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AVIATION SAFETY FROM COVER TO COVER

Cover Story:

All A Matter of Scale

U.S. Department
of Transportation

Federal Aviation Administration

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FAA Aviation news

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FEATURES

DEPARTMENTS

FRONT COVER: Claude McCullough adjusts the engine in his scratch-built model WACO S3HD. (Mark Lanterman photo courtesy of Model Aviation)

BACK COVER: Global Hawk, the U.S. Department of Defense's newest unmanned air vehicle. (Norththrop Grumman Corporation photo)

H. Dean Chamberlain photo

All A Matter of Scale

by H. Dean Chamberlain

Reality has surpassed fiction. Remember the yesteryear photos of kids building model aircraft in their bedrooms out of balsa wood and silk. How times have changed. To illustrate the change, one day more than 25 years ago, I flew a radio-controlled (R/C) glider at San Diego's Torrey Pines Gliderport. The cliffs at Torrey Pines and the Pacific Ocean breezes that flow up and over the cliffs made this site a great location for R/C model gliders and the then new full-size hang gliders with their intrepid human pilots suspended beneath the colorful craft. The site also had a cable winch launch capability for full-size piloted gliders. What made that site so good, particularly for the smaller R/C model gliders and the much larger hang gliders, was the fact that with the right weather conditions the resulting steady ocean breeze could provide good, strong, smooth lift for hours along the wide cliff face.

Life was simpler in those days. At that time, pilots flew "real" aircraft, while modelers flew radio-controlled aircraft. How times have changed. Now, both modelers and "real people" fly model aircraft and real aircraft by remote control. Now the world of the remote-controlled aircraft is only a matter of scale. At a recent radio-controlled model airplane club open house, the R/C "pilots" referred to "real" aircraft flying overhead as full-scale. Things have advanced to the point where the only question in some people's minds is when will the first remote-controlled or autonomous non-piloted aircraft carry its first commercial passenger.

That idea is not as absurd as some may think. One unmanned aircraft has flown from the U.S. across the Pacific to Australia. The U.S. military is using remote-controlled unmanned vehicles in its war on terrorism. An unmanned cruise missile can fly hundreds of miles and hit a target using GPS to navigate. With today's technology, a remotely-piloted (the politically correct term) aircraft can be radio-controlled, or have an autonomous flight control system onboard that can fly a predetermined flight profile, or have a combination of both systems so the autonomous aircraft can be redirected in flight if necessary by data link from another aircraft or satellite. Things have progressed to the point where, according to one magazine, the U.S. Air Force is concerned how its pilots and

The Predator Unmanned Aerial Vehicle (UAV) flies above the USS Carl Vinton (CVN 70) on a simulated Navy reconnaissance flight headed by Command Carrier Group One about 100 miles off the San Diego coastline. Predator has a wingspan of 48.4 feet, a length of 26.7 feet and weighs approximately 1,500 pounds when fully fueled. Cost of the aircraft is around 3.2 million dollars. Average speed is approximately 70 knots. (U.S. Navy photo by PH3 Jefffrey S. Viano)

those who support piloted aircraft will react to the continued development of unmanned aircraft to include the possibility of a future unmanned bomber and other aircraft types. Are pilots going to soon join the Dodo bird on the extinct list? Only time will tell.

Not only has the progress of radio-controlled aircraft development raised issues within the U.S. Air Force, but also it has raised one issue within FAA about the use of such craft in the National Airspace System (NAS). Someday, you may hear an air traffic controller issuing you a traffic advisory about an unmanned vehicle at 12 o'-clock and three miles. Before you panic, that aircraft may also have sensors onboard to help it "see" and avoid you. Now who has the right of way?

If the idea of flying crosscountry with an unmanned aircraft near your aircraft bothers you, you might as well start getting use to the idea. It may happen. But such aircraft will be subject to regulation.

They will be regulated both for your protection and the protection of those on the ground. A basis for that requirement is contained in the FAA's definitions in the Code of Federal Regulations (CFR), title 14, part 1, Definitions and Abbreviations. The FAA definition of "aircraft means a device that is used or intended to be used for flight in the air." Nowhere in that definition does it say the device has to be manned. Under this definition, a small or reduced scale aircraft such as a R/C model aircraft is just that. It is an aircraft subject to rules governing its operation in the NAS. For those who might argue that a 14 CFR part 103 ultralight vehicle is not an aircraft by definition, the definition of an ultralight includes the requirement for "...manned operation in the air by a single occupant." Therefore, an ultralight vehicle could not be an unmanned R/C aircraft by definition. If it is not manned, it is not an ultralight. It is an aircraft subject to the same rules as all aircraft.

If you still think the idea of unmanned aircraft flying is too futuristic, then you did not see the May 29, 2002, NASA Ames Research Center's news release announcing it had "...signed an agreement to explore development of a world-class center designed to investigate science and commercial applications of unmanned aerial vehicles (UAVs) equipped with high-resolution digital imaging systems." The center's program will include working with FAA on how to operate in the National Airspace (NAS). Currently, a NASA Ames research team is working on a $3.76 million project to test the commercial use of a solar-powered UAV in the NAS. The largest U.S. coffee plantation located on the Hawaiian Island of Kauai will be the test site.

So how did the line between radio-controlled model aircraft, such as gliders, airplanes, and helicopters, become so blurred with aircraft capable of carrying weapons, crossing an ocean, doing commercial aerial imaging, and potentially carrying passengers? In one word, the answer is technology. Technology, such as digital control units, data link, digital computers, satellites, and more efficient power sources, is responsible for blurring that line.

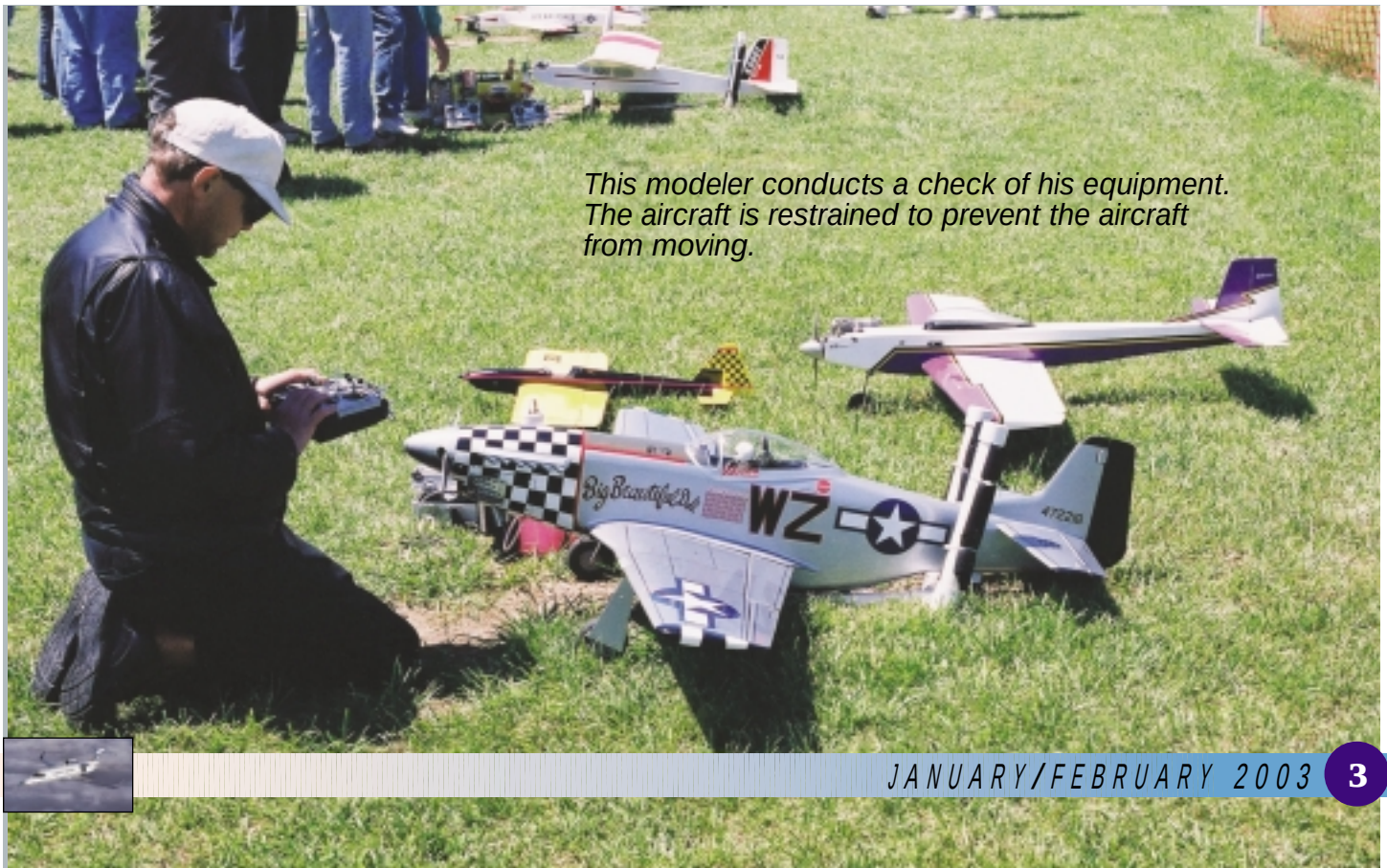
As an example, the July-August 2001 issue of *FAA Aviation News* published a photograph of a R/C 1/6-scale model of the F-86 jet aircraft John Glenn flew in the Korean Conflict. Built by FAA Aviation Safety Inspector Rene Alvarez in Miami, the 1/6 scale model was powered by a real miniature jet engine that burned Jet A fuel. Even in discussing such aircraft and their engines, it is hard to find the terminology to describe the aircraft. In the above example, wouldn't a miniature engine be real—just smaller? How many "unreal" miniature jet engines can there be? See what I mean? The old adage of if it looks like a duck, walks like a duck, and quacks like a duck, may no longer apply.

A recent visit to the airfield of the Maryland-based Chesapeake Bay Radio Control Club (CBRC) showed the diversity of what I would call the traditional R/C aircraft, and how things have changed in the last 25 years.

As I have been saying, the line between traditional R/C scaled aircraft and full-scale aircraft has become very blurred. For those who still think R/C aircraft are your simple, small models with limited control functions, you are in for a major surprise. You should see some of the newest R/C aircraft. Not only are these aircraft more sophisticated, but they are fast and getting bigger and bigger. For example, two of the club members arrived at the airfield with their cargo trailers in tow and their aircraft suspended from the walls of the trailers. The idea is to protect their aircraft's large wingspans. Tool kits and aircraft spare parts were also stored in the trailers. One trailer included a workshop so that field repairs could be made in case of a crash.

If you have to have a crash, a R/C crash is the type to have. One club member, Steve Barnett, noted that R/C pilots walk to their crash sites. They don't arrive at the scene of the crash in their aircraft. He had a good point. There is a lot to be said about being able to walk to your crash site to pick up your aircraft rather than "flying" to your crash site then being carried out.

Although R/C aircraft don't share the same personal risks for their pilots in a crash as full-scale aircraft, they do share many of the same problems as full-scale aircraft. For example, the CBRC's airfield shares the same development issues as all airports. Although on Maryland State property, the airfield is bordered by a housing development on one side and a church and school on the opposite side. As a result, aircraft noise is an issue. Like many full-scale airports, the CBRC has operating restrictions, such as when fuel-powered R/C aircraft can fly. Because of the church, Sunday flight hours for fuel-powered aircraft begins at 11:00 a.m. The good news for some CBRC members is that they have electric (battery) powered aircraft and gliders that can be flown during quiet hours. Then there is the chance of a run-away aircraft and an off-airfield landing. Like in real life, sometimes electronics failure, radio interference, or pilot error causes a loss of control situation. Then the fuel capacity and stability of the aircraft determines the landing site of the



This modeler conducts a check of his equipment. The aircraft is restrained to prevent the aircraft from moving.

H. Dean Chamberlain photo

ABOVE: The new RQ-4A Global Hawk unmanned aerial vehicle flies through the sky during its maiden voyage here April 23. The Global Hawk is designed to provide battlefield commanders with near real-time, high-resolution, reconnaissance imagery. Flying at extremely high altitudes, Global Hawk can survey large geographic areas giving military decision-makers the most current information. (U.S. Air Force photo)

BELOW: The second Tier III Minus DarkStar high altitude endurance unmanned air vehicle flies over the NASA Dryden Flight Research Center, Edwards Air Force Base, Calif., on June 29, 1998. The vehicle took off from the Air Force Flight Test Center at Edwards at 6:14 a.m. (PDT). During the 44-minute flight, the vehicle achieved an altitude of approximately 5,000 feet and completed pre-programmed basic flight maneuvers. The system successfully executed a fully autonomous flight from takeoff to landing utilizing the differential Global Positioning System. NASA photo by Carla Thomas.

out of control scale aircraft.

Although we are talking about reduced-scaled aircraft, these aircraft are not without certain risks. Anytime you have high-speed rotating propellers and rotor blades you have a potential danger. Add in the speed and mass of some of these scale or model aircraft, which may weigh up to 55 pounds, and you can begin to see some of the risks you face if the aircraft strikes someone. Serious injury is possible.

To avoid such risks while promoting the participation in R/C activities, the CBRC is a member of and follows the rules of the Academy of Model Aeronautics (AMA). According to the AMA's Internet web site, it is the world's largest sport aviation organization with a membership of more than 170,000. It sanctions more than 1,000 model competitions across the country each year. It also certifies official model flying records on a national and international level. It says it is the chartering organization for more than 2,500 model airplane clubs in the U.S. The Muncie, Indiana, based organization officially sanctions charter clubs' contests, provides insurance, and helps get and keep flying sites. AMA also represents modeler's interests with the FAA, the Federal Communications Commission, and other government groups both at the Federal level as well as with local governments and their subdivisions. AMA is a member of the National Aeronautic Association and represents U.S. modelers' interests in international aeromodeling activities.

AMA's safety standards sound like the FAA's air show standards. Like real-scale air shows with their FAA mandated crowd control lines and air show lines designed to protect the crowd in the event of an out of control aircraft, AMA safety rules are designed to protect spectators and property owners at AMA sanctioned events. AMA has specific regulations for each type of activity, since AMA aircraft events may involve control line aircraft, internal combustion powered aircraft, R/C controlled aircraft as well as turbine engine powered aircraft,

and aircraft ranging from rubber-band or electric powered aircraft up to large scale aircraft weighing up to 55 pounds. Failure to comply with the appropriate regulation jeopardizes the AMA liability protection in case of an accident. In today's world, the potential loss of liability insurance is a significant sanction and a great motivator for AMA clubs to abide by the AMA safety procedures. AMA's insurance protection includes not only liability, but also accident medical coverage, plus fire, vandalism, and theft coverage.

Rule Two in the General section of the Official AMA National Model Aircraft Safety Code (see page six) is important for full-scale aircraft and airports. It states that AMA members will not fly their models higher than approximately 400 feet within three miles of an airport without notifying the airport operator. AMA members will also give the right-of-way to and avoid flying in the proximity of full-scale aircraft.

The other rules establish safety-operating procedures for all of the types of model aircraft listed. To avoid confusion between model aircraft and full-scale aircraft, AMA defines a model aircraft in its Safety Code 7 in the General section "...as an aircraft with or without engine, not able to carry a human being."

As with the operation of full-scale aircraft, AMA's rules and those of the CBRC are designed to protect operators, other members, and any spectators. For example, the CBRC installed tubular restraints made from plastic water pipe into the ground to help keep a model aircraft from getting away from its operator while the aircraft's engine is being started. CBRC has also installed fencing between its operating areas and the spectator area to capture any run away aircraft before it could possibly hit a spectator or vehicle. CBRC also follows the AMA safety code regarding how and where its aircraft can be flown with spectators present. As with the FAA's air show rules, AMA modelers are expected to turn their aircraft away from the crowd if under control. The rules also list a maximum permissible take-off weight of models, including fuel, of 55 pounds. This weight limitation can be exceeded if the pilot complies with the requirements outlined in the AMA rules. The rules also require new or repaired radio-controlled models to be successfully test flown before being flown with spectators. These are only a few of the many AMA safety rules designed to promote the safety of R/C activities.

When asked what it costs to become a R/C modeler, CBRC-member Ray Stinchcomb said it varies by the type of aircraft flown and the capabilities of the R/C equipment installed. A typical or average aircraft could cost about $150 to $200 and the minimum accessories could add another $100 or $200. Based upon these estimates, someone could get a good system for less than $400 to $500. However, your imagination and the dollar amount you are willing to spend are the only real limits.

And what does 25 years and the computerization of the world bring to R/C aircraft today. Remember I started this overview of R/C aircraft by talking about flying a R/C glider at Torrey Pines in California. Like many certificated pilots, I remember trying to visualize the view from the cockpit that I would see if I were in the aircraft. This worked great when I was flying outbound away from myself. But when I turned the glider inbound towards me, everything became backwards. Much like flying a back-course localizer instrument procedure where you have to remember to fly away from the VOR needle instead of towards the needle if your aircraft does not have a BC selection capability, so it was with me flying the glider towards me. Several times, I almost lost control of the glider. Fortunately for me, the owner was standing near me to take control of the R/C command module. The good thing about progress is that today many R/C flight instructors use a system they call a "Buddy Box." Two control modules are wired together so the instructor can, by simply releasing the "trainer button," regain control of the student's aircraft when it gets into a less-than-desirable attitude, thereby avoiding a crash and returning the student's aircraft to straight and normal flight. (There must be a term used to identify those who control scale models. "Pilots" is becoming confusing.) These are especially good for FAA certificated pilots for the reasons listed. According to some CBRC members, FAA-certificated pilots try to put themselves in the model. Non-certificated "pilots" and the latest computer-generation of young modelers don't seem to have this problem as much as older FAA-certificated pilots. Non-pilots and computer kids just learn to fly the R/C aircraft without trying to transform themselves into miniature pilots flying scaled aircraft.

In closing, AMA is more than just about flying model aircraft. It provides many programs and benefits for its members including up to $20,000 this year in scholarships to graduating high school seniors. In addition to providing scholarships, AMA is actively involved in many local school programs designed to teach children and young adults about model aircraft and flight. There is even a Model Aviation Hall of Fame. To start on your own road to the Model Aviation Hall of Fame, you can contact your local hobby shop, your local AMA club, or the AMA in Muncie to learn more about the challenges of R/C aircraft.

ACADEMY OF MODEL AERONAUTICS INFORMATION

For more information about the Academy of Model Aeronautics (AMA), you can visit its Internet web site at www.modelaircraft.org. AMA's address is 5161 E. Memorial Drive, Muncie, IN 47302. Its telephone number is 765-287-1256. FAX: 765-289-4248. To help you find the nearest AMA model aircraft club; AMA's web site includes a national search capability by state for the nearest AMA club.

2003 Official AMA National Model Aircraft Safety Code

Effective January 1, 2003

Model Flying MUST be in accordance with this Code in order for AMA Liability Protection to apply

GENERAL

1) I will not fly my model aircraft in sanctioned events, air shows, or model flying demonstrations until it has been proven to be airworthy by having been previously, successfully flight tested.

2) I will not fly my model higher than approximately 400 feet within 3 miles of an airport without notifying the airport operator. I will give right-of-way and avoid flying in the proximity of full-scale aircraft. Where necessary, an observer shall be utilized to supervise flying to avoid having models fly in the proximity of full-scale aircraft.

3) Where established, I will abide by the safety rules for the flying site I use, and I will not willfully and deliberately fly my models in a careless, reckless and/or dangerous manner.

4) The maximum takeoff weight of a model is 55 pounds, except models flown under Experimental Aircraft rules, [Document Number 549*].

5) I will not fly my model unless it is identified with my name and address or AMA number, on or in the model. Note: This does not apply to models while being flown indoors.

6) I will not operate models with metal-bladed propellers or with gaseous boosts, in which gases other than air enter their internal combustion engine(s); nor will I operate models with extremely hazardous fuels such as those containing tetranitromethane or hydrazine.

7) I will not operate models with pyrotechnics (any device that explodes, burns, or propels a projectile of any kind) including, but not limited to, rockets, explosive bombs dropped from models, smoke bombs, all explosive gases (such as hydrogen filled balloons), ground mounted devices launching a projectile. The only exceptions permitted are rockets flown in accordance with the National Model Rocketry Safety Code or those permanently attached (as per JATO use); also those items authorized for Air Show Team use as defined by AST Advisory Committee (document available from AMA HQ). In any case, models using rocket motors as a primary means of propulsion are limited to a maximum weight of 3.3 pounds and a G series motor. Note: A model aircraft is defined as an aircraft with or without engine, not able to carry a human being.

8) I will not consume alcoholic beverages prior to, nor during, participation in any model operations.

9) Children under 6 years old are only allowed on the flight line as a pilot or while under flight instruction.

Bob Benjamim's Taylorcraft, a model aircraft he built from own plans, during takeoff. (Mark Lanterman photo courtesy of Model Aviation)

RADIO CONTROL

1) I will have completed a successful radio equipment ground range check before the first flight of a new or repaired model.

2) I will not fly my model aircraft in the presence of spectators until I become a qualified flier, unless assisted by an experienced helper.

3) At all flying sites a straight or curved line(s) must be established in front of which all flying takes place with the other side for spectators. Only personnel involved with flying the aircraft are allowed at or in the front of the flight line. Intentional flying behind the flight line is prohibited.

4) I will operate my model using only radio control frequencies currently allowed by the Federal Communications Commission. (Only properly licensed Amateurs are authorized to operate equipment on Amateur Band frequencies.)

5) Flying sites separated by three miles or more are considered safe from site-to site interference, even when both sites use the same frequencies. Any circumstances under three miles separation require a frequency management arrangement which may be either an allocation of specific frequencies for each site or testing to determine that freedom from interference exists. Allocation plans or interference test reports shall be signed by the parties involved and provided to AMA Headquarters. Documents of agreement and reports may exist between (1) two or more AMA Chartered Clubs, (2) AMA clubs and individual AMA members not associated with AMA Clubs, or (3) two or more individual AMA members, [Document Number 551*].

6) For Combat, distance between combat engagement line and spectator line will be 500 feet per cubic inch of engine displacement. (Example: .40 engine = 200 feet.); electric motors will be based on equivalent combustion engine size. Additional safety requirements will be per the RC Combat section of the current Competition Regulations.

7) At air shows or model flying demonstrations a single straight line must be established, one side of which is for flying, with the other side for spectators.

8) With the exception of events flown under AMA Competition rules, after launch, except for pilots or helpers being used, no powered model may be flown closer than 25 feet to any person.

9) Under no circumstances may a pilot or other person touch a powered model in flight.

Organized RC Racing Event

10) An RC racing event, whether or not an AMA Rule Book event, is one in which model aircraft compete in flight over a prescribed course with the objective of finishing the course faster to determine the winner.

A. In every organized racing event in which contestants, callers and officials are on the course:

1. All officials, callers and contestants must properly wear helmets, which are OSHA, DOT, ANSI, SNELL or NOCSAE approved or comparable standard while on the race course.

2. All officials will be off the course except for the starter and their assistant.

3. “On the course” is defined to mean any area beyond the pilot/staging area where actual flying takes place.

B. I will not fly my model aircraft in any organized racing event which does not comply with paragraph A above or which allows models over 20 pounds unless that competition event is AMA sanctioned.

C. Distance from the pylon to the nearest spectator (line) will be in accordance with the current Competition Regulations under the RC Pylon Racing section for the specific event pending two or three pylon course layout.

11) RC Night Flying is limited to low performance models (less than 100 m.p.h.). The models must be equipped with a lighting system that clearly defines the aircraft’s attitude at all times.

FREE FLIGHT

1) I will not launch my model aircraft unless at least 100 feet downwind of spectators and automobile parking.

2) I will not fly my model unless the launch area is clear of all persons except my mechanic and officials.

3) I will employ the use of an adequate device in flight to extinguish any fuses on the model after it has completed its function.

CONTROL LINE

1) I will subject my complete control system (including safety thong, where applicable) to an inspection and pull test prior to flying. Pull test will be in accordance with the current Competition Regulations for applicable model category. Models not fitting a specific category as detailed shall use those pull test requirements for Control Line Precision Aerobatics.

2) I will assure that my flying area is safely clear of all utility wires or poles.

3) I will assure that my flying area is safely clear of all non-essential participants and spectators before permitting my engine to be started.

4) I will not fly a model closer than 50 feet to any electrical power line.

GAS TURBINE

1) I will not operate any turbine engine (axial or centrifugal flow) unless I have obtained a special waiver for such specific operations.

2) I will fly my model in compliance with all requirements specified in AMA Safety Regulations for Model Aircraft Gas Turbines, [Document Number 513*], at all times.

GIANT SCALE RACING

1) I will fly my model in compliance with all requirements specified in AMA Required Safety Standards for Giant Scale Racing, [Document Number 535*], at all times.

• Document Numbers refer to the AMA web site Document Number.

Radio-controlled Aircraft Safety

H. Dean Chamberlain photos

Clockwie, from right: Frequency control board. Below, right, the aircraft is prevented from moving by the two posts that are firmly anchored to the ground. The safety barrier visible in the background protects the spectators and other modelers from runaway aircraft on the ground. Below, left, the pilot and safety spotters must stand behind the pilot station safety barriers.

→ *The transmitter impound combined with the frequency control board prevent accidents caused by frequency conflicts.*

Pilot and instructor prepare for takeoff as they move behind the pilot station safety barrier.

Pilot and instructor conduct equipment check as they move clear of the safety barrier toward the runway.

Properly restrained aircraft with its ground equipment organized for safe handling.

Aircraft operations are conducted parallel to the flight line in front of the pilot stations

Special Interest NOTAMS

from NASA's Aviation Safety Reporting System Callback

Since the events of September 11, 2001, the National Flight Data Center NOTAM system—always an important source of timely flight information—has become even more crucial to flight planning. Many new NOTAMS are in effect including, but not limited to, the following:

- Rules against circling or loitering over nuclear sites, power plants, dams, refineries, military sites, industrial complexes, and similar facilities
- Monitoring of Guard frequency (121.5 MHz) and understanding of intercept procedures
- Temporary Flight Restrictions (TFRs) over major professional or collegiate sporting events or other major open air assemblies
- Special TFRs concerning flight over some cities, especially the Washington, DC area
- Restricted airspace over wherever the President or Vice President happen to be
- New rules for operating into and out of Mexico and Canada
- New rules for foreign aircraft.

Because notices, restrictions, and advisories may change at any time and without warning, it is no longer enough to obtain NOTAMS before a flight. Pilots should now check NOTAMS before each leg of a planned flight. Current NOTAMS are available from Flight Service Stations at 1-800-WX-BRIEF or at the FAA web site <www2.faa.gov/ntap/index.htm>. Recent reports drawn from the ASRS database illustrate some of the latest NOTAM nuances.

Check NOTAMS Before Every Leg

- Departed for a non-tower airport in same state. I did a little flying with a friend and then returned to [home airport]. When I had departed [home airport] there were no new TFRs in effect. However, during my time at non-tower airport, the FAA had issued the TFR around all power plants. After returning I became aware of these TFRs. The non-controlled field was in a private community within the 10-mile ring of the power plant... I should check NOTAMS before every leg, not just the first. I had 1200 in the transponder and Guard 121.5 in the com [radio] during my flight.

Rethink Training and Flight Routes

- While conducting a low-level cross-country, our aircraft overflew what I thought was an auto salvage yard. There are a great number of these on the route we fly for this training. Coming over one of these 'junk yards,' I noticed a great number of people and realized it was a flea market! A part of [Special NOTAM] is not to operate lower than 3,000 feet and within three Nautical Miles (NM) of major open air assemblies. Not sure if a flea market falls under this, but there sure were a great number of people. We remained clear of schools, power plants, etc., but this one caught us off guard... No excuse, just some background... Maybe we need to rethink our routes for this training in light of the current security situation...

Our reporter's last comment is one that many training schools and flight instructors may take to heart.

"Can Anyone Hear Me?"

In the nation's heightened security climate, loss of communications by aircraft can have serious consequences, including intercept by military aircraft and other traumatic outcomes. Air carrier as well as GA aircraft are subject to lost communications events, as described by this ASRS report.

- Suspect moderate turbulence caused multiple failures of Com 1 and Com 2 [radios]. At least four calls to ATC gave no response. Switching to Number 2 Com brought initial relief followed by further failure while descending into [destination airport]. Blind transmissions indicating our listening watch on Guard (121.5 MHz) were heard by ATC. [Our] reply again appeared to be unanswered. Approach Control, when communications were re-established, gave handoff to Tower about 30 nm from Runway 16. A follow-up call indicated that ATC had a brief security concern... due to lost com and aircraft altitude and progress toward airport... Further lost com could have launched a potential intercept.

The flight crew suspected a loose radio rack as the cause of the lost communications. Many air carrier and GA pilots are planning ahead for the possibility of radio failure by carrying backup communications devices on flights. The most common devices are cell phones and handheld transceivers.

The Bottom Line

- Better information gathering, and doubting one's 'old instincts' regarding airspace boundaries and the freedoms we have come to take for granted, is what...can personally [be done] to avoid any future incursions. Communicating this to other pilots will also create awareness.

"VFR Flight Not Recommended"

A study of weather-related fatal aviation accidents (1995-2000)

by Douglas C. Pearson

The National Weather Service Vision states a need to "strive to eliminate weather-related fatalities." Their theme for 2002 was "Working Together to Save Lives." The yearly average for weather-related fatalities in general aviation is comparable to weather fatalities due to lightning, tornadoes, and floods combined, 230 and 213, respectively. From 1995 to 2000, 4,018 people died in general aviation and small commuter aviation aircraft accidents, of which weather-related accidents accounted for 1,380 deaths. Essentially, the NTSB cited weather as a factor in three of every 10 fatal aircraft accidents during this period. These weather-related accidents accounted for 34 percent of the fatalities.

The Federal Aviation Administration's (FAA) *Flight Service Manual* requires Flight Service Stations (FSS) to use National Weather Service (NWS) data and products when providing pilots with a flight weather briefing. As part of this briefing, the FSS specialist makes a recommendation on the appropriateness of a flight under Visual Flight Rules (VFR). If weather is observed or forecast to be Marginal VFR (MVFR) or Instrument Flight Rules (IFR), and VFR flight is doubtful, the attendant will advise the pilot "VFR Flight Not Recommended (VNR)." MVFR or IFR conditions were a factor in nearly 70 percent of the weather-related fatal accidents. In many of these cases, the pilot either chose to ignore the information provided at the weather briefing or inadvertently flew into adverse IFR weather.

This is not just a recent problem. In a 1974 National Transportation Safety Board (NTSB) report, Special Study of Fatal Weather-involved General Aviation Accidents, the NTSB cited 2,026 fatal weather-involved accidents that killed 4,714 from 1964-72. (Weather-related or weather-involved fatal accidents refer to accidents in which the NTSB determined weather to be a cause or contributing factor in the accident.) These weather-involved accidents represented 36.6 percent of the total accidents. Similarly, in 1996 the Aircraft Owners and Pilots Association (AOPA) Air Safety Foundation completed an extensive study of general aviation accidents for the period 1982-93. AOPA results showed a decline in the percent of weather-involved fatal accidents, from a high of 43 percent in 1982 down to a low of 24 percent in 1991. Despite the general downward trend, weather-involved accidents averaged 34 percent. Both of these studies also concluded that low ceilings, fog, and attempted VFR flight into Instrument Meteorological Conditions (IMC) were the most frequently cited cause or factor in weather-involved fatal general aviation accidents.

This quote from the August 1974 NTSB study is just as applicable today as it was 28 years ago:

> *"These accidents occurred with disturbing regularity despite improvements in aircraft, instrumentation, training, training facilities, the air traffic control system,*

weather facilities, weather services, and navigational aids."

Weather-involved fatal accidents have consistently represented 30-36 percent of total fatal accidents, and although there has been a slight downward trend over the past 28 years, there remains a need to dramatically reduce these numbers.

Methodology/Data Analysis

The objective of this study was to quantify the significance of adverse weather on fatal accidents involving small aircraft that fall within the category of general and commuter aviation. The magnitude of this sector of aviation is extensive with over 200,000 registered general aviation aircraft. This class of aircraft is most vulnerable to hazardous weather or weather conditions that exceed the aircraft and/or pilot capabilities.

From 1995-2000, there are 2,605 NTSB records documenting fatal aircraft accidents. From these records, only those accidents that occurred in the United States (including Alaska and Hawaii) and its coastal waters were counted. Thus, 293 accidents were eliminated because the NTSB listed them as occurring outside the United States. Additionally, nine major air carrier accidents were eliminated, as was one duplicate record. The remaining 2,302 fatal accident reports and NTSB conclusions were thoroughly reviewed using the NTSB and the FAA National Aviation Safety Data Analysis Center (NASDAC) web sites <http://www.ntsb.gov/ntsb/query.asp > and <https://www.nasdac.faa.gov>. This six-year period of record was used in order to provide the most current data as well as allow for sufficient sample size. Furthermore, FAA NASDAC recommends using the most recent five years for safety analysis and monitoring because the aviation industry is so dynamic and impacted by technology.

The review process initially involved accessing the NTSB accident database and doing a sort by year for all fatal accidents. The accident summary, the NTSB determined cause, and the full narrative were reviewed and the data classified. If weather was cited as a cause or factor then the following information was recorded and tabulated on a spreadsheet:

Date, number of fatalities, total pilot time, weather briefing source, location (city/state), cause of accident, weather phenomena as cause/factor, and phase of flight.

After reviewing each record from 1995-2000, the results showed

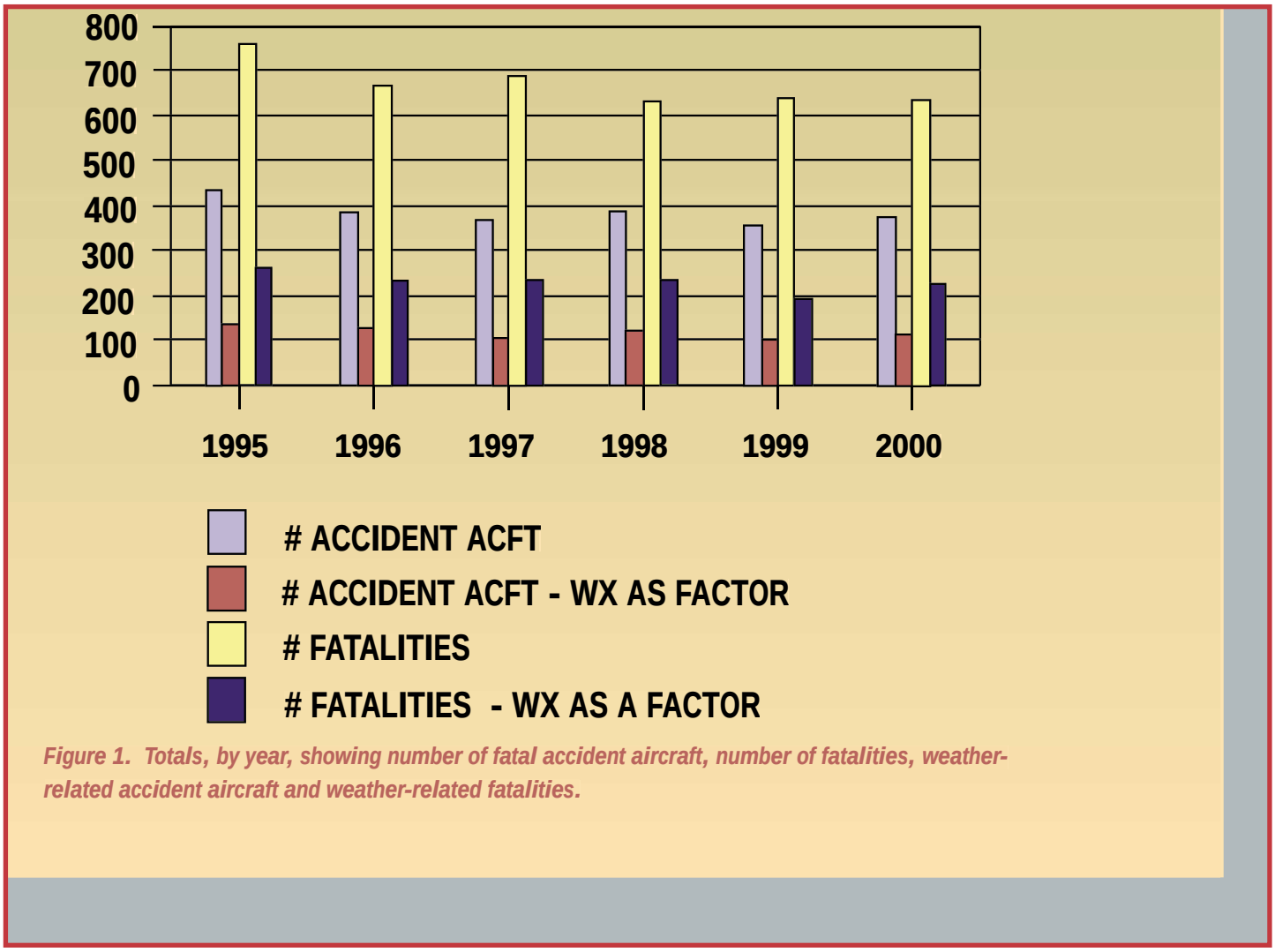


Figure 1. Totals, by year, showing number of fatal accident aircraft, number of fatalities, weather-related accident aircraft and weather-related fatalities.

weather was cited as a cause or factor in 697 fatal accidents. Note that in some cases weather was not listed as a cause or factor, but was adverse at the time of the accident. These cases were not included in the totals cited in this study, but were kept on a separate data sheet. Also, environmental conditions that favored carburetor icing and high density altitude were not included in this study but, again, were included on the separate data sheet. Finally, there were 36 accident reports that had not been finalized, most of these from 2000. Each of these preliminary reports was evaluated and only the obvious weather-related accidents were included in this study.

The final total reflects a conservative summary of weather-related fatal accidents using the following adverse weather phenomena:

Low ceiling, fog, rain, snow, turbulence, thunderstorms, icing, updrafts/downdrafts, tailwind/crosswind, and other.

Each of these accidents was also crosschecked using the FAA NASDAC database to verify information and in some cases supplement the data collection.

Data were analyzed and summarized by month, by year, and averaged over the period of record (1995-2000). Each fatal accident report was evaluated to determine the single most likely weather event. Other weather phenomena existing at the time were labeled as two, three, and so on. Also, the impact of low ceilings and fog was considered as related weather events and combined into one category. Similarly, all wind related (turbulence, updrafts/downdrafts, and tailwind/crosswind) fatal accidents were combined. These categorizations were done to simplify the results and enable the recommendations to be targeted towards a few key areas.

Results

The results of this study focus on quantifying the significance of adverse weather in fatal aircraft accidents, highlighting the long term nature of this problem, and compiling data so targeted recommendations can be identified. A quick look at the statistics for the last six years, as presented in Figure 1, shows the numbers to be fairly consistent. There were typically 350-400 fatal accidents per year during this period, with over 600 fatalities.

Weather was a cause or contributing factor in approximately 100 of these accidents and accounted for over 200 fatalities each year. These data provide convincing evidence that adverse weather still plays a significant role in the day to day operations and decision making for pilots.

Figure 2 is a percentage representation of the values presented in Figure 1 and shows that targeting adverse

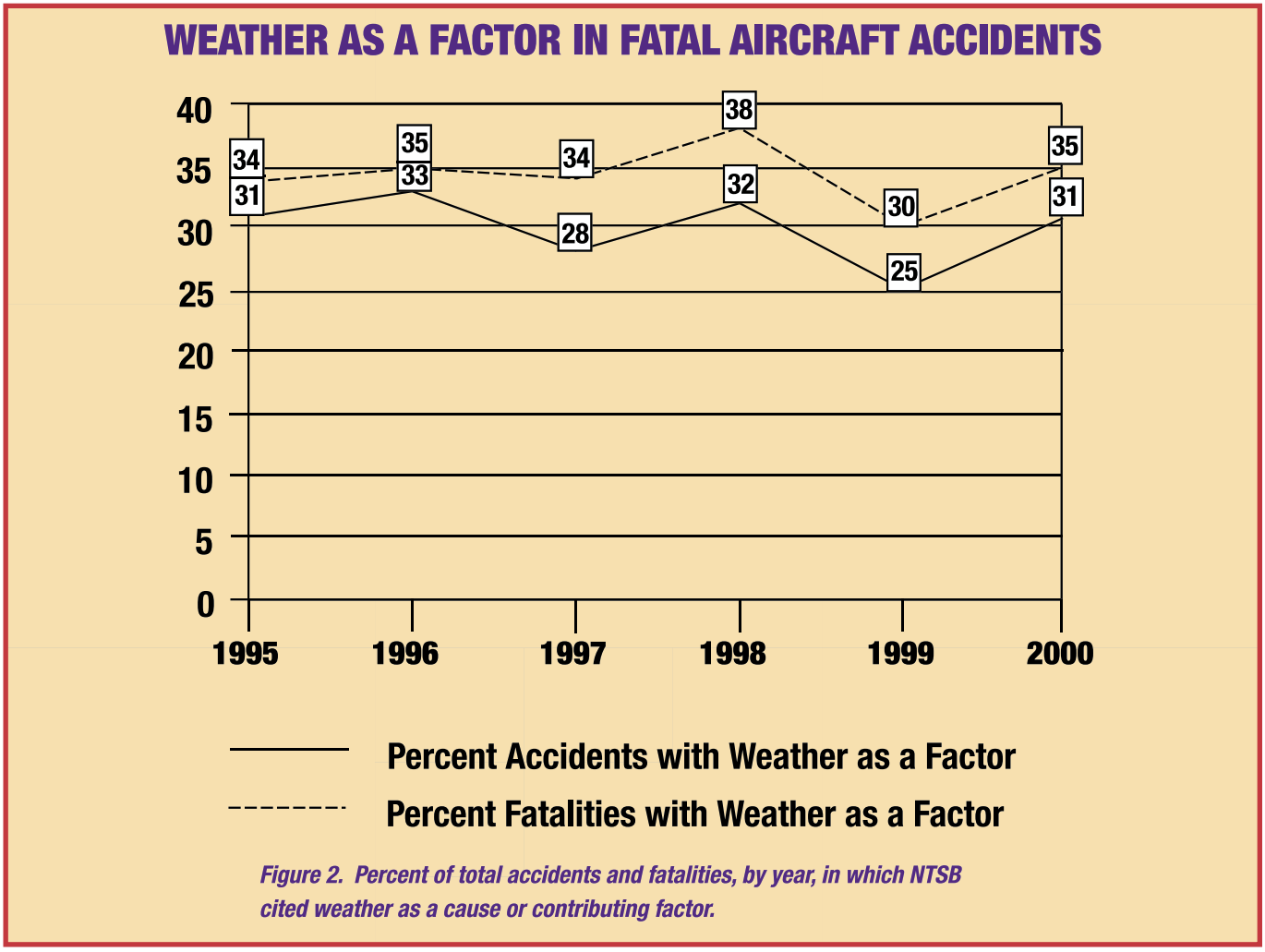


Figure 2. Percent of total accidents and fatalities, by year, in which NTSB cited weather as a cause or contributing factor.

weather can provide a focus for addressing 30 to 35 percent of the accidents and fatalities. These results are consistent with earlier studies (NTSB 1974 and AOPA 1996). The concern here is that in spite of a reduction in the total number of fatalities over the past 28 years, the percentage of these fatalities that is directly related to weather has remained relatively stable. By examining the primary causes and factors involved in these fatalities, the focus of a corrective effort can quickly be narrowed down.

In reviewing each of the 697 weather-related fatal accidents, there were four causal links the NTSB repeatedly addressed in their reports. One area reviewed was the quality of NWS forecast support. This includes all surface observations across the country, the aviation forecast products and terminal forecasts produced at each of the 120 NWS Weather Forecast Offices, and the NWS Aviation Weather Center (AWC)'s advisory bulletins which include convective SIGMET's and AIRMET's for IFR/mountain obscuration and turbulence/icing. Additionally, Center Weather Advisories and Meteorological Impact Statements are issued as needed by each of the 21 Center Weather Service Units collocated at FAA Air Route Traffic Control Centers. In these accidents, the NTSB cited NWS related weather support to be a contributing factor in only two of the accidents.

Another causal link addressed by the NTSB is the support provided to the pilot by the servicing FSS. There are nearly 3,000 FSS personnel providing weather briefing support. It is the responsibility of FSS personnel to provide the pilot with the latest available flight weather data prior to his/her making the decision to fly. Of the 697 weather-related fatal accidents, the NTSB cited FSS support as a contributing factor in only five of the fatal accidents.

A third area involves the extensive Air Traffic Control (ATC) system and the 17,000 plus personnel directing aircraft. The controllers provide vital assistance to the pilot once he/she is airborne. When a pilot inadvertently flies into adverse weather, the controllers can be the life-saving link in getting the aircraft down safely. In the

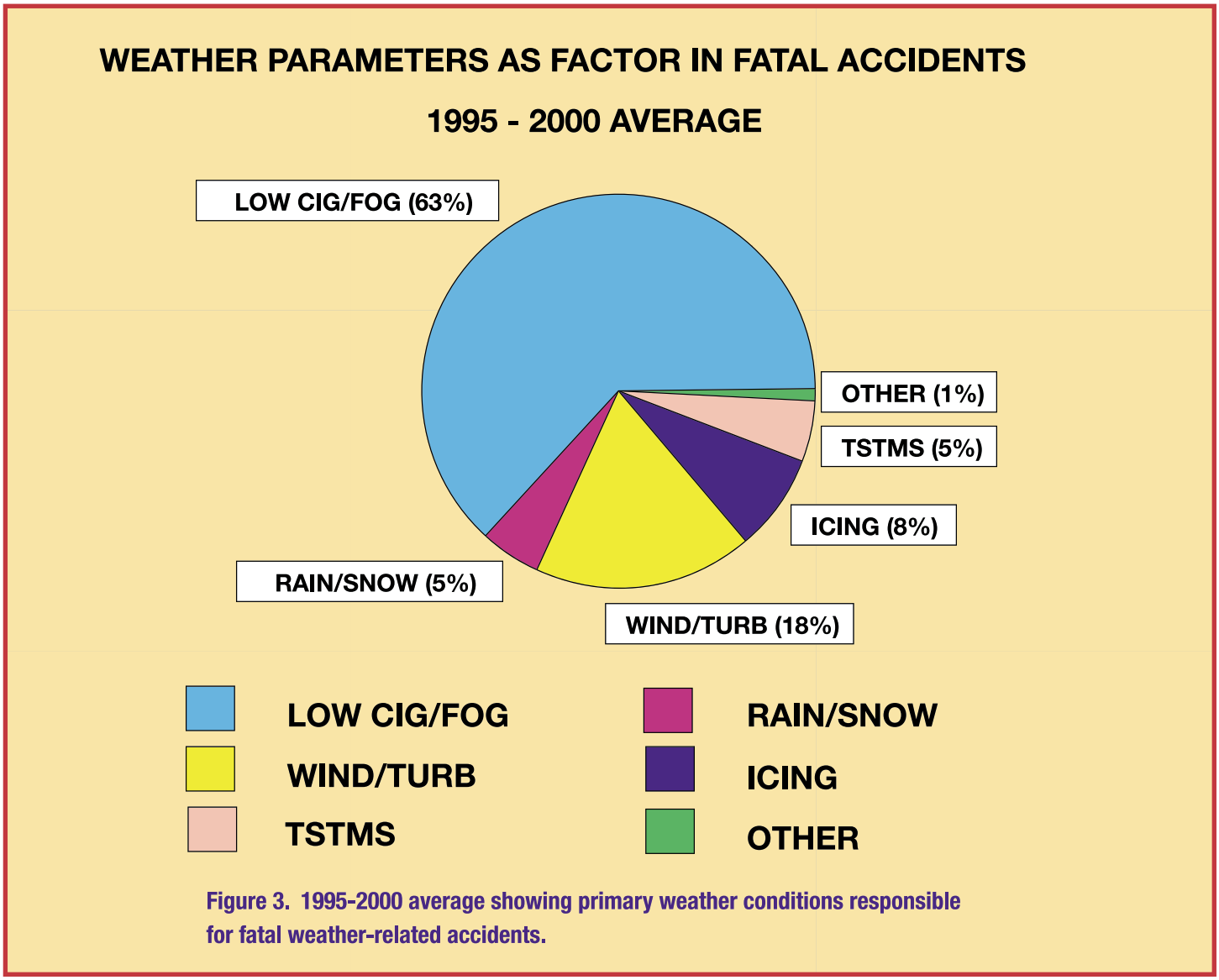


Figure 3. 1995-2000 average showing primary weather conditions responsible for fatal weather-related accidents.

accidents reviewed, ATC support was faulted as a cause or contributing factor nine times. Thus, these three causal links account for a very small fraction of weather-related fatal aircraft accidents.

The final causal link is the pilot. The decision making process and errors made by the pilot dominate the NTSB findings. The most common pilot error was continued flight into IMC, often resulting in loss of control due to spatial disorientation. The NWS is doing its job well, the FSS personnel are providing excellent briefings, and the ATC personnel are very professional in their handling of aircraft. It is impossible to discern the exact number of lives saved, but, collectively, these agencies are saving lives every day when a pilot makes a "smart decision" based on available weather data or properly uses these services once in flight. But for all the technological advances, the advancements in forecasting, improved aircraft, rapid communication of data, and better automation in the ATC system, safe flying still boils down to the decision making process and skill of the pilot.

Figure 3 provides a summary of the weather conditions most likely to cause these fatal accidents and can help the pilot focus his/her decision making process. On the one hand, pilots most certainly have a greater understanding of the intensity and inherent danger of a thunderstorm. They respect what ice can do to an airplane's aerodynamics. But it's the relatively tame, and more frequently occurring, clouds and fog that are contributing to 63 percent of the weather-related fatal accidents. When this factor is combined with rain and snow, another player in the restriction of visibility, IMC problems account for nearly 70 percent of all weather-related fatal accidents. Simply stated, these pilots died because they could not see where they were going!

The AOPA's 2000 Nall Report stated the same perplexing question when addressing VFR flight into IMC:

"What is it about the fact that they can no longer see the ground that pilots don't understand? Because so many of these accidents were fatal, there are few surviving pilots to answer the question."

In presenting this same issue, the *FAA Aviation News* published an article entitled "SIGMET's, AIRMET's, Thunderstorms, and the Force." Though another weather-related accident is highlighted, the "Force" addresses the mysterious decision making process that faces every pilot:

"Unfortunately there is an insidious force that works to flaw our rational decision making. I'll use the technical terminology of "it worked last time" to describe the force. Whether it is inadequate preflight planning, pushing a fuel supply, or taking a "look see" at forecast bad weather, the force often starts out weak and allows bad decisions to pass. But with each exposure the force strengthens and further clouds good decision making. Eventually the force

demands a high fee and catches the unwary off guard."

This bad decision making process often plays a role when dealing with the effects of wind, the second most significant category of weather that impacts fatal accidents. Small aircraft have lower tolerances for maneuverability and handling in strong winds. Tailwinds, crosswinds, gusty winds, updrafts/downdrafts around high terrain, and turbulence contribute to 18 percent of the fatal weather-related accidents.

Figure 4 provides a comparison of fatalities associated with the general public's vulnerability to severe weather and aviation weather-related deaths. These data show the key role the NWS plays in two essential areas of public support. By measuring the number of fatalities, it is easy to see where weather impacts the general public. Figure 4 shows that the combined number of fatalities associated with tornadoes, lightning and floods is very close to the same total of fatalities in weather-related aviation accidents; 213 and 230 per year, respectively. The U.S. Natural Hazard Statistics information on fatalities, injuries, and damages caused by weather-related hazards can be found at the following web site <http://www.nws.noaa.gov/om/hazstats.shtml>. Analyzing data in these two groups is not a direct comparison. Causes related to these fatalities and decision-making processes involved are quite different. Sometimes severe weather strikes and there are just helpless victims such as when a violent thunderstorm or tornado passes through a mobile home park. On the other hand, most of aviation fatalities are preventable because a conscious decision is made to take off. Both areas of public support benefit from the products and service provided by the NWS. While there are no obvious short-term trends in weather-related aviation fa-

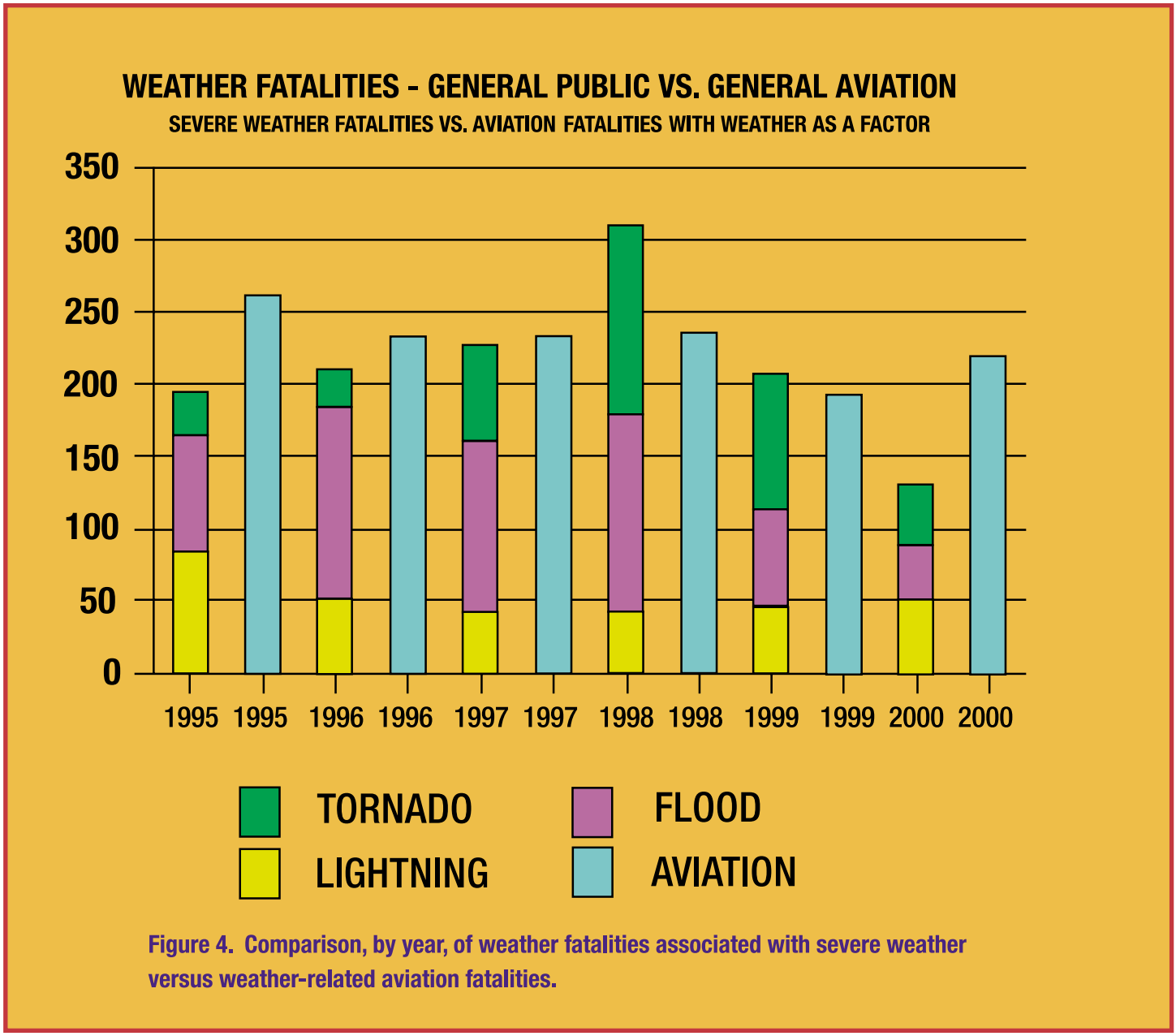


Figure 4. Comparison, by year, of weather fatalities associated with severe weather versus weather-related aviation fatalities.

talities, there has been a downward trend in severe weather fatalities over the past two years which may be partially linked to the actual frequency of severe weather. But identifying any single cause and effect of a trend is difficult, although technology, improved equipment, better forecasts, and an aggressive public awareness campaign certainly contribute to reducing the fatalities associated with severe weather.

The four figures presented here summarize data from over 2,000 fatal general aviation and small commuter airplane accidents. These figures were presented to increase the aviation community's awareness toward IMC weather as the single most significant factor in fatal accidents. The data also provide compelling evidence showing the equal role the NWS plays in two very important areas of public support—the general public and the aviation sector.

Summary/ Recommendations

The objective of this study was to show the significance of adverse weather on fatal accidents involving small aircraft. The intent was to review a large amount of data and summarize the results so efforts could be focused on a few critical areas. As presented here and in previous studies, adverse weather is a primary factor in fatal aircraft accidents. Repeatedly low ceilings, fog, or other visibility restrictions were the leading cause or a contributing factor in these fatal accidents. By all indications, the primary agencies (FAA/ATC, FAA/FSS, and NWS) responsible for supporting the pilot, in dealing with weather and aviation, are doing their job and doing it well. But it's the pilots who continue to err in their decision making process, and continue to take off or fly into IMC conditions even though they have access to the latest weather information or have received a complete pilot weather briefing.

Recommendations to remedy this problem are cited in numerous publications, agency goals, and articles. The FAA safety program, "Safer Skies – A Focused Agenda" targets weather as a safety issue for general aviation and FAA routinely carries weather safety articles in their publications. For more information on Safer Skies, see the following web site, <http://www.faa.gov/apa/safer_skies/Prsrls.htm>.

In a multi-agency publication, National Aviation Weather Initiatives, issued in 1999 by the Office of the Federal Coordinator for Meteorology, weather is cited as a factor in 23 percent of all aviation accidents. Annually this costs the country an estimated $3 billion for accident damage, related injuries, and delays. This thorough assessment identified 86 initiatives to improve aviation weather safety and services. The AOPA has an aggressive education and awareness program including seminars, recurring publications and articles. The 1974 NTSB study listed 10 recommendations, seven of those dealt with pilot training or familiarization of aviation meteorology. Their report concluded stating:

> *"an emphasis on weather awareness is required at all levels of pilot education…"*

The need for education and training concerning inadvertently entering IMC is a common theme in each of these studies, a recurring problem cited in NTSB accident reports, and the primary conclusion of this study. A special emphasis is needed for pilots with little or no IFR experience. For example, in June 1999, seven people died in Alaska because of a pilot's VFR flight into adverse weather, spatial disorientation, and failure to maintain aircraft control. The NTSB investigator asked the chief pilot of the company if he conducted any training for emergency use of basic flight instruments. He replied that he never did and emphasized that the company's policy was to "go down and slow down but never go into instrument conditions." When asked what he would do if he found himself in an IMC situation, the chief pilot indicated he was uncertain because he never intended to be in that situation.

With limited resources, it would be logical for all agencies concerned to target the number one causal factor and use the most cost-effective approach to reduce this factor. The results of this study indicate the focus must be on the pilot's decision making process when assessing whether to fly when IMC conditions exist or are forecast.

The aviation weather safety education campaign currently in place at the FAA and AOPA would be strengthened and complemented by an added focus from the NWS. For example, an outstanding NWS web site that some pilots are not familiar with is operated by AWC and is available at <http://adds.aviationweather.noaa.gov>. A multi-agency assault could be the difference in finally making a dent in this long-term aviation problem. In rough numbers, approximately 100 fatal crashes occur every year that are weather-related. About 70 of these 100 crashes are linked to IMC as a cause or contributing factor. An education campaign targeting this primary problem could save up to 100 lives per year or more. Perhaps a reasonable three-year goal would be a reduction in fatal crashes to 50 per year with 100 lives lost. Those numbers would be one-half of what the pilots are currently experiencing. A personal goal shared by all, however, is that this information reaches some pilot out there, and helps that pilot decide to fly smart, avoid IMC and heed the advice from FSS personnel when they say "VFR Flight Not Recommended".

I would like to extend a great deal of appreciation to Warren Rodie, Meteorologist-in-Charge of the Atlanta Center Weather Service Unit, and Lans Rothfusz, Meteorologist-in-Charge of the Forecast Office, Peachtree City, GA, for their support to proceed with this effort and their insightful technical review of the results.

Douglas Pearson is with the NOAA/National Weather Service, Atlanta Center Weather Service Unit at the FAA Air Route Traffic Control Center in Hampton, Georgia.

In a time when aviation security is being tightened and pilot certificates are being scrutinized more thoroughly then ever, a recent incident regarding a medical certificate led us to publish the following articles.

Doing Things Right

...Pays huge dividends for everyone concerned

by Jon L. Jordan, M.D., J.D.

Since first joining the Federal Aviation Administration in 1969, I have witnessed a dramatic change in the character and quality of the Aviation Medical Examiner (AME) system. I think this change is attributable to a number of factors. These include the establishment of more comprehensive AME selection criteria, better oversight of the system by both our regional flight surgeons and the Aerospace Medical Education Division, enhanced training methodologies, and better communication between AMEs and FAA medical personnel.

Perhaps, however, the most important factor has been the willingness of AMEs to adapt to technological change and to become more involved in providing services to pilots that facilitate their medical certification. While the AME system has improved significantly over the years, every now and then problems surface that need to be addressed and corrected.

As you know..., we [the FAA] expect AMEs to promptly forward the results of medical examinations to the Aerospace Medical Certification Division (AMCD). Failure to do so can have significant impact on airmen and damage the effectiveness of the medical certification system. In addition, it may have significant implications for the AME, both in terms of continued designation as an AME and possible liability if a medically related accident occurs.

In the last year or so, I have become aware of two instances in which AMEs have failed to submit examination results to the AMCD. In one case, the AME blamed a secretary for the problem. He made an attempt to repair the damage by searching his files and belatedly submitting "lost" examinations. In some cases, examination reports had to be reconstituted from notes and in other cases, no information on examinations could be found.

In the case of the second AME, no files could be made available to the FAA indicating that examinations had been performed or what the results of the examinations may have been. Therefore, we had no way of knowing whether the pilots had been properly issued their medical certificates.

Although we made every attempt to accommodate the pilots impacted by the AMEs' inaction, for a number of the pilots there was a cloud over their certification, and it was necessary that they undergo repeat examinations.

The consequences of these episodes were that the image of the certification system was significantly damaged, pilots were substantially inconvenienced, and resources were expended to correct the problems. Because of the magnitude of these problems, the designations of the AMEs were terminated.

Doing things right pays huge dividends for everyone concerned. [The FAA is] broadening the involvement of AMEs in certain elements of the certification process, with the objective of improving our services to airmen. Our success in doing this is highly dependent upon the willingness of AMEs to participate and the care that is taken to ensure that correct certification decisions are made.

In initiating this action, we are relying on AMEs to carefully follow the requirements of the authorizations granted by the agency. Unless this care is taken, we run some risk that the initiative will "bog down" the certification process, and the process will be impeded, rather than improved.

We are counting on all AMEs who participate in the [certification] process...to "do it right." In spite of the two situations I related in this article, I believe that they will. I also believe that we will be much further along in our objectives of providing quality service to the aviation community.

Dr. Jon L. Jordan is the Federal Air Surgeon and this article is reprinted from the Spring 2002 Federal Air Surgeon's Medical Bulletin.

So, You Thought You Had a Current Medical?

by Robert Martens

As a Safety Program Manager in a Flight Standards District Office (FSDO), I meet with the aviation public at least twice every week. And while I only reach a small segment of the aviators within our district, several years ago an inordinate number of program attendees asked why they were no longer receiving their monthly Aviation Safety Program Seminar announcement through the mail. Since only the holders of a current medical receive the announcement, which is mailed from Oklahoma City, my first question was whether or not they had a current medical. When they responded "yes," I knew we had a problem.

After checking their records on the FAA database, it was plain to see that their most recent medical information had not reached Oklahoma City, and all of these individuals had been to the same aviation medical examiner (AME)! The short version of this story is that this medical examiner "resigned" as an AME, but where did it leave the folks who went to him for FAA examinations? Were they legal or not?

In the early 1990's, similar questions from pilots in southern Connecticut revealed that an FAA designated medical examiner was performing medical examinations and not passing along the files to Oklahoma City. The most ironic incident that I uncovered was the AME who asked me about the status of HIS examination, only to find that his examiner had not forwarded the file. Subsequent follow up on other pilots revealed the files were still "sitting" in the medical examiner's office, while the unsuspecting pilots were flying with no record of their examination on file with FAA. The doctor was removed as an examiner, but countless pilots were left in limbo as to the status of their medical certification.

Why is this a problem, you might ask? Well, the answer is very simple. Should these unfortunate individuals have been involved in a fatal aircraft accident and have the only valid copy of their medical on their person, it may or may not be discovered by the accident investigators. And, if it weren't, the investigation would likely conclude that the individual was flying with an outdated medical certificate. Could this affect the insurance or liability claims? I think so!

If these incidents happened back in the 1990's, why am I bringing it up now—especially with the new computerized system of filing medicals?

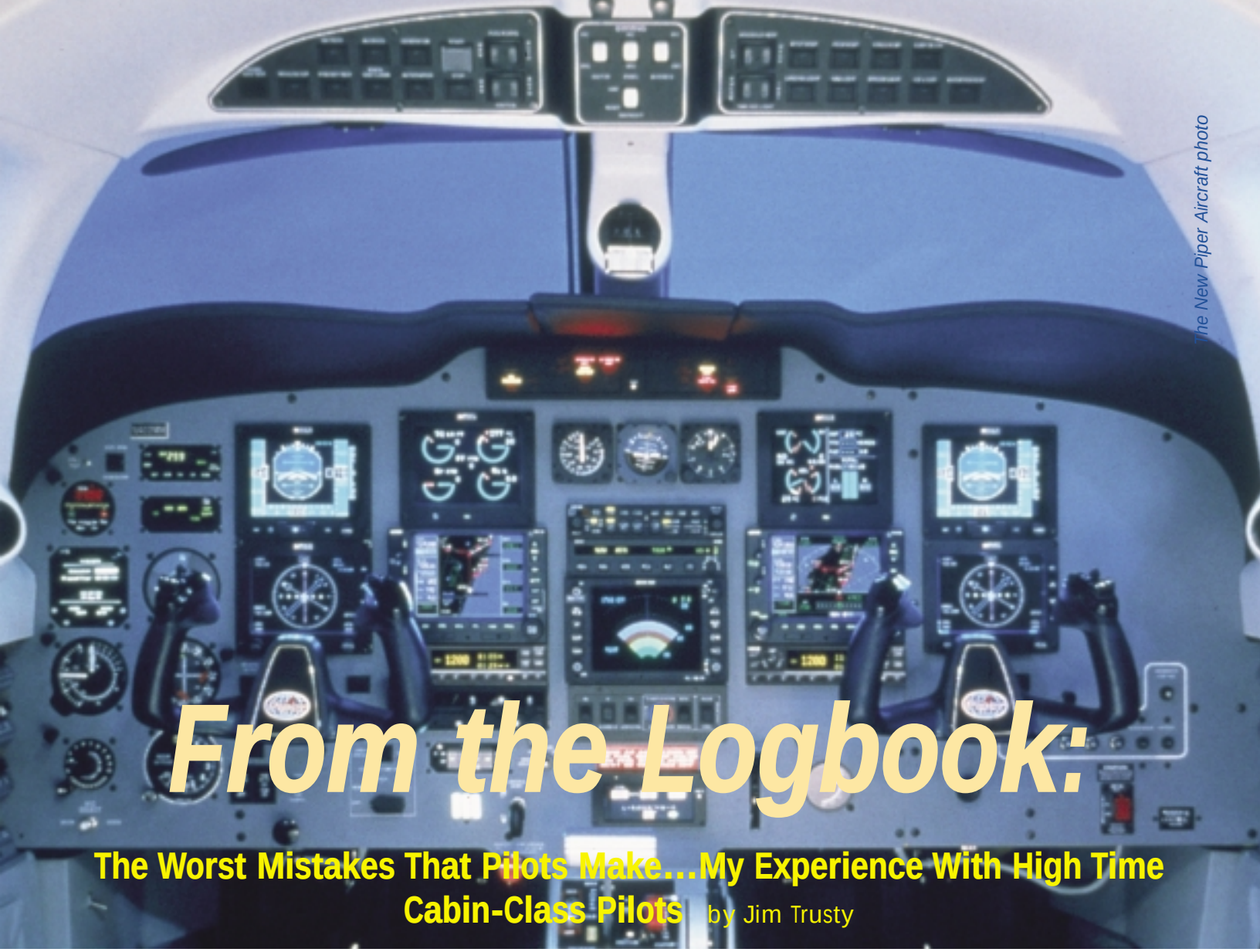
Recently I heard of another incident in the Washington, DC area when a pilot was applying for a security clearance to get out of Hyde Field in Maryland (one of the three remaining restricted airports). When the FAA safety inspector pulled up his records, it showed that the pilot didn't have a current medical. This was odd because the inspector had seen the copy of his medical when the pilot had come in to fill out the paperwork. What had happened? In this case the AME had moved to a new office days after the flight physical was completed. In the confusion of the move, the medical information was never transmitted to FAA. Fortunately, the pilot had no plans to fly any time soon, because it took three weeks to locate the missing papers and have them forwarded to Oklahoma City. However, for several months the pilot thought he was legal to fly. He was fortunate that nothing had happened.

How do pilot's know that their FAA medical is on file? At one time, unless they happen to tune in to the fact that they have stopped receiving their FAA Safety Seminar schedule each month, they would have to ask an FAA safety inspector to check it out for them. However, now airmen are able to look it up themselves by going to the FAA's web site. You just fill in the required information, and the site will tell you what certificates you hold and the date of the last medical Oklahoma City has on file. Medical information is derived from the records of the FAA's Civil Aerospace Medical Institute (CAMI). If the medical dates are incorrect, you can contact the CAMI at (405) 954-4821. The Airmen Inquiry Site can be found at <http://registry.faa.gov/amquery.asp>.

Let's go back to the accident scene and the only record of the poor pilot's medical examination has gone up in flames with the aircraft. What could the pilot have done to protect his/her family against liability claims and the possible voiding of the insurance policy? Some pilots keep copies of their logbook showing their endorsement and currency history in a file at home in case something happens to the original. It might be a good idea to also keep copies of your most recent medical and pilot certificates with them. This way, if something happens to the originals, you will at least have a copy until you can replace them. Also, in the event the worst happens, your family might need them to prove you were current and legal.

So, you thought you had a current medical. Are you sure? If you think there is a problem, check the FAA web site to see if the date listed is that of your most recent medical. If not, check with your AME and find out what happened.

Robert Martens is the Safety Program Manager at the Windsor Locks (CT) FSDO.



The New Piper Aircraft photo

From the Logbook:

The Worst Mistakes That Pilots Make...My Experience With High Time Cabin-Class Pilots

by Jim Trusty

You may ask: How can anyone at this level of aviation possibly make mistakes? Let me count the ways.

To begin with, pilots make mistakes just like any other professional we deal with on a daily basis simply because they are human. They forget. They start believing their own press releases (and sometimes write them, too).

They get comfortable with their past performance. They get complacent about the task at hand. They exceed their personal minimums. They rely far too much on newfangled ideas and technology. They let uncontrollable outside influences get them behind the power curve. Finally, and the most dangerous of all, are those that think of themselves as the "Hot Shot" or "Ace of the Base."

Pilots make mistakes by simply forgetting. What was the procedure they last used to avoid the problem they find happening once again? And right now! As they are progressing forward at over 200 knots, they have to put the brakes on their mind so they can simply think. In other words, at this very moment they are totally unprepared for this particular problem to rear its ugly head.

Whatever happened to them in that other long ago flight did not scare them enough to make an indelible impression on them that would speed up their thought processor and allow them to have a positive reaction to this present malady. They forgot!

They start believing their own press. They listen too closely when someone rides with them and tells them what a great flight it was, and they certainly listen when someone says they might consider a career with the "biggies" if their present career choice should suddenly go down the drain. They arrive at their destination on time and certainly ahead of all those non-pilots that had to take commercial flights to the important meeting. In their own minds, they become bulletproof.

They get too comfortable with their past performance. This usually turns out to be a major problem at any level of aviation, especially when something really stupid happens. This is usually the problem when we are told that some type of "pilot error" causes over 90% of all aviation accidents. They are usually very comfortable with their level of training, airmanship, aircraft knowledge, and certainly their expertise in getting from point "A"

to point "B" and landing safely. These pilots use the word "routine" a lot.

They get complacent. This is the easiest of all faults to fall into and the hardest to recognize and repair. You must first be the one who recognizes it and devise a plan of action that will not only cure it but possibly keep it from recurring. Some symptoms to look out for? The same route or flight on too regular a basis, with the same crew and the same airplane and the same old predictable weather. Starting to hit a nerve now? Same teacher or flight instructor at the same interval of time. Same destination and runway and cargo. It is predictable to the highest degree. It is also an erosion of all your skills and training if you let this happen to you. Just one tiny little surprise can get you in so much trouble that you might not be able to work your way out.

They exceed their personal minimums. Personal minimums are something that we as pilots in command set for ourselves. It is generally based on some scale or formula that we devise to rank or rate our previous performances. If any one thing changes in this flight that is one iota different from that personal minimum flight of sometime back, then very quickly we find ourselves behind the power curve.

Personal minimums should be improved on or at least added to on each and every flight. Don't mistakenly set your personal minimums too low in order to minimize the importance of the task on your shoulders. Write down what you feel are acceptable minimums that you have set for yourself and then discuss them with another pilot you trust or your personal flight trainer.

Get a second opinion. It just may be that you are capable of doing a lot more than you have been doing. Even worse, you may have overrated yourself to a level that you are unable to achieve on a regular basis. That can be very dangerous, and it is most easily spotted by you. No one knows you better than you.

They rely too much on new technology or ideas that can prove deadly without a backup. That dreaded Global Positioning System, or GPS if you will, has made a lot of pilots go bad, but we have lived through a lot of avionics changes over the years and survived. What we need to remember and use is the proven systems that have taken care of us for a lot of years—VORs, NDBs, Loran, time and distance, speed, wind correction, and certainly "Prior planning prevents poor performance."

The cockpit is no place to start planning your flight. After the engines fire up, you need to be on your way and on the instruments, not head down in the low altitude charts or the approach plates. Fly the airplane!

They let uncontrollable outside influences get them behind the power curve. Love life or lack of one, problems at home with spouse or kids, sickness, personal health problems, money, job, death, age—you simply cannot allow yourself to be anywhere but in that seat with all your thoughts on the job at hand or you are about to get into some serious trouble. "Can't chew gum and fly an airplane" is really a true statement.

I personally think that flying an airplane requires every bit of attention that you have to offer. Others may notice before you do that the power curve has not only caught up to you, but also is slowly passing you on the wrong side of the flight. If you are not mentally ready to devote your entire mind to taking this flight, don't go.

They think of themselves as the "Ace of the Base." In some instances they may really be the best pilots in the fleet, know an awful lot about aviation and airplanes, and along the way received the best aviation education. In reality, this can be the ticking bomb of the entire operation and if they go down they could take you with them. If something serious ever did happen to "Hot Shots," many times they crumble under pressure.

They take unnecessary chances, stress the other team members and the equipment, and in the end cost the company much more than they could ever have been worth. They also make it hard on all the other players as they try to do their jobs. You'll be able to recognize this person very quickly. They can fly anything better than anyone else, have been everywhere and done everything, and deep down know that this show-off attitude can someday hurt them or someone else. Be very wary of "Hot Shots." The smiles they see when walking by a group of pilots may not be happiness at their arrival, but joy that they are leaving.

Sometimes the very worst mistake pilots make is simply never learning that the airplane is really flying them. All they are doing is simply setting the knobs and going for a ride in a beautiful cabin-class aircraft. It is the most beautiful experience anyone can ever undergo (if aviation is your life and love). Prepare well for this experience and there will be many more trips for you. Do it wrong and you might get stuck with the tab.

Most of the mistakes listed above occur when pilots display the following five distinctive attitudes identified by the Federal Aviation Administration: (1) invulnerability; (2) anti-authority; (3) impulsivity; (4) macho; and (5) resignation. Don't let yourself fall into these traps by simply being aware of them. Know your enemy! And remember—"If all else fails, fly the airplane!"

There are certainly a lot of great flight instructors out there to help you stay at maximum performance. Try to find that certain one that exceeds your needs and is not afraid to tell you what has to be done. Learning and relearning how to fly is a constant battle; at least it's supposed to be. How is your flying? Are you completely satisfied with it? Remember, I said completely. If you can afford to fly that aircraft you are in, you can also afford good training.

I'll see you at the airport. Come up and say "hi."

Jim Trusty is the 1997 National Flight Instructor of the Year, the 1995 Southern Region FAA Aviation Safety Counselor of the Year, and works daily as a full-time, "Gold Seal" flight instructor at MQY in Tennessee.

DO YOU STILL REMEMBER

Mario Toscano photo

HOW TO DO IT?

By H.Dean Chamberlain

In September, I had the privilege of working with a great group of professionals, both industry and FAA, at the 2002 National Championship Air Races in Reno, Nevada. We will tell that story later this summer as we get closer to the date of the 2003 races. While working with the FAA Aviation Safety Inspector in charge at the races, I had the opportunity to ask him for his thoughts on aviation safety.

Clarence Bohartz is not your average FAA safety inspector. In all of the years I have worked with FAA inspectors while writing for this magazine, I have never met any inspector who seemingly knew as many people as he did. It seemed that everyone we met at the races knew him and wanted to either tell him something or ask him something. I jokingly told him the real story of Reno would be about the first person that we met who did not know him. Of course, Clarence has worked in the Reno area for years both as a civilian and now as an FAA inspector. Nor, have I met any inspector who had as good a working relationship with those responsible for an event as he did.

Clarence has had an interesting career. At one point, he worked for Bill Lear when Lear was developing his last aircraft in Reno. For those not familiar with the project, after Lear's death, Lear's wife continued the development program, but the program failed to attract the support it needed and the project faded into history. I am noting all of this to highlight the fact Clarence has been there, done that, and he has probably bought a T-shirt or two.

When asked, Clarence made comments about general aviation safety in his area that I think everyone should be reminded of periodically. He thinks basic flying skills and knowing how to calculate aircraft performance are vital skills for any pilot. His comments are especially important for those planning on flying into or through the Reno area and are unfamiliar with high altitude flight. He also told me. "I like to give an occasional private pilot check ride. It keeps me current and gives me a chance to see how much new applicants know."

Surprisingly, in today's high technology world Clarence's biggest concern is how many private pilot applicants and even certificated pilots know how to fly using basic flying skills and pilotage including how to plot a course using map, plotter, and the old E6-B flight computer.

When giving a flight test, he said, "I like to start failing things as soon as I can." From what he said, I could imagine a cockpit full of yellow stickers as he starts failing things. He said it is important for pilots to be able to fly using the basic flight instruments because things can and do fail. He said the same thing about batteries. As he spoke, I began to see images in my mind of someone's new, super, electronic flight computer sitting beside the applicant with a bright yellow sticky marking its failure. I could almost picture the sweat starting to developing on the applicant's forehead as the private pilot hopeful asks him-or herself, "Why me?"

It's hard for a mechanical E6-B to fail, and it is simple to use. Do you still know how to use it? If you are a certificated pilot, could you pass Clarence's no-frills basic check ride? Do you still remember the basics?

When talking about basic piloting skills, Clarence and other safety inspectors I have talked with have repeatedly expressed their fears that pilots today are losing their ability to maintain situational awareness in flight. They believe a significant part of the problem is the number of pilots who use GPS. Because GPS can provide extremely accurate heading, distance, and time information, many pilots have stopped plotting their course data on charts and flight logs. Check points-—what are they? When was the last time you did a complete flight plan? When it is so easy to punch in a destination identifier and your GPS, panel or handheld, displays all of the your flight data, it is hard to imagine doing it the old fashion way. But that is what Clarence wants to see someone do. Power does fail, especially when you take a check ride with Clarence.

How would you maintain situational awareness if your GPS fails? When was the last time you used your VOR or kept track of your flight route on a chart? When was the last time you plotted a radial or cross-bearing on your chart? When was the last time you calculated a wind-correction angle?

For that matter, when was the last time you brushed off your old mechanical flight computer and calculated data needed for a flight? Do you even remember what one looks like? Do you still own one? Have you ever owned one?

One of the most important functions any flight computer, mechanical or electronic, can do is calculate density altitude. But when you listen to some of the accident stories you hear about out west and, especially during the summer, it makes you wonder how many pilots ever calculate density altitude as part of their flight planning.

According to Clarence, in addition to pilots being able to master basic flying and knowing where they are, density altitude is one of the most important numbers pilots should be able to calculate. Using Reno's Stead airport as our baseline example with its eleva-

tion of 5,040 feet (see above chart), pilots flying into Reno/Stead need to know their aircraft's performance data when landing and later for takeoff. As Clarence and other inspectors have pointed out, normally it is not the local pilots who have trouble flying in their local operating environments, such as at Reno, or in their local mountains, or in their local desert areas. It is the transient pilot who is operating out of his or her normal environment. For example, now as an east coast based, lowlands pilot, I seldom get more than 5,000 feet above mean sea level (MSL) unless I am on an IFR flight plan. Even on a hot summer day, my density altitude factor may only add a few thousand feet to my home field elevation of 72 feet MSL.

To put all of this in perspective, the highest terrain elevation listed on the Washington sectional chart is 4,050 feet. This is almost 1,000 feet lower than the field elevation at the Reno/Stead airport. Add in a 80 or 90 degree day, and you can begin to appreciate why Clarence and others stress the importance of good flight planning, knowing how to calculate density altitude, understanding your aircraft's flight manual or pilot's operating handbook and being able to calculate the aircraft's performance when operating in a marginal performance environment, such as at a high elevation airport or in above normal weather conditions.

Another inspector here in Washington with years of experience flying in the mountains out west wanted an important safety item added to this article. He reminded me that aircraft operating performance data is based upon a new aircraft with a new engine being operated by a pilot experienced in testing aircraft. Then that test data is adjusted for standard operating conditions calculated to be sea level and 15 degrees Centigrade. Your aircraft may not and probably will not meet its published performance data. Your climb performance is also effected by your aircraft's rigging and trim, your piloting technique, and actual aircraft weights. Most of us don't really know how much weight we have loaded onboard since we don't normally weigh passengers, baggage, or ourselves. Add in the normal weight we carry in our aircraft such as extra oil, chocks, ropes and tie-down gear, charts, flashlights, water, and other items, and you can see how an aircraft may soon become very "heavy."

Now add in some high mountains surrounding that airport and you can begin to see why transient pilots may have problems landing and taking off in such areas. Although Stead airport has long runways, many airports have very limited runways. Some runways hardly meet the meaning of runway. Add in a few trees or obstructions on each end of an isolated desert or

Aviation Safety Inspector Clarence Bohartz checks off information at the Reno Air Races.

One photo says it all. Reno/Stead is not a sea level airport. Density altitude can be a critical factor on a hot day.

H. Dean Chamberlain photos

mountain runway or landing strip, and you can see why Clarence wants to see how well a private pilot applicant can fly the aircraft with minimal flight instruments. When flying in marginal performance conditions, he believes the ability to being able to fly the aircraft without having to look inside the cockpit may be the difference between an accident and a safe flight.

Again, this is back to basic airmanship and being able to control your aircraft.

To better show the comparison between the Washington sectional's highest terrain elevation of 4,050 feet; we need to review the Reno area which is on the San Francisco sectional. That sectional's highest terrain elevation is 14,491 feet located northwest of Owens Lake, California. Reno, itself, and Stead airport located about 10 NM northwest of the city are in wide valleys surrounded by mountains ranging in height from 8,000 to 10,000 feet MSL. So you not only have to work with a high airport elevation, but you have to be able to deal with high terrain in the immediate area. If you can't fly over the higher terrain, then you have to be able to fly through the valleys and passes to circumnavigate in and out of the area. In either case, you may have to deal with turbulence during certain times of the day. Add in rough terrain, and you can begin to see why Clarence and other inspectors worry about transient pilots flying in and through their areas or other mountainous areas. This is why Clarence wants to make sure the pilots trained in his area really know how to fly.

So you are taking your private pilot check ride with Clarence. You have done your homework well. Your flight instructor knows Clarence. She has briefed you on what you can expect from taking your check ride with a Fed. She has told you about his yellow stickers. So after you have said hello and he has reviewed your paperwork, you start looking for his pack of yellow stickers. You wonder how many he brought with him. You hope it is not a fresh pack. But as you pull out your electronic flight computer to work the cross-country flight he has asked for, you steal a glance at his bag and sure enough, he has gone for the dreaded yellow stickers. Your new electronic-do-everything whiz machine has taken a yellow bullet through its battery's electronic heart. Your expensive, pre-programmed silicon-valley pilot's dream computer has just "died."

Most applicants would start to worry at this point, but not you. You had been warned about what happens when silicon-valley cool stuff meets Clarence's plain yellow stickies. You know Fed yellow always beats high-tech gadgets.

But you are prepared, you have an old mechanical flight computer tucked away in your bag, and you know how to use it. You know how to plot your course; you know the rules for converting from a true course to a magnetic one and how to compensate for magnetic variation and deviation. You know how to use the airspeed side as well as the wind triangle side. You are prepared.

More importantly, you know how to calculate density altitude, don't you? You should because according to the FAA's *Pilot's Handbook of Aeronautical Knowledge*, AC 61-23C, it

states on page 4-10, "Air density is perhaps the single most important factor affecting airplane performance. It has a direct bearing on the power output of the engine, efficiency of the propeller, and the lift generated by the wings." The AC goes on to state, "… when the air temperature increases, the density of the air decreases. Also, as altitude increases, the density of the air decreases. The density of the air can be described by referring to a corresponding altitude; therefore, the term used to describe air density is density altitude." "Density altitude is determined by first finding pressure altitude, and then correcting this altitude for nonstandard temperature variations. It is important to remember that as air density decreases (higher density altitude), airplane performance decreases; and as air density increases (lower density altitude), airplane performance increases." The AC also says, "An increase in air temperature or humidity, or decrease in air pressure resulting in a higher density altitude, significantly decreases power output and propeller efficiency." I think this about sums up how important density altitude and aircraft performance are when operating in hot, non-standard conditions at or very near aircraft gross weight or in conditions that limit your aircraft's performance.

The following is a simple example of how to calculate density altitude on a manual flight computer for those who may not have done one in a while. If you forgot what one looks like, see page 22. First find the temperature at the airport, say 77°F, and convert it to degrees Celsius, 25°C. Next position the 25°C opposite the airport's pressure altitude of 3,000 feet. The density altitude of 4,800 feet will appear in the density altitude window. Armed with your density altitude number, you can now go to your aircraft's pilot operating handbook (POH) or flight manual to review its performance numbers. Depending upon the age and condition of your aircraft, you may want to be very conservative in calculating your aircraft's performance data.

If you find yourself in a marginal situation with limited performance, you may want to consider some of the following options. If you are at or near gross weight, you could off-load enough weight to give yourself a safety margin. Only you know if you need to carry everything, but if you really need to take all of the items you have packed for the trip, you may want to make multiple trips to ferry the items to your destination rather than risk taking off with no margin for error. Another technique is to fly early in the day or late in the evening when the air is cooler. Plus the turbulence should be less early in the day or later in the day. You may also try finding a lower route to reduce your need to climb high. And when route planning, it may be safer to fly a longer route over "friendly" terrain that may have lower terrain or more access to help or better landing options in case of loss of an engine than taking the shortest route that may expose you to more hazards. If you are flying through mountains or canyons, always give yourself an out by being able to safely make a 180-degree turn. You never know when you are going to run out of flying room. The choice is yours. Plan carefully.

Oh, and about that check ride and the yellow stickers, you will have to ask Clarence about what happened when you stop in an chat with him at the Reno Flight Standards District Office or at next year's National Championship Air Races. You do know him, Right?

The 40th National Championship Air Races will be held September 11 through September 14, 2003.

Make your plans on attending early, since all of the flight crews, their families, and supporters, and the thousands and thousands of spectators will all be in Reno for the event. For more information about the races, you can visit its Internet web site at <http://www.airrace.org/index.php>.

Reno/Stead sits in a wide valley surrounded by rising terrain. L-39's race by in the foreground.

H. Dean Chamberlain photo

All in the Approach

Landing a tailwheel aircraft starts a long way from the runway

by Timothy Brill

Landing a tailwheel aircraft can be a frustrating experience because transitioning from a tricycle-gear aircraft requires learning some new techniques and polishing some seldom-used skills.

As a former Alaskan bush pilot and flight instructor, I've taught many people how to tame the tailwheel. I've found students can tame the tailwheel by following a few simple steps. By planning the approach, precisely controlling the airplane's energy before landing, and exercising good rudder control, your students can master tailwheel landings, too.

The first step of the landing process is to "get to the runway." It sounds simple, but it still deserves some scrutiny. Keep in mind a few definitions:

- The aiming point is some point on the runway (or anything that may resemble a runway if you're in Alaska) that you fly your descent-to-landing pattern in relation to.
- The landing point or touchdown point is the actual point on the runway where the airplane touches down. It is past the aiming point.
- The go-around point may be based on an altitude or visibility, like an instrument missed approach, or on a performance consideration, an obstruction, or anything that causes the pilot to be unhappy with the approach. Keep your hand on the throttle during the approach in case you need to go around.

Given those definitions, let's look at some approach problems. Consider the ability of your airplane to get to the runway in case of a power failure. Most people fly patterns that are too big. Keep the pattern tight.

Consider your altitude. Most approaches are flown too low. The glide ratio on most small aircraft is about four to five degrees; a VASI (visual approach slope indicator) or PAPI (precision approach path indicator) is typically three degrees. If you follow the VASI, you are probably below your aircraft's glidepath. Of course, on an instrument approach, you may not have a choice.

Stay on, or just above, your aircraft's glidepath. If you are on it, you will steadily reduce your power as you get closer to your aiming point. If you have to add power, you are below it. If you are low and you have an engine failure, you will not make it to the runway.

Pitch and power are two sides of the same coin. You cannot change one without affecting the other. Interestingly, most private pilots are taught to use pitch for airspeed and power for altitude. Instrument pilots are taught to use pitch for airspeed and power for altitude, but then they are taught to maintain the glidepath with pitch and the airspeed with power. Confusing, perhaps, so just don't think about it; it works because they are essentially the same. On final approach, maintain a constant airspeed, then use power "as needed" to get to the aiming point—more power if "low," less power if "high."

Students improve their aircraft control by using trim to maintain airspeed. I normally establish my airspeed on downwind and then trim off the control pressures. Students will have to retrim every time they use flaps or change airspeed. This technique works well, even in windy conditions—students quickly discover in a stiff head wind they need constant "slight" forward pressure and lots of extra power to get to the runway. Remember, forward pressure establishes the best glide speed after an engine failure.

Once we have made it to the runway, we now have to get control of the airplane over the runway. In most bad landings, the pilot never really adequately controls the airplane over the runway. It can be called a random arrival, or perhaps just a controlled crash. So, what is control? Using "slow flight" over the runway is a good control exercise. [Editor's note: Students should only practice this exercise with an authorized flight instructor, who is current and proficient in this exercise.] Fly final, flare at the aiming point, and, just before the aircraft touches down, add some power. You can fly the entire length of the runway, under control and in the correct landing attitude. I generally add power right after I flare, when the airplane's energy is reduced. If you add power too early, you just keep flying. Once students can get to the runway, have them flare and fly down the runway in slow flight. Have them try some shallow banked turns, perhaps even some S-turns. This is great exercise for learning the required pressures for crosswind landings. When the airplane runs out of energy, it lands. It's that simple.

As the pilot, you essentially manage your aircraft's energy—both the energy of motion (kinetic) and the energy hidden in altitude or power (potential). You are continually trading one for the other—altitude for airspeed or airspeed for altitude. The key for a good landing is to fly a constant airspeed approach, get control of the airplane over the runway, maintain that landing attitude or sight picture, and let the airplane continue to fly down the runway until it runs out of energy.

While we're talking about landings, let's look at the rudder. Most people transitioning to tailwheel airplanes use the rudder improperly. The rudder keeps the airplane going straight down the runway. Rudder input always includes two parts—quick application and then quick return to neutral.

Rudder stalls are good exercises that demand particularly quick feet. It's a stall, so begin with lots of altitude. You control the stick and throttle, and your student will work the rudder. Stall the airplane and maintain the stall by holding adequate back-elevator pressure. Begin the exercise with idle power. Ask the student to keep the wings level with the rudder.

Remember, rudder inputs are two-part: First, a quick application to lift the dropped wing, and, second, a quick return to neutral. The airplane may roll violently, and if yaw couples with that roll, it can spin. If the student is aggressive with the rudder inputs, he or she will prevent the spin by minimizing the yaw. Add power above idle to increase the roll instability.

As I coach students through these exercises, I've noticed a couple of common faults. First, students do not use the rudder. Then, when they realize the importance of the rudder, they make big, slow rudder inputs, without getting back to the neutral position quickly. As a result, the airplane initially does not respond, then quickly over responds beyond the pilot's expectations. It's like a wave—the magnitude gets bigger and bigger, and finally it grows beyond most pilots' ability to control. The rudder inputs need to be small and quick. If the airplane's nose moves left, several quick taps on the right rudder will correct the problem. Students shouldn't stop moving their feet. Keep them dancing on those rudder pedals.

Your students need to memorize the sight picture for every aircraft they fly—especially if that aircraft has a tailwheel. When your airplane is tied down on the tarmac, all three wheels are in contact with the runway—this is your three-point landing picture. Have them look out the front as well as the wings. When you establish control of the airplane over the runway, there is no need to pitch the nose any higher than the three-point picture. If they do, they will land tailwheel first.

As the airplane's energy decreases (as airspeed decreases), students may have to add more back pressure—not to change the pitch, but to maintain the three-point picture they established during the flare. Teach them to think small pressures. When the main gear touches down, pull power to idle (except on soft fields) and bring the stick full aft. Make sure they do it slowly. If they yank the stick back, the airplane may balloon. If that happens, they have three choices—go around; get control of the airplane over the runway and try again; or cut power, pull the stick full aft, and make a second, harder, three-point landing. Make sure the student keeps dancing on the rudder pedals until the airplane is completely stopped.

Landing a tailwheel airplane takes planning and technique. But with some instructional tricks, you can make it as easy as a walk in the park and teach your students a lot about flying in the process.

This article is reprinted with permission from the September 2001 issue of the NAFI Mentor.

Staying Proficient

by Patricia Mattison

I overheard a conversation the other day, regarding a lack of pilot qualifications that troubled me a bit. No, to be truthful, it troubled me a lot. The conversation surrounded the subject of pilot certificates, pilot medicals, and flight reviews—or rather a lack thereof.

I want my readers to understand that the majority of pilots I deal with in Alaska are very straight arrow. That is to say that they follow the rules that apply to their certificate. There are the few, however, who—for the most part—are flying as private pilots, who own their own airplanes, and who choose to disregard regulations that are designed to save lives. Suffice it to say that there are those who have never had formal flight instruction of any kind. They usually fly alone and use the plane like a truck on a farm or what have you. There are those who have been unable or unwilling to get a medical certificate for whatever reason, but continue flying anyhow. These folks are in blatant disregard of the regulations, but the reality is that they do exist.

Then there is another group of pilots who fail to get a flight review as required in Title 14 Code of Federal Regulations §61.56. That group mystifies me the most. It seems that going for an hour or so ride with a flight instructor once every two years is the very least a pilot can do in the name of aviation safety.

I realize that I have written about the flight review many times before and have had questions regarding the flight review more frequently in the recent past. Once and for all the flight review is not a test. You cannot fail a flight review. You can take a bit longer than you think to get a sign off, but you will pass once the instructor feels that you can perform the functions of your rating safely. Maybe that means spending a bit more of your hard-earned cash, but consider how much you are worth to your family.

Most pilots use an airplane to go from point A to point B and don't do a whole lot of maneuvers along the way. Most pilots get rusty when it comes to stalls, steep turns, and specialty landings. Before you go for a flight review, practice the stall series and turning maneuvers. Take some time to go over a few landings, short and soft field and spot landings. If you feel uncomfortable doing this by yourself, wait and take a flight instructor with you. Don't do anything that could get you in a situation that compromises safety. You are by no means unique if you see yourself as an A to B pilot. The remedy is to fly with an instructor at least every other year, if not more frequently.

The FAA offers a program where you can get rewarded for being a proficient pilot. The program is called the Pilot Proficiency Program, better known as the "Wings" Program. If you come to one safety meeting held by the FAA or a safety counselor you can ask for a "Wings" card to be signed. Then take three hours of flight training in a period of one year. Have your instructor sign the back of the card indicating your flight time. Send the card to your local flight standards district office (FSDO) and you're entitled to a certificate attesting to your accomplishment towards safety, a letter of congratulations, and a "Wings" pin. You can receive a different level of pin each year (up to 10) that you complete the requirements. If you are lucky enough to own an aircraft you just might qualify for a reduction in your insurance premium. Completion of the "Wings" Program also takes the place of the flight review.

In addition, the FAA offers an inspection program for pilots and aircraft called the Pilot Aircraft Courtesy Evaluation or PACE. An FAA operations inspector or safety counselor reviews your pilot certificates and flight log books to see if you need to accomplish anything that you might have overlooked. Then an FAA airworthiness inspector or safety counselor looks at your aircraft and aircraft logbooks to see if everything is in order. There is no action taken even if something is found, other than pointing out a discrepancy, if there is any. In other words you can't get into trouble if you have overlooked something. You only need to take care of the overlooked item and you are on your way. All this for free, no strings attached.

It is all so easy that I find it hard to be sympathetic to pilots who ignore currency or especially proficiency. You owe it to yourself to be the best pilot you know how. You owe it to your passengers and family as well.

Fly safely.

Patricia Mattison is the Safety Program Manager at the Juneau (AK) Flight Standards District Office.

FAMOUS FLYERS

A Dream of Wings

by Deidria N. Shaw

In 2003 we prepare to celebrate the centennial of the Wright brothers' first controlled, powered flight, but they weren't the first to be fascinated by the idea of flight and to suggest ways for man to fly like a bird. The following article highlights some of these early attempts—both real and imagined.

Birdlike flight through infinite space is one of mankind's oldest dreams. It is a dream, which has persisted since ancient time. Early man no doubt watched the birds flying and wondered if he too could fly.

Believed to be one of the earliest achieved winged flights known to man is said to have happened in the 15th century B.C. Legend has it that Persian Monarch Kai Kaoos found that conquering all lands and territories visible was not enough. He decided to extend his empire to the sky. The king tasked his eminent advisers to discover a way to achieve flight. Their answer was powered flight courtesy of four eagles. The eagles were attached to the four corners of the king's throne while chunks of meat were waved overhead, exciting the birds into furiously flapping their wings. Although, the throne was airborne quickly, King Kai's directional control was nonexistent. After wandering aimlessly around the sky, he descended with nothing but harsh words for his advisers.

The Greek father/son story of Daedalus and Icarus was the most popular legend of the "flight-kind." Daedalus, being a master artificer (or maker of things), created many objects that figure prominently in various myths. He was most famous for constructing a labyrinth on the island of Crete. A maze so intricate that no one could find their way out of it. The labyrinth was where King Minos kept Minotaur, a half-man, half-bull monstrosity. As a result of Crete winning a war against Athens, Minos demanded that Athens send seven maidens and seven youths to Crete every nine years to be sacrificed to the Minotaur. After years of Minos feeding Athenians youths to the creature, the hero Theseus arrived and eventually slayed the Minotaur. Because of the Athenian prince-hero's success, Daedalus soon fell out of the king's favor, and he and his young son, Icarus, were imprisoned and shut into the labyrinth (some stories say a tower). Daedalus, knowing his way out and fearing the king would harm him and his son, decided escape by air was his only option, as the seaports were too well-guarded. Being a skilled artificer, he fashioned two sets of large wings using feathers his son had collected. The larger feathers were sewn together and the smaller ones were held to the frame with wax.

Before making their escape, Daedalus warned his son that flying too close to the sun would melt the wings, and too close to the sea would dampen the feathers making it hard to fly. Exhilarated by the flight, Icarus forgot his father's warnings, soared too close to the sun, and fell to his death into the sea. Saddened by his son's death, Daedalus continued on to Sicily where he flourished but flew no more.

One of the earliest recorded "tower jumpers"—people who tried to fly by jumping off a high place (usually a tower, thus the term) with wing-like devices connected to their arms or body—was King Bladud of Britain in the 9th century A.D. Medieval chronicles reported that the king journeyed to Athens to gain the knowledge of the legendary Daedalus. Upon his return home, King Bladud built a pair of wings and, in an attempt to fly off a London church tower, fell to his death.

Oliver of Malmesbury, an 11th century English monk and astrologer, attempted a flying leap from a tower in 1020. He reportedly glided a short flight of 250 yards and survived a bumpy landing (he broke both legs). He crossly announced that his failure was attributed only to his forgetting to fit a tail to his "hind parts." There is no record that the monk attempted another flight. Fellow Englishman Roger Bacon may have been referring to the monk when he said "there is an instrument to fly with, which I never saw, nor know any man that hath seen it, but I full well know by name the learned man who invented the same."

In the 13th century, Bacon also advocated the building of a flying device, but whether it flew successfully is one of the best kept secrets of the Middle Ages.

Leonardo Da Vinci was quoted as saying, "there shall be wings! If the accomplishment be not for me, 'tis for some other." During the 15th century Da Vinci pursued the dream of flight in his own inimitable way by studying the flight of birds and designing flying machines. He considered hundreds of ideas for human flight. However, it ap-

pears that the only concept he actually tested was of a toy helicopter with a spiral shaped wing. This idea might have worked if a lightweight power source had been available. It should be noted that Leonardo also invented the parachute, a device that would enable humans to safely descend from heights.

The court of King James IV of Scotland was home to some extraordinary individuals, but none as fascinating as John Damian de Falcuis, the Court Physician. Damian was an Italian scientist, physician, metaphsician, and an alchemist who charmed the king with promises of creating gold from base metals. Having failed to enrich the king with homemade gold, Damian's next ploy was to fly like a bird from the walls of Stirling Castle and soar towards France. In September of 1507, he announced that he had solved the mystery of human flight after spending many hours studying the flight patterns of birds and was prepared to demonstrate it. By the accounts of all who were present, it seems that Damian did not make it to France. After a fanfare of trumpets, Damian flung himself from the castle's wall madly flapping the pair of 10-foot wings he had constructed by nailing hundreds of chicken feathers to a wooden frame. The cheering crowd watched as he momentarily achieved lift, but he soon plunged earthward into a dunghill below the castle walls. Escaping with only a broken leg, Damian blamed his failure on the fact that he used the feathers of a chicken, a bird that does not fly, to make his wings.

The problem with the myth of Daedalus and Icarus is that it was just that—a myth. Man can not fly like birds. Using arms and the most cleverly contrived wings, man can not generate enough flapping power to fly. The power to weight ratio of man is far less than that of a bird. This fact alone did not stop many from trying. With the misguided encouragement of scientific literature of the medieval period, tower jumping became a daring sport.

Many dreamed of flying, others pursued this dream and escaped within an inch of their lives, some merely breaking bones, but exhilarated by the experience. Even the Montigolfier brothers' invention of the hot air balloon did not deter winged individuals from leaping to their fate. As late as 1801, a 72-year-old French general, Resnier de Goué, made a flapping leap from the ramparts of Angouleme. Fortunately, he survived with no injuries since he landed in the Charente River. We may never know how many lives were lost or bones broken in this pursuit of flight that began several millenniums ago. What we do know is that on December 17, 1903, on a sandhill in North Carolina, two brothers from Ohio made this dream of powered flight into a reality and forever changed the course of history.

Editor's Note: The lure of human-powered flight continued to intrigue potential aviators over the centuries. Every imaginable contraption was designed, and many were built and tried, but none showed even a glimmer of success until August 23, 1977, when an ungainly huge-winged aircraft rose from the desert sands of California to make the first officially recorded successful flight entirely under human power. The craft was named the Gossamer Condor by its designer, Dr. Paul MacCready, after the rare California Golden Condor whose long-winged configuration it resembled and gossamer for its transparency.

Can I Take It With Me? Permitted and Prohibited Items

Prohibited items are weapons, explosives, incendiaries, and include items that are seemingly harmless but may be used as weapons—the so-called "dual use" items. You may not bring these items to security checkpoints without authorization.

What Happens to Prohibited Items?

If you bring a prohibited item to the checkpoint, you may be criminally and/or civilly prosecuted or, at the least, asked to rid yourself of the item. A screener and/or Law Enforcement Officer will make this determination, depending on what the item is and the circumstances. This is because bringing a prohibited item to a security checkpoint—even accidentally—is illegal.

Your prohibited item may be detained for use in an investigation and, if necessary, as evidence in your criminal and/or civil prosecution. If permitted by the screener or Law Enforcement Officer, you may be allowed to: consult with the airlines for possible assistance in placing the prohibited item in checked baggage; withdraw with the item from the screening checkpoint at that time; make other arrangements for the item, such as taking it to your car; or, voluntarily abandon the item. Items that are voluntarily abandoned cannot be recovered and will not be returned to you.

The following are some of the items that are permitted and items that are prohibited in your carry-on or checked baggage. For the full list visit the Transportation Security Administration's Travelers and Consumers web site at <http:// www.tsa.gov/public/theme_home1.jsp> and click on "Permitted & Prohibited Items." You should note that some items are allowed in your checked baggage, but not your carry-on. Also pay careful attention to the "Notes" included for each section. They contain important information about restrictions.

The prohibited and permitted items chart is not intended to be all-inclusive and is updated as necessary. To ensure everyone's security, the screener may determine that an item not on this chart is prohibited.

The chart applies to flights originating within the United States. Please check with your airline or travel agent for restrictions at destinations outside of the United States.

Personal Items That Can Be Carried On Or Checked

Eyelash curlers
Knitting and crochet needles
Knives, round-bladed butter or plastic
Nail clippers and files
Personal care or toiletries with aerosols, in limited quantities* (such as hairsprays, deodorants)
Safety razors
Scissors-plastic or metal with blunt tips
Toy transformer robots
Toy weapons (if not realistic replicas)
Tweezers
Umbrellas and walking canes (allowed in carry-on baggage once they have been inspected to ensure that prohibited items are not concealed)

Sharp Objects** That Can't Be Carried On, But Can Be Checked

Box cutters
Knives (any length and type except round-bladed, butter, and plastic cutlery)
Razor-type blades (such as box cutters, utility knives, razor blades not in a cartridge, but excluding safety razors
Scissors, metal with pointed tips

Defense Items/Firearms*** That Can't Be Carried On, But Can Be Checked

BB Guns
Compressed air guns
Firearms
Mace/pepper spray****
Pellet guns
Realistic replicas of firearms
Starter pistols

Tools** That Can't Be Carried On, But Can Be Checked

Axes and hatchets
Crowbars
Hammers
Saws (including cordless portable power saws)
Tools (including, but not limited to wrenches and pliers)

NOTES:

* Some personal care items containing aerosol are regulated as hazardous materials. This information is summarized at <http://cas.faa.gov/qa.html>.

** Any sharp objects in checked baggage should be sheathed or securely wrapped to prevent injury to baggage handlers and inspectors.

*** Check with your airline or travel agent to see if firearms are permitted in checked baggage on the airline you are flying. Ask about limitations or fees, if any, that apply. Firearms carried as checked baggage MUST be unloaded, packed in a locked hard-sided gun case, and declared to the airline at check-in. Only you, the passenger may have a key or combination.

**** One 118 ml or 4 fl. oz. container of mace or pepper spray is permitted in checked baggage provided it is equipped with a safety mechanism to prevent accidental discharge. This information is summarized at <http://cas.faa.gov/qa.html>.

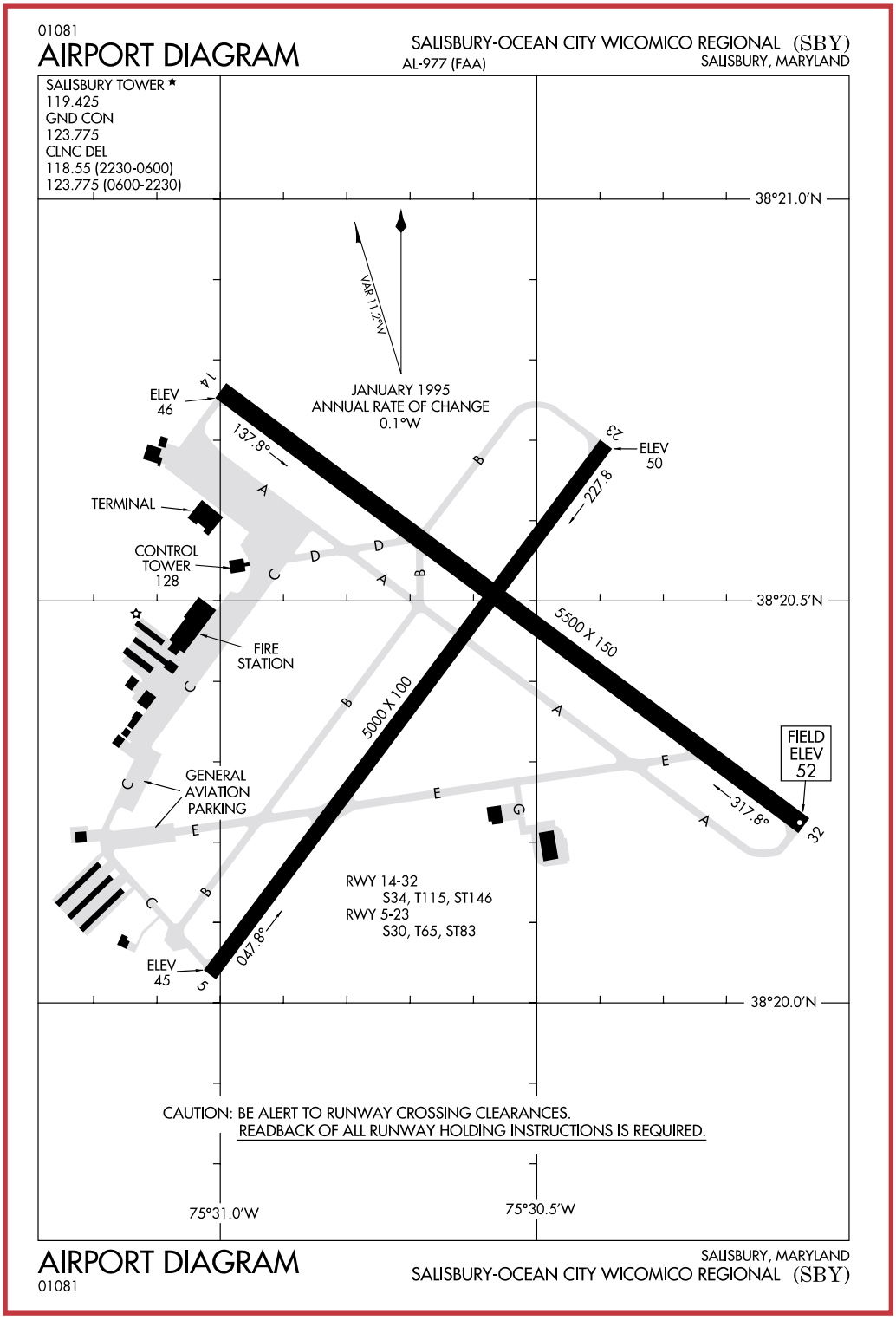
Information provided by the Transportation Security Administration and subject to change

Airport Diagrams

It has come to our attention that many pilots aren't aware that the FAA now offers airport diagrams for selected Title 14 Code of Federal Regulations part 139 airports. The airport diagrams depict current runway and taxiway configurations and will assist both VFR and IFR pilots in ground taxi operations at large complex metropolitan airports.

The process is simple. Just visit the FAA's National Charting Office's web page at <http://www.naco.faa.gov/ap_diagrams.asp>. If that doesn't work, the long way is by going to <www.naco.faa.gov>. Then click on "Safety," "Online Products," and "Airport Diagrams." You then choose one of three ways to find the airport: airport ID, state, or airport name. The state search will list all the airports within the state for which there are diagrams available.

If you don't have access to the Internet, a separate section has been added to the *Airport Facility Directory* (A/FD) for airport diagrams of selected Part 139 airports. The diagrams are listed in order by associated city and airport name. The airport diagrams will be the same full-page charts that are published in the IFR Terminal Procedures Publications, and will be in addition to the VFR sketches already added to the A/FD.



• Busiest Airport?

I was lead to believe that Hartsfield in Atlanta has passed O'Hare in Chicago as the busiest airport in the world to date in 2002. Is this true?

Rick Roth
via the Internet

It depends on which statistic you are looking at. According to the Airports Council International's most recent figures (January to July 2002), to date Atlanta leads in passenger movement (44,559,095 compared to Chicago's 37,629,348). However, if you are talking about aircraft movement, then Chicago is still in the lead (526,115 to Atlanta's 519,131). To make things even more confusing, Memphis tops them both in cargo movement at 1,933,758, compared to Chicago (#16) at 691,361 and Atlanta (#22) at 415,513.

FAA AVIATION NEWS welcomes comments. We may edit letters for style and/or length. If we have more than one letter on the same topic, we will select one representative letter to publish. Because of our publishing schedules, responses may not appear for several issues. We do not print anonymous letters, but we do withhold names or send personal replies upon request. Readers are reminded that questions dealing with immediate FAA operational issues should be referred to their local Flight Standards District Office or Air Traffic facility. Send letters to Dean Chamberlain, FORUM Editor, FAA AVIATION NEWS, AFS-805, 800 Independence Ave., SW, Washington, DC 20591, or FAX them to (202) 267-9463; e-mail address:

Dean.Chamberlain@faa.gov

• Opspecs.com Oops

I need to point out a misprint in the article on Op Specs in the September/October 2002 issue of *FAA Aviation News*. On page 15 in the third paragraph there is a reference to the need for Operations specifications and it states that 14 CFR 91 contains this requirement. In fact, this is a requirement of Part 119.

Wayne Fry
FAA Aviation Safety Inspector

We apologize for the error. We made the mistake. We checked the copy you sent us (Wayne wrote the article). There was no reference to Part 91. The only thing we can figure is that the numbers were transposed to 911 when they were typed and in proofing it became the more familiar 91.

• Traveling with Pets

I just finished the article about traveling with a pet in the November/December issue. One important item was left out. That is the fare for carry-on animals. Most airlines charge between $50 and $100 to carry-on your pet. The airlines also must know ahead of time if you plan to carry-on your pet because they normally only allow one carry-on animal per flight. If the dog starts to bark and sets off other dogs or cats it would be quite a chorus. Some will also let you take the animal—especially a cat—out of the carrier as long as no one around you objects and it remains quietly in your lap. I had reason to checkout this information awhile ago when I was considering a journey that would include my cat.

Pam Griffen
via the Internet

• Backwards Prop

Did the Wright R-2600 on that immaculate Grumman TBF/General Motors TBM really turn backwards or did someone in the darkroom get the negative flopped over. (See page 15 of the November/December issue.) Was this a test to see if anyone would notice?

Rich Carlson
FAA Aviation Safety Inspector

Would you believe it was a secret design project to reduce noise by pushing it out in front of the aircraft. All joking aside, we wish we could say it was a test, but we just blew it. Unfortunately, there were no obvious words that our artist could read, which is how he can usually tell right side up on slides. Thanks for catching our mistake.

PHOTO ID FOR GA PILOTS

In a move to further balance security and the needs of the aviation community, the FAA is issuing revised rules that provide a readily available, low-cost way for pilots to carry acceptable photo identification when flying. The new regulations also require pilots to present that ID when requested by the FAA, Transportation Security Administration (TSA), National Transportation Safety Board, or any law enforcement officer. Both rules become effective immediately.

The FAA expects the most commonly used photo ID will be a valid driver's license issued by a U.S. state, the District of Columbia, or a U.S. territory or possession. The agency based its rule changes on a petition submitted by Aircraft Owners and Pilots Association (AOPA) last February. AOPA suggested that a valid driver's license would be an immediate, cost-effective solution to address security concerns about pilot identity in the general aviation community. The organization also proposed that pilots be required to present photo identification on demand. Other suitable forms of identification under the new rules are a valid Federal, state, District of Columbia, or U.S. territory or possession ID card; a U.S. armed forces' ID; credentials that authorize access to airport secure areas; an official passport; or other identification that the FAA accepts.

The rules were developed in response to provisions contained in the Aviation and Transportation Security Act (ATSA), enacted in Nov. 2001. The TSA requested immediate adoption of these rules to help prevent hazards to aircraft, persons and property within the United States, and the FAA agreed. The TSA has issued other regulatory documents that became effective immediately to minimize security threats and potential security vulnerabilities. The FAA issued the new rule changes without prior notice and public comment for the same reason. The new regulations can be viewed by clicking on the "Recently Published Documents" link at <http://www.faa.gov/avr/arm>.

866-GA-SECURE

In December, the Transportation Security Administration, in conjunction with the Aircraft Owners and Pilots Association (AOPA), established a hotline for pilots to report suspicious activity at general aviation airports. When you call the hotline, a real "live" person will answer and route the call to the proper local law enforcement agency according to the information provided. The toll-free number is 866-GA-SECURE (ignore the last "E" when you dial) or 866-427-3287.

AOPA is distributing information on its "Airport Watch" program (similar to the local Neighborhood Watch programs) to the nation's 5,400 public-use airports. In the meantime, pilots, flight schools, or fixed base operators should report suspicious activity to local law enforcement or a nearby field office of the FBI.

GENERAL AVIATION AIRPORT SECURITY

To assist flight schools and fixed base operators (FBO) in enhancing security in and around general aviation airports and aircraft parking areas, the FAA has issued Notice N8700.17 which contains a list of security suggestions. As each airport has its own security concern, the FAA suggests that each school or FBO implements those appropriate to the size and scope of its operations. Some of the possible security enhancements are:

1. Use a different aircraft ignition key from the door lock key.
2. Limit pilot access to aircraft keys until the pilot has met the fixed base operator's or flight school's insurance requirements for rental of or instruction in aircraft.
3. Consider having all pilots check in with a specific employee (i.e., dispatcher, aircraft scheduler, a flight instructor, or some other "management" official) before being allowed access to parked aircraft; or have the pilot sign or initial a form and not receive keys until an instructor or other "management official" also signs or initials.
4. Establish positive identification of any pilot before every flight.
5. To prevent unauthorized use of aircraft, take steps appropriate to the specific type of aircraft to secure it when it is unattended.
6. Place a prominent sign near areas of public access warning against tampering with or unauthorized use of aircraft; clearly post emergency telephone numbers (police, fire, FBI) so that people may report suspicious activity. (Emphasize that people other than employees should not take action on suspicious activity but should report it to the appropriate law enforcement authority.)
7. Train employees as well as pilots who regularly use the airport to be on the lookout for suspicious activity. Some examples are: transient aircraft with unusual or unauthorized modifications; persons loitering for extended periods in the vicinity of parked aircraft or in pilot lounges; pilots who appear to be under the control of another person; persons wishing to rent aircraft without presenting proper credentials or identification; persons who present apparently valid credentials, but who do not display a corresponding level of aviation knowledge; any pilot who makes threats or statements inconsistent with normal uses of aircraft; or events or circumstances

that do not fit the pattern of lawful, normal activity at an airport.

Before attempting to implement any of these suggestions, the FAA suggests that an employee be designated as a security coordinator to be responsible for maintaining, upgrading, and updating any security policies and procedures.

2002 AVIATION SAFETY COUNSELOR OF THE YEAR

Major Dorward "Jim" McDonald's efforts as an aviation safety counselor in Arkansas are well above and beyond the call of duty. As the 314th Airlift Wing's Flight Safety Officer, he established an aggressive briefing and airport visit program across the state. His program is two-fold: 1) briefing civilian pilots across the state concerning military low-level routes and 2) briefing military pilots on areas of highly-concentrated civilian flying.

Major McDonald made over 65 visits and briefings to over 2,200 civilian pilots in the last year. In addition, he integrated a program including a comprehensive mid-air collision avoidance pamphlet, key chains with key numbers/frequencies, business cards, and posters which he placed at over 90 civilian airports. Major McDonald ensured concerns from the entire spectrum of general aviation (including aerial applicators, commercial operators, and private pilots) were addressed.

After 9/11, he briefed over 2,000 civilian pilots on intercept and airspace procedures. To ensure information flow in both directions, Major McDonald emphasized high civil aviation areas to every military pilot in the 314th Airlift Wing during wing safety days, briefing more than 5,000 aircrew members this year. He established new procedures for military pilots to call on UNICOM when near local airfields and developed procedures to pass real-time areas of increased flying activity during aerial application seasons.

A military instructor pilot, as well as a civilian instrument/commercial-rated pilot, Major McDonald aggressively pursued every opportunity to further aviation and strengthen relationships between military and civilian aviators. His unique dual perspective makes him truly deserving of this award.

This was taken directly from the Major McDonald's nomination form. Why rewrite something that says it all?

NTSB EXPANDS WEB SITE

The National Transportation Safety Board has expanded its web site to include aviation accident synopses and data covering the years from 1962 to the present. Previously, data issued prior to 1983 were not available online. Now, over 90,000 additional data records from air carrier and general aviation accident investigations, conducted from 1962 to 1982, have been added and are accessible through the NTSB web site. These include five years of investigations conducted by the Board's predecessor agency, the Civil Aeronautics Board, before 1967.

Full query capability can be found on the NTSB web site at <http://www.ntsb.gov>, under "Aviation."

2003 WORLD AEROBATIC CHAMPIONSHIP TEAM

Ten pilots have been chosen as members of the United States Unlimited Aerobatic Team that will represent the U.S. at the World Aerobatic Championship in Lakeland, Florida June 25 through July 4, 2003. These top pilots were selected at the National Championships held in Denison, Texas September 21 through September 29, 2002. The Unlimited category is the most difficult, featuring complex flying maneuvers that test the precision flying skill and physical endurance of the pilots. Held every other year in locations throughout the world since 1960, the World Aerobatic Championship‹the "Olympics" of aerobatics‹awards individual men's and women's world titles and national team titles. Pictured are the U.S. Unlimited Aerobatic Team immediately after they were chosen at the National Championships. Kneeling (L-R) are Steve Andelin, Kirby Chambliss (Team Captain) and David Martin. Standing (L-R) are Julie Mangold, Mike Mangold, Vicki Cruse and Debby Rihn-Harvey. Team members Chandy Clanton, Marta Meyer and Robert Armstrong are not pictured. (LeeAnn Abrams photo)

Editor's Runway

from the pen of H.Dean Chamberlain

A Magazine in Transition

By H. Dean Chamberlain, Acting Editor

On behalf of the staff of *FAA Aviation News*, I want to thank you for being a loyal reader of the magazine. The magazine is in transition. This summer, the magazine lost its editor of the last 12 years when she accepted another position within the Flight Standards organization. At the same time, a new printing contract for the magazine was awarded that changed the number of issues per year. Starting with the September-October 2002 issue, *FAA Aviation News* is now being printed six times each year. However to offset the reduction in issues, we have increased the number of pages in those six issues. We are planning on printing 36 pages plus covers per issue.

Our reasons for reducing the number of issues were to simplify our workload here on the magazine which will permit us to produce a better magazine while doing our other duties within Flight Standards' General Aviation and Commercial Division and to make it easier for everyone reading the magazine to know when to expect the next issue. Some readers found knowing when to expect any given issue confusing. So did the staff, for that matter. Adding to the confusion were the mail delays readers have told us about. We regret and apologize for those delays although we have little or no control over them other then printing each issue even earlier than we normally print it. The Government Printing Office is responsible for public subscriptions and their distribution.

For those of you who remembered when the magazine went from six to eight per year, our goal then was to ultimately publish 12 issues per year. A goal we were not able to accomplish because of staffing levels and funding. Now we are back to six issues, but with more pages per issue to help compensate for the reduced number of issues per year. The Government Printing Office has adjusted the annual subscription price of the magazine based upon the change from $28 to $21 per year.

In addition to the changes in the magazine's number of issues, pages, and price, a new AFS-805 manager and editor will be selected to manage the publication plus other work within the branch. At this time, we don't know when a selection will be made. But, as in all selections, change is inevitable.

As the magazine continues to undergo these changes, we ask for your support and your comments. At the present time, we don't know if the magazine will remain in the General Aviation and Commercial Division (AFS-800) or be relocated to another division within Flight Standards. The reason is the Publications' branch, which is responsible for the magazine is being reorganized, and we don't know if the magazine will be part of the new organization or not. Because of all of the above changes and potential changes, this is an ideal time for you to submit your likes, dislikes, and recommendations on how to improve the magazine. Please note: replacing the remaining staff members is not a viable option. We reserve that right for our management.

All comments received will be kept until a new manager/editor is selected. Because of the FAA's administrative hiring procedures, we don't expect anyone from the current staff to be selected to that position. Since the new editor will have no history with the magazine and possibly the FAA, your comments will provide an unbiased review of the magazine's recent performance. Please be frank in your comments. Although we will not acknowledge each comment received, we will summarize them in a future issue. This is your magazine. Those of us on staff are here to help make your aviation experience a safe one. We work for you. Our mission is simple. We are here to promote aviation safety by providing you with lessons learned and helpful tips from across the aviation spectrum. Tell us if we are meeting your needs.

Comments can be sent electronically to the magazine's Internet webmaster at <webmasteravnews@faa.gov>. Written comments can be sent to me, Dean Chamberlain, *FAA Aviation News*, AFS-805, FAA, 800 Independence Ave. SW, Washington DC 20591.

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