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FAA Aviation NEWS

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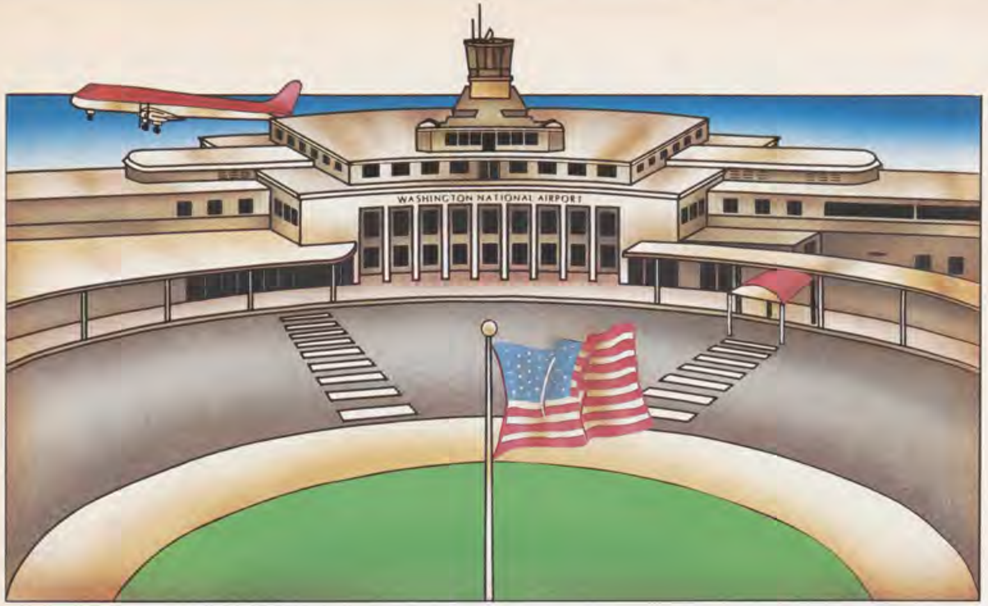
Features

Departments

On the cover:
N600ZE, a 1944 Grumman G-21A "GOOSE" owned by William R. Rose of South Barrington, IL, was one of many aircraft at Sun 'n Fun '91 in Lakeland, FL. The Goose has the honor of being the first aircraft printed in color on a cover of the "new, reformatted, full-color" FAA AVIATION NEWS.



Forecasting Aviation's Future

by Phyllis Duncan, Editor

The time-honored "good news-bad news" saw held forth in the 16th Annual FAA Aviation Forecast Conference held recently in Washington, DC. The forecast conference serves the purpose of allowing FAA to engage in some important strategic planning based on trends and forecasts in aviation growth. As well, the forecasts are useful to manufacturers, other aspects of the aviation industry, and communities. This year's forecast focussed on the period 1991-2002.

The forecast's fiscal 1991 review was clouded by an uncertain U.S. economy and higher fuel prices resulting from an equally uncertain situation in the Middle East. However FAA's Associate Administrator for Policy, Planning, and International Aviation is optimistic about an economic recovery and a stabilization of oil prices, which, in turn, will cut aviation operating costs and improve business.

The reality of the current downturn in business among air carriers was obvious: Eastern Airlines in liquidation and both Continental and Pan Am in bankruptcy. However, Mr. John Rogers, Director, Office of Aviation Policy and Plans, in his overview of the forecasts, used a mathematical model to soften the reality. The model notes that random, extreme events often cluster, producing catastrophic consequences, but are then followed by average events that restore normalcy. Thus, when the economy recovers and the situation in the Middle East ameliorates, the aviation industry will grow again. However, this is all based on the *assumption* that the economy is on the upswing. (Note: As of press time, a cease-fire had been initiated in the Middle East, but Kuwaiti oil fields were still burning.)

That was the bad news. The good news is that regional/commuter operators and general aviation have continued to grow, and that trend should continue regardless of the economy and world politics. Regional and commuter airlines grew at a faster rate than the air carriers in the same economic environment. WHY? The industry is consolidating and the integration of regional/commuter operations with major, national air carriers has increased.

In 1978, the advent of deregulation, regional/commuter airlines flew less than .3 billion revenue passenger miles annually. In 1990 that figure approached two billion. In 1978 passenger enplanements numbered slightly more than two million, soaring to nearly 11 million 12 years later. The forecasts predicts 16 billion revenue passenger miles at the beginning of the new millennium; enplanements should reach a staggering 78.6 million.

The number of seats per aircraft on regional/commuter airlines has increased and will continue to do so. As larger aircraft enter the regional/commuter fleet, these airlines can offer passengers the same amenities enjoyed on the major air carriers. In 1990, the 15- to 19-seat aircraft dominated regional/commuter fleets. Over the next decade the 20- to 40-seat aircraft will probably dominate and will have to in order to move those 78 million passengers!

The other good news from this forecast was that general aviation did not get lost among the talk of air carriers and commuters, "hubs and spokes," and export billings. The forecast recognized that general aviation will continue to be an important component of the aviation industry and the U.S. economy. To some this is preaching to the choir: Many of those attending the forecast began aviation careers in general aviation and know that it provides services that commercial aviation cannot or will not. Principal among these services are support services such as flight schools, fixed based operators, and production of avionics and other elec-

(Continued on page 11)

Experimental Aircraft Association

Experimental Aircraft Association

by Dean Chamberlain
Associate Editor

To some people, Oshkosh means clothes (B'gosh!). To others, Oshkosh means trucks, but to aviation enthusiasts Oshkosh in summer means airplanes, excitement, and an aviation extravaganza. Oshkosh is the home of the Experimental Aircraft Association (EAA) and the site of its annual International Fly-In Convention and Sport Aviation Exhibition. But EAA is more than an annual gathering of *Mustangs* and *Skyhawks*, *Warriors* and *Tomahawks*, swarming ultralights and gaggles of homebuilts grouped like birds of a feather around each other at Oshkosh and other EAA fly-ins, such as the annual Sun'n Fun Fly-In in Lakeland, FL, the second largest EAA fly-in in the country.

EAA is people. It is vintage aircraft from aviation's golden past. It is warbirds from yesteryear and today. It is composite kit-built aircraft out of a box, and it is aerobatic aircraft weaving and dancing their way across the sky. It is thousands of volunteers. They are all part of EAA.

EAA also includes three unique divisions that focus on specific aircraft and related activities. The Warbirds of America have enough aircraft to fight a war. The Antique/Classic Division members have their vintage aircraft. The International Aerobatic Club (IAC) serves pilots who like a different twist to their flying. Each division publishes its own magazine. In addition, EAA's flagship publication, *Sport Aviation*, is mailed each month to 130,000 EAA members. A fifth magazine, the *EAA Experimenter*, is known as "The 'How To' Magazine for the Aircraft Builder."

Even with all of this, EAA is more than aircraft, pilots, and magazines. It is an organization of dreamers, homebuilders, mechanics, and volunteers who love aviation, and who want to preserve sport aviation as they know it today.

Why is *FAA Aviation News* writing about EAA? For that matter, what is EAA? We are writing about EAA as Part 2 of our series on aviation membership groups, their support of aviation, the services they provide airmen, and their working relationship with FAA.

Although the annual fly-in at Oshkosh, with its thousands of aircraft and people, is probably the most visible and well known of EAA's many accomplishments, it is not the primary reason for EAA's existence.

EAA traces its heritage to a January 1953 meeting held by Paul Poberezny in Milwaukee, WI, for a small group of area airplane enthusiasts interested in homebuilt planes. The group held what was to become the first EAA fly-in that September at Curtiss-Wright (now Timmerman) Field in Milwaukee. The popularity and resulting growth of the organization and its annual fly-in prompted EAA to move its annual convention to Rockford (Illinois) Municipal Airport in 1960. Needing more space, the annual event moved again in 1970 to Wittman Airfield in Oshkosh. Last year, the Oshkosh fly-in hosted 13,000 aircraft and 850,000 people during the week-long event. About 500 forums, seminars, and workshops were held during the week.

From its humble beginning in 1953, to hosting one of the largest aviation events in the world, EAA has played a vital role in sport aviation, in its growth, and its safety.

This is the story of EAA and how the organization helps pilots everywhere.

EAA described itself in the Oshkosh '90 Convention magazine as, ". . . an association dedicated to making aviation accessible—while maintaining high standards of quality and safety—to all those who wish to participate."

EAA's appeal is its preservation of America's nostalgic aviation heritage and using that heritage to plan for sport aviation's future. Then and now the typical EAA member personifies the early ideal of the grassroots aviator, the solitary aircraft designer, builder, or "lone eagle" pilot who conquers the world through hard work, perseverance, and ingenuity. These are the same traits EAA members want to pass on to tomorrow's aviators.

Many of today's EAA members, like aviators of yesteryear, still build their own aircraft. They still dream of flying their homebuilt aircraft from their backyards. Many do. They dream of building a better, faster, or more practical aircraft than what is commercially available. Many do. They are the modern-day version of the Wright Brothers: men and women who design, build, and fly their dreams without benefit of big companies, big money, or complex computers. These are the people, pilots, mechanics, designers, and aviation enthusiasts of EAA.

Although Oshkosh is the location of EAA headquarters, the backbone of EAA's membership can be found in the more than 700 local EAA chapters around the country where members plan, build, and discuss homebuilt aircraft and sport aviation. It is through the local chapters that the views and needs of the "grassroots builders" become known and are forwarded to EAA headquarters where appropriate action is coordinated. EAA then works with the FAA, Congress, and other aviation groups to work out solutions to the many challenges facing aviation. Examples of such work include testing and securing the approval to use automobile gas in aircraft, working with the FAA on airspace use, the need for developing a low-cost, primary trainer, and the evolution of building, testing, and flying homebuilt aircraft.

As Paul Poberezny, Founder, Past President, and now Chairman of EAA's Board of Directors, said at one of this year's Sun'n Fun forums, it was because of its track record that EAA was able to discuss with FAA their concerns and make changes over the years. He said many people take the changes for granted today, but he added, "The changes were because all of us in this organization worked quietly, diligently in a cooperative attitude with government to make it possible. This doesn't mean that every thing works like we would always want it to because there are a lot of people involved in making decisions, not only in government but outside government forces." He continued, "Having worked with so many aviation organizations and so many individuals, one wonders how we ever got to the point that we can even fly...just look at how many of the magazines are telling us constantly something new about flying, something that I thought we had already established."

Photo courtesy of EAA.

Paul Poberezny, EAA Founder and EAA Board of Directors Chairman (left), and Tom Poberezny, EAA President.

During his remarks, he recognized the contribution of the local EAA chapters, their members, and supporting family members. He said without them, EAA could not have become the organization it is today.

The local EAA chapters also provide an important forum for ensuring that vital safety information and appropriate construction techniques are passed to aspiring homebuilt aircraft designers and builders. Skilled, experienced builders provide guidance and safe operating procedures for new members and builders. Chapter members also ensure builders are aware of and comply with the various FAA regulations for constructing homebuilt aircraft. Since each experimental homebuilt aircraft must be FAA inspected and approved before its first test flight, EAA technical counselors provide the help and guidance the builder needs before the FAA inspector checks the aircraft. EAA's Ben Owen said technical counselors are individuals who are either FAA certificated Airframe and Powerplant (A&P) mechanics, people who have either built or restored an aircraft or who have other qualifying experience such as being an engineer, or military mechanic. He said about 50 percent of the counselors are A&P's. EAA and its technical counselors work closely with the FAA in ensuring the flight safety of homebuilt aircraft. Examples of that working relationship include the publication of a homebuilt flight test guide, the establishment of a new FAA computer bulletin board for homebuilt and ultralight aircraft, and the dissemination of accident reports, airworthiness directives and other safety related information to homebuilders. He said EAA meets periodically with aviation officials from both Canada and the FAA to discuss aviation related topics.

EAA chapter involvement and help in the FAA certification process for experimental aircraft is just one of the important aspects of the EAA and FAA working together, a working relationship that dates back to 1954. First EAA worked with the Civil Aeronautics Administration, then with the Federal Aviation Agency, now the FAA. Since those early beginnings, the FAA and FAA volunteers have participated in EAA fly-ins. FAA'ers have provided Air Traffic Control services as well as technical services and information. As part of its ongoing mission of promoting aviation and flight safety, the FAA has established permanent safety centers at both Oshkosh and Sun'n Fun

EAA class on wing building teaches participants how to make an aircraft wing rib. The class teaches the design elements and techniques used in actual construction.

to provide fly-in visitors important flight planning services. At the recent Sun'n Fun Fly-In in April, employees from around the FAA staffed various displays explaining current projects and services available to pilots. Other FAA'ers held forum seminars on various aviation matters. Topics included certificating homebuilt aircraft, Remedial Training, and pending rulemaking topics.

As part of the EAA/FAA working relationship, FAA Administrator James B. Busey attended the opening ceremony at Sun'n Fun and held a "Meet the Boss" session to answer questions from the audience. Later in the week, FAA Deputy Administrator Barry L. Harris held a similar "Meet the Deputy" forum meeting.

The EAA and FAA also work together by co-sponsoring local airport and airman safety meetings. These are just some of the ways the EAA works with FAA, both at the national level and local level.

EAA's support for aviation goes beyond designing and building homebuilt aircraft. EAA chapters promote the safe efficient use of local airports and airspace. "Making aviation accessible, while maintaining high standards of quality and safety," is one of EAA's stated goals. The local chapters play an important role in striving for that goal. They closely monitor their local flying areas for potential airspace hazards and other threats to the safe operation of aircraft. They also actively promote aviation within their local communities.

EAA's support of aviation does not stop at the airport. EAA actively promotes aviation's future through many educational programs available for both members and young men and women interested in aviation. One such program is EAA's aviation forums for people of all ages. EAA and its chapters also provide many safety and aircraft construction related forums for members and the public at many of their fly-ins and meetings.

EAA's support of aviation goes beyond just building aircraft. According to Chuck Larsen, EAA's Director of Education, EAA offers an extensive education program for children and young adults. The programs teach aviation lore, theory of flight, and the importance of quality work and craftsmanship in aviation. One such program which began in the 1950's is *Project Schoolflight*. The program teaches high school and technical school students the importance of craftsmanship and quality work in aircraft construction as the students build an actual aircraft in class. Over the years, thousands of students have completed numerous aircraft projects in schools around the country. Student pride and motivation have been important by-products of the program. Another program, EAA's Air Academy provides 35 youngsters each summer the opportunity to study and learn about aviation at the EAA Aviation Center in Oshkosh. Larsen said another EAA program sponsored by local chapters called Air Adventure Days teaches youth ages 10 through 16 about aviation. The program teaches students about flight and aircraft building though classes, model balsa wood glider construction and flying, and the construction of an actual aircraft component such as a wing rib. Program emphasis is again on quality craftsmanship, aeronautical knowledge, teamwork and motivation. In addition to its various elementary and high school-level programs EAA also administers awards scholarships to qualifying students. EAA also offers periodic adult training programs such as the special one-week aviation courses at the EAA Aviation Center in Oshkosh. EAA's Education Office, (414) 426-4888, can provide complete information on the various programs including cost and dates.

EAA's home is the Aviation Center complex near Wittman Airfield in Oshkosh. From its small beginnings in Paul Poberezny's basement to today's $10 million Aviation Center complex, EAA has grown into a worldwide organization dedicated to aviation. The Center complex includes EAA's International Headquarters, the EAA Aviation Foundation Corporate offices, the Goldwater Conference Center, the Paul Harvey Audio/Visual Center, the Cessna Aeronautical Restoration Center, the Boeing Aeronautical Library, the EAA Air Adventure Museum, the World War II Eagle Hangar, and Pioneer Airport which represents a 1920's and '30's airport. The convention site at Wittman Airfield is adjacent to the Center complex.

According to EAA President Tom Poberezny three special "Showcase Events" have been planned for this year's EAA Fly-In and Convention. One will feature the "Golden Age of Air Racing" of the 1930's. The second event will highlight the 50th anniversary of the American Volunteer Group, the "Flying Tigers" of World War II fame. The third will be a tribute to Allied air power involved in Operation Desert Storm. The dates for Oshkosh '91, the EAA's 39th annual Fly-In Convention, are Friday July 26 through Thursday August 1, 1991.

See you there. ■

The FAA Aviation Safety Center at Sun n' Fun in Lakeland, FL, serves as a Flight Service Station, Flight Standards Office, display area, and auditorium. A similar building provides the same services at the EAA Convention and Sport Aviation Exhibition site in Oshkosh, WI.

(Photo by Phillips 66)

SQUAWKS:
Reporting Mechanical Problems

by Peter Rohrbach

The pilot of the Beech *Baron* experienced some navigational problems during an otherwise routine flight in the midwest. After landing in Indianapolis the pilot wrote a "squawk" on the problem and left it at the FBO that serviced the aircraft. The squawk read, "VOR malfunctions intermittently."

The next morning the aviation maintenance technician assigned to the *Baron* read the squawk and shook his head in exasperation. Here was another squawk that did not tell you very much, and there it was again, that awful word—*intermittent.* To maintenance technicians "intermittent" is one of those catch-all words that sound really nice but do not adequately indicate what and where the problem is.

When working on a problem as potentially serious as a navigational error, what the technician wants to know is what, when, and where, i.e., what exactly happened and during what phase of operation. Armed only with that simple squawk, "VOR malfunctions intermittently," the maintenance technician would have to do a thorough—and maybe costly—check of the *Baron's* VOR equipment and all the associated electronics. In this particular case, had the technician done so, he would have found that the aircraft's systems checked out perfectly. The pilot would then receive a non-committal response such as "Bench-checked okay," and not to mention a substantial bill. The pilot would also be left with the uneasy feeling that perhaps there was something undiscovered in the VOR system that might fail in a critical moment of flight.

Fortunately, that is not what happened.

The maintenance technician knew the *Baron's* pilot and phoned to get more precise details, details the pilot should have included in the squawk. The conversation went something like this:

"What did you mean by intermittent?" the technician asked.

FLYING CLUB, INC
RADIO TROUBLE REPORTING FORM ______ AIRCRAFT

DATE: __________ MEMBER NAME/ID ____________________

Fill out form as complete as possible using one form per radio. Without this information, repairs normally take much longer.
Thank you

Circle the radio reported:			COM 1	COM 2	NAV 1	NAV 2
GLIDE SLOPE	LOCALIZER	ADF	DME	MARKER	LORAN	XPDR

IF COM RADIO:	OK	Weak	Intermittent	Never Worked
Transmit	__	__	__	__
Receive	__	__	__	__
Test before flight	__	__	__	__
Test after flight	__	__	__	__

IF TRANSPONDER: Circle one, Entire transp./ Mode C only
Location when problem reported? ______________
Name of ATC facility reporting problem? ______________
Code squawed? __ __ __ __ Other codes also? Yes / No
IF MODE C:
What altitude did the controller report? ________
What was your actual altitude? ________

FREQUENCIES PROBLEM OCCURRED:
______, ______, ______, ______

FREQUENCIES NO PROBLEM OCCURRED:
______, ______, ______, ______

INTERCOM: Used / Not Used
If Used circle Jacks used:
FR / FL / RR / RL
If Not Used was the intercom turned OFF or ON.

PROBLEM OCCURRING USING:
Headphones ____
Aircraft Speaker ____

AUDIO PANEL:
(circle position of each switch, if aircraft doesn't have the switch cross off)

Mic.	Com1/Com2
Auto	Spk/Off/Phones
Com 1	Spk/Off/Phones
Com 2	Spk/Off/Phones
Nav 1	Spk/Off/Phones
Nav 2	Spk/Off/Phones
DME	Spk/Off/Phones
ADF	Spk/Off/Phones
Marker	Spk/Off/Phones
Loran	Spk/Off/Phones

Describe the problem in as much detail as you can.

____
____
____

Resolution of problem. Date ________

____
____
____

This sample radio "squawk sheet" is a good example of how to provide your repair technicians with the information they need to troubleshoot.

"Uh, well, during part of the flight the off flag kept coming up."

"During what part of the flight?"

"Let me see, I was flying through central Illinois when it happened."

"Only in central Illinois, no where else?"

"Yeah, now that you mention it, that was the only place."

"Where in central Illinois?"

"Near Springfield. I was using the Springfield VOR."

At last, the technician had something to go on. The technician's next call was to the FAA in Springfield, IL. From them he learned that during parts of the previous afternoon, they had experienced electrical problems in the ground VOR equipment in the area. The problem had since been corrected, sorry for the inconvenience.

So, the problem was not with the equipment on the *Baron*, something the technician was able to discover without cracking the panel to get at the *Baron's* electronic innards and only after eliciting the information from the pilot. The technician saved the pilot a sizable bill (except for a long-distance call) and was able to assure the pilot that the trouble was not with the airplane.

This pilot was fortunate because of a personal and good relationship with the maintenance technician, but the pilot could have made it a little easier for all concerned had the pilot written a more descriptive squawk, i.e., "Lost VOR reception while flying in the vicinity of the Springfield VOR on the 268° radial. Only instance."

Aviation maintenance technicians complain that their most serious breakdown in communications with pilots occurs in the case of the written squawk. The crux of the problem is that many squawks are not precise enough, do not contain enough information for the technician to begin troubleshooting efficiently. This, of course, makes the technician's job harder, but it also creates problems for the pilot or owner of the aircraft:

- A poorly written or incomplete squawk means that the technician may have to spend more time and use more equipment examining the aircraft, thus creating unnecessary maintenance expenses and keeping the aircraft off the line for longer periods of time.
- More importantly, there is a safety factor involved. If the squawk does not adequately describe the problem, the technician may not be able to address it properly and correct it the first time. (In answering a squawk, the technician usually works on the specific complaint rather than doing a full inspection, as in an annual or 100-hour inspection.)
- In addition, if the technician is not able to find the problem because it has not been properly described, then it will probably recur, just when the pilot needs the system affected. Hopefully, all that means is more down time in the hangar and not an accident.

A pilot can avoid all this with a well-written, descriptive squawk. We do not mean to imply that pilots have to possess writing skills on the Pulitzer level. Veteran aviation maintenance techni- cians suggest some basic do's and don't's.

DON'T —

- Use a one-word adjective to describe something wrong with a sophisticated, complex machine like a modern aircraft. Words like intermittent, inoperative, fluctuating, or deviating simply do not tell the whole story. Rather, give a precise description of what happened. If, for instance, there was a loss of rpm, give the numbers and the phase of operation when it occurred.
- Assume that the technician knows what you mean by any of those adjectives or other, similar words. Words have different meanings to different people, in and out of a particular context.

DO —

- In your description try to isolate the problem to a single system, such as the autopilot, the ADF, the hydraulics, etc. (The list of aircraft systems in the standard Air Transport Association's numbering code, which can be found at most maintenance hangars, is an excellent way for a pilot to communicate with a technician without a doubt in anyone's mind.)
- Try to give as much "when" information as possible: altitude, weather, airspace, and phase of operation, even time of day. Providing the RPM and/or MP setting when it happened could not hurt, either.

Many FBO's and flying clubs that rent aircraft have their maintenance technicians design a standard squawk sheet to go in the aircraft. Often, the pilot does not have to do much writing, merely checks off all information that applies to the particular problem. This system could be a good solution to the communication problem.

Pilots, remember, the technician is not asking you to troubleshoot the problem; the technician is only asking for as many pertinent details as possible, so that the technician can locate and correct the problem as efficiently as possible. To that end, a well-written squawk is a sure way to get your airplane back in the sky where it belongs quickly and safely. ■

—EDITOR'S NOTE: Mr. Rohrbach is a freelance writer from the Washington, DC Metropolitan area. He is the Editor of *PAMA News* and has contributed articles to *FAA Aviation News* for many years.

One of the oldest problems in aviation maintenance communications is the written squawk. Anyone who needs to write a squawk should first analyze it. Is it . . .
Descriptive, with regard to condition?
Descriptive, with regard to location?
Actual, i.e., is the condition actually discrepant?
Considerate; are you considering the technician?
Considerate; are you considering the inspector who has to "buy" the squawk?
Specific? Unusual squawks require clear and understandable wording.
Worthwhile; is the squawk worthy of being written?

Foremost, have you avoided using words like probable, suspect, indication of, possible, and, of course, intermittent?

—Adapted from PAMA News, publication of the Professional Aviation Maintenance Association.

A Curious Squawk . . .

The National Aeronautics and Space Administration (NASA) has a nationwide incident reporting system, and it recently published an incident about a squawk written in a transport aircraft's records. After a flight the pilot had written this rather descriptive squawk:

"Aircraft satisfactory, except Autoland very rough."

Under that squawk, the maintenance technician had written the following resolution:

"Autoland not installed on this aircraft."

Pilots, it just goes to show, you can't win for losing!

Cellular Telephones and Airplanes *May Not Mix*

by Dean Chamberlain, Associate Editor

Do you carry a cellular telephone with you when you fly? If you do, and you use the telephone in flight, you may be endangering the flight and creating havoc for other cellular telephone users. You are also violating a Federal Communication Commission (FCC) policy, which prohibits the use of cellular telephones in flight.

The FCC rule prohibits the use of cellular telephones in flight to avoid the possibility of wide-area interference with the cellular telephone system. The cellular system was designed as a limited-range, ground-based, mobile-telephone system using shared frequencies. Because of the use of shared frequencies, an airborne cellular telephone call can cause interference not only with other local calls, but it can cause interference with calls in adjacent systems over a wide area as well. Telephone interference is only part of the problem.

For airmen, the more serious problem with using a cellular telephone in flight is the possibility that its transmissions can interfere with an aircraft's communication or navigation equipment.

Recently, there have been reports of air carrier and business aircraft having erratic communication and navigational equipment problems that have been traced to the use of cellular telephones in the aircraft. In some cases, personal computers have caused similar problems. In the case of an air carrier or commercial aircraft, the flight crew may not even be aware a passenger is using a cellular telephone or computer. Obviously, the pilot of a small aircraft should know if a passenger is using either type device. Or a pilot may use a cellular telephone without being aware of the potential problem.

All pilots should review FAR § 91.21 titled, "Portable electronic devices," to find out what the FAA rules are on such devices. The FAR do not prohibit the airborne use of a cellular telephone, which is a FCC function, but it does prohibit the operation of any portable electronic device that can interfere with the communication or navigation equipment on an aircraft operated by an air carrier, commercial operator, or on any aircraft operated IFR. The FAR list the types of portable electronic equipment exempt from the rule.

The FAR also define who has the authority to determine if the device causes interference, and if the device does cause interference, who has the authority to prohibit its use during flight. In the case of an air carrier or commercial operator, the operator makes the determination. The pilot in command or operator makes the determination in other types of aircraft.

All pilots need to remember that certain types of electronic equipment not designed and FAA approved for aircraft use can interfere with an aircraft's electronic systems. The fact the FAA does not prohibit the use of the equipment in an aircraft does not mean the equipment is safe to operate in an aircraft. The Radio Technical Commission for Aeronautics published a two-volume report, *Potential Interference to Aircraft Electronic Equipment from Devices Carried Aboard*, dated September 16, 1988, that discusses the problem in detail. The report is available from RTCA Secretariat, Suite 500, 1425 K Street, N.W., Washington, D.C. 20005, telephone (202) 682-0266. The pilot in command may decide that the only completely safe way to avoid a problem is not to use either a cellular phone or portable computer while in flight. Under FAR § 91.21, only the aircraft's operator or pilot in command can determine if an aircraft can be operated safely with portable electronic devices being used.

The September 1, 1990, issue of the National Business Aircraft Association's "MOB," Maintenance and Operations Bulletin, reported three incidents where portable cellular telephones were apparently the cause of aircraft communication and navigation problems. One case involved a DC-9 in flight. The First Officer's CDI fluctuated and the VOR fail warning came on a few times. The second case involved a MD-80 in flight. The First Officer's HSI and VOR were erratic. The Captain's wouldn't move. Two computers and a cellular telephone were being used on board the aircraft. When the computers and telephone were turned off, the aircraft's systems worked properly. The final case involved a B-727 which had a radio problem while taxiing. After a cellular telephone was turned off, the radios worked fine.

Each of the three incidents shows that there may be a potential safety problem when a cellular telephone or personal computer is used aboard an aircraft.

The use of FCC- and FAA-approved airborne air to land mobile telephones and other communication systems are not restricted by the above FCC policy. The FCC has a Notice of Proposed Rulemaking, CC Docket 88-411, released September 2, 1988, that would prohibit the use of cellular telephones in aircraft, even while on the ground, is currently pending. The notice was also published in the September 15, 1988, *Federal Register*. ■

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Keeping The Flight Controls *FREE* and *CORRECT*

by Phyllis A. Duncan
Editor

Everyone has seen these pilots at the airport: The aviation version of the computer whiz, they load the airplane with two large chart cases, a headset case, a flight bag, a survival kit, portable oxygen, and several other containers whose size and shape defy identification. The pilots themselves have every available pocket stuffed with plotters, E6B's (manual and electronic), VOR navigation helpers, holding pattern entry helpers, carbon monoxide detectors, rulers, penlights and spare batteries, pens, pencils, highlighters of assorted colours, glasses, sunglasses, glare glasses, etc. To this they add sectionals and WAC's, approach charts, SID's and STAR's, aircraft manuals, *Airport/Facility Directories*, personal checklists, navigation logs, performance charts, and the weight and balance we all hope they worked. Surely this must be a flight of international proportions, onlookers conclude. When queried, the subject pilot usually responds that the trip is to some airport barely 50 miles away for lunch. In spite of the derision of older, supposedly wiser pilots and regardless of the nature of the flight, that pilot is prepared for any contingency.

That, of course, is an excellent attitude and one to be encouraged. We have all had FAR § 91.103 (old § 91.5) drummed into us—about obtaining all available information before a flight. We all know the importance of a good preflight and exterior inspection of the aircraft. However, when we pack that trusty C-152 to the gills with all the information and equipment we *might* need during a flight, we may be creating a hazard that few consider. Often, we neglect to inspect the interior of the aircraft, other than ensuring that the appropriate documents are on board and checking the instruments and the fuel gauges. Is that oversize chart case stowed properly? Are the snaps snapped and the zippers zipped? Is there anything carried aboard that could become an unidentified flying object in turbulence or during a hard landing (you know, those landing gear prangers that the other person makes)? Is there some usually innocuous object that can take on a sinister demeanor as a jammer of controls?

Never thought of that, you say? Consider this: How many times have we shoved charts or instrument approach plates or the portable oxygen under the seat, out of the way. Out of sight, out of mind, remember. That very practice may have been the cause of a recent accident involving a PA-30. The flight went well until the rollout from a landing when the two pilots found they had no right rudder. As a result, the airplane veered off the left side of the runway. One pilot had stowed a portable oxygen bottle under the seat, but the bottle protruded about six or seven inches from under the seat. After the accident, the pilot noticed that the bottle was midway between the seat and the rudder pedals. The airplane had porpoised during the landing. That and some heavy braking during landing could have caused the bottle to come forward and jam the right rudder. A mechanical inspection of the controls revealed no other problems with them.

Over the past seven years, there have been 16 general aviation accidents where the National Transportation Safety Board (NTSB) cited loose objects in the cockpit jamming flight controls as a probable cause or contributing factor. Three of those accidents were fatal, accounting for four fatalities. Of the 16 accidents, the list of objects doing the jamming is pretty much what we could expect: flashlights, fire extinguishers, tools, unrestrained cargo, headsets, cameras, seat cushions, a tackle box, seat belts (fastened around the rear seat stick and not unfastened), the pilot's shoes (too big), and even a passenger (apparently nervous on a first glider flight). There may be hundreds of incidents where something in the cockpit interfered with a control, but the pilot was able to overcome it or compensate for the problem and land safely. No damage caused and, therefore, no need for an investigation. If control-jamming is not enough, in turbulence or during a hard landing, loose objects in the cockpit could become lethal missiles, and you do not have much of an "incoming" warning.

Crews of aircraft in air transportation are responsible for stowing their equipment so that it does not present a hazard. (FAR § 121.576) There is no similar regulatory requirement for FAR Part 91 operations; rather, the responsibility lies with the pilot, i.e., the sole responsibility for assuring safety of a flight rests with the pilot-in-command. (FAR § 91.3) Part of that responsibility includes securing the cockpit so that the plethora of objects brought on board stay in their assigned places.

Manufacturers have some very useful and helpful aviation products on the market, and we are not discouraging pilots from purchasing those they feel they need. However, many new and some old pilots fall to the peer and advertising pressure that the

(Continued on page 11)

NIGHT VFR AND RADAR SERVICE

by Dean Chamberlain
Associate Editor

The phase "continued VFR flight in IFR conditions" and the Captain's poor pilot performance were cited as the causes of one of the worst commuter accident in U.S. history, according to the National Transportation Safety Board (NTSB). NTSB cited the Captain's decision to continue his visual flight into clouds that obscured rising mountainous terrain as the probable cause of the crash of Aloha IslandAir Flight 1712 on October 28, 1989, near Halawa Bay, Molokai, HI. The commuter was on a night VFR flight from Maui when it hit a mountain. The pilot, copilot, and 18 passengers, including a high school volleyball team, died in the crash.

As a result of the investigation, NTSB asked FAA to encourage pilots to use IFR or radar flight following during periods of darkness and marginal VFR weather in Hawaii. This advice is valid throughout the United States, even for operations under FAR Part 91. NTSB concluded that the accident probably could have been prevented if the flight crew had filed IFR or had used radar flight following.

The scheduled passenger flight, a de Havilland DHC-6-300 *Twin Otter*, departed at 6:25 p.m. for the 25-minute, inter-island flight from Kahului Airport on Maui to Molokai on a VFR flight plan. The flight's departure clearance included a 320° heading and an altitude of 1,000 feet MSL.

A few minutes after takeoff, Departure Control advised the aircraft, "Radar contact, resume own navigation." The flight leveled off at 1,000 feet MSL and shortly thereafter descended to 500 feet MSL. Departure Control informed Flight 1712 at about 16 miles from Kahului Airport that radar contact was lost and for the flight to squawk 1200 (the transponder code for VFR). The crew's acknowledgement of the instruction was the last known contact. Except for the brief period during the middle of the flight when radar contact was lost, ATC radar was able to track the aircraft for most of its flight.

At 6:36:36 ATC again lost radar contact with the flight. At about 6:37 p.m. Flight 1712 hit one of the coastal mountains near Halawa Bay on Molokai at about the 600 foot level. Flight 1712 was declared missing about 7:30 p.m. Searchers found the wreckage the next morning.

NTSB believes the crew thought it had cleared the eastern tip of Molokai, known as Cape Halawa, and the area known as Lamaloa Head. Once clear of the two points, the crew could then turn to a westerly heading and fly parallel to Molokai's north shoreline to the airport.

The NTSB concluded in its accident report that the crew apparently misjudged its location, turned too early, and flew into the mountain. The NTSB report also identified several factors that it believes contributed to the misjudgement that caused the accident.

Darkness was a major factor, i.e., the accident occurred about six minutes before the end of nautical twilight. The lack of ground or navigational lights on the eastern end of Molokai was a factor. NTSB said the lack of lights and the darkness may have prevented the crew from being able to see Molokai clearly and to discover an orographic cloud that had formed over the northeastern tip of the island. The cloud, with a base of about 500 feet MSL and a top of about 4,500 feet MSL had not been forecast. The Area Forecast the crew received called for a 2,000 foot ceiling that night.

The crew's descent to and flight at 500 feet MSL, in violation of their operating procedures and FAR Part 135, was another factor. (Two of the mountains in the eastern portion of Molokai have peaks of 4,607 and 4,961 feet MSL, respectively.)

The Captain's decision to continue VFR flight into the cloud which obscured the mountainous terrain was a further factor.

The most significant part of the NTSB report is the Board's belief the accident could have been prevented had the crew filed an IFR flight plan and/or had used radar flight following. Two Victor airways parallel Flight 1712's course. An IFR flight plan could have provided the needed safety margin to circumnavigate the eastern portion of Molokai. The two IFR routes would have added only a few extra minutes to the flight. Had the crew used it, radar flight following might have also saved the flight; the crew would have remained in contact with ATC. Even with the aircraft flying only 500 feet MSL, a review of radar data indicated radar tracked the flight until just before the plane hit the mountain with only the previously mentioned short radar break during the middle portion of the flight. If the crew had maintained radio contact with Air Traffic Control, ATC could have warned the crew of the plane's proximity to the coastline.

Based on its investigation, NTSB believes pilots should, whenever possible and practical, use all available safety services during a flight. Flight following and maintaining contact with ATC in case of an en route emergency are both excellent accident prevention measures that can provide assistance and rapid search and rescue if required.

The Board also cited several accidents in Hawaii in which search and rescue (SAR) was delayed because of a lack of pilot contact with ATC. This has been true for remote areas on the mainland as well. ATC cannot quickly activate SAR procedures for an overdue aircraft unless ATC knows the aircraft is missing. The only quick way ATC knows a flight is missing is if the pilot filed and activated a VFR flight plan, departed on an IFR flight plan, or, if not on a flight plan, the pilot contacted ATC about a problem or asked for flight following.

Perhaps if the crew of Flight 1712 had used any of the available ATC services, one of the worst commuter air crash in U.S. history may have been prevented. The ATC services are available; the question is, do you use them or are you an accident waiting to happen? One that might have been prevented?

The choice is yours. ■

The NTSB report, PB90-910405, is available from the NTSB by calling (703) 487-4650. For a review of ATC services, pilots can read the Airman's Information Manual *(AIM), the* FAA Pilot's Handbook of Aeronautical Knowldge, *or contact their local FAA Flight Standards District Office, FAA Accident Prevention Program Manager, local ATC facility, or a flight instructor. The appropriate* Airport/Facility Directory *also lists ATC services available including appropriate radio frequencies and available telephone numbers for the various facilities. When in doubt about anything, there is always 121.5.*

Forecasting Aviation's Future

(continued from page 1)

tronics. General aviation has been the historical source of airline and military pilots and will be the future source of those pilots as well.

Although the production of single-engine piston aircraft continues to decline, the number of general aviation-trained pilots continues to increase. The overall pilot population is now over 700,000. Of those, commercial and airline transport pilots increased, but private pilots declined. Student pilots were up, but the number of students pilots becoming private pilots was down. One concern in the forecast is that if private pilots continue to upgrade but are not replaced by new private pilots, the future source base of airline pilots could be eroded.

General aviation pilots are also flying more hours even though operational costs have increased. The increase of business flying is primarily responsible for this and for the predicted increase in turbine airplane and turbine rotorcraft activity over the forecast period.

And speaking of general aviation, FAA recently held the first ever forecast conference strictly for general aviation in Denver, CO. The fact that FAA separated general aviation from the overall forecast for a conference of its own reaffirms general aviation as an important aspect of both the aviation industry and the economy.

Anyone interested in the documentary aspect of the forecast may order "FAA Aviation Forecast—Fiscal Years 1991-2002" (FAA-APO- 91-1) from the National Technical Information Service, Springfield, VA. Please contact them for the price. ■

Flight Controls

(continued from page 9)

more aviation gadgets you have on board, the more professional-appearing pilot you are. At times we forget that for years before these labor-saving devices were invented, we flew safely without them; they only make it a little easier for us. Charles Lindbergh flew solo across the Atlantic with a fairly clean cockpit. (About the only loose object was a common housefly that accompanied him, and it flew away.) Of course, just about every open space was taken up by fuel tanks, but his cockpit management had to be and was remarkable.

Pilots must keep those things they are going to need on a flight within reach. We do not want to spend precious moments pawing through the flight bag in the back seat and not looking out for traffic or monitoring our instruments. Thus, there is something to be said for taking along only what we need for the particular conditions of flight. Of course, it is a good practice to take VFR charts along on an IFR flight, and an IFR chart is a handy reference for ATC frequencies on a VFR flight. However, if the flight is contained within one chart's area of coverage, why bring the rest of the country with you? If you are not going to an altitude where the FAR require oxygen, leave the portable in the car. If the flight is in summer, leave the winter survival kit behind.

However, if a pilot feels more comfortable with all that equipment on board, by all means that pilot should continue to fly that way, but that pilot should make a little extra time during preflight to ensure that everything is properly and safely stowed.

That pilot might also give some thought as to what could stay at home. ■

EDITOR'S NOTE: See the November/December 1988 issue of FAA Aviation News *for another article on this topic, "The Law of FOD."*

The Maiden Flight

by George Denniston & Glen Moyer
Editor and Contributing Editor
Balloon Life

Adapted by Louise Oertly
Associate Editor

It is Saturday morning, October 22, 1960, in Bruning, NE. The air is crisp and clear; temperature 44°F. There is a slight breeze blowing from the west. It is one of those bright, sunny days that heralds the changing of the seasons from summer to fall.

At a nearby abandoned WWII bomber training base a team of seven men prepare to make history. Five, including Ed Yost and Jim Winker, are from little-known Raven Industries and the last two are from the Office of Naval Research. The object of their attention is the world's first modern hot air balloon. Constructed of nylon with a mylar coating laminated to the interior, the balloon—the Mark I—is 40 feet in diameter, contains 30,000 cubic feet of air and looks like an inverted onion. Liquid propane is the fuel of choice because of its capability to deliver itself to the burner overhead via its own pressure. To fire the burner the pilot has only a needle valve requiring 22 turns to fully open or close. There is no basket. Instead the pilot will sit on a plywood plank connected to the balloon's mouth (a 28" load ring) by four lengths of 1/8 inch aircraft cable.

The inflation is proceeding slowly, much more slowly than expected. The plan calls for two aircraft engine heaters to be used, but one unit has failed. Inside the heater a gasoline engine drives a fan which blows air past a burner housing that channels the air through a cylindrical duct into the balloon.

After 30 minutes "of feverish activity," the balloon is filled with warm air. Then the burner is lit and the fuel valve laboriously turned 22 complete revolutions to full open. The air inside the envelope becomes still warmer, but the balloon does not take off. So the support crew walks the system downwind, with Ed Yost strapped to the plank. Before they go 50 feet, the balloon and its pilot become airborne.

Jim Winker

Ed Yost had prepared for this flight for many years. He received his early training in flight at the School of Aeronautics, in Oakland, CA, in 1940. When General Mills, the cereal company, wanted to lease his small plane to track their high altitude balloons in 1950, he joined their program. The cereal maker had a contract with the U.S. Navy to experiment with helium balloons.

"We were doing low altitude as well as high altitude helium balloon testing," Yost said. "We trained a lot of men to fly them under a classified program to put men behind the Iron Curtain. It cost you over a dollar per pound for lift from helium, and it just seemed to me that, for training, you had just as well used hot air, if you could get something going."

Yost's experience with gas balloons got him thinking. They took many hours to inflate with an expensive gas, which could be used for only one flight. Gas balloons also require lots of ballast; so their useful load is small. On the other hand, he reasoned, hot air balloons could be used over and over again. They should be capable of rapid inflation, and fuel to heat the air should be much less expensive. Yost began to experiment on his own in 1954. Starting with a 10-foot hot air balloon with a plumber's fire pot under it, he soon graduated to a 30 footer, with a volume of 16,000 cubic feet, which lifted the envelope plus the three fire pots and 40 pounds of sand. All this was done in his backyard using a vacuum cleaner for the inflation.

"Then," Yost recalls, "I clustered five fire pots together, made a 39-foot, 27,500 cubic foot balloon. I had a plywood seat under that one and a foot tire pump to pump air pressure into the white leaded gas tank. That's how we got the fuel to the burner. We inflated this darn thing in Huron, SD, in 1955, and it picked up a man on a tether. I took pictures of the darn thing and took them back to Washington. That's the reason I got my grant." The Office of Naval Research grant was $47,000 and charged Yost with developing a balloon able to carry one man and fly for three hours. It should be capable of ascending to 10,000 feet and should be reusable.

With this grant Yost and three others, J.R. Smith in sales, Joe Kaliscewski in sales and management, and Dwayne Thon in electronics, formed Raven Industries to continue the balloon experiments. Yost had to bootleg almost all the labor for his experiments, because he spent the majority of his small grant on equipment.

Several years of experimenting went on before the flight at Bruning. Systems were developed, and constantly modified. "We spent about four and a half years of studying the temperature profile inside the envelope, skin temperature throughout, analyzing the different fuels, materials for the envelope, and developing the burner system," recalls Yost.

"What I remember most about those early days," says Winker, "are not so much the early flight attempts but the working with different fabrics and the development of the burner . . . the burner needed further development. The Navy wanted it to operate on liquid fuels like gasoline or kerosene. We spent a lot of time trying to work that out but never found anything satisfactory, so we had to back off to propane which had been used at General Mills but with barely adequate output."

Mark I

When all was finally ready the excitement of the day was almost lost on the already veteran Ed Yost. "I had flown five years in helium balloons before the flight at Bruning," Yost said, "so there was really no thrill on this flight." Indeed, Yost called this first flight "a pretty miserable experience" because of the inadequate burner. "My main problem was trying to get enough heat out of the burner. Indoors it worked beautifully. The problem at Bruning was a pretty chilly morning. We weren't smart enough to figure out that we were not getting the vapor pressure out of the propane. I was kept busy shaking the tank, trying to get the liquid propane on the inner tank walls for more area of vaporization, trying to keep the damn thing in the air." (At this time the burner was fed with propane vapor from the *top* of the tanks. A later innovation would see *liquid* propane fed to the burner.)

The burner remained wide open during the entire flight. The balloon ascended very slowly (50-100 feet per minute) to 500 feet AGL and levelled off for 10 minutes then gradually descended. Level flight was not regained, and the balloon landed after twenty-five minutes in the air. This first flight had covered a distance of three miles.

Pilot Ed Yost remembers the landing this way: "When I got up to altitude and the balloon started to descend, it was pretty frustrating."

"On landing, we were clear out in the boonies, and the chase crew was a quarter mile away. I fired the squib to release the top, but the hole was too small, so it took a long time for the air to get out. I jumped out of the chair and held on to the rig while it slowly deflated. I was not dragged or hurt, not a scratch."

Was there a huge post flight celebration? "Not immediately, no," says Winker. "I think everybody was relieved and pleased that it had flown. Everybody realized too that it wasn't the performance that we needed to get out of it before the project was done, but it was a major milestone. The moments of elation were brief, people just went about their business cleaning it up, packing it up and getting ready to go back home."

Back home they went. Back to the drawing board and to the repair shop where the list of "fixes" was growing. "Before the flight," says Yost, "we didn't think we were going to have any problem with the vapor pressure. But after the flight, we immediately thought, boy, we are going to fix this, we are going to fix that! We knew we were going to change the fuel supply system. About the only thing we could do was use the pressure in the tank to send the liquid to the burner. Then we used the burner to heat the liquid and vaporize it there. That was the only way we could do it. We did it out of necessity."

Other changes included the addition of three handling lines anchored at the equator to better stabilize the balloon during inflation. The apex opening in the balloon (top) was increased in size from nine to 13 feet. This doubled the cross sectional area allowing for more rapid deflations.

When he was flying at Bruning, NE, did Ed Yost think there was a future in sport ballooning? "I was not thinking much about the future at that time. We were just trying to learn everything we could. Every flight was different and we would come back, sit down and regroup, make a few more changes and go again."

Mark II

Three weeks later, the team was ready for the second free flight, featuring a new, improved balloon—the Mark II. For this flight the Stratobowl, a large natural amphitheater in western South Dakota, was selected. The elevation was 4,500 feet, which made it possible to do some experiments at altitude with the balloon tethered.

At 0840 on the morning of November 12, 1960, weather conditions were ideal. This time using a larger fan, and a weed burner to preheat the air, the inflation took only six minutes.

The balloon took off, again with Ed Yost as pilot, and climbed at 400 feet per minute to 7,000 feet MSL. At this altitude Yost closed the fuel valve a few turns, reducing the burner output.

This resulted in a leveling off, which was maintained for about 20 minutes with minor adjustments. Then the burn rate was increased again, and the balloon sought higher altitudes. It climbed at 300 feet per minute to 9,000 feet MSL. When Yost began to close the valve this time, he closed it a bit too much, and a rapid descent (600 feet per minute) occurred. He applied full heat to recover, and the balloon, after having lost 1,000 feet, began to climb rapidly. These oscillations continued for 15 minutes while he gathered experience in controlling them. Finally, he regained level flight. Then he reduced the heat slightly to permit a gradual rate of descent.

"I had a parachute on. I didn't put this in the final report, but that thing was going up and down for a while so wild, I almost bailed out. Then I said to myself, 'You dumb fool, it hasn't hurt you yet! Sit back and enjoy it.' I finally got her halfway levelled out and made a long gradual descent."

One hundred feet above the ground, descending at 150 feet per minute, Yost dropped 30 pounds of ballast that he had carried aloft. As he expected, he was unable to detect any appreciable reduction in his rate of descent. At 1030, after one hour and fifty minutes of flight, and after covering a distance of 39 miles, Yost accomplished a normal landing. "This flight was a beauty," Yost said.

This second flight and further test flights over the next year led to a modification of the fuel valve to provide an immediate on- off response. The vaporization jacket surrounding the flame was replaced by seven coils of stainless steel tubing. A skirt below the mouth and a maneuvering vent were also invented and added.

With these improvements, virtually all of the technical innovations essential to the modern hot air balloon were in place and a new type of sport aviation was born. ■

• ARSA and Mode C

As a subscriber to FAA Aviation News *we enjoy the publication and often find bits of useful information helpful to our own readers.*

By the way, I think there was a small error in the "Briefs" of the September/October issue. You reported that "Effective December 30, 1990, all aircraft operating within the airspace of an ARSA" must be equipped with a Mode C transponder. Though I do not have the FAR in front of me, memory suggests that balloons, gliders, and other non-electrically equipped aircraft are exempt from that. Just a friendly reminder that not all of your readers are fixed wing drivers.

Glen Moyer
Editor, Balloon Life

The "Brief" was correct. According to FAR §9.215(b)(4) all aircraft flying within or above an ARSA (up to 10,000 feet MSL) must have Mode C. Balloons, gliders, and other non-electrically equipped aircraft are excepted from the Mode C requirement within the following airspace:

1) Within 30 miles of a terminal control area (TCA) primary airport provided they remain outside the TCA and below the altitude of the TCA ceiling.

2) At and above 10,000 feet MSL and below the floor of a positive control area.

3 Within a 10 nautical mile radius of any airport listed in Appendix D of Part 91.

Please see FAR Part 91 for more specific information.

• Number, Please

In relation to a cruise clearance the AIM states that once a pilot starts descent and verbally reports leaving an altitude, he may not return to that altitude without additional ATC clearance. Does this mean that if the pilot reports a climb, the same restriction would not apply? Does this also mean that if the pilot does not report leaving an altitude, whether for climb or descent, no further clearances are required?

Name Withheld

According to the *Airman's Information Manual* "cruise" used in an ATC clearance authorizes a pilot to conduct flight at any altitude from the minimum IFR altitude up to and including the altitude specified in the clearance. The pilot may level off at any intermediate altitude within this block of airspace. Climb/descent within the block is to be made at the discretion of the pilot. However, once the pilot starts descent and verbally reports leaving an altitude in the block, the pilot may not return to that altitude without additional ATC clearance.

• F = MA

There still seems to be "in depth" misunderstanding about the "tail wind that robs an aircraft of airspeed" as noted in the "Flight Forum" of the May-June 1990 issue of FAA Aviation News. *May I suggest that we should ask physicists—not pilots—when it comes to matters of Newton's laws.*

As a CFI myself, I also teach that the airplane wing "sees" only still air as it moves through the air, however, with all possible emphasis, I add the condition—PROVIDED THAT NEITHER THE AIRPLANE NOR THE AIR ARE ACCELERATING. On the contrary, if either the airplane or the air is accelerating, then the fate of the airplane is determined by Newton's very famous law of motion, F=MA (force = mass times acceleration).

To give an example, I will note this ancient "brain teaser". Given a Cub in flight, maintaining 60 knots airspeed in a 60 knots head wind. Will the Cub stall if the head wind is suddenly reduced to zero? Lots of pilots will say that it will not stall because the airplane wing "thinks" it is in still air. In fact, the Cub WILL stall (just as the airliner did) because the Cub does not have enough power to bring the airspeed back up to some value above stall in the very short time available. And in a real case, the airliner suddenly lost its head wind—and its airspeed—as it descended into a tailwind. Whether it can pick up speed fast enough to remain aloft depends entirely on Newton's equation, F=MA, where F is thrust, M is the mass of the airplane, and A is the acceleration necessary to replace the lost airspeed. To get an idea of how quickly you can (or cannot) replace airspeed lost in this way, you need only look at your takeoff roll, a maneuver in which the airplane is accelerating as a result of maximum thrust from the engine. Obviously, there are no airplanes flying that can accelerate fast enough to prevent or recover from a stall caused by accelerating air in windshear conditions.

Any wind shear accident is simply further proof of F=MA, not that we need further proof. What we really need is better pilot understanding of Newton's Laws.

L.S. Kupta, CFI
Palo Alto, CA

Thanks for your letter. Any comments?

FAA AVIATION NEWS welcomes comments from our readers. Letters may be edited for style and length. We will not print anonymous letters, but we will withhold names on request. Address: FAA AVIATION NEWS, AFS-20, Washington, DC 20591.

• Landing Approach

While conducting a straight-in nonprecision instrument approach, a pilot is at the MDA prior to the MAP, is it legal to circle to land if approach minimums are the same for straight-in and circling, but the pilot is not in a position to make a normal descent to the runway?

Please state the reference test if this is allowed.

Name Withheld

Yes. If the pilot is not in a position to make a normal descent to the runway, the circle-to-land maneuver would be required and "legal" if at or above circle-to-land minimums.

INSTRUMENT CORNER

• Circle to Land

I am a CFII and need clarification regarding an article on circling approaches which appeared in Aviation Safety. *According to the AIM para. 381 (f)(1),(2), & (3) and FAR §91.127, just what is an IFR pilot to do? May he circle to land in a right hand pattern at an uncontrolled airport declaring his intentions on the CTAF or must he always circle to the left? Advisory circular 61- 27C (Figure 12-12) shows circling approaches and suggests one can circle either right or left. Your past article (Sept./Oct 1980) shows you can circle either way. However, according to an article from* Aviation Safety *(Dec. 1990), I now have my doubts.*

If possible, kindly publish your answer in the "Instrument Corner." There seems to be much confusion regarding this procedure among CFI's.

Lou J. Wipotnik
Mt. Prospect, IL

As per FAA policy, a pilot may circle right or left from a circling approach unless the approach procedure specifies only one direction of turn.

THANK YOU

To every *FAA Aviation News* subscriber who received one of the *FAA Aviation News* survey forms (not all subscribers did) and returned it to the Government Printing Office, your *FAA Aviation News* staff says, "Thanks." To those readers who have not returned your survey, please mail it today.

The Aviation News Staff appreciates your help in providing us with the information we need to better serve all of the magazine's readers. As soon as we receive the remaining forms and tabulate them, we will publish the results in an upcoming issue. The information will enable us to provide you, our readers, with the type of news, flight safety, and regulatory information you want and expect from the FAA.

VOICE RECORDERS UPDATE

FAA Administrator James B. Busey wants aircraft operators, who are required to have cockpit voice recorders (CVR's) installed by October 11, 1991, to order early to avoid a last-minute rush. The requirement for FAR Part 91 operators is contained in FAR §91.35(d), Flight recorders and cockpit voice recorders.

Current information indicates that CVR's have been installed in only about one-third of the aircraft required to have them. Some operators may be delaying the installation of CVR's because they expect the deadline to be extended. According to Busey, the deadline will not be extended. To avoid a delay or possibly a surcharge on equipment installed near the deadline, operators should order now to ensure installation by October 11. After the deadline, operators may be subject to a $1,000 fine per flight if a required CVR is not installed.

The Cockpit Voice Recorders and Flight Recorders Final Rule, as published in the Federal Register, Vol. 53, No. 132, on Monday, July 11, 1988, outlined the requirements for both CVR's and flight recorders. The rule amended FAR Parts 23, 25, 27, 29, 91, 121, 125, and 135.

Answers to quiz on Page 17

1. a	4. b	7. a	10. d
2. d	5. d	8. a	11. c
3. c	6. b	9. c	12. e

DESERT STORM RELIEF

In an effort to alleviate potential hardships for civilian and military personnel who served or are serving in the Operation Desert Storm during the time period of August 2, 1990, to December 31, 1992, FAA proposes to issue a Special Federal Aviation Regulation (SFAR). It will provide such personnel additional time to renew expired flight instructor certificates, inspection authorizations, and meet other types of regulatory requirements. Written test result expiration dates are also extended. The SFAR will not include medical certificate, pilot proficiency, pilot recurrency, and/or mechanic recency of experience requirements as they involve a person's medical fitness or demonstration of piloting skills and/or mechanic skills.

POWER VS PERFORMANCE

Readers of last month's *Single vs Twin* story may have noticed the interchangeable use of power and performance in the initial description of what happens when a light twin loses an engine. Obviously a light twin loses 50 percent of its power when one engine stops, but it can lose 80 percent or more of its performance. That significant performance lose was the basis for the story. Yes, we remember the equation: Power + Attitude = Performance.

Million Air Dallas has a unique way of reminding everyone of the cockpit voice recorder (CVR) installation deadline for certain multi-engine aircraft. Its name is "Sarge," a five-foot long and four-foot high stuffed dog. What makes "Sarge" an attention getter at aviation conventions is not his St. Bernard looks, but his Fairchild CVR body.

Photo courtesy of Million Air

TRI-AREA ADDENDUM

In the January/February 1991 issue, we published a list of over 300 airports, within the Mode C veils of TCA's, that no longer need to have an operable transponder with Mode C. With that lengthy list, you would expect to make a few mistakes, but so far only one eagle-eyed reader has spotted one: As idyllic as it sounds, we left out Lake in the Hills Airport within the O'Hare TCA veil. In Illinois, Lake in the Hills is identified as 3CK, and its maximum altitude is 1,200' AGL.

Also, the new Washington Tri-Area TCA went into effect in March. The list of airports not requiring Mode C has lengthened from those published in our magazine. Aircraft operating to/from the following additional airports do not have to have an operable transponder with Mode C:

Airport Name	Arpt ID	Alt. (AGL)
Albrecht Airstrip Airport, Long Green, MD	MD48	2,000'
Armacost Farms Airport, Hampstead, MD	MD38	2,000'
Carroll County Airport, Westminster, MD	W54	2,000'
Clearview Airpark Airport, Westminster, MD	2W2	2,000'
Fallston Airport, Fallston, MD	W42	2,000'
Faux-Burhans Airport, Frederick, MD	3MD0	2,000'
Forest Hill Airport, Forest Hill, MD	MD31	2,000'
Fort Detrick Helipad Heliport, (Frederick) MD	MD32	2,000'
Frederick Municipal Airport, Frederick, MD	FDK	2,000'
Good Neighbor Farm Airport, Unionville, MD	MD74	2,000'
Happy Landings Farm Airport, Unionville, MD	MD73	2,000'
Harris Airport, Still Pond, MD	MD69	2,000'
Hybarc Farm Airport, Chestertown, MD	MD19	2,000'
Kennersley Airport, Church Hill, MD	MD23	2,000'
Phillips AAF, Aberdeen, MD	APG	2,000'
Pond View Private Airport, Chestertown, MD	0MD4	2,000'
Reservoir Airport, Finksburg, MD	1W8	2,000'
Scheeler Field Airport, Chestertown, MD	0W7	2,000'
Stolcrest STOL, Urbana, MD	MD75	2,000'
Tinsley Airstrip Airport, Butler, MD	MD17	2,000'
Walters Airport, Mount Airy, MD	0MD6	2,000'
Weide AAF, Edgewood Arsenal, MD	EDG	2,000'
Woodbine Gliderport, Woodbine, MD	MD78	2,000'
Wright Field Airport, Chestertown, MD	MD11	2,000'
Aviacres Airport, Warrenton, VA	3VA2	1,500'
Birch Hollow Airport, Hillsboro, VA	W60	1,500'
Flying Circus Aerodrome Airport, Warrenton, VA	3VA3	1,500'
Fox Acres Airport, Warrenton, VA	15VA	1,500'
Hartwood Airport, Somerville, VA	8W8	1,500'
Horse Feathers Airport, Midland, VA	53VA	1,500'
Krens Farm Airport, Hillsboro, VA	14VA	1,500'
Scott Airpark Airport, Lovettsville, VA	VA61	1,500'
The Grass Patch Airport, Lovettsville, VA	VA62	1,500'
Walnut Hill Airport, Calverton, VA	58VA	1,500'
Warrenton Air Park Airport, Warrenton, VA	9W0	1,500'
Warrenton-Fauquier Airport, Warrenton, VA	W66	1,500'
Whitman Strip Airport, Manassas, VA	0V5	1,500'

WANTED: TWO OUTSTANDING PERSONS

The aviation community is again looking for two persons to be honored as the Outstanding CFI and the Outstanding Maintenance Technician of the Year. The winners receive several thousand dollars in cash and prizes, also a trip to Washington, DC.

Contest criteria and application forms are available from your local FAA district office. Nominations must be submitted by July 31, 1991.

FAPA PRESIDENT RECEIVES FAA AWARD

Louis Smith (left), with Allan Englehardt, Accident Prevention Counsellor and United Airlines First Officer, and Admiral Donald Engen, AOPA Air Safety Foundation President and former FAA Administrator.

Louis Smith, founder of the Future Aviation Professionals of America, received a special award from FAA Administrator James Busey for Smith's support of FAA's Accident Prevention Program. Ms. Ruth Grasel, Regional Accident Prevention Program Manager for the Western-Pacific Region, presented Mr. Smith his award at the Fifth Annual Super Aviation Safety Seminar in San Jose, CA.

Mr. Smith founded FAPA in 1974 when he was one of several thousand surplus military pilots who found themselves without a flying job. Originally FAPA was a networking organization with only 35 members who kept Smith informally informed about airline jobs they knew of, and he, in turn, passed that information on in a newsletter. The informal system worked only sporadically, and Smith himself lobbied airline personnel offices to recruit FAPA members. He also took the opportunity to drop off his own resume, eventually winning a position with Northwest Airlines, where he still flies the line. FAPA eventually grew into a profit-motivated organization of over 60 full and parttime employees and attained national recognition. The organization now has some 20,000 members and offers a number of services to its members, including resume preparation, employment counselling, and financial planning.

Mr. Smith was cited for FAPA's financial support of Accident Prevention Program Counsellors at seminars and his own enthusiasm for general aviation safety programs. The reason is simple, he says, "General Aviation is and will continue to be the source of all pilots."

PHASE I OF FAR PARTS 61 AND 141 REGULATORY REVIEW COMPLETED

On April 15, 1991, the first of the three phase Federal Aviation Regulations Parts 61 and 141 regulatory review went into effect.Phase one amendments update certain requirements and, in some cases, relax requirements when compensating factors can ensure the safety standard will be maintained.

- *High Altitude Airplanes:* To act as pilot in command (PIC) in a pressurized airplane with a service ceiling or maximum operating altitude, whichever is lower, of 25,000' MSL, a pilot must have a logbook or training record endorsement from an authorized flight instructor certifying completion of ground and flight training. Those who served as PIC of a high altitude aircraft before April 15, 1991 are exempt.
- *Tailwheel Airplanes:* To act as PIC in tailwheel airplanes a pilot must obtain flight instruction in a tailwheel airplane from an authorized flight instructor. The instructor then places a one time endorsement in the pilot's logbook. This endorsement is not required if a pilot has already logged flight time as PIC in a tailwheel airplane before 4/15/91.
- *Flight Review:* Completion of one or more phases of the Pilot Proficiency Award ("Wings") Program will satisfy the biennial or annual flight review requirement.
- *Airplane Requiring a Type Rating:* On or after April 15, 1991,an applicant must have completed ground and flight training on the maneuvers and procedures in FAR Part 61, Appendix A, and received an authorized flight instructor's endorsement in the pilot's logbook or training record certifying satisfactory completion of training.
- *Aeronautical Knowledge:* The new rule adds aeronautical knowledge training on stall/spin awareness and recovery techniques to the basic subject areas of required training.
- *Instructor Spin Demonstration:* Initial flight instructor candidates require a flight instructor endorsement certifying that they have received flight instruction and are proficient in spin and spin recovery techniques. If the candidate fails either the oral or flight portion of the practical test because of deficiencies in stall/spin awareness and associated procedures and techniques a spin demonstration on a retest is required.
- *Chief/Assistant Chief Flight Instructor:* Amendments to FAR Part 141 remove the 100-hour recent instruction eligibility requirement for chief instructors and reduces total flight and instruction eligibility time to one-half that of the chief instructor for assistant chief instructors.
- *Pilot Schools:* The chief/assistant chief instructor may be off site, but must be available by electronic means while a school is conducting instruction. The regulation also allows satellite bases more than 25 miles from main base and a designated assistant chief instructor for each satellite base.

Phase two deals with the requirements for aircraft operations in today's environment and phase three will identify the requirements for pilots in the year 2010 and beyond.

DRUG TESTING UPDATE

FAA proposes to modify its November 14, 1988 drug-testing requirement for certain types of aircraft operators. Under the drug-testing requirement FAR Parts 121 and 135 operators had to develop an FAA-approved drug testing procedure for certain types of employees. Flight instructors and other special operators performing functions listed in FAR § 135.1(c) were included in the drug-testing policy.

The proposal, outlined in the Notice of Proposed Rulemaking (NPRM) titled, "Anti-Drug Program for Personnel Engaged in Specified Aviation Activities," Docket No. 25148; Notice No. 91-6, as published in the Federal Register of February 15, 1991, would eliminate the drug-testing requirement for FAR § 135.1(c) operators with the exception of sightseeing flights for compensation or hire. Both airplane and helicopter sightseeing operators would still have to have an FAA-approved drug-testing program. The NPRM states the FAA's opinion, "that such sightseeing flights pose a potential public safety risk sufficient to warrant their continued inclusion under the drug testing rule."

Proposed operations that would be exempt from the drug-testing requirement include student instruction; ferry or training flights; aerial work operations; sightseeing flights conducted in hot air balloons; nonstop flights within a 25-mile radius of the airport of takeoff carrying persons for the purpose of intentional parachute jumps; certain limited helicopter flights conducted with a 25-mile radius of the airport of takeoff; and federal election campaign flights conducted under FAR § 91.321.

Although the NPRM's proposed amendments to FAR Parts 121 and 135 only refer to sightseeing operations, if the proposal is approved, it is the intent of the FAA to modify the amendments to exempt glider and hot air balloon sightseeing operators from the drug-testing requirement. Airplane and helicopter sightseeing operators would have to comply with the drug-testing policy.

TEST YOUR PILOTING IQ: Airport Environment

Even the most knowledgeable pilot finds a periodic review helpful in honing piloting skills. So with that in mind and in response to several well-publicized accidents, we have printed the following questions on airport markings, signs, lighting, and procedures relevant to preventing runway incursions.

(See page 15 for answers.)

1. **You must readback all taxi, takeoff, and landing clearances.**
   a. True
   b. False
2. **What markings are used to separate the "ramp" (or non-movement area) from the aircraft movement area?**
   a. Two yellow lines
   b. Two white lines
   c. One yellow line
   d. Various lines; none are standardized
3. **What color is centerline taxiway lighting?**
   a. Yellow
   b. White
   c. Green
   d. Blue
4. **What should a pilot do if, when following a yellow taxi line at a towered airport at night, it simply "disappears" in the dark?**
   a. Stop and refer to airport chart, then proceed
   b. Stop and call the tower
   c. call the FBO
   d. Proceed into the dark of night
5. **What are "progressive" taxi instructions?**
   a. Published (textual) taxi instructions
   b. Special airport chart
   c. A verbal ATC clearance
   d. Step-by-step verbal ATC instructions
6. **How can progressive instructions be obtained?**
   a. File a taxi clearance with ATC
   b. Ask ground control
   c. Consult the special chart
7. **Runway threshold lights are?**
   a. Red and green depending upon where you are
   b. White and red
   c. Amber only
8. **Should landing lights be used for takeoffs and landings during daytime?**
   a. Yes
   b. No
9. **Runway edge lights (when installed at airports with instrument operations) are?**
   a. White only
   b. White and red
   c. White or amber and white depending upon where you are
10. **Where runway centerline lighting is installed, the lights are?**
   a. White
   b. Amber and white
   c. Blue and white
   d. White, and white and red, then all red depending upon where you are
11. **Who has *legal* responsibility for aircraft separation while taxiing on an aircraft movement area?**
   a. Pilot-in-command
   b. Air Traffic Controller
   c. Both a and b
   d. Airport Authority only
   e. None of the above
12. **After landing, where should your aircraft be positioned *before* you change frequency to talk to ground control?**
   a. Still on the runway
   b. Past the hold lines
   c. With the tail of the aircraft safely clear of the runway
   d. Past the ILS "critical area" if installed"
   e. A pilot should not change from tower frequency to ground control until directed to do so by the controller

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A part of FAA Airways history displayed at Sun n' Fun, N34, is a restored FAA DC-3 Airways Inspections aircraft. Shown in the traditional CAA paint scheme, the Oklahoma City, OK based aircraft shows people the type of electronic equipment and aircraft the FAA used to check the navigational airways in the "old days." Today, modern aircraft and avionics gear continue the job of ensuring the safety of the navigational services provided by the FAA.