• This taxi technique will "hook" water pilots •

by
George C. Snyder

Seaplanes combine two loves for many pilots—flying and water. Operating a seaplane on the water in strong winds offers some unique situations that ground-based pilots will not encounter. This article, courtesy of the Seaplane Pilot Association's Water Flying, *Fall 1990 issue, describes one technique for handling taxi turns in strong winds. Pilots should also refer to Advisory Circular 61-21A, Flight Training Handbook, Chapter 15, for additional information on seaplane operations. —Editor*

Turning a seaplane 180° downwind in a strong wind is a questionable maneuver and should not be attempted if high waves or swells are present which would rock the seaplane dangerously. The rolling action would expose a high wing to the wind and bury the downwind float with consequential capsizing tendencies. Taxiing closer to the lee shoreline, before attempting the turn, will eliminate the chop and resultant spray damage to the prop.

A seaplane does, however, have some built in safety factors not present in a landplane. Lift and centrifugal forces created in the turn act together against the capsizing tendencies. If the seaplane resists the turning moment too emphatically, it may be warning us of an impending dangerous situation. It might be prudent to consider sailing to our destination.

A prime example of a seaplane's built-in safety factor is its reluctance to become airborne when overloaded because of water friction increasing with speed. Conversely, an overloaded landplane becomes light on its wheels with speed because of less friction and can become airborne when it should not be flying.

The accompanying figure depicts a technique called a "Sharp Hook Turn" which, when accomplished correctly, offers a helpful method of turning from upwind to downwind. We will go through the various positions of the turn and describe how to use all the controls plus the air and water elements available to us. We already know that the seaplane turns easier to the left (port) than to the right (starboard) because of torque effect. This knowledge dictates the advisability of a final left turn.

Some words of caution before we continue: Practice makes perfect, BUT practice this technique in moderate winds before letting strong winds challenge you.

Scenario: The wind is from the north (0°), and the pilot wants to turn to the south (180°). The pilot checks the directional gyro before beginning the turn to make sure it is aligned with north. This will help in turning the appropriate number of degrees.

Position 1. The seaplane is taxiing in the idling position. Note that the floats are on an even keel (flat) on the water. The water rudders are down, and the elevators are in the UP position. *(see illustration on page 12)*

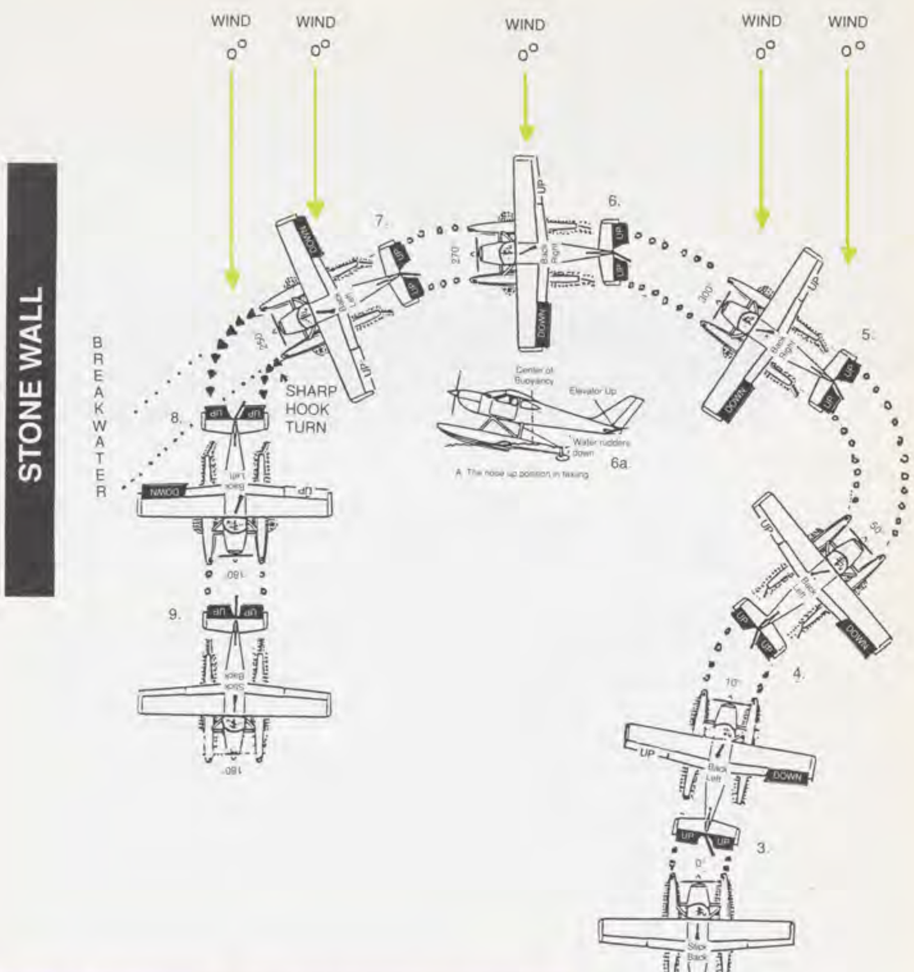
Position 2. The seaplane has the water rudders down, aileron and rudder controls in the neutral position, and the stick back. (The elevators are colored black and marked "UP" to show that the wind is blowing on them.) The elevator control should be held aft for all water handling to keep the nose up and reduce spray on the prop. The seaplane has become a weathervane because of the wind blowing on the tail surfaces and fuselage, aft of the center of buoyancy, causing the nose to weathercock into the wind.

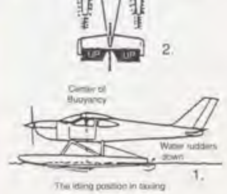
At this point let us experiment to see how air and water elements plus flight controls can assist you in making the turn. First, we raise the water rudders to eliminate their steering action. To determine how the wind blowing on the DOWN aileron alone can help the turn, try dropping the left aileron by using right stick. You will notice the nose swing a few degrees to the left as the wind blows the left wing aft. Now drop the right aileron by using left stick and observe the nose swing to the right. You guessed it: Although one aileron offsets the other, the DOWN aileron presents more surface for the wind to blow on and turn the nose in that direction. You will be able to observe this action easily since water offers little resistance to the floats when turning at idle speed. You can further check the movement by watching the nose move on the horizon or by reading your D.G.

Now let's present the air rudder to the wind to aid the ailerons. We have to use opposite controls when taxiing upwind, that is, left rudder, right stick to turn left and right rudder, left stick to turn right. (Think of using opposite stick and rudder when taxiing upwind and coordinating them taxiing downwind.) The old adage "stick into the wind" is true only when facing the wind and does not apply when quartering downwind (see position 7). Note that the air rudder increases the turn; confirm it by checking the nose on the horizon or the DG.

Position 3. The seaplane has the stick back and left, right aileron DOWN, air rudder right, and water rudders UP. The DG reads 10°. The right aileron is colored black and marked "DOWN" to show that the wind is blowing it aft, which together with the right rudder presented to the wind, is causing the tail to move left and the nose to swing further right. A blast of power here would add prop wash to the wind's action on the right air rudder.

Position 4. The seaplane now has the water rudders DOWN for more turning control. The pilot applies power to bring the nose up to a plowing position, attained by combin-





180° Downwind Turn out of a Strong Wind Position:

1. IDLING POSITION—STICK BACK WATER RUDDERS DOWN.
2. WEATHERCOCKED INTO WIND—WATER RUDDERS EFFECTIVE.
3. WATER RUDDERS UP—WIND AND PROP EFFECT ON CONTROLS.
4. DROP WATER RUDDERS—PLOW TO RIGHT SIDE OF COURSE.
5. WEATHERCOCK—LEFT TORQUE—CHANGE CENTER OF BUOYANCY.
6. 90° TO WIND POSITION—BUOYANCY EFFECT WORKING.
7. DROP RIGHT AILERON—WIND BLOWS RIGHT WING AROUND.
8. CUT POWER SHARPLY—FORCES NEGATED—SHARP HOOK TURN.
9. 180°—AVOID COMPLACENCY—KEEP STEERAGEWAY.

ing prop wash and wind on the elevators with hydrodynamic force on the float bottoms. The pilot should apply the power rapidly to cause the bow to rise sharply and to get the prop above its self-induced water eddy and bow spray, both of which could cause erosion of the propeller blades. We start the turn to the right to facilitate the final left turn by getting as far right as possible and thus use the weathercocking tendency to initiate the left turn. No further benefit would be derived by continuing the right turn since both the weathercocking tendency and torque effect are working against the right turn and will soon limit the degree of turn.

Position 5. We will now take advantage of the weathercocking action to initiate and accelerate our left turning moment. To accomplish this, we will cut the power back and reverse the controls: Right stick to drop the left aileron; left water and air rudders. The nose will swing through the wind direction and the momentum will carry it further left of the wind than it was to the right. Now, as we reapply power, we are also adding to the engine's torque effect to turn us even further left. We end up 60° left of the wind with a heading of 300° on the DG.

As we gain speed and the bow rises, we are moving the center of buoyancy aft and exposing more forward surface to the wind, allowing it to blow the nose downwind, further aiding the turn. We will soon learn how far the bow wave has to move back along the floats for the center of buoyancy factor to take effect. Note Position 6a, showing the side view.

As the nose swings to a 290° heading we will be 70° left of the wind and should now be able to get by the 90° point, well on our way to completing the 180° turn. We have, however, created some factors that are working against us at this point. Newton said, "A body set in motion tends to remain in motion." Our forward motion is working against the turning moment. The floats tend to TRACK in a straight line and resist turning because of the design of the float surfaces—namely, the keel, fluted bottom, and chines. Now, couple these with the diminishing effect of the water rudder. Because the water rudder is spring loaded, it tends to streamline with the floats and to be forced upward because of the greater speed through the water. It also becomes less efficient because the wake disturbs the water around the stern.

Position 6. Our seaplane is now 90° left of the wind, on a 270° heading, and we are still holding aileron into the wind. To our advantage the relative wind, now moving toward our nose, will act on the ailerons and add lift to our left wing and lower the right wing, which, together with centrifugal force, counteract the tipping tendency. The center of buoyancy factor is becoming more effective, and we are making good progress as we pass the 90° to the wind mark.

Position 7. As we are now turning downwind, we will use left stick to drop the right aileron for the wind to blow on from the rear. This helps bring the right wing around. (This is the one instance when the "stick into the wind" theory does not apply.) We are now 20° beyond the 90° mark, on a 250° heading, and if we maintain this arc of turn, we will complete the 180° turn. We notice, however, that we are traveling at an alarming rate of speed and fast approaching a breakwater into which, if we continue our course, we are sure to crash and spoil our whole day, as well as our dreams of becoming a proficient seaplane pilot.

Position 8. All is not lost at this point because we have prudently left ourselves an out, as all good pilots do. We are surely not going to plow into that breakwater at full bore. We are going to smugly cut the power and allow the seaplane to weathercock back safely into the wind.

When we cut the power, however, strange things begin to happen:

1. Forward speed slows rapidly.
2. The seaplane comes to an even keel.
3. The tracking tendency of the floats diminishes.
4. Weathercocking action is momentarily arrested by forward speed.
5. Disturbance around the water rudder diminishes.
6. The water rudder's full travel turns the seaplane sharply left.

Now that we are in no immediate danger of crashing into that breakwater, let us blast some prop wash on our air rudder. Lo, and behold, we have made a SHARP HOOK TURN to the downwind position and safely completed our 180° turn!

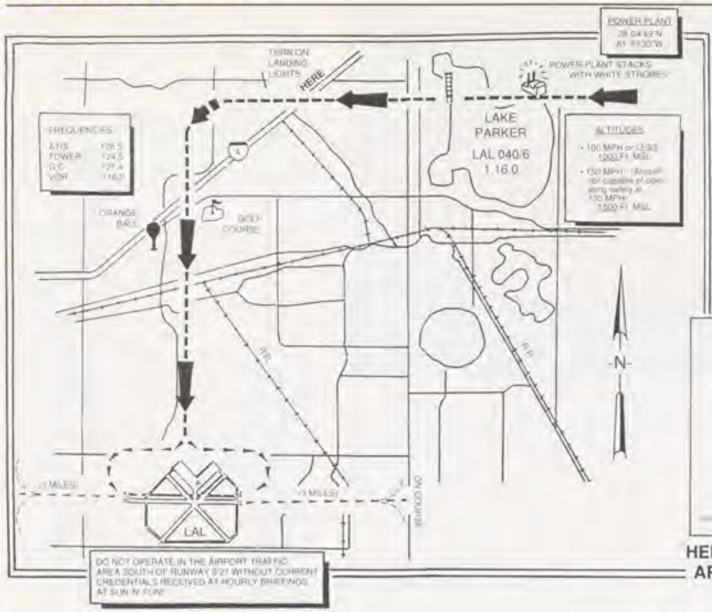
Position 9. This is not the time to become complacent, however, as we are now walking the proverbial tightrope with the wind trying hard to weathercock us. We have to keep the seaplane tracking straight downwind and that will require a great deal of attention. Remember to coordinate the controls now, and do not let it turn off the downwind heading, or we will have to do this all over again. Use the throttle to keep steerageway, which is the minimum forward speed needed to make a ship react to the helm. The wind blowing from behind on the air rudder offsets the water rudder until steerageway and prop blast on the air rudder negate the effect of the wind. If we should experience inadvertent weathercocking while taxiing downwind, we must use power and rudder against the turn to minimize the rapidity of the weathercocking. The coupling of wind and centrifugal force produces dangerous capsizing tendencies by sinking the outside float and exposing the underside of the windward wing to the wind. Remember, our flight is not complete until we are safely on a buoy, ramp, or dock.

If the accompanying diagram of our 180° water turn looks something like a question mark, it may be trying to tell us something. Reread the second paragraph of this article. By practicing this technique in moderate winds at first, you will soon be able to make an educated assessment of how strong a wind you can handle safely with your own expertise.

Every good pilot has a bag of tricks. We hope you can add the Sharp Hook Turn to yours. ■

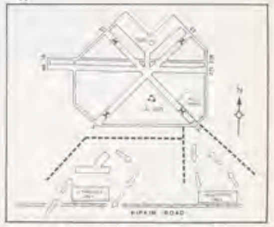
Author's note: The above article describes the taxi turn technique using a 65 hp J-3 Cub on floats with a single water rudder. The technique may differ somewhat on seaplanes with twin water rudders and higher horsepower.

As a former U.S. Air Force pilot, Mr. Snyder ferried aircraft from J-3's to B-29's and instructed on many of them. He operated the first seaplane base in metropolitan Chicago at Navy Pier in 1942 and 1947 through 1958. He also established the first Helicopter Flight School in metropolitan Chicago. He is an Airline Transport Pilot and served as a FAA Designated Commercial Pilot Examiner on single and multi-engine land, sea, and helicopter. He has over 33,000 flight hours and gives free lectures on the humorous and tragic aspects of a U.S. Air Force pilot's life. —*Editor*



VFR ARRIVALS AND DEPARTURES AT LAKELAND MUNICIPAL AIRPORT

SUN 'n FUN—LAKE PARKER ARRIVAL PROCEDURE



HELICOPTER AND ULTRALIGHT ARRIVALS AND DEPARTURES

SUN 'N FUN FLY-IN

Come spring most birds are again heading north, but on April 7-13 a bird migration of the mechanical variety will be winging its way south to Lakeland, FL, and the annual Sun 'N Fun Fly-In.

If you plan to attend Sun 'n Fun, we strongly urge that you obtain and read the *Notices to Airmen* (NOTAM's) , issued after February 21, 1991, before you go. As an increase in traffic is expected, special procedures are in effect at Lakeland Airport from April 6 through 13.

To facilitate the flow of traffic, airplanes will normally arrive and depart using the northwest or southern routes. Ultralights shall enter and exit from the south-southwest, and helicopters shall enter and exit from the southeast. For more details on IFR and VFR arrival and departure procedures, see NOTAM's.

Advanced notice and approval is required for certain special needs operations. To request to deviate from the Mode C transponder requirement in the Orlando TCA Mode C Veil, a pilot must notify an FAA Flight Service Station (FSS) at least four hours before the estimated time of entering the Orlando TCA. The following information should be provided: operator's name, aircraft identification, estimated date(s) and time(s) entering the veil, and requested route (northwestern or southern, written permission required for any other route). Advise the FSS that the information should be forwarded to the Orlando ATCT via the St. Petersburg AFSS.

Operators of aircraft not equipped with Mode C transponders are advised to remain outside the lateral boundary of the Tampa TCA and use airspace at and below 2,500 feet MSL east of Highway 39. This notice does not consitute authorization to enter the Tampa TCA. Of course, aircraft without electrical systems, balloons, and gliders are excluded (FAR § 91.215) from the Mode C transponder requirement.

Limited grassfield operations can be accommodated. For "Special Grassfield Authorization and Procedures," contact: Sun 'n Fun (EAA) Fly-In, Inc., P.O. Box 6750, Lakeland, FL 33807, telephone (813) 644-2431. For those planning to fly an aircraft without a radio to Sun 'n Fun, a postcard should be sent to: Wayne Boggs, Air Traffic Control Tower, Tampa International Airport, Tampa, FL 33607. Be aware that this postcard will indicate to ATC that you have read and understand all the procedures presented in NOTAM's for Lakeland Airport.

The Lakeland Municipal Airport control tower will be open and the control zone in effect from 6 a.m. to 10 p.m. EDT. However, these special procedures will be in effect ONLY from 7 a.m. to 7 p.m. EDT on April 6-13.

A WARNING TO LORAN-C USERS

The Coast Guard has delayed transmissions from Great Lakes LORAN-C Chain 8970's Secondary Station Z until April 15, 1991. This was done to allow the FAA to issue a warning to Chain 8970 users that they may have a potential problem. If your LORAN-C receiver was not designed or modified to recognize the presence of Station Z in addition to the chain's X and Y Stations, it could compute your position incorrectly. The result could be a position error of up to 20 miles or more from your actual location.

After the station is operational, your receiver must recognize the Chain 8970 Z Station to prevent display of an incorrect position. For LORAN-C receivers that were not designed or modified to recognize the presence of this station, the only way for you to verify that your receiver is not incorrectly using the Z Station is to verify the position provided by the LORAN-C receiver with a known ground reference point or other navigation system (VOR/DME, airport reference point, etc.). As always, you should not use LORAN-C position information until its reasonableness has been verified. The Limitations Section of your LORAN-C receiver's FAA Approved Flight Manual Supplement contains the requirement for verifying LORAN-C position information prior to use for navigation.

(Continued on page 16)

• Landing at a Closed Runway

Is it legal for a pilot to land at an airport which is closed for the purpose of construction on various parts of that airport if in the opinion of the pilot safety would not be compromised.

For the purpose of this question, we can assume that the airport has a NOTAM indicating closure as well as having the runway marked with the traditional X.

Gregory G. Gorak
Milwaukee, WI

AIM paragraph 60 (i) defines a closed runway as one which is unusable and may be hazardous even though it may appear usable. The pilot, who is responsible for the operation and safety of an aircraft during flight time, could be in violation of FAR § 91.13 (old § 91.9 and § 91.10), Careless or Reckless Operation, and FAR § 91.103 (old § 91.5), Preflight Actions, among other possible violations. Deliberate operation on a runway, or other airport area, that has been closed and so listed in NOTAM's and that results in an accident, incident, or other hazardous condition could be grounds for enforcement action. Of course, this does not preclude a pilot from opting for a closed airport in an emergency situation. FAA would then investigate to determine that it was a *bona fide* emergency.

• Initial CFI Training

I just need a couple of yes and no answers this time. Is the following statement published in Jeppesen Sanderson Training News Correction:

1) "According to the FAA, FAR §61.187(b) applies to initial flight instructor ratings. This means a newly certificated flight instructor could not provide instruction to a person seeking initial flight instructor certification. However, that same person could provide the instruction required for additional flight instructor ratings." Please just give a yes or no to the part underlined.

2. "Finally an instructor who once met the requirements of FAR §61.187(b) is still considered to meet them following reinstatement."

Lyle Mortenson
New York

Yes, both statements are correct. To give initial flight instructor training, the CFI, according to FAR §61.187(b), must have held the certificate during the preceding 24 months and given at least 200 hours of flight instruction (80 hours for gliders) as a CFI.

• GI Sign Off

I recently obtained my Ground Instructor certificate for Advanced and Instrument. Since I no longer can sign off as a CFI (lost my medical and let my time run out). I looked through AC 61-65B, "Certification: Pilot and Flight Instructors," for information on a proper "sign off," however, I just can not find any.

Can you please let me know how, as a Ground Instructor, I now sign off a student to take the FAA exam? Is it just my name followed by GIxxxxxxxxx? In addition does my Advanced and Instrument rating permit me to teach private, commercial, and instrument ground school for all pilot writtens (ATP, Flight Engineer, Helicopter, etc.)?

Any information will be appreciated.

Sidney Fleishman
Tallahassee, FL

We suggest that you use an endorsement that reads something like this:

"I certify that I have given (pilot's name) ground instruction that covers the aeronautical knowledge requirements of (appropriate FAR) and find him (or her) competent to take the [type of written test] written test."

Date
Signature
Ground Instructor Certificate Number

A certificated ground instructor with Advanced and Instrument ratings may teach ground subjects for any grade of pilot certificate and/or instrument rating and aircraft category.

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.

• Banner Towing Right-of-Way

I would like clarification of FAR §91.113(d)(3) which states, "...an aircraft towing or refueling other aircraft has the right-of-way over all other engine-driven aircraft." Does this mean that an aircraft towing a banner has the right-of-way, or only an aircraft towing another aircraft?

Jacqueline Tulumello
Babylon, NY

FAR § 91.113(d)(3) refers only to aircraft towing or refueling other aircraft. It does not refer to an aircraft towing a banner. An aircraft towing a banner has to comply with the same rules, FAR §91.113, as any other engine-driven aircraft.

• I Meant to Say

The January/February issue featured the winners of the Flight Instructor and Maintenance Technician of the Year (1990) Awards. When the CFI winner made her acceptance speech, in the presence of her peers and her sons, she was overcome. Her "speech" was a simple, "Thank you." She sent FAA Aviation News what she says she "meant to say," and we have reprinted excerpts from it here. Ms. Provenzano's career is inspiration enough to pilots and flight instructors, but her words carry an important message.—Editor

"I have never been very good at saying "Thank you," but I find myself saying little else since notified of my selection. At each meeting I conduct, each class I teach, each presentation I make, I look out over the audience and see still more people who have made valuable contributions to me, both personally and professionally, more people who really deserve a special thank you...

"I believe the Flight Instructor is the heart of aviation. Without us, there would be no student pilots and no airline pilots. Without us, there would be no industry, no FAA. We are not only aviation's past, but aviation's future...We change not only behavior but perceptions and feelings, as well. Those changes also affect the friends and families who get caught up in the ripple effect...The CFI is touched by these changes. As the students grow and learn, we must also continue learning and expanding our skills and knowledge. Few students understand that they give much more than they get...So it is crucial that we live up to the responsibilities and obligations that go with the title 'CFI.'

"...As I received the plaque...I thought about all the people who made it possible for me to be there and all the people who deserved it more. I thought about how fortunate I was to succeed in a field where survival deserves a reward and how much I wanted to share that award with all the CFI's who go that extra mile and take pride in what they do and who they are...

"As I look to the horizon, I realize how truly fortunate the pilots of the world really are. Only we know the sun is still shining above the clouds because we have seen it. Only we know it is raining in one small part of the world because we have flown around it. And we know at the completion of that last approach we will break out of the clouds to find bright lights and concrete.

"...Our horizons are so much bigger and brighter and farther away than they are for ordinary, everyday, landlocked people. But Flight Instructors have the ability, even the necessity to continually expand those horizons, to broaden their knowledge and hone their skills, to give nothing but the best and expect it in return...And we must always remember that a horizon is nothing, save the limit of our sight, and of course, the sky is our sight, and of course, the sky is our limit!"

Sandra Provenzano
Houston, TX

U.S. Department
of Transportation

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Administration**

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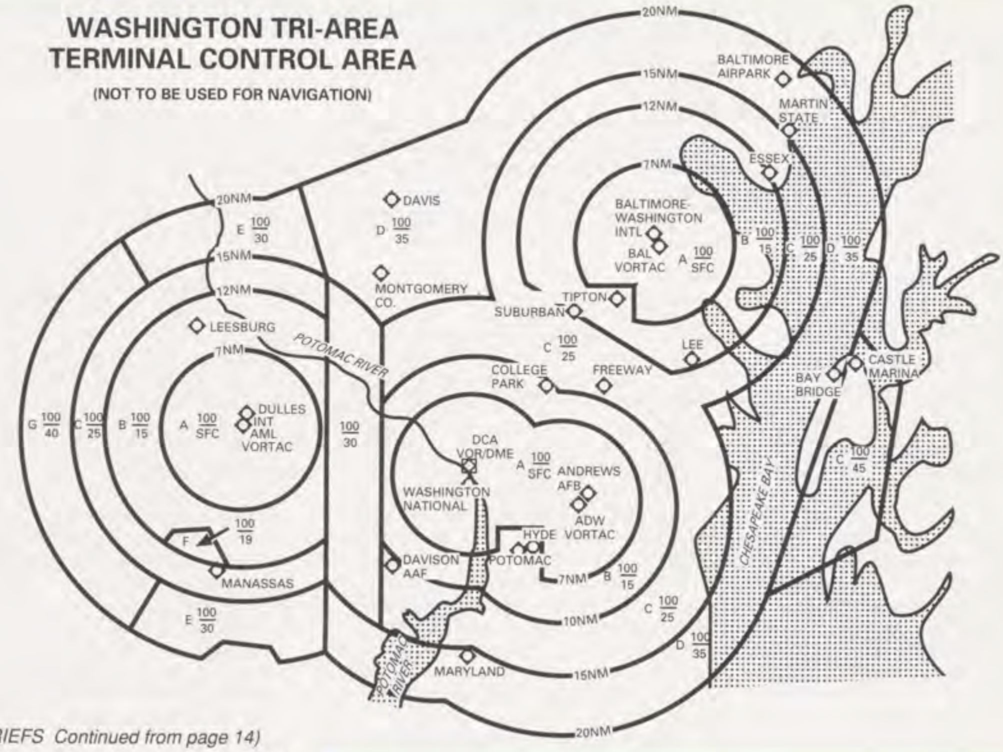

(AV NEWS/ BRIEFS Continued from page 14)

You should check with your LORAN-C receiver's manufacturer for instructions on how to deal with this potential problem and any necessary receiver modifications.

Remember, LORAN-C receivers that are approved for IFR use also require an operating approved alternate means of navigation, such as VOR/DME, which can be used along your route of flight.

To help further ensure the safe use of LORAN-C, LORAN users should always ask FSS briefers if there are any NOTAM's (D) for the chain you plan on using. The information identifier is "LRN." You can also call the telephone numbers listed in Tables 1-6 and 1-7, paragraph 20 of the AIM, for recorded information regarding the status of LORAN chains. The recording will also have information on any interference or other problems that might affect navigation.

Remember, the pilot in command is always responsible for ensuring a safe flight.

TRI-AREA TCA

The new Washington Tri-Area Terminal Control Area (TCA) is operational as of March 7, 1991, and serves the greater Baltimore/Washington, D.C. area. The Tri-Area TCA includes four major airports, Washington National, Dulles International, Andrews Air Force Base, and Baltimore-Washington International. The new TCA replaces the Washington TCA and both the Dulles and Baltimore Airport Radar Service Areas.

The dimensions of the new TCA include some significant changes from the old Washington TCA. The top of the TCA will be 10,000 feet MSL instead of 7,000 feet MSL. The TCA's outer dimensions are based upon a 20 NM radius from each airport instead of the old Washington TCA's 15 NM radius from both Washington National and Andrews AFB. The Federal Register of Tuesday, January 29, 1991, which announced the final rule for the Tri-Area TCA, has detailed information on the TCA.

The operational date of the TCA is also the publication date of the new Tri-Area TCA chart. On the reverse side of the VFR terminal area chart is a VFR flyway chart which shows the VFR routes through the TCA. VFR pilots planning on flying the flyways need to pay particular attention to the instructions on the new chart to avoid violating the TCA. All pilots, IFR and VFR, are cautioned to review the new chart very carefully because of the new procedure.