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FLYING NEWS & NOTES

Going Direct

BY ROBERT GOYER



Aviation's Holy Relic

THIS YEAR WE CELEBRATE THE 75th anniversary of the Piper J-3 Cub, one of the few cultural icons in light aviation and without much argument the single most identifiable and imitated model in general aviation history.

As with many anniversaries, pinning down the exact date of the Cub is a bit of a semantic exercise. While the “birth” of the J-3 model specifically can be traced to 1937, the Cub itself — in the form of the Taylor Cub, created not by anyone named Piper but by a self-taught Pennsylvania airplane designer named Clarence Gilbert Taylor — is at least several years older than that. William T. Piper, who gets name credit for the Cub, was more of a money man, and unlike most aviation outsiders who run airplane companies, he wound up making some excellent calls, including encouraging one of his designers to improve Mr.

Taylor's Cub, creating a new light airplane that would be designated the J-3 Cub, an airplane Piper Aircraft would build for about the next decade.

Within a few years of investing in the fledgling airplane-manufacturing endeavor, Mr. Piper would own the company, which would go on to become one of the most important airplane makers in aviation history, producing dozens of important models. Of course, the company today still bears the Piper name.

With this perspective, it's interesting to note that Piper is still strongly associated with the J-3 Cub, an airplane it hasn't produced in 65 years. The link is so strongly entrenched in flying lore that it's hard for those of us raised in the culture to see it as being anything but a natural connection to make.

From any objective viewpoint, such a link seems far-fetched. If we didn't know it were true, who would believe

that the Cub, an old-technology product of Depression-era economics and engineering, would be viewed for nearly three-quarters of a century as the symbolic gate-guard for all of aviation.

Even during the Cub's short production lifespan, other airplanes would go on to far greater heights. Before the J-3's run was done, stratospheric four-engine bombers from Boeing and Consolidated would be commonplace, Messerschmitt jets and rocket planes would fly in battle over European skies, and the Bell X1 would bust the old world's supersonic bubble, all while the Cub soldiered on low and slow at 75 knots without an electrical system.

Despite its humble roots, the Cub's symbolic hold on our collective imagination remains strong, which is surprising in an industry that values technological progress seemingly above all else.

After it discontinued the Cub, Piper Aircraft itself hardly stood still. It is, in fact, hard to argue that the Cub is the most noteworthy model in *Piper's* history. Why not the popular and versatile Cherokee, the pressurized single-engine Malibu or, perhaps, the remarkably utilitarian Super Cub?

The J-3 Cub, I will admit, was a remarkably popular airplane, with Piper building (a handful through license) right around 20,000 of them over an approximate 10-year span that roughly shadowed that of World War II. Why it enjoyed so short a lifespan is an easy thing to understand. Piper's customers demanded improvements, and rightly so. In objective terms, the Cub is in many ways far from a perfect airplane.

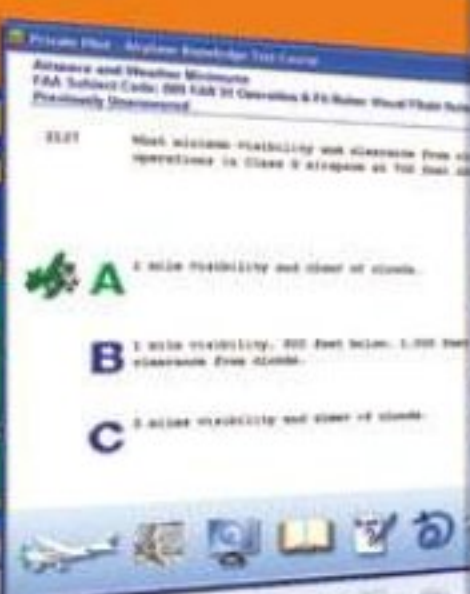
This is so patently true that it's hard to know where to begin, though the tandem configuration is probably a good place. Why anyone would want a tandem airplane in the first place is a bit of a mystery — perhaps the narrower seating area was easier to engineer, to produce or both. Regardless,



>>> Piper produced the J-3 Cub for just a decade, discontinuing it 65 years ago. What factors went into making such a simple, antique airplane a timeless icon?

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this configuration won out in the early days of aviation, despite there being early side-by-side models.

Why most early light airplanes are taildraggers is an easier compromise to explain. Taildraggers are better suited to rough fields, which were about all there were in the mid-1930s. That's

all well and good, but when you combine the tailwheel configuration with the tandem layout, you get real visibility problems. Couple that with the unfortunate fact that the J-3 is soloed from the *rear* seat, a detail that several of Piper's competitors used to their advantage, and you've got an odd

collection of eccentricities.

Oh, the Cub had other shortcomings: It was built from antique materials, welded steel, wood and doped fabric that, while light and easy to build without expensive tooling, had a short lifespan and poor weather resistance. Let's not forget that getting into a Cub seems to require the build and flexibility of an Olympic gymnast, that starting the thing required spinning a horribly lethal weapon around by hand until it came to life inches from you, and that its kitelike flying characteristics were the inspiration for scores of aerodynamicists of the era to seek ways to improve upon the flying manners of general aviation airplanes.

Perhaps the worst insult to the humble J-3 is that Piper and its customers gave up on it so readily, that its own creators found ways to improve upon all of its shortcomings. This Piper did by launching models with side-by-side seating, with more adequate power, with tricycle landing gear and, eventually, with low wings and all-metal construction. The Cherokee, a Piper product just 25 years removed from the birth of the Cub, we should remember, might represent the polar opposite of the company icon. A nicely harmonized, all-metal, low-wing, tricycle gear side-by-side flier (with a couple more seats in back), the Cherokee is in some ways the anti-Cub, a fact that didn't go unnoticed by the tube-and-rag crowd in 1963, some of whom still hold a grudge today.

Like many of you, I have a history with the Cub. The first flight on which I had ostensible control of the airplane for any length of time happened when I was 12 years old and my dad handed to me the controls of the beautiful J-3 we were flying in on a gorgeous upstate New York autumn day. From my first flight on, in my heart this odd little bird was the very essence of an "airplane."

This leaves us with the original questions unanswered. If there's so much wrong with the J-3 Cub, why has its legend endured?

When you think about it with your heart instead of your head, the answer is easy. The J-3 has the right *attitude* for flying. It is tailor-made for that perfect day, that perfect place, that perfect state of



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I've owned Cubs, Turbine Maules, AirCams and Cessna Aircraft. I got into a Husky for the first time last week and I was instantly impressed how much confidence it gave me. The ailerons responded to my every move. When I got into some mountain turbulence, no big deal. The plane is so well balanced that it just molds itself to the pilot - all inputs are immediate. It was love at first flight.

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airflow directly into joy. It is an equation that gets to the very heart of flying.

101 Airplanes

This month we launch *Flying's* Top 100 Airplanes (flyingmag.com/top100), our Web-based compendium of the best and most important airplanes of

all time. The project, which was six months in the making, began as a bit of a lark but soon became a full-fledged obsession, as the seemingly simple act of compiling a list of *just* 100 airplanes soon turned into a fiendishly difficult pursuit. After a month, we'd managed to narrow the list to 150 models. Voting the remaining 50 airplanes off the metaphorical island was nearly impossible. Finally, we succeeded in almost doing that. The final list has an extra airplane on it, for 101. We'll ask our readers to decide which one to leave off. We expect some spirited debate from our readers, who we know very well love airplanes as much as we do and will be hard-pressed to choose. You'll notice too that we couldn't even keep our list of "airplanes" to actual airplanes. There is a smattering of different kinds of flying machines in the Top 100, from a couple of helicopters to ... well, you'll just have to see the oddballs that made the cut.

As we began to extol the virtues and flaws of our chosen 100 — allowing ourselves just 100 words per airplane, give or take a few — we realized there were folks out there who might be able to assist us in our quest. So we engaged a few famous aviators to help us out. Our list of aviation luminaries who contributed to the list include test pilot and airshow legend Bob Hoover, golf Hall of Famer Arnold Palmer, Hollywood A-lister Harrison Ford, NASA astronaut Robert "Hoot" Gibson, aviation training pioneer Hal Shevers, former Cessna CEO Jack Pelton and more.

The process was remarkably educational too. As we researched and wrote up the mini histories of our selected models, it was hard not to fall in love with each one at least a little bit as we imagined ourselves with the control stick in our hand and the wind at our backs in some spectacular flying machines.

In the end, it was all for fun, though we fully expect that our readers will take us to task for some airplanes we left off the list and for others we never should have included. In the end, though, we're confident we came up with a list you'll love a lot and maybe love to hate a little. Have fun with it. We sure did. ✈



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A photograph of four business professionals (two men and two women) walking on a wet tarmac in front of a white private jet. They are all dressed in business attire and carrying luggage or briefcases. The scene is set against a backdrop of tall evergreen trees under a clear sky. The wet surface of the tarmac reflects the people and the aircraft.

< TODAY >

23

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FEEDBACK FROM OUR READERS

Understanding Lift Less

In reference to Peter Garrison's June 2012 Technicalities: great article. Truer words were never spoken.

Ronald R. Thomas

Via e-mail

There is a mountain of test airfoil pressure distribution data that shows lift and drag versus airfoil design variables for a range of Mach numbers and angles of attack. The difference between upper surface and lower surface pressures measures lift, and the wake rake measurements measure drag. There is nothing like experimental data that will clear the mind. Your approach to show a history of man's efforts to explain lift with articles before the year of 1940 helps your title.

Airfoil design was one of my favorite jobs. For sure, your article omitted technical progress and knowledge about airfoils over the last 70 years! Why, I don't know.

Byron Miller

Via e-mail

I do understand lift. When the sun is bright and high in the sky, its gravitational pull on my airplane lifts it and me into the wild blue yonder. When the sky is gray and dangerous, there is no sun so my airplane and I sit safely on terra firma.

John Misner

Seattle, Washington

Actually "lift" is well understood. The Lift Gods figured it out long before the English and German scientists of 1909 to 1930. I pray to the Lift Gods regularly through a special idol I have set up to honor them. Sure, it's nothing more than a metal lunchbox with a picture of Sky King and Penny on it, but I do pray to it.

Ben T. Foster, CFI

Via e-mail



I much enjoyed Peter Garrison's thoughtful and amusing riff on why "You Will Never Understand Lift." I happen to agree, even if Peter left out such delicious conundrums as the marvelous ability of symmetrical airfoils to hold up aerobatic craft, and the ability of flat pieces of balsa to hold up model airplanes.

In any case, the good news for airmen is that it doesn't matter at all to success in aviation. The explanation of lift provided in my 32-year-old copy of Wolfgang Langewiesche's *Stick and Rudder: An Explanation of the Art of Flying* has served perfectly well to keep my wings lifting and my frail body intact, regardless of [the book's] possible scientific inaccuracy. Langewiesche's explanation is "good enough." As he wrote, "The most important fact in the art of piloting ... [is] the Angle of Attack, and how it changes in flight. [The usual explanation of lift] fails to give a clear understanding of the various flight conditions in which an airplane can proceed ... from fast flight to mush and stall. ... If you will forget

some of this excessive erudition, a wing ... is in the last analysis nothing but an air deflector ... an inclined plane. ..." Works for me.

Best regards to all at *Flying*.

Hunter Heath III

Indianapolis, Indiana

A fun way to see your flight instructor squirm on the spot and to test whether he or she really understands aerodynamics is to ask this: I know that when air moves rapidly its pressure is reduced, but *why* does air move more rapidly over the wing than under it? The answer lies in the theory of circulation.

I recommend to interested readers that they pick up a copy of *What Makes Airplanes Fly?* by Peter P. Wegener. It does a good job of explaining aerodynamics accurately without delving deeply into mathematics. A good textbook for those interested in the mathematics is *Theory of Flight* by Richard von Mises.

I have recently started training to become a CFI, so, in time, I will know if my hypothesis that the concepts of circulation can be understood by all pilots is true or not.

Gabhan Berry

Carnation, Washington

Nowadays computers slice through the complexity with ease and have stilled most of the world's wind tunnels. While you and I may never understand lift, some computer does and I guess that is all that matters. An aeronautical engineering friend of mine says he simply defines the "use-cases" for a desired wing and feeds them into a computer. The computer then spits out the foil to suit — if one exists.

About five years ago I became a private pilot and began thinking about lift again. The complexity of

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the problem haunts me to this day. Thanks for helping to sort out some of what I learned or tried to learn so many years ago.

Peter Kuykendall
Mountain View, California

Mr. Garrison, your pithy observations in the article on lift, in the June issue of *Flying*, reminded me of a similar response at college. In our second year of engineering, one of the chaps asked our lecturer what the difference between a scientist (mathematician) and an engineer is.

Our esteemed lecturer responded: "If a man and a woman were to stand in diagonally opposite corners of a room and each were to halve the distance to the center of the room, the scientist declares that they can do so an infinite number of times and still *never* touch. The engineer declares that they will get close enough for all *practical* purposes."

Charles Hammond
Kingston, Massachusetts

Primary Trepidation

Both Eric Crump and David Clark offer great advice on ways to calm student fears related to practicing stalls [Flight School, June 2012]. Yet both instructors miss the most important element of all. That is to ensure that the student is looking outside the airplane most of the time, and making control inputs solely by reference to the outside picture.

Charles McDougal
San Antonio, Texas

I enjoyed Eric Crump and David Clark's advice on helping student pilots get over their fear of flying, especially stalls. Four decades ago I was a student pilot learning to fly in, of all things, an Aeronca Champ, an old airplane even then. My instructor had a wonderful method of helping me get over my fears of stalls: We

went out and *spun* the airplane! At first, I'll admit, it terrified me. But after that, stalls were nothing.

Dave Devereaux
Via e-mail

Blue Ash Memories

Martha Lunken's wonderful stories often bring back memories, some of them a bit harrowing, as she did again in the June article regarding Blue Ash Airport near Cincinnati. We can only hope that Blue Ash escapes the fate of Chicago's Meigs Field, but, at least, Martha and *Flying* magazine got in a little zinger at the former mayor, who is named Daley, not Daly.

Robert Rue
Bolingbrook, Illinois

From the Jumpseat

Being a former international captain, now retired 16 years, I look forward to Les Abend's well-versed articles that keep me in the loop. I was quite delighted to read his June Jumpseat article on NYARTCC Oceanic Control. Prior to my 30-year flying career, I was an air traffic controller in New York Center from 1963 to 1965. I was part of the team that opened that center in 1964 in ISP. I worked LGA, EWR departures and arrivals. I grew up overlooking the approach end of Runway 13R at IDL/JFK and the Lead-In Lights. I was quite lucky to be on board during the latter years of piston engines and the early years of jets. I miss the flying, the camaraderie and the respect that flight crews deserve, however not the degrading scrutiny. In any event, keep the articles coming. We old, bold pilots look forward to you keeping us informed.

Capt. Nicholas Gravino,
Delta Air Lines, retired
Via e-mail

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NetJets Inks \$9.6 Billion Business Jet Deal

Cessna and Bombardier are beneficiaries of bulk orders.

NETJETS HAS PLACED orders with Cessna and Bombardier for up to 425 new business jets worth \$9.6 billion that will form the cornerstone of the private aviation giant's new NetJets Signature Series fractional ownership program. While only 125 of the airplanes constitute firm orders, NetJets called the purchases the largest deal for private aircraft in aviation history.

The Ohio-based company said it will buy up to 150 Cessna Citation Latitudes in a deal that includes 25 firm orders and options for 125 more. The Latitude deal is valued at \$2.3 billion at list prices. Deliveries are to begin in 2016 and stretch over 10 years.

NetJets also will buy up to 275

Bombardier business jets, including 100 firm orders for Challenger 300 and 605 series airplanes, with options for 175 more. These airplanes, at list prices, are valued at \$7.3 billion. Deliveries are to begin in 2014.

"This purchase demonstrates our long-term planning and represents our ongoing commitment to providing unparalleled safety and service in aircraft uniquely customized for our owners," said NetJets Chairman and CEO Jordan Hansell.

Hansell said the addition of the new midsize jets to the NetJets fleet, along with its recently ordered Embraer Phenoms and Bombardier Globals, marks the launch of the NetJets Signature Series, part of the fractional giant's

10-year business plan, which includes continual renewal of its current fleet of more than 725 business aircraft. The Signature Series airplanes, he said, are the first aircraft that NetJets "helped design from start to finish."

Owned by Warren Buffett's Berkshire Hathaway, NetJets has made a number of bulk business jets purchases in the past, but never has it inked a deal this big. The sales provide a welcomed boost to the Cessna and Bombardier order books, while also signaling that the fractional ownership concept, which allows travelers to buy a share in an airplane and have access to the entire fleet at set monthly and hourly prices, is alive and well.

— STEPHEN POPE

Hawker Beech Bankruptcy Hits Bizjets

Premier and Hawker lines are on the cutting block.

HAWKER BEECHCRAFT'S path out of bankruptcy includes some tough choices, including the possibility of discontinuing production of some or all of its business jet models.

As part of its recent bankruptcy filing, Hawker Beechcraft submitted a "Project Flight Plan" outlining three potential scenarios for moving forward, each of which preserves the company's piston, King Air and military aircraft lines while possibly doing away with its Premier light jet program and the Hawker line.

The company called the prospect of attaining cost reductions needed to continue production of the Hawker 4000 — originally introduced in 1996 as the Hawker Horizon — as "highly unlikely." It was unclear whether the business jet programs might be sold, or if any interested parties have come forward.

Of all the options available to the company, the one aligned with the highest margins is the plan that eliminates all business jet production, lawyers said. The options come after Hawker Beechcraft reached a

bankruptcy filing agreement that would slash \$2.5 billion in debt and \$125 million in annual cash interest liabilities, which have piled up after years of slow sales.

While company officials said the hope is to emerge from the bankruptcy proceedings as an independent company, Hawker Beechcraft lawyers have signaled that potential bidders have expressed interest in buying the company, in whole or in part, from owners Onex Partners and Goldman Sachs.

— **STEPHEN POPE AND
BETHANY WHITFIELD**



EASA Approves LSA Criteria

First three light sport models gain approval in Europe.

> The European Aviation Safety Agency (EASA) has certified the first airplanes in a newly created certification category for light sport aircraft. Airplanes approved under the new framework are the Czech Sport Aircraft PS-28 Cruiser, Flight Design CTLS-ELA and Evекtor SportStar RTC. Airplanes in the European LSA category are limited to two seats and a maximum

weight of 1,320 pounds.

In a statement, EASA said it has been actively working to address feedback from industry agents and operators who complained the regulatory framework applying to recreational aircraft was too burdensome.

Cessna in April halted sales of the Skycatcher in Europe, citing European LSA rules that the company

said are too expensive. It remained unclear when or if Cessna plans to resume Skycatcher sales in Europe. A Cessna spokesman said the company is "watching developments with great interest and will be forming a best path forward with regard to EASA and LSA."

EASA said it will continue to work with the aviation community and that "further improvements to certification procedures for European light aircraft are expected in the near future."

— **S.P.**

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Eclipse 550 Enters Production

Build rate will be slow at first as tooling moves to Poland.

MARKING AN IMPORTANT turning point for the company, Eclipse Aerospace has officially started production of the Model 550 very light jet, the successor to the original Eclipse 500.

Eclipse expects the first 550 to roll out of the factory next year. The original Eclipse Aviation obtained certification for the Eclipse 500 in September 2006 and built 260 airplanes before going bankrupt. The new Eclipse Aerospace said it is planning for an initial low-volume production schedule, with the first airplane predicted to take approximately 12 months to complete.

Full production of an estimated 50 to 100 airplanes per year is expected to be reached by 2014 — depending on demand — when supply of major components fully shifts to Sikorsky subsidiary PZL Mielec in Poland.



In addition to the production announcement, Eclipse also announced the official start of the Eclipse international dealer organization. Eclipse dealers from around the world representing more than 30 countries attended and signed agreements at the inaugural dealer meeting in June in Albuquerque, New Mexico, for the

purchase of new Eclipse 550 jets slated for delivery in 2014 and early 2015.

The Eclipse 550 is based on the Eclipse 500 but will include enhancements such as autothrottles, synthetic vision, enhanced vision and a redundant flight management system. The price for the new model has been set at just under \$3 million. — S.P.

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GippsAero GA10 Makes First Flight

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> **GippsAero**, the Australian aircraft maker, said it has successfully completed the first flight of its new turboprop single, the GA10. Powered by a Rolls-Royce 250 turboprop engine, this newest model is a 10-seat multirole airplane based largely on the piston-powered GA8 Airvan utility airplane.

The first flight took place at GippsAero's home base at Latrobe Regional Airport in eastern Victoria. The GA10 fits a niche that its makers say will suit a wide range of applications from passenger and freight work to air survey and surveillance roles. Type approval of the airplane is planned for next year.

The GA10's maiden flight went exactly as planned, according to Gerhard Jordaan, engineering project manager at GippsAero. "The first flight was a great success, as it showed that the GA10 retained the inherent stability and docile flying qualities of the successful GA8," he said.

The turboprop airplane is expected to be popular with operators in parts of the world where 100LL avgas can be hard to impossible to come by. As was the case with the GA8, the manufacturer plans to offer a STOL kit for the GA10.

GippsAero is owned by India's Mahindra Group. — S.P.



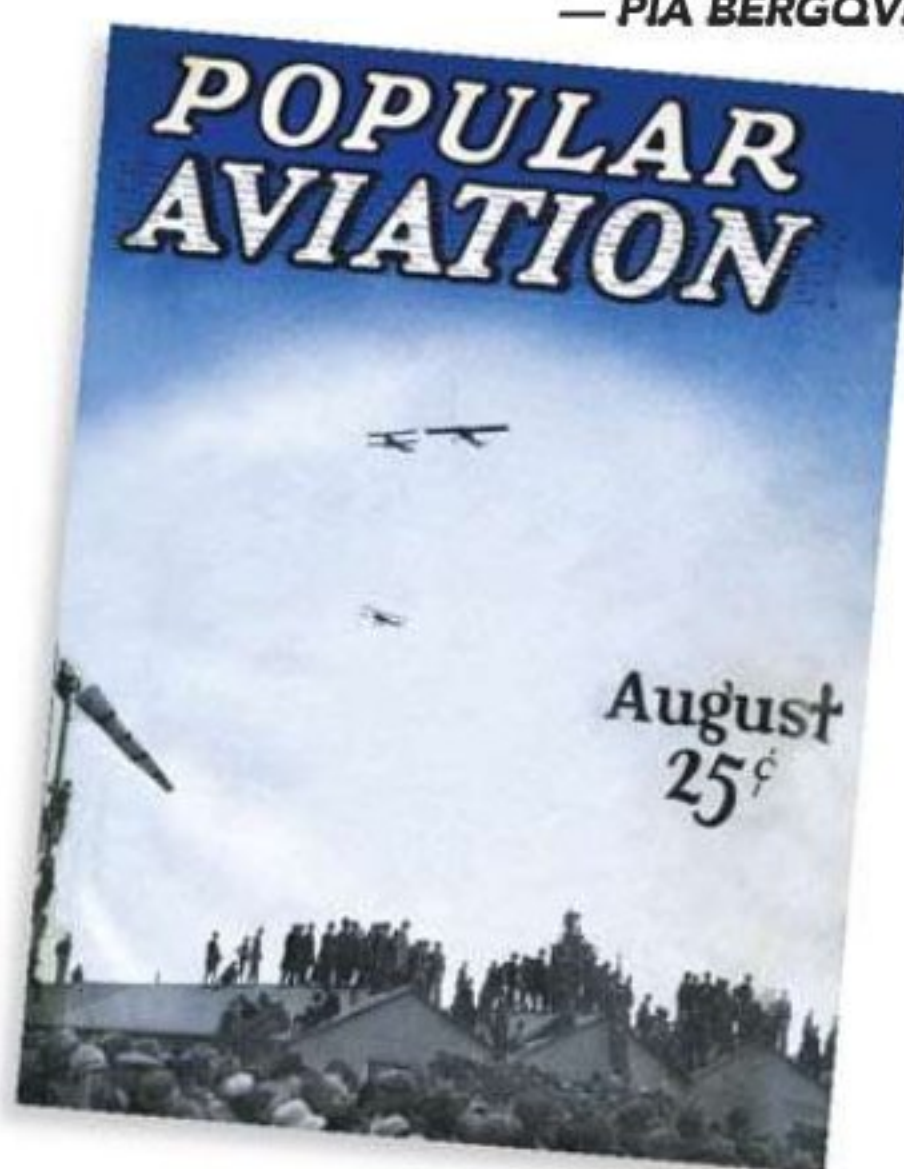
Flying Celebrates 85th Anniversary

> **This month we celebrate the 85th anniversary of *Flying* magazine.** Our first issue was published in August 1927 under the name *Popular Aviation*. Within two years, the magazine rose to the top of the aviation magazine charts, with a circulation, at that time, of 100,000. The name *Flying* was adopted in 1942.

Since the magazine's inception, the editors at *Flying* have been passionate, experienced aviators who capture the adventure of flying and provide unbiased, current coverage of the general and business aviation industry. Legendary writers such as Richard L. Collins, Gordon Baxter and Richard Bach have graced the pages of the magazine.

Check out the August iPad edition of *Flying* for content that was featured in the August 1927 issue.

— PIA BERGQVIST



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FLYING NEWS & NOTES



Reno Air Races Set to Proceed

New safety rules implemented this year.

AFTER SEVERAL MONTHS OF speculation about the future of the National Championship Air Races outside Reno, Nevada, air-race pilots and enthusiasts can finally breathe a sigh of relief. The Reno Air Race Association (RARA) has received its race permits from the Reno Tahoe Airport Authority and has secured insurance for the event, which will proceed at the Reno-Stead Airport Sept. 12-16.

While there have been changes to the race rules based on NTSB recommendations, some of which have yet to be defined, they may not be very noticeable to the general public. But to the race participants, it's the dawn of a new era. The racecourses have been refined many times in the past, so the modifications for this year's courses won't come as a surprise. But there have been some other significant changes to the race rules as a result of the tragic accident last year in which more than 60 people were injured and 11 people were killed, including the pilot of the *Galloping Ghost* as it crashed into a spectator area.

During its investigation of the crash, the NTSB found safety issues with regards to "the extensive modifications made to the airplanes that race in the Unlimited class and the lack of documentation and inspection associated with those modifications." As a result, there will be Class

Aircraft Compliance Inspection Teams assigned for each race class. The teams are tasked with ensuring that the airplanes meet the standards of FAR 43, Appendix D — the FAA's outlines for a 100-hour inspection.

A RARA pilot coordinator will collect all the reports from the inspection teams and submit them to the Reno FSDO. No airplane will be released to race until this process is completed. And any flight-critical maintenance, such as an engine or cylinder change or the replacement of flight controls, conducted during the week of the races is subject to additional inspections by the Class Aircraft Compliance Inspection Teams and the approval by RARA and FAA prior to the airplane being released for the competition.

RARA now also requires more stringent medical testing. All participating pilots must hold a Class I or Class II medical certificate issued within six months prior to the races. Additionally, it is recommended that pilots get an EKG and a stress test.

The new rules have the potential to eliminate some pilots and airplanes from the races that have become icons through the years. While the results of the new rules remain to be seen, the racing community seems to be embracing whatever changes are necessary to maintain the tradition of racing at Reno, which, after last year's tragedy, seemed a remote possibility. — P.B.

Sporty's iPad Briefcase

This compact bag accommodates the tech-savvy pilot's gear.

> Sporty's in-house FlightGear designers have developed a new iPad briefcase to accommodate pilots who have decided to recycle their paper charts and receive their aviation data electronically. Though the briefcase-style bag measures only 12 by 9 by 2 inches, the space should satisfy the tech-savvy pilot's needs.

The iPad briefcase's soft padded main compartment fits an iPad with a case, but the velvet liner will protect an iPad screen from scratches if you carry it bare. There are also pockets inside where you can put cleaning cloths, charging cables or other iPad accessories.

In addition to the main compartment, the bag has a zipper pocket on the outside where you can place an external GPS, a backup battery or even a Stratus, Sporty's new weather and GPS unit, which is updated via ADS-B and connects to ForeFlight's app to display weather and position data on the iPad. An additional open pocket with penholders on the outside of the briefcase works well for a notepad.

You can carry the iPad briefcase by two retractable handles or attach a shoulder strap to save your arm muscles. The bag costs \$39.95 and is available now. — P.B.



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NTSB Issues Nexrad Warning

The displayed information is more outdated than the screens indicate.



THE NTSB HAS ISSUED AN alert warning pilots about the possible lack of currency of Nexrad data, which provides radar images for panel-mounted avionics as well as portable GPS units and electronic flight bags. The safety alert uses strong language to get its point across. "Weather conditions depicted on the weather image will *always* be older than the age indicated on the display," it said. The data could be as much as 15 to 20 minutes older than what is indicated by the display, according to the report.

It appears that some pilots are relying too much on the information on their Nexrad screens. The safety alert included information from two fatal accidents: a Eurocopter AS350 AStar and a Piper PA-32 Cherokee Six. In both cases, the pilots were flying near severe weather and the screens indicated that the Nexrad data was one minute old. However, during the investigation following the accident it was determined that the information was between six and eight minutes old.

In the case of the AStar pilot, the NTSB found that the screen would have indicated that the storm was seven miles from the home base when it was in fact immediately above it. The Cherokee Six pilot likely flew into an area of developing precipitation, but the screen would have indicated that he was still flying on the edge of the severe weather, according to the report.

The FAA's message is clear. While Nexrad is a wonderful tool for avoiding severe weather, it should be used with good judgment. Pilots need to realize that their screens depict where the weather was, not where it is, which makes confirmation, visually or by other means, a necessity. Pilots, the FAA stressed, should look for weather information in other forms, including a standard briefing. — P.B.

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E-Volo to Develop Volocopter Line

E-VOLO RECENTLY ANNOUNCED it is developing the VC Evolution series of vertical take-off and landing (VTOL) aircraft. The aircraft will be in a class of their own,

currently called volocopters, with 16 electrical power units enabling vertical and forward flight. E-Volo is considering two versions of the VC Evolution: a single-seat 1P and a two-seat 2P.




The new volocopter line will be based on the German company's VC1 concept aircraft, which flew successfully for the first time last fall. While the VC1 is a highly unconventional-looking aircraft — the pilot is perched atop an exercise ball and surrounded by 16 tiny propulsion units on a basic metal framework — its siblings will feature a Space Age, helicopter-like cabin with propulsion units on top and skidlike landing gear below. The control stick will connect to a fly-by-wire system, and computers will automatically control the volocopter by adjusting each drive separately. The system even enables continued flight with several failed power units.


The VC1 concept was restricted to approximately 20 minutes of flight due to limited battery capacity. E-Volo expects battery capacity to increase rapidly and that fully electric volocopters will be able to fly for more than an hour. However, the company said the VC Evolution 2P “is being developed as a serial hybrid electrical aircraft with a range extender.”

A pusher propulsion unit can also be added for increased forward speeds. E-Volo expects its volocopters to reach speeds of at least 54 knots and altitudes higher than 6,500 feet.

E-Volo hopes to complete the development phase in the next few years. Its success may appear unlikely, but the volocopter has the potential of becoming the Daimler Smart car of the skies. The volocopter's potential future as a form of short-distance air transport with very low environmental impact earned it the AERO 2012 Lindbergh Prize for Innovation.

— P.B.





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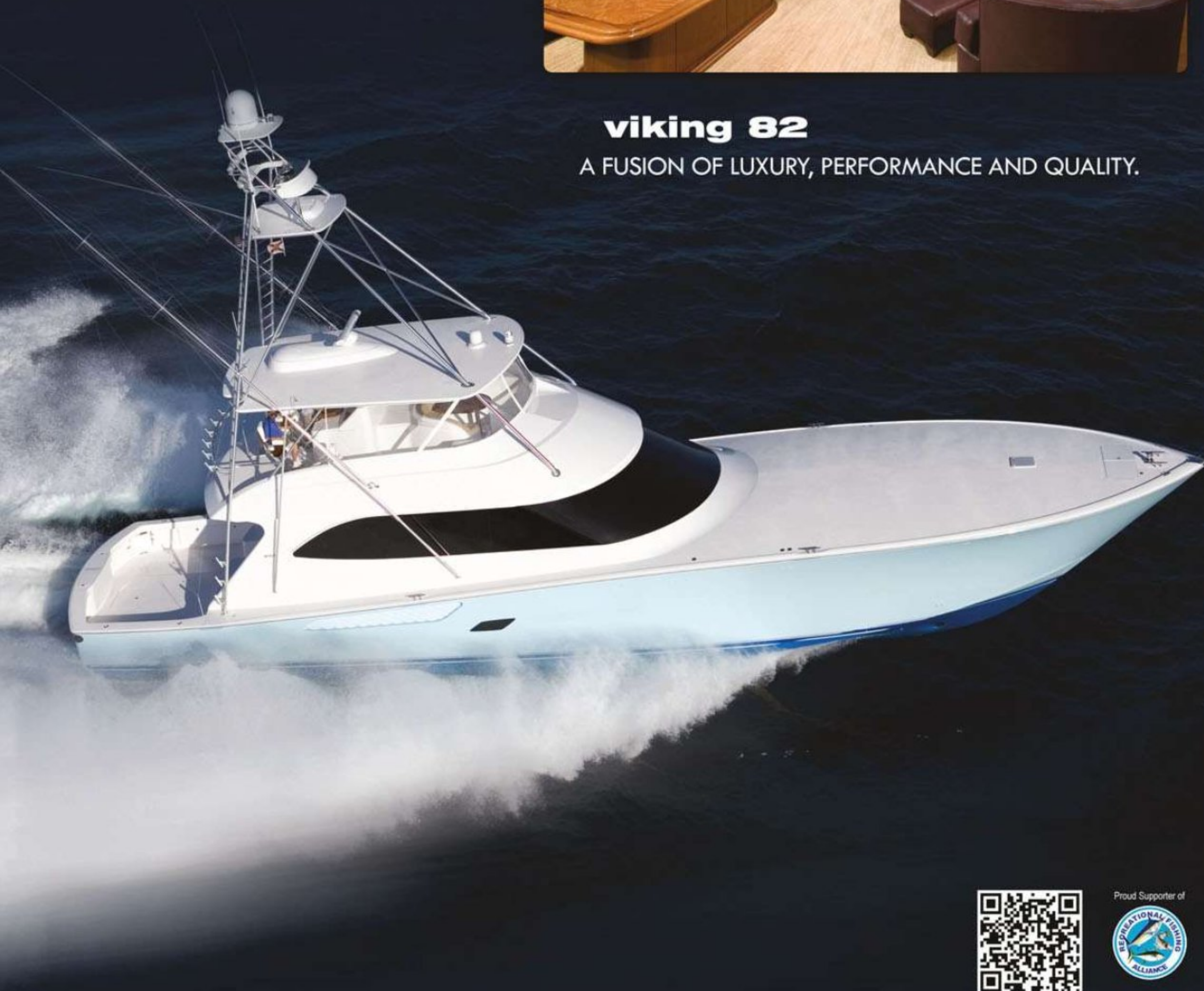
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FreeFlight Achieves ADS-B STC

FREEFLIGHT has received a supplemental type certificate (STC) for its Rangr FDL-978TX universal access transceiver (UAT) to be installed in AgustaWestland's AW139 helicopters. The AW139 is a medium twin-turbine helicopter capable of carrying up to 15 passengers that is used for a variety of operations including emergency medical transport, law enforcement, military operations and support for offshore oil drilling platforms.

According to FreeFlight, the STC provides the first opportunity for Gulf of Mexico (GoMex) operators to



use a rule-compliant ADS-B out system. ADS-B out reports the aircraft's course, speed and altitude information to air traffic controllers and nearby aircraft with ADS-B capabilities.

ADS-B is particularly useful in the GoMex area since there are thousands of daily flights to and from the platforms. Due to the busy airspace, "the FAA allowed operators to install early versions of ADS-B that do not meet the final rule," according to FreeFlight President and CEO Tim Taylor.

FreeFlight teamed up with Chevron, one of the largest operators in GoMex, and used its AW139 helicopters for the development of the STC.

The cost of the Rangr FDL-978TX is \$8,000, including the antennas and installation kit. A certified WAAS-capable GPS must also be installed in the aircraft for the system to work. — P.B.

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The Human Factor



BY JAY HOPKINS

Learning from Others

MY FLYING HAS RECENTLY come full circle. My first flight was in a Piper J-3 Cub back in the 1950s. I worked line service as a teenager in the 1960s to pay for my flying lessons, and in the early 1970s I earned my fixed-wing single-engine and glider commercial and instructor ratings so I could work as a flight instructor and tow gliders in L-19s. Over the next 10 years I accumulated several thousand hours as an instructor and charter pilot. Securing my ATP in 1979 led to the next jump

rating flying a Learjet 55, followed by a type rating in the Westwind several years later. When I became the manager of military instructor training for CAE-Link in the late 1980s, my time in the cockpit, whether simulated or real, decreased greatly. My logbook shows just a few hours each year with large gaps until I purchased a Turbo Twin Comanche in 1999 to use for my business travel. I flew that airplane 500 hours over the next four years as I traveled around the country presenting my Preventing Human Error Seminar.

Three years later my life has finally calmed down enough that I am ready to get back into the cockpit. Besides, I have some grandchildren that want to go flying, and I am taking seriously my own advice in my column last month to introduce people and especially kids to the joy of flying. Although I have had a problem with my left eye for 25 years that required a Statement of Demonstrated Ability, I met the minimum vision requirements for my last third-class medical, so I decided to dispense with the medicals and fly a light-sport airplane. After much searching, I located Parrish Traweck (pcaircraft@hotmail.com) in San Manuel, Arizona, who has a couple of Ercoupes that qualify under the Light Sport regulations available for rental pilots.

Making the Transition

It would be easy for someone with my experience to be dismissive about getting checked out in an Ercoupe. After all, it is a simple little airplane. The only glass in the cockpit is in the face of the few round-dial instruments on the instrument panel. There are very few systems or procedures to learn. It doesn't even have rudder pedals — how hard can it be? However, I am very aware that it is just as easy, or perhaps even easier, to kill yourself in an Ercoupe as it is in a Learjet. Every airplane has its own peculiarities and techniques for flying it well, and I wanted to know everything I could about an Ercoupe before I climbed into the cockpit to fly one. The best source of information on an airplane is the pilots who fly it, so I spent \$25 to join the Ercoupe Owners Club (EOC, ercoupe.org).

On the EOC website, under the ubiquitous FAQ heading, I hit pay dirt. EOC member Ed Burkhead has written a very comprehensive article



>>> Whether transitioning to an Ercoupe or MU-2, training is critical for all pilots.

in my experience — flying as a copilot in the Metroliner for a commuter airline in Tucson, Arizona. That in turn led to a job as an international corporate pilot, adding experience in the Piper Seneca, Beech Baron, Cessna 320 and 414, Navajo Chieftain and P-Navajo.

My aviation experience made a huge jump in 1982, when I was hired by FlightSafety in Tucson as a Learjet 35 simulator instructor and later became the Learjet 55 initial ground school and simulator instructor. Then, in 1983 while instructing at SimuFlite in Dallas, I earned my Learjet type

Eventually the cost of maintaining a 40-year-old airplane led me to sell the Twin Comanche and return to the airlines for my travel. From 2005 to 2008 I served as an instructor, check pilot and mission pilot for the Civil Air Patrol, flying a Cessna 182T out of Payson, Arizona. In the meantime life's distractions were mounting. In the November 2010 issue of *Flying* I wrote about my "Difficult Decision" to take myself off of flying status because I was under so much stress and had so many distractions that I felt I was not safe to fly.

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FLYING SAFELY > The Human Factor

on everything I needed to learn to fly an Ercoupe but didn't know enough to ask. He starts with a short but complete history of the Ercoupe and what made it a revolutionary airplane, especially in 1939 when it was first produced. He explains in simple language why many Ercoupes don't have rudder pedals and no Ercoupes have flaps, and the reason for the "H" tail and the cut-out in the middle of the elevator. Most important of all, he explains how to safely operate an Ercoupe.

Using Ed's simple but complete guide, I tried to imagine "steering" on the ground using the control wheel. I mentally prepared myself to let the airplane land in a crab in a crosswind, and to let it straighten out by itself without trying to keep the wings level with the control wheel because that would turn the nosewheel. I carefully studied the "falling leaf" method of losing altitude on final approach and made a mental note of the importance of pushing the nose down at or

before 200 feet to increase the airspeed for the flare and landing. I also mentally sketched out the fuel system in my head, with the engine-driven fuel pump moving fuel to the header tank in front of the pilot that will allow the airplane to fly for up to an hour after a fuel pump failure.

When I arrived at the airport for my checkout, instead of trying to learn everything from Parrish for the first time, I found his instruction was clarifying and confirming what I already knew. It was still kind of weird steering with the control wheel on the ground, but I had mentally prepared myself to do that. I was ready to take off without holding the upwind wing down, and on approach I had no problem just letting the airplane land in a crab and straighten itself out because I had already done that before in my head.

Recognizing the Risk

I also recently had an opportunity to fly a short body Mitsubishi MU-2P.

During an extensive briefing by Rick Wheldon, co-owner of Turbine Aircraft Services, Mitsubishi Heavy Industries America Inc.'s Aircraft Product Support Division contractor for the MU-2, Rick told me about the significant difference in the center of gravity between the short- and long-body MU-2s. I could easily see how a pilot with experience flying a long-body MU-2 could get in trouble trying to fly a short-body model without getting instruction from someone with experience in that airplane. Instead of the smooth, effortless takeoff and gentle landing I accomplished in a long-body Marquise, the MU-2P required the strongest back pressure to rotate for takeoff I have ever experienced, and I followed Rick's advice to do an initial flare and then just let it land to avoid having the nosewheel slam down on the runway.

We have always known that the first few hours in a new type of airplane are the most risky for a pilot. The

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NTSB recently confirmed this when it focused on the fact that experimental amateur-built (EAB) aircraft represent less than 10 percent of the general aviation fleet in the United States but accounted for 15 percent of all accidents and 21 percent of the fatal accidents in 2011. The NTSB said the gap in safety is widest on the first flight and during the first few hours being flown by a pilot without experience in that kind of airplane.

The NTSB found that pilots who did not seek training were overrepresented in the accidents, and that EAB aircraft accidents involving loss of aircraft control could be reduced if more pilots received transition training. This was especially true of pilots who purchased an EAB from the original builder. The NTSB said that in many cases the accident aircraft lifted off in the hands of a pilot who had never read an operating handbook for that specific aircraft.

With the wealth of information available today, there is no excuse for taking off in an airplane without fully familiarizing yourself with the systems and operating characteristics of that airplane. Most airplanes have an owner/operator group like the Ercoupe Owners Club that can provide a wealth of information and advice. The Lancair Owners and Builders Organization even offers a special transition course for new owners and claims that pilots who have taken its course have a significantly lower accident rate than those who haven't.

Mitsubishi Heavy Industries America Inc., SimCom and Honeywell regularly offer a free Pilot's Review of Proficiency (PROP) to the MU-2 community and others who may want to attend in a number of cities around the United States and sometimes internationally. I attended this year's PROP in Reno, Nevada, and found the presentations were very interesting and informative even for someone who doesn't fly an MU-2. Approximately 65 percent of all MU-2 pilots attend the PROP on a regular basis, and along with the FAA SFAR, this has helped the MU-2 achieve the lowest turboprop accident rate for the last five years.

Whether you are moving up the aviation ladder to more sophisticated airplanes or like me are getting back to your aviation roots, treat every new kind of airplane you fly with the same respect. Take the time to fully familiarize yourself with the airplane before you do any flying, or do a thorough

review if it is a type of airplane you have not flown for many years. Careful preparation will ensure your first flight is safe, leading to many enjoyable flights for you and your passengers instead of another news story that reinforces in people's minds that flying is dangerous. ✈



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FLYING SAFELY

IFR Insight

BY MATTHEW GOLDEN

Be Prepared for the Missed Approach

BELIEVE MOST PILOTS WOULD agree the execution of a missed approach is one of the most demanding situations a pilot may encounter, short of an emergency. Appropriately, we practice them numerous times during initial instrument and recurrent training. But when was the last time you executed a missed approach outside of the training environment? Knowing that your next missed approach could occur tomorrow, let's take a moment to review the fundamental elements so you're prepared for your next IFR flight.

The FAA's *Instrument Flying Handbook*, a primary reference in instrument training, states the following: "When a missed approach procedure is initiated, a climb pitch attitude should be established while setting climb power. Configure the aircraft for climb, turn to the appropriate heading,

advise ATC that a missed approach is being executed, and request further clearances." This advice follows the principal pilot mantra, "Aviate, navigate, communicate."

I can assure you, as an instructor who has worked with hundreds of instrument students, there's a bit more to the story. Saying "Aviate, navigate, communicate" is one thing; *doing* it is another.

Aviate

It's quite simple: Without aircraft control we have nothing. However, the simplest tasks are sometimes the most difficult to complete. This is because we have many other tasks vying for our attention, such as getting established on the missed approach course, communicating with air traffic control and completing the missed approach checklist. With so many distractions

pulling at our attention, it is almost no wonder I have been witness to numerous student crashes (in the simulator) immediately after initiating the missed approach procedure.

How can this be? Without the proper patience we may tend to believe that the airplane is safely established in a climb after the initial pitch-up and a couple of turns on the trim wheel.

But after the initial power application and pitch adjustments, we have to monitor the airspeed to ensure it stabilizes appropriately. And the pitch trim must be adjusted until the airspeed is stable. It's easy to apply trim until the control pressures seem to be gone, but if the airspeed is trending up or down, the pitch will ultimately change — sometimes unbeknownst to the pilot.

Most missed approaches also involve at least one, if not many, configuration changes (i.e., retracting the landing gear and flaps, etc.). This will certainly change the pitch of the airplane and, thus, the need for trim.

A few seconds invested to ensure the airplane is properly configured and trimmed will go a long way in aiding you to safely adjust navigation equipment and make the necessary calls.

Navigate

Let's assume you've exercised good patience and the airplane is fully configured and trimmed, climbing safely to the missed approach altitude. The initial climb, while close to the ground, is not the time to be figuring out which way to fly and to begin programming navigation equipment.

Nowadays, the average IFR-certified training airplane is equipped with the avionics to fly the approach and, at the same time, to have the missed approach navigation aids tuned and set. Use your approach briefing (while safely en route prior to the approach)



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Scott Fera, Vice President Marketing
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Michael Young
Former Senior Captain
Eastman Kodak
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Dear Mr. Fera,
I have been employed by Eastman Kodak Company in Rochester, New York, for the past 13 years. As you are undoubtedly aware, Kodak filed for bankruptcy on January 19 of this year. On that morning, all members of our 65-year-old flight department were called into the hangar and told we were closing, effective immediately. Though not entirely unexpected, it was nevertheless a shock for us all to learn our home of many years (we had all been there more than ten) would no longer be there.

The closure came less than a week prior to my next scheduled Global Express recurrent training in Wilmington. Prior to the fateful day, I had prayed I would at least secure one more recurrent, in order to retain the credentials needed to stay afloat doing contract work until I landed another permanent job. However, that was not to be, and I'd been forced to come to terms with the fact my 61.58 Global currency would expire at the end of April.

So, imagine the elation my wife and I experienced a few weeks ago as we sat drinking coffee, staring at each other, wondering what to do next, when I received an email notification that FlightSafety was reinstituting its phenomenally generous Proficiency Protection Plan. A friend and long-time co-worker benefitted from the program in 2009 after being downsized, but that was immediately following the onslaught of the financial crisis of 2008.

I hadn't even imagined it would be available to me at this time. What a gift! Having trained at FlightSafety for nearly 20 years, I've always considered it the pinnacle of flight training. The leader. The team of professionals I've dealt with over the years, primarily in Wilmington, has made each training experience a true pleasure. They welcome me on the first day, greeting me by name. Throughout the week everyone there, up to and including the cleaning staff and the gentlemen who take care of the coffee area upstairs, treat me and my buddies like we truly matter. It's a culture of customer service based on competence and cordiality. So honestly, though this is one of the most generous gifts I've ever received, it comes as little surprise based on FlightSafety's history of benevolence within the aviation industry.

All that said, I'd just like to say thank you, from the bottom of my heart, to all involved in presenting the overwhelming gift of a complimentary recurrent training session. It will help us immensely in seeing our way through this unfortunate turn of events, enabling me to remain marketable and employable as we plan for the future. Due to FlightSafety's overwhelming generosity and loyalty, I am in turn a loyal customer, promoter and friend for life. Thanks again!

Sincerely,
Mike Young

(Michael D. Young, former Sr. Captain, Eastman Kodak Aviation Services)

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as an opportunity to preprogram your avionics for the missed approach.

Make sure you are completely familiar with the process of sequencing your GPS receiver into the missed approach phase. All receivers require some pilot action, which consists of pushing a button, usually labeled

“SUSP,” “OBS” or “G/A.” Some airplanes have a TOGA (take off and go around) switch that is also used to transition to the missed approach.

Here is some food for thought: Even if you are not flying a GPS or RNAV approach, you can have the approach loaded into the electronic

flight plan for help during the missed approach procedure. The use of a properly sequenced GPS flight plan is especially helpful during complicated missed approach procedures with more than one navigational aid.

In addition to the preparation of your avionics, make sure your mind is prepared as well. When performing your approach briefing, review the entire missed approach procedure. It is a bit optimistic to commit the entire procedure to memory, but at a minimum remember the *first* step of the missed approach.

Communicate

While there is the occasional exception to the rule, communicating with ATC always comes in third place behind controlling the aircraft and navigating safely. My students are always in a rush to report the missed approach, sometimes even doing this before the climb has been initiated!

The question is: Are you ready to *listen* to what ATC is about to tell you?

If I am playing the role of ATC for my students when they report too soon (in the simulator), I seize the opportunity to assign a new communication frequency along with modified missed approach instructions. This results in degradation of aircraft control and loss of situational awareness. I don't do this for my amusement, of course, but it sure leads to a very beneficial debriefing during which the student relearns the importance of aircraft control and workload prioritization.

With a little patience and a firm respect for this manner of workload prioritization, you will be fully prepared for your next missed approach.

Matthew Golden was the 2007 Arizona Flight Instructor of the Year. He holds Airplane Land and Sea ratings, Flight and Ground Instructor certificates, a type rating for the CRJ-700, an Aircraft Dispatcher certificate, and a graduate certificate in Instructional System Design. For nearly a decade, he has served as a flight instructor, check instructor and professor at Embry-Riddle Aeronautical University in Prescott, Arizona. ✈

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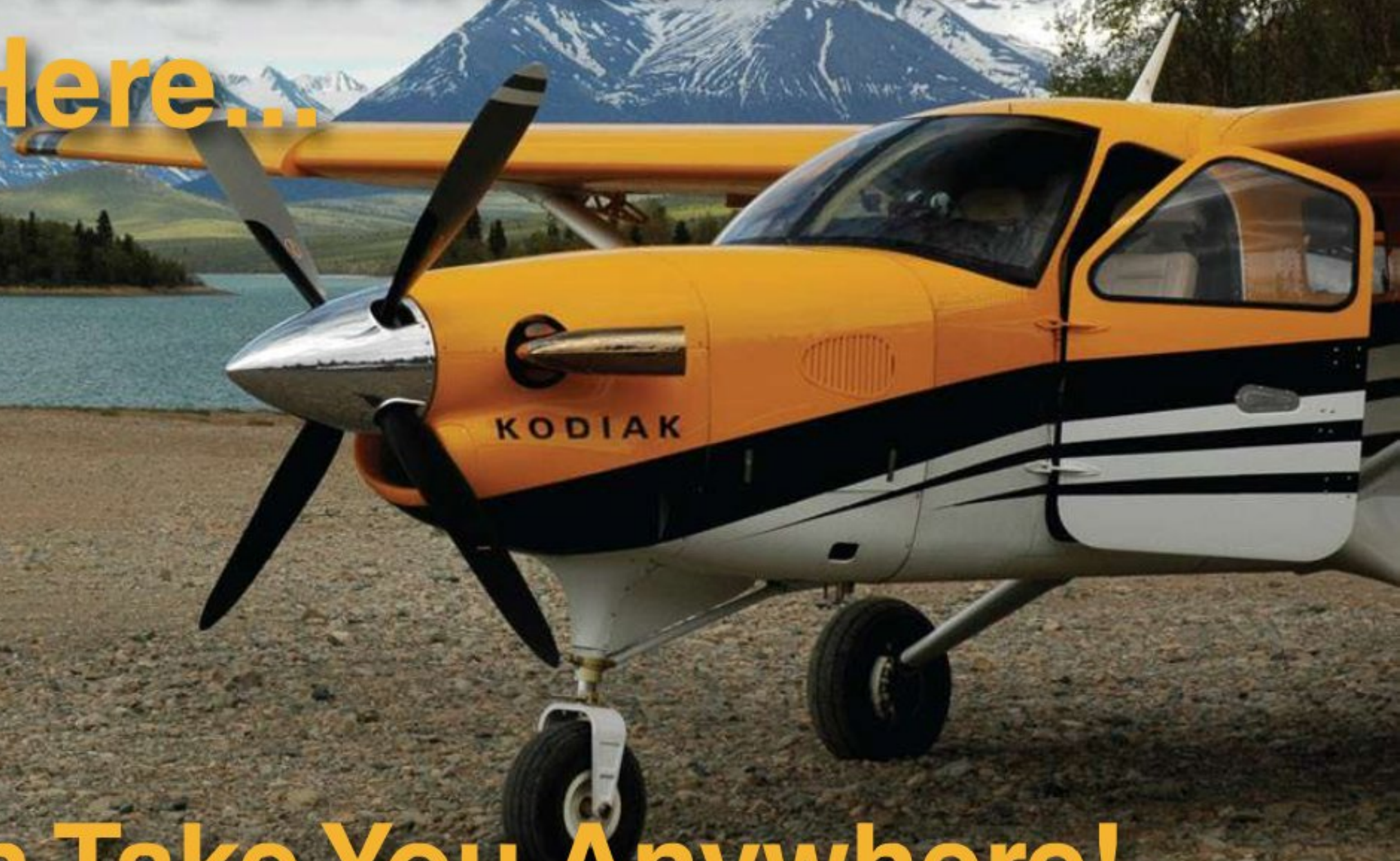
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BY PIA BERGQVIST

Maintaining Proficiency

What kinds of things should pilots practice regularly once they obtain their pilot certificate?

Max Trescott is the 2008 National Certificated Flight Instructor of the Year. Based in Palo Alto, California, he teaches in glass cockpit aircraft and in Lake amphibians. He also publishes aviation books and software available through g1000book.com. He says:

Celebrate your pilot certificate by flying often! But don't get stuck in a rut and fly the same routine each time you fly. Instead, reinforce all of your flying skills while developing new ones. Build a plan to get regular experience in these areas: piloting skills, flight planning and aeronautical decision-making (ADM).

In the skills area, practicing landings is most important. Pilots seem to understand that, and a typical flight for many pilots involves eight or 10 landings and then calling it quits. But make sure you practice the full range of landings, including power-off landings from the pattern altitude and higher. When I pull the power at 4,500 feet, I sometimes hear from the student: "I haven't done that since I got my license 10 years ago." "Well, why the heck not?" I wonder.

If you fly tailwheel aircraft, practice wheel landings regularly. Seaplane pilots should practice glassy water landings even when the water's not glassy. And, no matter what equipment you fly, make sure that you practice go-arounds often. Make sure that the right side of your body is moving forward in concert as you add power and right rudder.

While maintaining your flying skills, don't forget to exercise your brain. Practice planning trips to various destinations, even some you may never fly to. Consider the safest routes, not just the

GPS direct route, taking possible emergency landing sites into consideration. Pick safe altitudes that avoid terrain and obstructions. Evaluate the weather on different days and decide which of those days you would cancel.

Finally, become a student of ADM. Before each flight, think about the unique risks you face for that flight. It could be issues related to weather, terrain, familiarity with the aircraft or airport, night, fuel, unfamiliar airspace or even noise abatement regulations. If anything makes you uncomfortable, mitigate the risk by getting more information, bringing along a CFI or canceling the trip.

Eric Radtke is an airline transport pilot, Gold Seal flight instructor, advanced ground instructor and NAFI-accredited Master Flight Instructor. Eric has been involved in aviation education since 1998 and currently serves as president and chief instructor of Sporty's Academy — the educational arm of Sporty's Pilot Shop. He says:

Earning a pilot certificate is a special accomplishment. It also comes with the responsibility to continue learning and refining those skills through practice. Creating a plan for doing so will only enhance your aviation experiences and provide even greater personal enrichment.

Practice landings: A wise person once told me: "You can't practice anything effectively unless you have goals and a method to measure progress." In terms of making more consistent landings, this means examining your landings with a critical eye. Some things to consider:

Speed: Are your pattern speeds correct and consistent through all legs?

Aiming and touchdown points:

Are you maintaining the discipline to select aiming and touchdown points for every landing and making those touchdown points?

Flare and touchdown: Are you appropriately trading airspeed for altitude in the form of a shallower descent in the flare and touching down as the wings stall?

Runway alignment: Are you on centerline with the longitudinal axis parallel to the runway?

Go-arounds: Are you following your own rules for a stable approach and executing a go-around when appropriate?

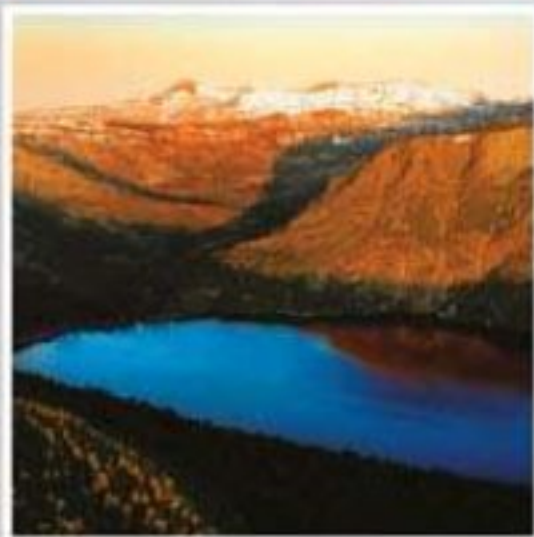
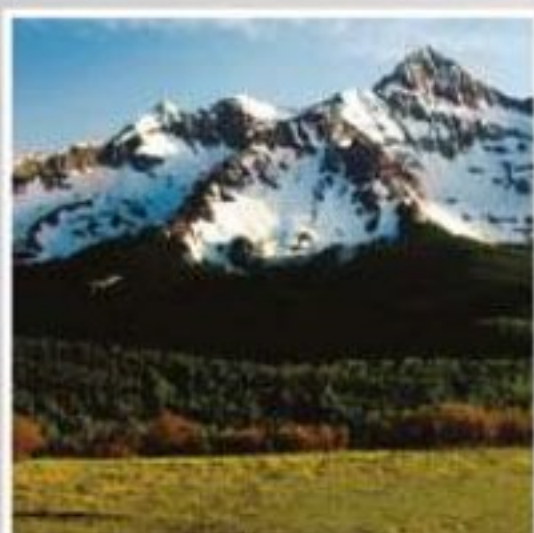
Judge your improvement on the quality of your "bad" landings. And practice under a variety of conditions (wind, configuration, time of day, etc.) to better hone your visual cues and mastery of the airplane.

Practice abnormal procedures: Read the wonderfully insightful section of your POH that includes an expanded discussion of abnormal and emergency procedures. On your next flight, review the table of contents for the emergency section and select an event you haven't practiced. Follow the checklist for that item and understand the "why" behind it. This exercise not only will prepare you for real-time anomalies, but also will ensure a better understanding of your aircraft's systems.

Finally, fly: There's nothing better for proficiency than to fly more and visit unfamiliar airports. ✈



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FLYING SAFELY

Aftermath

BY PETER GARRISON

Unforeseen Circumstances

IN FEBRUARY 2010, A CESSNA T337G Skymaster made a low pass over the runway at Farmingdale, New Jersey. As it pulled up, a six-foot piece of the right wing broke away; the ensuing crash, before the eyes of friends and relatives for whose benefit the pass was being made, killed all five aboard.

In August of the same year, in Saltsburg, Pennsylvania, a Beech Baron crashed into a house. The pilot-owner of the Baron and a flight instructor died, and the house was destroyed by fire.

Both airplanes had been modified under multiple STCs, and the NTSB concluded that interactions between various modifications could have played parts in both crashes.

The pilot of the Baron, a 1982 Model 58, had owned the same airplane 22 years earlier. He had sold it, moved up to a Cessna Citation 510, and four days before the accident purchased his old Baron again. In the interval, the airplane had been modified with more powerful engines — 300 hp rather than the original 285 — four-blade props, winglets, and vortex generators on the wings and vertical stabilizer.

The purpose of the vortex generators was to lower the minimum control speed by delaying the stall and improving the effectiveness of the rudder. Normally, the minimum control speed of the 58 is 81 knots; the VGs dropped it to 74, and the modification included replacing the original airspeed indicator with one marked to reflect the new, lower VMC.

The more powerful engines were installed later. One of the consequences of the added power was an increase in VMC, which rose from 81 to 87 kias on the stock airplane. In the absence of flight test data, the NTSB noted that the VMC of the VG-equipped airplane was likely to have been similarly

increased by the added engine power; but the holder of the engine-replacement STC was not required to determine a new VMC for every Baron variant, only for the standard model. The STC instructions did include a direction to “mark instruments in accordance with Flight Manual Supplements for the appropriate model,” but it was probably unclear to the installer what the instruction meant in the particular case of the VG-equipped Baron, and the FAA provided no guidance; so the airspeed indicator with the red VMC line at 74 knots remained unchanged.

The Baron’s radar track, as well as

column, which might have impaired the instructor’s ability to prevent the spin or recover from it. Another contributing factor was “the lack of guidance by the Federal Aviation Administration for an installer of a supplemental type certificate (STC) modification to determine the interrelationship between all STCs incorporated into an aircraft.” At the end of 2011, the FAA partially remedied the omission with an airworthiness directive (AD) mandating that, in the absence of other information, the VMC for the VG-plus-engines mod would be the VG-equipped VMC multiplied

>>> As far as NTSB investigators could determine, the pilot may not have flown a reciprocating-engine airplane for three years prior to the accident.

the statements of witnesses and the evident purpose of the flight, suggested that it was performing a VMC demonstration at around 4,000 feet when the spin occurred. The maneuver would involve reducing power on the left engine to idle, bringing the right engine to full throttle, and gradually reducing speed until it was no longer possible to hold heading.

As far as NTSB investigators could determine, the pilot may not have flown a reciprocating-engine airplane for three years prior to the accident. They noted too that he was required to have a second pilot with him in the Citation, which is eligible to be flown single-pilot, because he did not meet single-pilot proficiency requirements. There were indications that his shortcomings were related to speed control, which could, of course, be involved in a VMC-related mishap.

A possible contributing factor was the airplane’s throw-over control

by the ratio between the re-engined VMC and the stock VMC — in other words, $74 \times (87/81)$, or 79.5 kias.

It should be noted that VMC-related spins are by no means unheard of in the stock Baron or in its precursor the Travel Air, and so the fact that this Baron had a misleadingly marked airspeed indicator, while suggestive, cannot be absolutely linked to the loss of control.

The Baron had been modified with only two STCs (the winglets and props came with the engines). The Skymaster whose wing failed after the low pass in New Jersey had 22. Many of them were unrelated to the accident, but those that the NTSB thought might be related included span-extending tip tanks, winglets and a STOL kit that included stall fences and drooped leading edges on the inboard wing panels.

There were five people in the airplane, and it had just taken on 90 gallons of fuel. NTSB investigators calculated that the weight of the airplane was over gross,

most likely by several hundred pounds, and that its CG was significantly behind the aft limit. The overload was concentrated in the fuselage, increasing the bending stresses in the wing.

Again, the NTSB identified air-speed indicator markings as a factor. The wingtip extension STC required a placard reducing the maneuvering speed to 117 kias when the tip tanks were empty. How much fuel, if any, was in the tip tanks is unknown, but at any rate that placard was absent; the placard in the airplane instead gave a maneuvering speed of 135 kias. The low pass was conducted at about 160 knots. The NTSB said that the airspeed had “exceeded this operating limitation,” a judgment that seems to betray a misunderstanding of the concept of maneuvering speed. The maneuvering speed is the speed below which a rapid, full application of the pitch control should not overload the structure. There is nothing in it to suggest that you cannot legally and safely make a pass over a runway at any speed right up to VNE. The critical issue is the nature of the pull-up, not the speed of the pass.

In principle, the wing should have withstood its design ultimate load factor of 5.7 G’s for at least several seconds without breaking, or somewhat less because of the cabin overload. If the pilot really pulled that much G, the aft CG location could have had a role; control forces get lighter as the CG moves aft, and dangerously light when it’s well beyond the aft limit.

A witness said that the pilot had made low passes “followed by rocking the wings or pitch-up maneuvers” on several previous occasions — behavior which the NTSB characterized as “consistent with an ostentatious display.” Now, many pilots make low, fast passes over runways, and while their purpose may be “ostentatious display,” it is certainly not tantamount to “reckless flying.”

There was more to the story. Investigators found indications of abnormal skin fatigue in the wing and attributed them to “vibratory stresses” related to unspecified interactions among the airplane’s many wing modifications. Field reports on similarly modified

airplanes revealed other instances of wrinkled skins, cracks, loosened rivets and “loose wingtips.” The FAA advised operators to have their wings inspected but did not consider that the situation warranted an AD.

STC certificates include a piece of boilerplate that is supposed to deal with interactions of aftermarket modifications: *This approval should not be extended to other aircraft of these models on which other previously approved modifications are incorporated unless it is determined by the installer that the interrelationship between this change and any of those previously approved modifications will cause no adverse effects on the airworthiness of the aircraft.* How the installer is supposed to make such determinations is not explained.

Postscript

In the April issue, this column discussed an accident involving a stall-spin following a steep climb performed in a gusty wind. The NTSB report (CEN11FA304) cited witnesses who said that they had seen the pilot, Pete Vinton, flying in a reckless manner — specifically, performing “downwind departure stalls at 200 feet” — in similar conditions the day before.

Several friends and associates of the pilot have petitioned the NTSB to amend the report. In particular, Dagmar Kress, a former member of the German national aerobatic team, and Brian DeVandry, a retired United Airlines 747 captain, state that they were in the airplane with Vinton during the flights the day before, that no departure stalls took place, that no maneuvers were performed at inappropriate altitudes, and that there was nothing reckless about the pilot’s flying then or, to their knowledge, at any other time.

If the NTSB had interviewed these witnesses, the general impression created by its report would have been different.

This article is based on the NTSB’s report of the accidents and is intended to bring the issues raised to our readers’ attention. It is not intended to judge or to reach any definitive conclusions about the ability or capacity of any person, living or dead, or any aircraft or accessory. ✈

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On the Record

ACCIDENT REPORTS

The following are excerpts of official NTSB summaries of general aviation accidents in the continental United States.

Beech 35-C33 Debonair **Rockwall, Texas**

INJURIES: 1 Uninjured

The pilot was returning to his home airport and obtained the automated weather information from a nearby airport. The pilot misinterpreted the wind direction, which was from 010 degrees at 9 knots, as 110 degrees at 9 knots. As a result, the pilot landed long on Runway 17 with a left quartering tailwind, bounced and tried to turn onto a taxiway with too much speed. The pilot was unable to slow the airplane down and subsequently went off the end of the runway into a construction zone. A post-accident examination of the airplane revealed that the firewall and left wing spar were substantially damaged. No mechanical deficiencies that would have precluded normal operation were noted with the airplane or its systems.

> PROBABLE CAUSE(S): The pilot's loss of control while landing with a tailwind due to his misinterpretation of the wind conditions.

Bellanca 14-13 Cruisair **Stoughton, Wisconsin**

INJURIES: 2 Serious

The pilot reported that he performed an engine run-up prior to takeoff and everything was normal. He had the flaps extended two notches when he initiated the takeoff to the north on the 2,500-foot-long wet grass runway. The airplane became airborne about half-way down the runway. The pilot stated that upon reaching 65 to 70 mph, he reduced the flaps to one notch to maintain the best rate of climb. He stated that the airplane cleared the initial group of trees before descending. The airplane subsequently contacted the trees and sustained substantial damage to the fuselage and both wings. A witness said the airplane was "mushy" during the takeoff and the nose remained high

prior to the right wing dropping and the airplane descending. The airplane was about 190 pounds under gross weight and the density altitude was approximately 2,600 feet. The operation of the airplane near maximum gross weight at a high-density altitude on a wet grass runway degraded the airplane's takeoff performance. A post-accident examination of the airplane and engine did not reveal any anomalies. The pilot reported that he did not get the gear retracted prior to impact.

> PROBABLE CAUSE(S): The pilot's improper preflight planning and his failure to gain proper airspeed during takeoff from a grass airstrip resulting in a stall, the loss of control, and subsequent impact with the trees. Contributing to the accident was the pilot operating the airplane at near maximum gross weight and the high-density altitude.

Piper PA-30 **Twin Comanche** **St. Petersburg, Florida**

INJURIES: 1 Serious, 4 Minor

During the takeoff roll, with the flaps extended, the pilot overrotated the airplane when it reached an airspeed of 85 mph. He retracted the gear, the airspeed decreased to 69 mph, and the airplane stalled. The left wing dropped, the pilot lowered the nose of the airplane, and it collided with the ground resulting in substantial airframe damage. A visual examination of the airplane verified the pilot's statement that there were no mechanical malfunctions or anomalies. The airplane flight manual indicated the airplane will stall at 69 mph with the landing gear and flaps extended.

> PROBABLE CAUSE(S): The pilot's improper rotation during takeoff, resulting in a stall and subsequent collision with the ground. ✈



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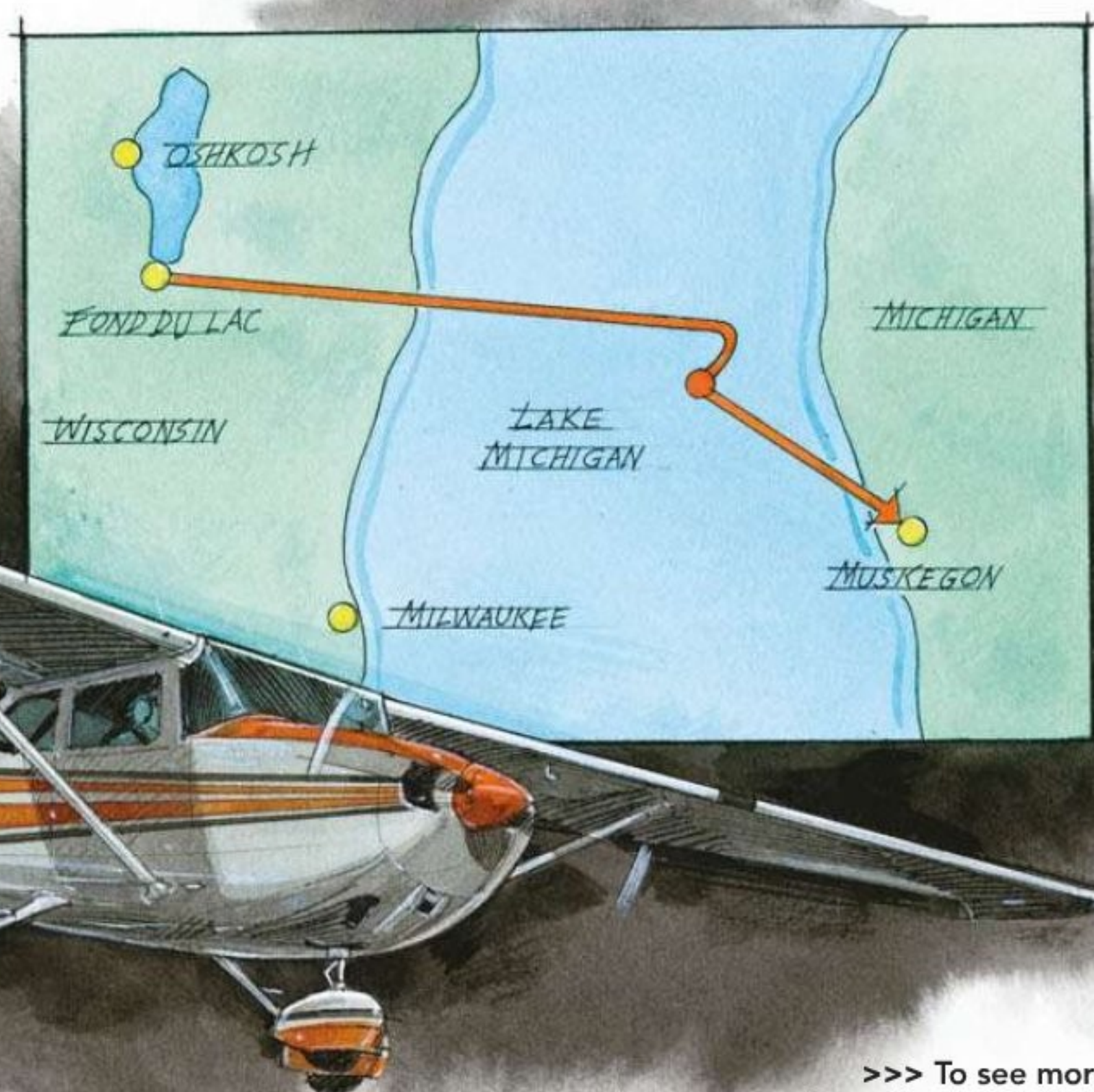
EARNED MY PRIVATE PILOT certificate in October 2006 at the age of 35. A few months later, in July 2007, a pilot friend of the family heard I was a new pilot and invited me along to EAA AirVenture Oshkosh. Even though I had just met Steve, I thought it was an awesome opportunity, so of course I said yes. It was my first real flying trip, and it was to Oshkosh! I was excited, to say the least. All my training was still fresh in my mind, so I felt like I would make a good copilot and also learn a lot from this guy who has *his own airplane*. His plan was to fly there and back in the same day. I had a whole 11 hours of PIC time and not much cross-country experience.

I met Steve at his hangar for our 7:30 a.m. departure. We departed in his 1970 172 from the Detroit area (PTK) and headed directly toward Oshkosh, planning to fly over Lake Michigan. I was concerned about visibility and horizon issues over the lake, but I felt I wasn't

experienced enough to say anything. Steve told me that he wasn't instrument rated, and I cracked half a smile when he commented, "The airplane doesn't know it's over water." His comment was the first of many eye-openers for me. I remember the day was overcast with scattered rain showers over all of Michigan and Wisconsin.

We headed direct to Fond du Lac, Wisconsin, and flew a west-northwest heading of about 290 degrees at 2,500 feet because Steve liked to stay low and enjoy the view. This was in direct opposition to my training — that there is safety in altitude — but Steve blew me off when I mentioned a higher altitude. Steve also thought my idea of flight following was a bad one. He was starting to make me feel like a

safety freak. The first half of our flight was uneventful. We did encounter occasional rain showers, but ceilings were somewhere above us (not hard to do at 1,500 feet agl). After about an hour we started a climb to gain some altitude for the crossing. (So Steve's not totally crazy!) We reached the shoreline of Lake Michigan, and looking out over the lake, all we could see was haze and clouds. The forward visibility was nil and there was no horizon to be seen — everything was a gray blob. Steve was not concerned about this, but without an IFR flight plan I insisted we turn and follow the shore of Lake Michigan around to Chicago. Steve reluctantly agreed, and as we flew south along the shoreline, storms were popping up everywhere. We got



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FLYING SAFELY > I Learned About Flying From That

some weather information about a storm heading our way from Flight Watch, so we stopped at Andrews University (C20) to wait for the approaching thunderstorm to pass. After about an hour we took off and continued our journey. The rest of the trip was met with rain showers and thunderstorms,

but fortunately the ceilings were high enough and we could continue VFR. We spotted many heavy rain showers as we made our way (many thanks to the great controllers throughout Wisconsin who helped us pick our way through). Eventually we made it to Fond du Lac. It was about 11 a.m. by

now, and we parked the airplane, filled out our fuel card and attached it to the prop. We hopped on the shuttle bus and headed to the fun!

Our day at Oshkosh was amazing. The storm clouds finally parted and it was hot and sunny. We saw as much as we could have, and around 5 p.m. we started back to the airport for a departure. The shuttle bus took quite a while, and when we reached our airplane we found it hadn't been fueled up. Before we could get fuel, another rainstorm rolled in, and it wasn't until after 8 p.m. when we were finally fueled up and we departed for home, with clear skies and a beautiful setting sun at our backs.

We headed eastbound over Lake Michigan, which was a mutual decision — the last storm had departed the area and the skies were clear and beautiful. We climbed up to 7,500 feet. There were some scattered clouds way down below but we were in severe clear. At the show, I had bought a Garmin 496 with Nexrad weather (after the morning flight, I had to have it ...). We were watching it paint plenty of weather ahead of us, over mid-Michigan.

Initially we were thinking of staying high and maybe flying over the weather all the way to Detroit, or we felt we could pick our way around the weather. While we were humming along discussing our options, we never gave any thought to daylight, but the sun was quickly dipping down and would soon leave us in the dark. If we had considered the time change, we would have realized that it was working against us, having left at 8 p.m. CST, which is 9 p.m. EST, and we would be flying in the dark for most of our trip.

It kept getting darker by the minute, which didn't seem to bother either one of us until it happened — complete, total darkness over Lake Michigan. It was like the lights were turned off, and we were caught by surprise. I know that sounds silly — that it got dark and it surprised us — but with our location, over probably the midpoint of Lake Michigan, we had no lights or horizon to reference out of the windows. Steve was flying, and after a brief discussion we decided to start a descent to make sure we would

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be below the upcoming clouds before reaching them.

Sometime during our descent I realized we were making a shallow right turn and at that moment were heading southwest, back toward the middle of the lake instead of toward the eastern shoreline. One look at Steve and I instantly realized he was nervous and disoriented. A sick feeling came into my gut. I asked him about our heading and he was confused. Right away, I knew I could not count on him to bring this flight to a safe conclusion, and internally I visualized we were writing the beginning of an NTSB report. I decided right then and there that I would break the accident chain and take charge of the situation. I asked Steve if I could take the airplane, and he said sure. We couldn't see anything out the window — it was pitch black.

I decided we needed to get on the ground as soon as possible and get ourselves together. I contacted Muskegon approach and asked for vectors for landing. I descended to 2,500 feet msl to ensure we would be below any clouds and trudged along. I told myself to make a video game out of the situation and used the artificial horizon, altimeter and GPS to keep us on course to MKG and maintain my altitude. Fortunately, it was easy to do because there was no turbulence — in fact, it was eerily smooth. I kept thinking about my wife and child at home and was determined to keep it together even though the windows were filled with blackness and I knew the water was below us. The controller told us that there were thunderstorms east of Muskegon but we should be able to beat them to the airport. The minutes went by slowly and then finally it happened — lights came into view. The pressure instantly lifted as we began to make out the shore lights. We brought it in safely to Muskegon. Of course, on short final the landing light blew out to top off our night! We landed with few minutes to spare as the thunderstorm rolled over the airport, and the rain started when we tied down the airplane. We waited in the FBO for at least an hour, but the storm wouldn't budge, so we called for a hotel room

and stayed the night.

We finally got to bed around midnight. I was exhausted but I didn't get any sleep. On this trip, I was lulled into a sense of safety because I was with an "experienced" pilot. I thought he would personify everything I had learned in training to be a pilot. I'm

sure Steve's no dummy, but I don't fly like he does. At the time, I didn't know what I didn't know. I've done a lot of flying since then, and I'm always trying to learn more. I'm almost ready for my Instrument written test. I learned a lot on that trip. I learned about flying from that. ✈



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PIPER J-3 CUB

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turns 75



>>> BY STEPHEN POPE / PHOTOS BY JIM KOEPNICK



SIMPLICITY

and durability are defining characteristics of so many of the classic American products we love best: The Harley-Davidson Flat-head. A well-worn pair of Levi's jeans. A Rawlings baseball improved by the scuffs and scars and patina of use. For generations of pilots, the object of our nostalgic affection is the Piper J-3 Cub. Introduced 75 years ago, the J-3 established the idea of a simple, inexpensive and easy-to-fly trainer. In the 1940s and 1950s, more pilots learned to fly in J-3 Cubs than any other model. Even if you've never sat behind the controls of one, you understand the importance of the J-3 to general aviation history. If you have flown a Cub, well, you don't need to be told it's one of the best-flying light airplanes ever made.

I started out learning to fly in a 1946 J-3 when I was 15. That was in the late 1980s at a grass strip close to my home in northern New Jersey. I can remember some days soloing in the Cub it would be just me and another pilot in a Stearman and still another in an old T-6, the three of us circling the pattern as though we'd been transported through time to a summer afternoon when the only things that mattered were seeing which way the wind moved the corn and making certain to get the stick all the way back at the last instant in the flare. When you did it just right in the Cub, the effect was magical. And when you got it slightly wrong, the J-3 wouldn't let you off the hook without a lesson that could stay with you for a long time. Maybe forever.

The story of the J-3 Cub begins with two barnstorming brothers, C. Gilbert and Gordon Taylor, who together formed the Taylor Brothers Aircraft Co. in the late 1920s. Their goal was to produce and sell a small, two-seat, high-wing monoplane named the Chummy that cost \$4,000 — about the price of a new house in 1928. They'd built a handful of airplanes, but tragically Gordon Taylor was killed in an airplane crash and the company went bankrupt.



William T. Piper, a Bradford, Pennsylvania, businessman who was running his family's oil business, purchased a controlling share in the Taylor Aircraft Co. for \$761 as it emerged from bankruptcy in 1930. Piper retained Gilbert Taylor as president and asked him to build an inexpensive, easy-to-fly trainer that the average person could afford to rent. Most of the trainers in those days were heavy biplanes with big radial engines and as a result were expensive to fly. Piper reasoned

that a small, simple airplane might cut the costs in half, enabling more people to learn and creating demand for the company's products.

In September 1930, Taylor introduced a two-seat tandem taildragger, the Taylor E-2. This model featured wings mounted high on the fuselage, an open cockpit, fabric-covered tubular steel fuselage and wooden wings. Power came from a 20-horsepower Brownbach Tiger Kitten engine. The trouble was the Tiger Kitten didn't

have the oomph to power the E-2. On Sept. 12, 1930, a test flight ended almost as soon as it started when the airplane ran out of runway, the underpowered engine unable to lift the E-2 out of ground effect.

The company soon introduced an improved E-2 powered by the newly developed Continental Motors A-40 putting out 37 horsepower. The new Taylor E-2, now affectionately known as the “Cub,” earned its type certificate on July 11, 1931. Despite some early reliability problems with the engine, the airplane was a hit.

Taylor chose the lightly loaded USA-35B airfoil for the E-2, a design that provided good low-speed flying qualities — it was reluctant to stall and provided plenty of warning before it did. All Cubs, including the J-3 and Super Cub, have used this same airfoil shape. For this reason, the Cub is a forgiving airplane in the hands of a novice and downright divine with a skilled pilot at the helm. Many of us have marveled at the flying antics of the drunk, Cub-stealing farmer — a role played at airshows by J-3 maestros like the late Bob Weymouth, who could make a Cub do things you wouldn’t believe if you didn’t see it with your own eyes.

>>> After 50 years in storage, this rare Taylor E-2 Cub underwent meticulous restoration to flying condition at the Golden Age Air Museum in Bethel, Pennsylvania. Opposite: Many pilots know the joy, and challenge, of making a perfect three-point landing in the J-3 Cub, widely considered one of the greatest trainers ever made.



Birth of the J-3

For the next few years after the E-2’s introduction, Taylor Aircraft struggled. The company sold a handful of airplanes and showed only small profits. It was during this time, under the direction of a young aircraft designer named Walter Jamouneau, that the E-2 Cub was redesigned with rounded angles and other alterations and reintroduced in 1936 as the Taylor J-2 Cub (the “J” standing for Jamouneau, according to Piper lore).

The changes to the original Cub design angered Taylor, who disagreed with Piper’s philosophy that airplanes should be mass-produced and sold

cheaply. Piper loved what he saw in the J-2, so much so that he green-lighted further changes for a new model to be known as the J-3 Cub. The modifications from the J-2 to J-3 included integrating the tail’s vertical fin into the rear fuselage, changing the rearmost side window’s shape to a smoothly curved half-oval, and replacing the J-2’s leaf-spring tailskid with a steerable tailwheel.

The price for a brand-new Piper J-3 Cub was set at \$1,300 — less than twice what the average new car cost in 1937. It was all too much for Taylor to take. He quit, selling his share to Piper and moving to Ohio (where he would go on to achieve success with the establishment of Taylorcraft Aviation Co.).

With Taylor out, Piper assumed the role of president and chairman of the board and eagerly prepared for the





J-3's public introduction. Then disaster struck — or, as Piper would later say, perhaps it was serendipity.

On the morning of March 17, 1937, a spark from an electric drill ignited dope-soaked rags and other debris in the original Taylor Brothers Aircraft factory paint room in Bradford. The blaze quickly grew out of control, destroying the factory and everything inside it. The company held no insurance on the main plant, and the town wasn't willing to pitch in for rebuilding. Piper decided to move all manufacturing equipment and the company's 200 employees to an available factory in an empty silk mill in Lock Haven, Pennsylvania, more than 100 miles away. At the same time, he renamed the company Piper Aircraft Co.

Despite the damage from the fire,

Piper production in 1937 grew to 687 airplanes and the work force doubled. The new J-3 Cub made its debut late in 1937, and Piper soon introduced a uniform color scheme for the model — Piper Cub Yellow trimmed with a black lightning bolt. Engine horsepower rose from 40 horsepower to 50 horsepower and then to 65 horsepower by 1940. A number of air-cooled engines, most of them flat-fours, were used to power J-3 Cubs, resulting in differing model designations for each type: The J3C models used the Continental A series engine, the J3F the Franklin 4AC, and the J3L the Lycoming O-145. A very few examples, designated J3P, were equipped with Lenape Papoose three-cylinder radial engines.

In 1938, the J-3's first full year of production, Piper built 736 airplanes.

The outbreak of war in Europe and the growing realization that the United States might soon be drawn into the conflict led to the formation of the Civilian Pilot Training (CPT) program, for which the J-3 Cub would play an integral role, becoming the primary training aircraft for the program. More than 75 percent of all new pilots in the CPT were trained in Cubs. By war's end 80 percent of all U.S. military pilots received their introduction to flying in Piper Cubs.

The Legend Grows

In 1940, the year before the United States' entry into the war, Piper built 3,016 J-3s. Soon, wartime demands would push the production rate so high that one Piper J-3 Cub was being built every 20 minutes. In military



>>> For the Cub, C.G. Taylor chose a wing shape developed by the Army and wind-tunnel-tested by the National Advisory Committee on Aeronautics. Known as the USA-35B airfoil, it produced lots of lift and had good low-speed characteristics, giving the J-3 its legendary handling traits. Below: Piper introduced the Super Cub in 1949.

versions Cubs were variously designated as the L-4, O-59 and NE-1, and generically nicknamed Grasshoppers. They were used extensively in World War II for reconnaissance, transporting supplies and medical evacuation.

During the J-3's relatively brief production run from 1937 until 1947, Piper built 19,073 J-3 Cubs, the majority of them L-4s and other military variants. Postwar, thousands of Grasshoppers were civilian-registered under the designation J-3. Hundreds of Cubs were assembled from parts in Canada (by Cub Aircraft as the Cub Prospector), in Denmark and Argentina, and under license in Oklahoma.

The manufacturing capacity that churned out record numbers of Cubs during the war was quickly exploited to satisfy demand for light aircraft afterward, and the affordable cost of the J-3 Cub in postwar dollars, \$2,195, was carefully priced to be within the reach of returning war veterans. But despite its success, Piper Aircraft soon ceased production of the venerable Cub to concentrate on the development of its more advanced Vagabond, Pacer and, eventually, Tri-Pacer models. The era of the J-3 Cub

at Piper was over, but the airplane had cemented the reputation of the company and laid the path for Cub variants to follow. In the late 1940s, Piper replaced the J-3 with the PA-11 Cub Special, 1,500 of which were produced. The Piper PA-18 Super Cub soon followed, which Piper built from 1949 until 1983 and again from 1988 to 1994.

Cub Renaissance

Piper's Lock Haven plant closed in 1984. Every summer since then Cub lovers have returned to Lock Haven for the Sentimental Journey Cub fly-in. This year's event, featuring a special commemoration of the Cub's 75th anniversary, was one of the biggest ever.

Because the J-3 meets light sport aircraft guidelines, there has been a resurgence of interest in the airplane, both the original and remakes of the design, including the models built by CubCrafters, Legend Aircraft and others (see story on [page 57](#)). Of the incredible number of original J-3 Cubs built, more than 5,500 remain on the FAA's aircraft registry today, a testament to the design's longevity. Prices for used Cubs start at under \$20,000 and can rise well above \$50,000. Thanks to simple construction and low fuel consumption (under five gallons an hour), the care and feeding of a J-3 Cub requires less cash on hand than almost any other production airplane.

The J-3's 75th birthday was a perfect excuse for me to get reacquainted with the Cub, which I hadn't flown in a few years. For my reintroduction to Cub flying, there was no question about whom I would call. Damian DelGaizo runs Andover Flight Academy, a bush-flying school in northwest New Jersey that relies on J-3 Cubs and other tail-wheel airplanes including a Stearman and a modern CubCrafters Top Cub on tundra tires. DelGaizo has more than 20,000 hours under his belt, most of it in taildraggers teaching people how to fly — or how to fly better. (When Harrison Ford trained for his role in



the film *Six Days, Seven Nights*, he flew with Damian in New Jersey.)

My impressions of the Cub were nearly the same as when I was taking lessons as a teenager. The airplane is a joy to fly, with excellent control harmony at low speed that makes you want to keep on flying — unfortunately, the Cub's 12-gallon gas tank limits endurance to about two hours. At its max cruise speed of around 85 miles per hour, you can't go very far either.

Our plan was to depart Andover-Aeroflex Airport (12N), which has a 1,981-foot paved runway flanked by an equal-length turf runway, and head a few miles west to Trinca Airport (N13), a 1,900-foot grass strip. I was thrilled about the chance to try some takeoffs and landings at Trinca because that's where I learned to fly, under the tutelage of my instructor, Ernest "Pete" Billow, in N91949. When he was still alive, Pete was one of the foremost Cub experts in the country. Born in 1922, he started instructing in Cubs at Trinca in 1950. When he died in 2005, scores of friends and former students turned out at the airport for a moving tribute and fly-over.

"You want to fly with the door open?" Damian asked as I was climbing aboard.

"Of course!" I said.

It was June, after all. This was a J-3 Cub. Was there really any other way?

It didn't take long to refamiliarize myself with the basics of Cub flying — probably because it's about as basic as it gets. As Damian pulled the prop through, I dug my heels into the brakes and kept one hand on the mag switch. The engine fired and I was hit with a blast of air thick with the wonderful smells of gasoline and motor oil and freshly cut grass.

This particular Cub, NC6114H, has been upgraded with an 85 hp Continental, so it would have a little more get-up-and-go on takeoff, but otherwise it handled pretty much exactly how I remembered. I started by S-taxiing to the runway, made necessary because of the Cub's tailwheel configuration and steeply pointed nose, which blocks out the view ahead.

Besides the mag switch, the Cub

has a stick and throttle for each pilot, rudder pedals, heel brakes, carb heat knob, fuel shutoff and trim. In the panel, the only instruments are a wet compass, airspeed indicator, altimeter, rpm, and oil temperature and pressure gauges. The fuel gauge is a metal wire connected to a cork float (or, more likely these days, a synthetic float) that protrudes from the top of the cowl. In a Cub, you really don't need anything else — and much of the time, even this sparse array of instrumentation is overkill.

back for a proper takeoff. This time, I was in control. Lined up on the turf runway, I smoothly applied power, keeping us pointed straight with the rudder and waiting for the tail to come up. When it did, I knew the Cub was ready to fly. Easing back on the stick, we lifted off the ground and departed at the Cub's tried-and-true 55-mile-per-hour best climb airspeed. As we gained altitude, a panoply of green hills, black lakes and winding rivers appeared before us. The cool rush of air hit me full in the face through the



>>> There's nothing quite like the view out the open door of a Cub. This image was captured in a 1938 J-3 over Maryland's Fallston Air Park with a GoPro HD camera.

Flying the Cub

By the time we reached the departure end of the runway, I was used to the Cub's rudder pedals, which require a good amount of travel at slow speed and a lighter touch on takeoff. After the run-up, our first trip down the runway was a fast taxi to give my feet a chance to come alive. Damian handled the throttle as I focused on keeping us pointed straight down the runway.

After I'd passed this test, we taxied

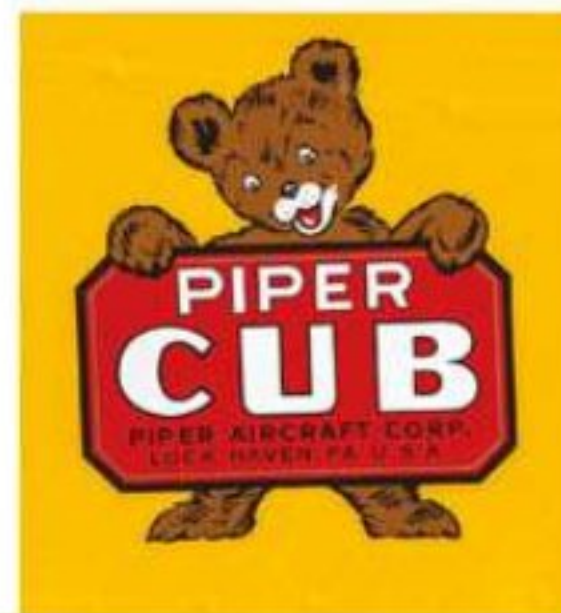
Cub's open window and door, and for a moment I could almost believe I was 15 years old again.

Even with the extra horsepower, this Cub wasn't much of a performer. I estimated the climb rate at about 500 feet per minute. Once out of the pattern, I performed some steep turns and climbs and descents to get a feel for the controls, which were as nicely balanced as I remembered.

Flying the J-3 requires you to lead

CUB FOLLOWERS >>> BY PIA BERGQVIST

The simple design, appealing shape and fun flying characteristics of the Piper Cub put a glint in the eye of most pilots. Countless aviators trained and made their first solo flights in this beloved bird. But, being introduced in the 1930s, it's no wonder the original Cub design could benefit from some improving modifications. Piper went through several iterations of the design, and a few companies have made a business of producing modern versions of C.G. Taylor's ingenious little airplane.



Piper Cub Coupe

Introduced in 1939, the Piper J-4 Cub Coupe featured a door on each side of a wider fuselage that was able to accommodate a side-by-side seating arrangement. Despite an upgrade to Continental's 75-horsepower engine in later versions, the Coupe's cruise speed didn't increase much over the J-3 Cubs'.



Piper Cub Special

To ensure that the new Cub Special really stuck out from earlier Cubs, Piper strayed from the J designators and called it a PA-11. The Cub Special was introduced in 1947 with a full-cover cowl and a two-tone paint job. The tandem seats were moved slightly aft, and the front seat was raised to enable solo flight from the front or rear. The fuel tank was relocated from inside the engine cowl to the left wing root.



Piper Super Cub

With the FAA designator PA-18, the Super Cub replaced the Cub Special in late 1949. The original model had no flaps, but they were added in 1950. Piper started offering it with a 90 hp Continental or 115 hp Lycoming engine, but the most successful one was the 150 or 160 hp Lycoming O-320. Dual wing tanks gave a total fuel capacity of 36 gallons. Piper built more than 10,000 until production ended in 1994.



Aviat Husky

Frank Christensen loved the Super Cub so much that he wanted to take over the design during Piper's production pause in the 1980s. When his attempt to purchase the Super Cub failed, Christensen decided to engineer his own "huskier" version of the airplane. His rag-and-tube Husky was certified in 1987. With engine selections ranging from 160 to 200 horsepower, the Husky does well in the backcountry.



CubCrafters

When Jim Richmond opened the doors to CubCrafters in 1980, the purpose of his business was to modify existing Super Cubs. But after Piper finally ceased its Cub production, the company evolved to produce new airplanes. Today, CubCrafters offers two LSA versions of the Cub and a more robust, certified "Top Cub" with a gross weight of 2,300 pounds and a 180 hp engine.



American Legend Cub

As the latest Cub-like airplane producer, with fewer than 10 years in production, American Legend produces three LSA versions of the Cub using the same metal fuselage design, which has dual doors. The airplane has the added benefit of having been designed using SolidWorks 3-D software, something C.G. Taylor did not have the luxury of when he spawned the original design in the 1930s.

your turns with the rudder just a bit. There are airplanes of its vintage with more adverse yaw to overcome, and the Cub turns beautifully. Damian's advice is to imagine that the rudder is mechanically linked to the stick in such a way that stepping on it will pull

the stick in that direction. In other words, step on the rudder first to get the nose moving and then move the stick in the direction of the turn.

Next I slowed us to 40 miles per hour, where control authority is still solidly felt, and cut some lazy turns

followed by power-on and -off stalls. It reminded me of what a docile creature the Cub is. Even if a pilot unintentionally spins a Cub, all he usually has to do to recover is pull back the throttle and take his hands and feet off the controls — assuming he's high enough

COMPETITORS TO THE CUB >>> BY ROBERT GOYER

With Piper's Cub formula being such a simple one, one would naturally assume there would be competitors, and there were, many of them, in fact. Some were very clever imitations with an improved feature here or there, and others were wholesale reimaginings of the entry-level concept. All of them, however, paid homage to the Cub, either directly or through clear references to the market leader in their marketing materials. In every case, the message was clear: These upstarts were following the leader. Here's a look at the Cub's competition from start to finish.



Taylorcraft A

Cub creator C.G. Taylor started a new firm in Alliance, Ohio, to build an airplane to compete against the design he had launched several years before as the Cub's progenitor. The new Taylorcraft featured a side-by-side design, by then widely considered the superior seating arrangement over tandem, and it had improved aerodynamics, options for more powerful engines and even "control wheels" instead of sticks.



Ercoupe

The brainchild of Fred Weick, the Ercoupe was arguably the most innovative piston airplane in aviation history. As a low-cost, Everyman model, it competed directly against the Cub. But it was a very different bird. From its tricycle landing gear to its metal construction, low wing design, pilot-friendly glass canopy and rudderless two-axis flight controls, the Ercoupe was certified by the FAA in 1940 as spin-resistant.



Luscombe Model 8

The fine-flying, side-by-side seating Luscombe Model 8 (Silvaire) was a keen J-3 competitor. It was nimble, significantly faster, more modern with its mostly metal design, and undeniably pretty. But with its narrow gear and tiptoe stance, the Luscombe could be a handful to land in gusty conditions, which scared off many prospective buyers. Still, thousands of Luscombes were sold in the brand's heyday.



Cessna 140 and 120

Coming toward the end of the J-3 Cub's successful run, the new Cessnas were an attempt by the company to earn a place in the entry-level market, a segment in which it previously didn't compete. The 140 and economy version 120 were big hits. The side-by-side taildraggers flew great, had all-metal fuselages (all-metal wings would come later), control wheels instead of sticks and "modern" instrument panels.



Aeronca Champ

The Aeronca Champion, commonly referred to as the "Champ," was a latecomer to the game but had a great formula. It was an easy-to-fly, high-wing taildragger with sticks and tandem seating — maybe that wasn't such a bad idea after all? One big advantage was that a pilot soloed the airplane from the front seat. The Champ was a big seller during its five-year production life, with more than 10,000 sold.

when it happens. The Cub will right itself given the chance to do so.

Before my first landing attempt, Damian reminded me about shifting my attention from the forward view to the edges of the runway, roughly at 3 o'clock and 9 o'clock out the side windows. His tip for judging the height of the round-out was to imagine a man standing in the middle of the runway, with the idea being you want to try to knock his hat off with the Cub's spinner. Not only was it good advice, but it was devilishly fun too.

My first landing was OK but I over-controlled in the flare. That's when

Aeroflex for the last one of the day. I was eager to make it the best of the bunch and end on a good note. Turning final, I allowed myself to get slightly high on the approach and Damian suggested I put in a "baby slip" to lose the extra altitude. The advice was spot on. I rounded out nicely over the approach end of the turf runway, right where I wanted to be. The imagined farmer's hat popped off his head and was flung wildly into the air.

"Hold it off," Damian said as we floated in ground effect, the stick in my hand edging closer and closer to my belly, the speed decaying until

design or luck, somehow it all comes together. It has excellent harmonization in flight. It flies wonderfully. If you do something wrong and it flies ugly, it's your fault and you'll know about it immediately. That's what makes the Cub such a great trainer — and a great airplane."

I couldn't agree more with that assessment. Happy birthday, old friend. Here's to many, many more. ✈



>>> The black piston jugs protruding from the yellow cowl are a signature design element of the J-3 Cub, which most often flew with the venerable Continental A-65.

Damian suggested we try a little game. On the next try, I would be allowed to move the stick backward or stop it from going rearward, but I could never allow it to move forward. If I felt us sinking in the flare, I could pull back, but if we ballooned I was not allowed to relax the pressure, only to stop the stick right where it was. Of course, I understood what he was getting at. The second landing was a good one, and my control movements were more fluid and quiet — the Zen of landing a Cub.

We did several more landings at Trinca, each of them feeling better than the last. Then we headed back to

touchdown — delightfully slow and smooth as honey. "Yes!" Damian said. "Great job."

Right there, that's what I remember best about the Cub. It can be a challenging airplane to land well, but when you do it just right, few things in aviation are more satisfying.

After the flight, Damian put it this way: "Really, the J-3 has no redeeming qualities," he said. "It rides like an ox cart. It doesn't hide a pilot's mistakes. It takes finesse to land well. It's miserable in the cold weather. You have to hand-prop it. You can't see out of it while landing." And yet, "whether by

1946 Piper J-3 Cub

> The Piper Cub flown for this report featured an upgraded 85-horsepower Continental engine, two-place intercom and wheel pants. Performance numbers listed below are based on a 1946 Piper J-3 Cub with Continental A-65 engine producing 65 horsepower.

Price, new 1946:	\$2,195
Price, as tested (est.):	\$38,500
Engine:	Continental A-65 65 hp
Recommended TBO:	1,200 hr
Propeller:	Sensenich 2-blade fixed pitch, 72-in diameter
Seats	2
Length	22 ft 5 in
Height	6 ft 8 in
Wingspan	35 ft 3 in
Wing area	178.5 sq ft
Wing loading	6.84 lbs/sq ft
Power loading	18.75 lbs/hp
Max takeoff weight	1,220 lbs
Empty weight	765 lbs
Max useful load	520 lbs
Payload, full fuel	448 lbs
Max usable fuel	12 gal/72 lbs
Service ceiling	11,480 ft
Best-rate-of-climb airspeed	55 mph
Best-angle-of-climb airspeed	50 mph
Rate of climb	450 ft/min
Cruise speed	73 mph
Max cruise	87 mph
No-wind range	191 nm
Stall speed	38 mph
Takeoff ground roll	370 ft
Landing ground roll	290 ft



FLYING FUSION

We fly Rockwell Collins' brand-new avionics platform and tell you what all the fuss is about. >>> BY ROBERT GOYER

When Rockwell Collins launched its new Fusion avionics system on the Bombardier XRS (now the Global 6000) at NBAA 2007, I was completely mistaken about what this new avionics suite was all about. It was hardly my fault though. New products in our industry have always been associated with new stuff, new displays, radios, radars, antennas and so forth, so I naturally assumed that Fusion was more of the same, a product revamping that would take the company's already highly regarded Pro Line 21 system and give it a shiny upgrade.

As nice as that sounds, this view sold Fusion short. The new product suite, as it turned out, wasn't about products at all, but it was, rather, a new way of *thinking* about avionics, an architectural and systems approach that, it's no exaggeration to say, has changed the way that Rockwell Collins thinks about avionics and the way, increasingly, that its customers do as well.

The genesis of Fusion was something called Flight 2, a project that Collins did early last decade on the Air Force's KC-135 tanker program, work that found its way onto the Boeing 787 and Airbus A380 and A350.

The magic of Fusion, said Joel Otto, senior director of commercial systems marketing for Rockwell Collins, is that it is flexible, scalable and hardware-agnostic. This range of characteristics, Otto said, gives Rockwell Collins "the ability to create a range of configurations and solutions that span that spectrum of aircraft while bringing the capabilities that are embodied in [Fusion] software across those configurations relatively simply."

Just how the company arrived at this kind of architecture sounds simple in theory, especially in retrospect, but it required a companywide

commitment to the new framework. "It's primarily a software-based architecture," Otto explained, "and it's a networked and modular-based system too, so it's much easier to add these building blocks in without disrupting the highly integrated system that already exists."

This flexibility in terms of hardware and scale have allowed Rockwell Collins to create wildly different-looking suites with very different feature sets and capabilities without having to start from scratch each time out. "We've gotten to the point where the software is independent of the hardware configuration," Otto said. "Our primary touch-screen displays, for instance, that we had at AirVenture and NBAA last year with embedded FMS and other avionics functions, were all Fusion, with all of its functionalities rehoused."

To make this happen, Rockwell Collins engineers migrated the software to a new hardware configuration, such as the company did with the touch displays it showed off last year and just as it has done with the version of Fusion that will soon go into existing Hawker Beechcraft King Airs as Pro Line 21 upgrades. "We've tailored [that version of Fusion] with new interfaces," Otto said, "to enhance single-pilot operation, in part by simplifying the flight management interface by making it more icon-based and more intuitive for that segment of the market," though Otto added that some of the single-pilot



>>> Fusion's integrated design frees up panel space by eliminating dedicated hardware switches, greatly simplifying the pilot's job. Graphical flight planning with overlaid weather and terrain creates remarkable situational awareness.

features are likely to "migrate" up to larger platforms over time.

Otto explained that, in terms of fielding new systems on new airplanes in different market segments, Fusion makes life a lot easier by allowing the company to design and certify systems far more quickly than it ever could before. Fusion, Otto said, "gives us the ability to migrate and rehost that software across different hardware platforms and to easily change up the configuration of Fusion. [This] is

what gives us the flexibility, making it easy to add or subtract features — you might have three FMSs on long-range aircraft but only two on domestic aircraft and perhaps only one on [an entry-level] class of aircraft. You can easily do all that because it's all networked, and you don't have dedicated data buses that you have to run every time that you want to add a new hardware unit on an older airplane. Now all we need is one network switch connection and we're done."

Some of the new benefits of Fusion were envisioned before customers were even aware they would want them. One such feature is Fusion's information architecture, a design that allows Rockwell Collins to get the data that flows throughout the system to every system on the airplane and even into the corporate offices, effectively "making the aircraft a node on an information network, helping the owner of the aircraft manage that asset more effectively," Otto said, while helping Collins develop new products to aid in that record keeping endeavor.

Fusion will also help Rockwell Collins keep its products up to date. "We know we haven't envisioned every potential application that pilots are



>>> Fusion can also integrate flight communications management, including use of personal devices, through Rockwell Collins' Ascend suite.

going to need over time," Otto said, "so we've created an architecture and a framework that make it much easier for us to bring those new features and capabilities into the market as they become available or necessary. The architecture is very well positioned to be able to incorporate those more efficiently and effectively than previous architectures were able to do."

From an aircraft manufacturer's point of view, Fusion is magic, because it takes out a lot of the hard and expensive work of upgrading avionics capabilities, something that high-flying customers demand on a regular basis, and instead simplifies that process, not only in development but in the certification phase too, because it's easier to "show that it's not going to adversely affect other functions on the airplane," Otto said. With training too, Fusion makes it simple, allowing pilots trained on previous avionics systems to upgrade to a new airplane sometimes with minimal differences training.

HUDs Integrate

Another hallmark of Fusion is that its user interface is designed to seamlessly integrate the use of a head-up display (or two) and to bring the numerous benefits of a HUD onto the primary flight display even if there's no HUD present.

As you might know, a head-up display is a projection system that allows the pilot to keep his head up (hence the name) looking at the outside world with primary flight instrumentation superimposed upon a pane of glass so there's no need to look down at the panel-mounted display in order to land the airplane. The benefits of a HUD are many, but most important is that pilots using a HUD fly approaches more accurately and more reliably. The FAA recognizes this and gives credit in certain cases to lower minimums, down to 100 feet decision altitude, for crews using a HUD to fly an approved approach.

For years HUDs have made use of a variety of sensors that see through

darkness and certain types of clouds to make flying many approaches in IMC largely visual affairs. In the very recent past, these see-through sensors have been supplemented by a new technology, synthetic vision, which paints a conformal computer-generated image of the outside world. On Rockwell Collins HGS, the synthetic (SVS) and enhanced (EVS) vision pictures are combined along with flight instrument and some navigation data, and it's all presented through a small glass display through which the pilot continues to look at the real, outside world.

I've flown HGS on a few different platforms now, and it changes the way you look at flying a jet. For one thing, with a HUD it is much easier to hand-fly the airplane very precisely, since there's no need for a scan — all the information you need is right there in front of your eyes. In addition to the traditional critical flight information, there's more, including extensive trend information, that makes anticipating diversions, even small ones, easy.

Fusion recognizes the importance of HGS and runs with it, integrating elements of Fusion into the HGS (such as those cool, glowing airport domes that make it easy to see where the flight-planned destination is) while taking HUD symbology and using it on the primary flight display in order to make the transition from head-up time to head-down time as seamless as possible.

Fusion will also allow, as Otto pointed out, new features as they emerge. One such feature, said Peeter Sööt, principle marketing manager for head-up guidance systems for Rockwell Collins, is an enhanced vision sensor the company is developing that might help lower landing minimums down to as little as 300 feet RVR. Fusion frees up development of such products because the calculus behind building them is easier than ever, since it goes without saying that Fusion will be able to efficiently accommodate the new hardware and software related to them.

Flying Fusion

I was among the first journalists to get to see the certified version of Fusion in action when I flew the system on

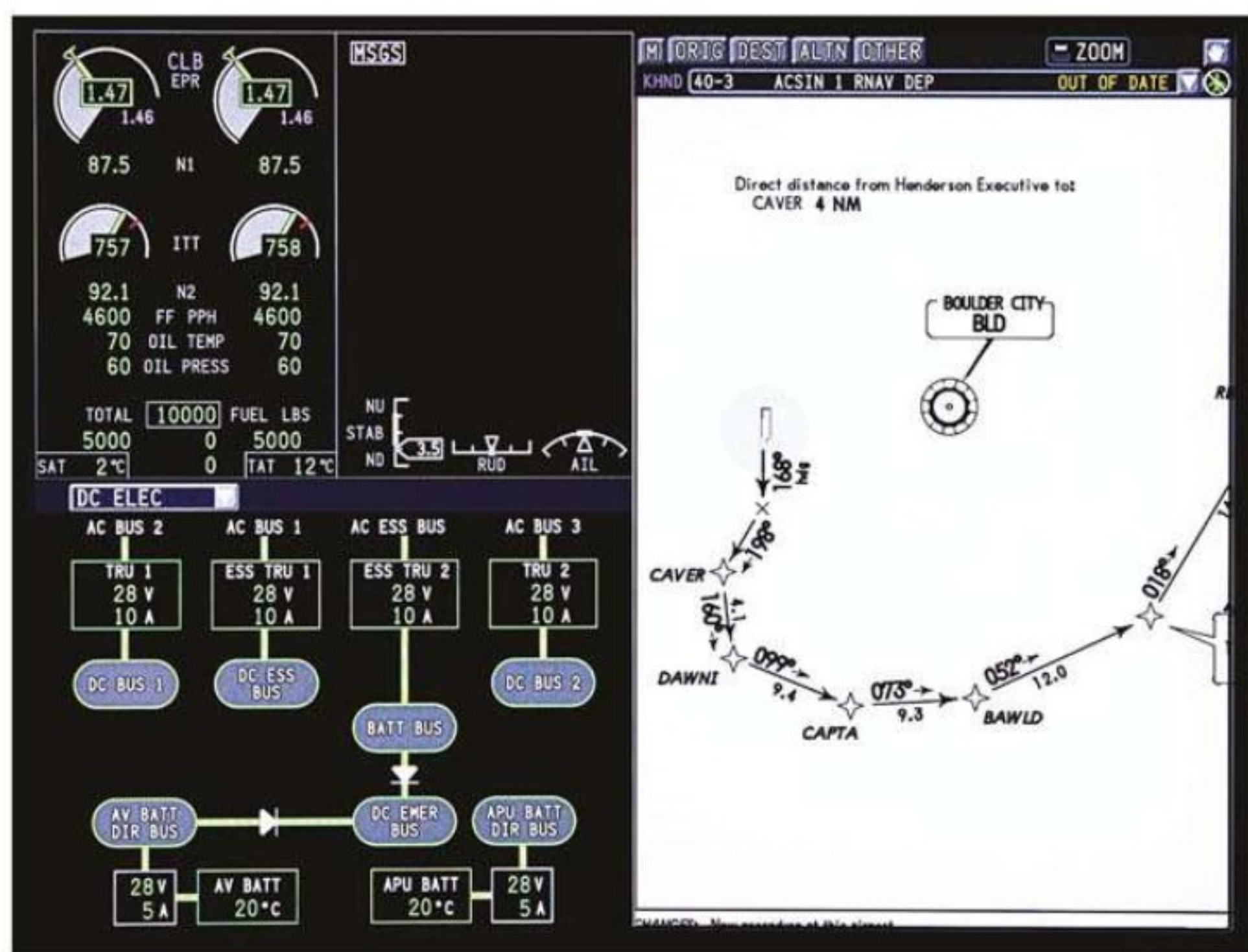
>>> Rockwell Collins recognizes the importance of HUDs to today's business aviation flying and has made their use an integral part of the way Fusion works.



Bombardier's Global 6000 intercontinental bizjet out of Bradley International Airport in Connecticut recently. The Global 6000 is an amazing airplane (look for a full story on it in a coming issue of *Flying*), and Fusion, or the "Vision" flight deck, as Bombardier refers to it, fits into the 6000 as it does any airplane, by using the technology and interfaces appropriate to the platform.

In the case of the 6000, that meant HGS on the pilot's side; graphical, keyboard- and cursor-driven flight management; large-screen PFDs; and multiple large secondary displays, in addition to synthetic and enhanced vision on the HUD plus a wealth of automated checklists, charts, integrated engine and systems utilities and communications utilities. One of the most elegant and useful features is the ability to "window" the displays using a single large display, a half-and-half display or a three-up display, allowing pilots to customize their information or, very importantly, continue viewing a geo-referenced approach chart full-size while keeping tabs on the systems and progress of the flight (among other options).

Interestingly, because of its size, crew makeup and mission, the Global 6000 has a relatively straightforward



>>> Fusion allows pilots to segment their screens into various arrangements. Here, a departure chart is to the right of engine gauges and an electrical system page.

implementation of Fusion, one that seems perfectly aligned to the 6000's very long range mission while giving its professional crews everything they need to do the job over land or on long over-water legs while leaving out features they arguably don't need, such as touch displays and a second HUD, for instance.

While the Global 6000 aptly demonstrates the suitability of Fusion to

the high end of the market, Rockwell Collins sees a wide range of applications, from twin turboprops to intercontinental airplanes like the Global 6000. Indeed, a lot of the capabilities of Fusion — such as its easy integration with touch displays, its highly graphical user interface and its chameleonlike reconfigurability — lend themselves to creating effective single-pilot operation solutions, such as the Pro Line 21 retrofit solution that Rockwell Collins announced last year for Hawker Beechcraft King Airs.

Fusion has been announced on more than a dozen airplanes, including the entire Bombardier Global series, the Learjet 85 and Bombardier's emerging CSeries airliners. Embraer will feature it on its Legacy 450 and 500 midsize airplanes, and Gulfstream will showcase it on the G280.

We'll likely see many more new airplanes with Fusion as time passes, in part because pilots will love its user-friendly design, cutting-edge features and easy upgradability and in part because manufacturers get built-in efficiencies with Fusion, both when they initially certify it in their new airplane and then each time they look to upgrade it, something that will keep Fusion fresh as the years go on while keeping customers happy. ✈



>>> Fusion symbology borrows heavily from the HUD world, so when pilots go from the HUD to the PFD, there's no culture shift associated with the transition.

THERE IS NO DENYING that tricycle-gear airplanes are the way to go if you're looking for an easy airplane to take off and land.

The center of gravity of tailwheel airplanes is located farther aft and tailwheels are generally not steerable, so the airplanes have a tendency to want to trade ends if the pilot isn't skilled enough to maintain a straight path during the take-off and landing phases of flight.

Pilots who haven't been bitten by the tailwheel bug inevitably ask the question: Why would anyone in their right mind willingly fly these types of airplanes? Takeoff and landing accidents and incidents are less likely in airplanes with a nosewheel, so why would anyone increase the risk of having an accident by flying a taildragger?

Despite the increased risk, there are some die-hard taildragger pilots. The reasons why some people are

passionate about these types of airplanes are many. Some like the challenge, others want to experience history, and for some types of flying operations taildraggers simply make more sense. And the general consensus with tailwheel pilots is that taildraggers simply make them better pilots, whether they're behind the controls of a tricycle or tailwheel airplane. Here's why taildraggers hold a special place in the hearts of those who fly them.

WHY TAILDRAGGERS?

Nosewheel-equipped airplanes have proved to be easier to land. Here's why some pilots are still passionate about tailwheel flying.

>>> BY PIA BERGQVIST

A Little Background

When mass production of airplanes first began in the early 1900s, pilots didn't have the luxury of paved or otherwise hard-surface runways. Early aviators landed mostly on grass or dirt — that's why runways were and are still referred to as fields. When the early engineers went from landing skids to wheels, they were right to put the third wheel below the empennage for several reasons.

The tailwheel was a good choice in those days since the slope of the fuselage toward the rear kept the propeller higher off the ground. The high location prevented the prop-wash from picking up debris and damaging the propeller, which was probably even more critical with the old wooden props.

The tailwheel also made more sense in those days because the soft surface prevented groundlooping, at least to some extent. Nosewheels have a

tendency to dig themselves into soft surfaces and could make the airplane tumble during a landing, something that won't happen with a tailwheel unless you slam on the brakes and push the stick forward violently. No matter how hard you tried, I think you'd be hard-pressed to flip a tail-wheel airplane onto its back.

Another benefit is that there is less weight putting pressure on the tailwheel (there is no engine sitting on



top of it), so the wheel assembly can be lighter without compromising its strength. The linkage between the rudder pedals and the tailwheel is generally lighter than in its nosewheel counterparts as well.

Once paved runways were built, the soft surface issues were eliminated and engineers realized the benefits of placing the third wheel up front. They made landings a whole lot easier and prevented the dreaded groundloop. As a result, most manufacturers made the switch. Cessna's legendary Land-o-matic gear replaced the tailwheels of the Cessna 170 and 180 in the 1950s to create the 172 and 182 — the most highly produced airplanes ever.

Although tricycle gear is by far the most abundant today, the tailwheel is still referred to as conventional gear.

A Personal Love Affair

My love for tailwheel flying flourished a few years into my flying career. I had worked as a flight instructor, so I had a lot of flight time, and I knew several pilots who flew airplanes such as Cubs, Pitts, Christen Eagles, RVs and Cessna taildraggers. Their passion for tailwheel flying was palpable, which sparked my interest. I got my tailwheel endorsement with my friend Greg Oates in a beautiful old Piper Cub. The tail-dragger challenge kept me on my toes

and made me want to play more.

Around the same time, I also learned about the remote dirt strips on the Baja California peninsula that were easily accessible by airplane, but not much else. Since it's difficult to find an airplane to rent to fly to Mexico and even more difficult to find a tailwheel rental that's available without an instructor on board, I decided to purchase an airplane. I didn't have much of a flying budget, but since many taildraggers are of early vintage they're fortunately quite inexpensive.

Since my budget was tight, I was initially looking for a Cessna 140. I could have found a good one at the time (the year was 2004) for right around \$20,000. But I realized that for another small stack of dollar bills I could purchase a Cessna 170, which has a lot more useful load without burning much more fuel. With an annual insurance premium below \$1,000 and a fuel burn of about seven gallons per hour, I realized that the airplane would be economical enough for me to own.

I found a great 1948 Cessna 170 in a small town in Michigan and picked it up with my friend David Curry, who had lots of time in type. My first take-offs and landings were ironically made

at the Peoria airport (PIA) in Illinois, on our way back from Michigan. The experience humbled me, to say the least. Keeping the airplane straight on takeoff was a challenge, and I finally understood the concept of gyroscopic precession, something that never truly made sense to me before. And I had never experienced a landing in which a slight bounce became a wild roller-coaster ride. Each bounce would get worse, and I was afraid that I had made a bad mistake in purchasing the airplane. But as we kept heading west, my landings kept getting better, and my smile kept getting wider.

In addition to several trips to the Baja to watch whales and relax on its vacant sandy beaches, I had a chance to fly through the Rockies with their incredible backcountry airstrips, particularly in the Idaho region. And I had many fun local flights in my 170. In addition to bringing me to unique places, the airplane was a challenge to fly and made me a much better stick-and-rudder pilot. Buying that 170 was the best decision I ever made.

Nostalgia

My Cessna 170 not only transported me to fun and remote destinations,

>>> Alaskan airports are easy to recognize by the ample numbers and wide variety of taildraggers, often with big bush tires and STOL modifications.





but it also took me to another era. Stepping foot in that airplane was like stepping into a time machine. I felt like I was suddenly transported to the 1940s. And that sensation apparently appeals to many. That is why Dan Gryder has made a business out of giving instruction in a Douglas DC-3.

"The only people who come to fly with me in the DC-3 are people who have discretionary income and are very foolish and want to throw their money away getting greasy and sweaty in an old airplane. It has no real practical value for 99 percent of the people whom I train. It's for fun and for fun only," Gryder says. "And all those people want is their chance to go back in time and have the throttles in their hand of 2,400 horsepower to feel what it may have felt like to fly in the 1930s and 1940s. No book can make you feel the vibration like you can in the airplane.

"We sell it as training and we provide a type rating, but really it's more about the beer and the stories and the memories and the nostalgia and reliving a time period," Gryder says.

Training

Gryder's Douglas DC-3 training is quite unconventional, to say the least.

>>> Easily identified by its round tail, the Cessna 170 was the taildragger predecessor to the 172 Skyhawk, the most popular airplane ever produced.

But there are many other people around the country who make a living teaching people the novelty of flying tailwheel airplanes that are more traditional than the DC-3, as far as flight training goes. But that doesn't mean they don't present a good challenge.

"Training in a tailwheel airplane is like training for a marathon with weights around your ankles," Gryder says. "You can always go on and convert yourself from tailwheel to nosewheel, but to convert from nosewheel to tailwheel is a different story altogether." Tailwheel training undoubtedly makes you a better stick-and-rudder pilot.

"It makes you more aware of what you're supposed to be doing with your feet and what makes the airplane go straight," says Judy Phelps, who teaches aerobatics, emergency maneuvers training (EMT) and tailwheel training in Citabrias and a Pitts S-2B at CP Aviation in Santa Paula, California. "You can land a Cessna 150 a little crooked and it'll straighten itself out. Tailwheel airplanes don't do that."

Bruce Bohannon takes the difference between tailwheel airplanes and

nosewheel airplanes even further.

"If you're not flying a tailwheel airplane you can replace the rudder pedals with an ottoman," he jokes.

Bohannon made a name for himself racing at the Reno Air Races and breaking numerous speed and altitude records in his legendary airplanes — an amateur-built Miller JM-2 called *Pushy Galore* and a highly modified RV-4 called the *Flyin' Tiger*. He now specializes in tailwheel, aerobatic and EMT training using an American Legend Cub and a Pitts S-2B at his private airstrip, Flyin' Tiger Field (81D) in Angleton, Texas. The airfield has two grass runways, each about 2,200 feet long, which Bohannon seeded himself using his RV-4.

There are many different types of tailwheel airplanes, and each one has its own idiosyncrasies. But, the tailwheel skills transfer to some extent from airplane to airplane.

"When you fly the Pitts or the Citabria it's just really small movements with the rudder," Phelps says. "With the Cessna 180 it is the same movement but just more of it. If you add a



little and feel like nothing's happening, you simply add a little more."

And the rudder skills obtained during tailwheel training will undoubtedly transfer to tricycle airplanes as well. Taildragger pilots tend to fly other airplanes more efficiently because they are more aware of their feet. Some airplanes have a tendency to rock back and forth during turbulence, a motion that is more pronounced in the rear seats, and this type of motion is more likely to be damped by taildragger pilots because they have a natural tendency to keep their feet active.

"A lot of people think that V-tail Bonanzas are really sloppy in yaw, and, if you put a tricycle gear pilot in them, they generally are," Bohannon says. "Nobody likes to sit in the back of a Bonanza with that tail swishing back and forth, but with a good tailwheel pilot it doesn't do that."

Backcountry Benefits

Tailwheel training is sure to make you a better pilot, and there are certain types of operations in which taildraggers are definitely the best choice.

Bush pilots in remote areas often fly taildraggers for many reasons. As with

>>> Many taildraggers have good short-field capabilities — such as this Maule M-4 — one of many reasons these types of airplanes are great for the backcountry.

the early aviators, one of the biggest reasons is the improved prop clearance. Bush pilots often put very large bush tires on their airplanes, which increase the angle of the fuselage even more and bring the propeller even farther away from rocks, stumps and other debris that may damage the blades. The fat tires also absorb vibrations caused by rocks and debris as the airplane rolls over the ground and make for a smoother ride.

In addition, as I mentioned earlier, tailwheel assemblies are lighter than their nosewheel counterparts, and a pound less in the airplane may be worth two in the bush. There is often additional equipment that you should bring along when you're flying in remote areas, such as some type of shelter, extra food and beverages, and spare clothing in case you get stranded.

As a very experienced bush pilot, Gary Chamberlain often flies with a heavy load. He regularly goes on multiday camping trips and has flown support missions for the Yukon Quest and Iditarod dog-sled races.

"A lot of people in Alaska fly

taildraggers, but it's not really a necessity, to be honest with you. I have a lot of time in a 206 with 29-inch wheels, and the places you can take that airplane are absolutely phenomenal."

But Chamberlain bought his 185 because he was flying a lot in the mountains and felt that it was a better choice.

"I was going into places where there weren't any strips or maybe nobody had ever landed," he says. "In areas with boulders or with off-field work, yeah, a tailwheel airplane is a good idea."

Lori MacNichol, the owner of McCall Mountain/Canyon Flying Seminars, agrees. In addition, she says, "there are more tailwheel airplanes that fly at lower approach speeds. Speeds on approach of 40 to 45 mph are common in Cubs. Even the Carbon Cub and the Husky fly in at speeds of 55 to 60 mph depending on the configuration. And the liftoff speed is very slow as well."

The ability to fly at slow speeds is critical for the type of flying MacNichol does. She teaches students to land airplanes on airstrips as short as a few hundred feet.

Another factor that makes tailwheels the configuration of choice in the backcountry is the ability to land on steep uphill grades. This would be nearly impossible to do with a wheel up front since the touchdown angle already needs to be quite steep, even if you do a wheel landing. And touching down with the nosewheel first at a backcountry airstrip will make neither the pilot nor the airplane happy.

Aerobatics

Backcountry flying demands a very high skill level and precise speed control. But the ultimate achievement of stick-and-rudder skills is arguably aerobatics. While there have been pilots who have performed beautiful aerobatic routines in nosewheel-equipped airplanes, including Sean Tucker in a Columbia 400 (which is not certified for such use), tailwheel airplanes, once again, have the upper hand.

"Aerobatic airplanes don't tend to use nose gears because of the weight and extra drag," says Kermit Weeks, the founder of Fantasy of Flight in Polk City, Florida, who is an accomplished aerobatic pilot and aircraft builder. "Aerobatic pilots learn a better feel for flying, so the taildragger aspect of flying one is not an issue. Showing up at an aerobatic contest in a nosewheel airplane would be like showing up at a black-tie event in white shorts, black socks and

sandals! Sorry, it's just not cool."

The increased weight and drag of nosewheel airplanes is also the reason that the Reno Air Races includes mostly tailwheel airplanes (the only exception I can think of are the airplanes in the jet category). And who doesn't think a P-51 Mustang, an F8F Bearcat or a Hawker Sea Fury is cool?

The "cool" factor associated with taildraggers may also be why some

pilots are so in love with them. There simply aren't that many pilots who are willing to learn the skills necessary to control these birds. It is an exclusive club that I'm very happy and privileged to be a part of. And for those who feel that flying tailwheel airplanes is unnecessary torture, Bohannon has a great saying: "I would way rather have a skill that I don't need than to need a skill that I don't have." ✈

>>> Aerobatics competitions and airshows are full of taildraggers since the configuration is lighter and creates less drag than tricycle-gear airplanes.



Three-Point Versus Wheel Landings

There is a constant debate going on between tailwheel aficionados about the preference between wheel landings and three-point landings. While a three-point landing is not unlike a landing in a nosewheel airplane in that the nose is up and the elevator control is aft, wheel landings are completely different. During the touchdown, you need to hold forward pressure on the control stick or yoke or else you will likely experience the roller-coaster ride that I endured during my first few wheel landings in my Cessna 170.

Regardless, I prefer to wheel-land a taildragger in stronger winds and crosswinds. I feel that I can maintain more control over the airplane, and if things go wrong I won't need much power to get back in the air for a go-around.

Gary Chamberlain agrees. "Flying in southeast Alaska we fly in a lot of winds — 20, 30, even 40 knots is a daily

occurrence there. My preference is to wheel-land the airplane in the winds. That way I have some sort of control authority until I'm in firm contact with the planet."

Others disagree. Jim Ross, who is the owner of a Cessna 170 I have the pleasure of flying these days, prefers to three-point because he feels that the slower speed will reduce the chances of anything bad happening in the unlikely event that he loses control. Judy Phelps is also a firm believer in three-point landings, and CP Aviation won't allow its students to wheel-land an airplane without an instructor on board.

Lori MacNichol's philosophy is right in the middle.

"We teach our students to land on the mains in a tailwheel-low attitude. Remember, the tailwheel is the weak link here, so we don't want to bang it on rocks and rough surfaces."

WELCOME TO THE CLUB

If you're looking for a way to shave your flying costs and socialize more with other pilots, joining a flying club can be a great option.

>>> BY STEPHEN POPE

There are lots of reasons you might consider joining a flying club. The most often cited centers on the economics: A flying club with lots of members can offer many of the benefits of aircraft ownership without the hassles or expense of being totally responsible for the upkeep of one. At the same time, the rates a club charges for the use of its aircraft are almost always less than what you can find at the local FBO or flight school.

Maybe you fall into the category of a pilot who has earned his Private certificate and now you're wondering what to do with your newfound freedom as a licensed pilot. Perhaps renting your school's airplanes isn't ideal because students are clogging the schedule. And although you've combed the pages of *Trade-A-Plane*, you can't quite justify the cost of buying an airplane yet.

Of course, that's not the only type

of pilot who should consider joining a flying club. Maybe you used to own an airplane but decided to sell it. Or, even if you still own an airplane, you could think of membership in a flying club as cheap insurance for those times when your airplane is down for maintenance but you still want to fly. Most clubs charge a fee to join and nominal monthly dues, which gives you access to the club's fleet of airplanes.

Even a brand-new student pilot can benefit from the flying club experience, since many clubs allow zero-time pilots to join and learn in club airplanes with club-approved instructors. The benefits of choosing this path are that learning to fly in a club airplane will normally be less costly than training with a local flight school, and the instructors in most clubs are members as well. That means there's a better chance that your early mentors will still be around long after you've earned your ticket — and will probably even become your friends.

A while back when I was weighing my options about where and what to fly — and how I could get the best return for my money — I looked at everything within my budget. A few of the local flight schools I contacted flat-out told me they didn't want to rent their airplanes because their schedules were chockablock with students. Great for them, bad for me.

I talked with a friend about going in on a share in a Bonanza, but I hesitated pulling the trigger, mainly because I'd just bought a house and most of my savings was gone. Besides, I had another option in mind that I wanted to take a closer look at first.

I'd been interested in the idea of joining a flying club for a long time. A few years ago I joined a boating club on the lake near my home and loved it. This club had four boats that members could schedule in advance. I paid one upfront fee at the beginning of the season, and after that the only extra cost was for the gas I used. The owner of the marina who formed the club told me he based some of the economics for the concept on what he'd heard and read about NetJets, the business jet fractional ownership firm founded in the 1980s by financial whiz Richard Santulli.

Club Economics

I contacted a few of the clubs in my area and quickly learned the ones I liked the best had waiting lists. I put my name on the list of the one I preferred, the 150th Aero Flying Club at Morristown Airport in New Jersey, and waited. Lucky for me, the club was in the process of buying a fourth airplane, and that meant it was expanding the membership from fewer than 60 pilots to about 70. I was in.

Each flying club has its own way of making the dollars and cents work, but here's how my club does it: New



members pay a one-time, nonrefundable fee of \$250, plus a deposit, refundable upon resignation from the club, of \$1,500. Each month, members pay \$70 for the dues. The club has four IFR-capable Cessnas, with hourly rates that are wet (meaning the fuel is included) and based on tach time, not Hobbs — which can save a pilot a lot of money over the long run. Hourly rates for the airplanes are quite reasonable too: It costs \$80 an hour to fly the lowliest of the bunch, a Cessna 172N; \$92 for a slightly nicer 172N; \$105 for a more modern 172SP (by far the most popular airplane in the fleet); and \$130 for a 182RG.

Members are allowed to reserve an airplane for up to two weeks at a time. A maximum of four simultaneous reservations are allowed, which helps keep available aircraft slots from filling up. All scheduling is done online through a password-protected area at aircraftclubs.com.

The schedule can get pretty full in the summer, but because of the reservation limits, reserving an airplane for a long weekend or even a couple of weeks is no problem as long as the member can plan in advance. As is the case with many flying clubs, members of the 150th Aero Club are named on

the aircraft registrations. That makes me and everybody else in the club a 1/70th owner of four airplanes.

Besides having access to multiple aircraft, there is also a social aspect to belonging to a club that I really enjoy. The 150th Aero Club was founded in the 1960s by a group of Bell Labs employees. I'm told that in the past the club was a much closer-knit group — but these days members still manage to get together for dinners, and also hold a club picnic each June and fly with each other often.

Many of the club's social and flying events are arranged by the vice president, Stephen Taylor, who caught the aviation bug a few years ago and tries to get up in the air with other members as much as he can.

"I love flying, and I love interacting with everybody in the club," he said. "It's so much fun to be around a group of people who love aviation as much as I do and want to fly together."

The Mega Club

There are about 300 nonprofit flying clubs operating in the United States, according to flying-club.org. The largest is Plus One Flyers in San Diego, which has nearly 1,000 members and 61 airplanes based at Montgomery

Field (KMYF), McClellan-Palomar Airport (KCRQ), Gillespie Field (KSEE) and Ramona Airport (KRNM). That's a big club. So big, in fact, that Aircraft Owners and Pilots Association President Craig Fuller made a personal visit to Plus One last year to learn about what makes the group so successful. He came away so impressed that he encouraged other clubs to follow Plus One's lead — and that's exactly what's happening, said club Vice President Dave Eby.

"Our model is much different from most other clubs'," Eby said. "We're a nonprofit 502(c) organization, but we operate more like a business."

Founded 26 years ago, the club's philosophy centers on making dues affordable, offering a large variety of aircraft and keeping insurance costs low. Here's how it works: Club members pay a one-time, upfront fee of \$99 and monthly dues of \$33.50. After attending a safety briefing, a new member gets checked out with one of the club's instructors in the type of airplane he or she will fly. Hourly rates are wet and based on Hobbs time. Eby estimated its rental prices are about 25 percent less than what nearby flight schools charge.

The diversity of the Plus One fleet is truly something to behold. Members have the choice of flying Cessna, Piper, Beech and Cirrus singles, Beech and Piper twins, LSAs and even a nice Decathlon or Citabria. Rates start at \$78 an hour for a Cessna 150 and top out at \$295 an hour for a Piper Malibu.

Online scheduling is done through schedulemaster.com, where members are allowed five reservations at a time (plus one more if it's made the same day). There is no restriction on how long an airplane can be reserved. Eby said there is also no cap on membership, meaning no waiting list to get in. The one catch is that you'll be billed for a minimum of one hour of flying for each day that you have the airplane scheduled. Another caveat is that the fuel a member buys while away from home base is capped at \$6 per gallon. That prevents the club from getting stuck with a large fuel bill because a member decided to pay \$8 a gallon for fuel, say, at Las Vegas McCarran International





instead of going someplace with cheaper gas — all to avoid paying ramp fees.

The club prides itself on imposing as few rules and restrictions as possible. It requires a check ride with a club instructor once per year, but that's about it. There is one ironclad restriction, however: no flying to Mexico. "With everything that's going on down there right now, we don't want our airplanes going there," Eby said. "One of our sister clubs had a Cessna 182 stolen right off the ramp at a Mexican airport."

Eby said Plus One Flyers has a good relationship with its insurance provider, Chartis Aerospace, and as a result, members are provided with

\$1 million of liability coverage and \$100,000 per passenger and no subrogation (meaning the insurance company has agreed not to come after individual members in case of a mishap). The club maintains a special insurance fund, Eby said, that is designed to cover 80 percent of a member's \$500 deductible. "That means if you go out and wreck a Cirrus on the runway, the most you'll be out of pocket is a hundred bucks," he said. "Our members appreciate having that peace of mind."

By this point you're probably wondering how in the world Plus One Flyers manages to offer members access to

a fleet of more than 60 airplanes. Unlike traditional flying clubs, which usually own the airplanes in the fleet, Plus One leases airplanes from owners, who then become club members. Aircraft owners pay a management fee of \$5 per month and in turn lease their aircraft to Plus One, which cuts them a check for the hours flown. Most owners, said Eby, place their aircraft under an LLC, which provides certain tax benefits.

The check owners receive at the end of each month can help significantly offset costs. Eby said one Cirrus owner who joined the club and flies about 100 hours a year estimated that his hourly cost of ownership went from \$400 down to less than \$200 thanks to the revenue he receives from the club. The one downside of the arrangement is that once an aircraft owner joins the club, he or she is on an equal playing field with all other members. In other words, if an owner's airplane has been booked for a two-week trip to Reno during the same time he wants to take the family to Catalina Island, he'll have to find a different airplane to fly — the good news is he has 60 from which to choose.

Flying Club Roots

Flying clubs are almost as old as aviation itself. The concept really took off after Charles Lindbergh's 1927 solo Atlantic crossing, when it seems everybody wanted to learn. In doing some research, I was able to find

A New Idea for Aircraft Rental

Joining a flying club can be a great way to add time to your logbook, but what if you're away on vacation or a business trip and are struck with the urge to go fly? Normally you'd have to find a flight school, get a checkout from an instructor and only then be permitted to go up yourself or with your family. A start-up company called OpenAirplane is trying to change that paradigm by launching an intriguing program that would let participating pilots rent aircraft from a nationwide network of flight schools by receiving just one annual checkout at one location.

The company is trying to raise seed money to get the idea off the ground. It has partnered with the insurance company Starr Aviation to create a "standardization and

evaluation program" that could eliminate the extra time and cost of a local checkout. If the program is successful, the obvious benefit to the industry is in growing the pool of pilots who will rent aircraft and giving participating schools and FBOs an advantage over their competitors while providing an extra source of revenue. For pilots, the ability to fly anywhere, any time could pay big dividends, especially for those traveling on business.

It remains to be seen whether flight schools with rental fleets will buy into the idea, but if OpenAircraft can reach critical mass, it could change how pilots view opportunities for flying when away from home on business or pleasure. The company hopes to launch the program by the end of the year. Stay tuned.

information about scores of flying clubs that existed in the 1930s through the 1950s. They all operated much the way clubs do today. For example, in the August 1954 issue of *Flying*, I read about a flying club in Ohio that charged members a \$50 fee upfront, which gave them access to a fleet of several well-maintained J-3 Cubs and Aeronca Champs. There was a \$15 a month service fee, and the rental rate was \$3.50 an hour for the Cub.

Besides private flying clubs, many aviation companies, including Garmin and Cessna, have clubs for employees. The largest employee club is the Boeing Employees Flying Association in

at civilian clubs, but also has a Beech T-34B Mentor in its fleet.

An obvious benefit to joining a flying club versus buying your own airplane or even co-owning with a small group is that all maintenance is overseen by the club officers who are appointed to those positions. In some clubs, officers are paid for their time, while in others they receive compensation in the form of free flying. Either way, it frees the rank-and-file members from worrying that a repair will far exceed the money he or she has budgeted, as well as the hassle of having to call the shop and schedule repairs. Likewise, database updates,

— guys who will constantly forget to lock the aircraft doors or leave trash strewn in the cockpit or who won't call for fuel after they've flown. Sometimes, the best course of action in such cases is to politely ask — or even force — the offending member to resign.

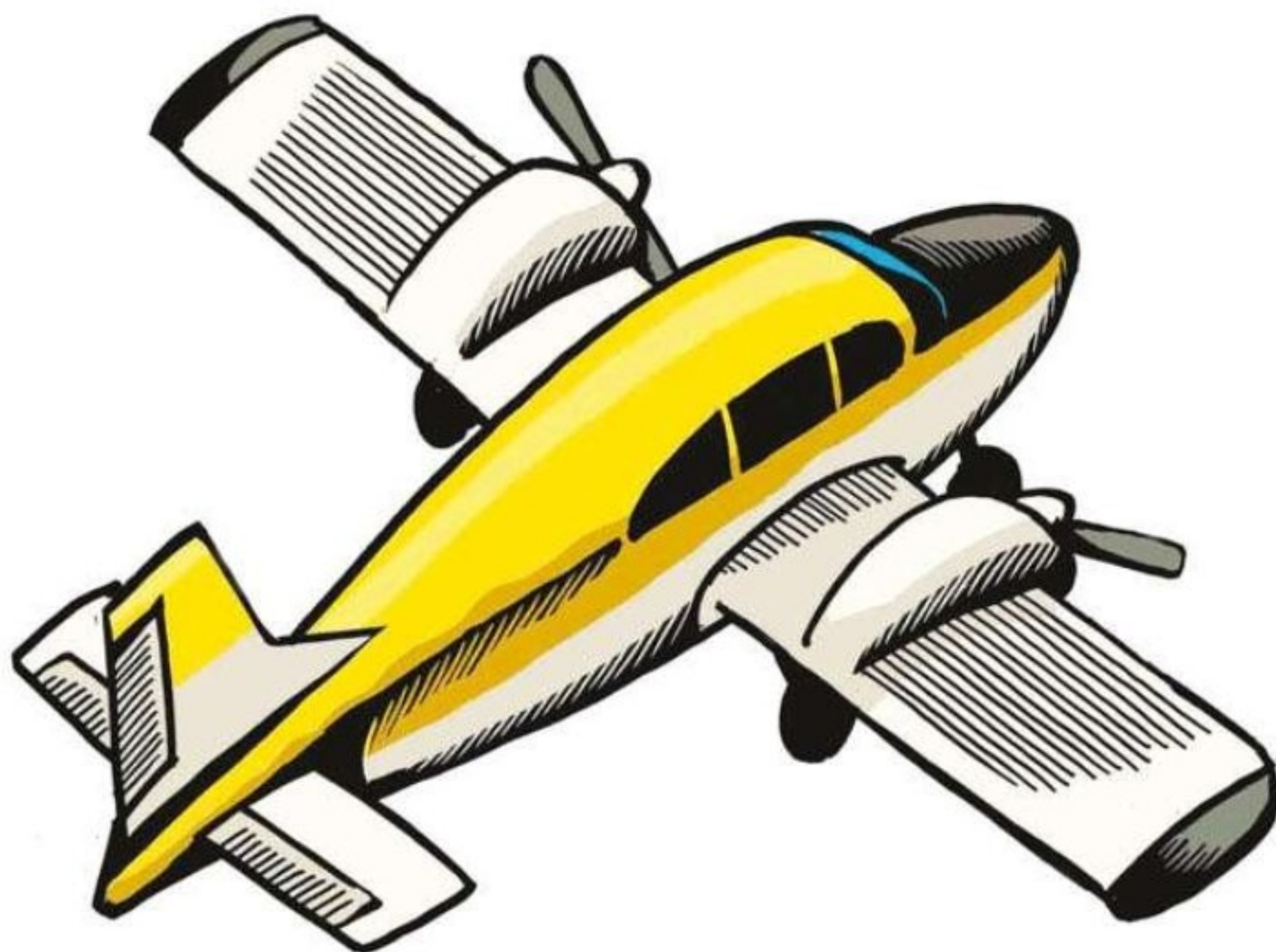
If a member of Plus One Flyers does something dumb, he or she will normally be required to write about the experience in the club newsletter. "We follow *Flying's* I Learned About Flying From That concept," Eby said. The offending member, he said, must use his or her real name. If a member refuses, he or she is out of the club.

Novel Approaches

A brand-new concept that falls under the flying club umbrella is the recently formed Lakeland Aero Club in central Florida. Started by a group of pilots and other aviation supporters headed by Gulf Coast Avionics' Rick Garcia, the club's goal is to help young people earn their pilot certificates. The concept goes beyond traditional training by immersing the young adults in the club, not only the flying aspects but also in running a business by serving as club board members. If the students, mostly from the Central Florida Aerospace Academy, can't afford to fly, there is a scholarship fund to help them out.

Whatever your reasons for wanting to join a flying club, it's an experience many pilots can benefit from — and not merely in terms of the money you'll save. Being around other pilots is a great way to learn and grow. Depending on your style, you can choose to lay low and do your flying alone, or you can recruit groups of pilots to come with you, and even get involved by joining a committee and running for a position on the club board.

Pilots are good people, and the ones I've met through my flying club certainly fit the description. There's just something about hanging out with others who share your life's passion that can make you feel more connected to this world. And once you join a club, you'll probably never again ask yourself the question, What am I going to do with my license now? Once you're in, the possibilities are endless. ✈



the Puget Sound area in Washington. This nonprofit club has 21 airplanes including Cessna and Piper singles, a Cirrus SR20 and even a Cessna 210 on floats. The club is intended for Boeing employees, but anybody can join. Share prices start at \$550 with rental rates in a Cessna 172SP averaging \$125 an hour. For comparison, one flight school in the Seattle area that we checked with charges \$160 an hour for a similar 172.

Military flying clubs also abound, but to join you normally have to have some affiliation with the armed forces. Sometimes, membership in the Civil Air Patrol can suffice. The Jacksonville Navy Flying Club in Florida, as an example, offers the usual Cessna and Piper singles you'd expect to find

routine maintenance, annual inspections and all record keeping are overseen by club members who take on those responsibilities. And if you enjoy changing oil or fixing flat tires or keeping books, by all means, sign up to become a club officer.

Of course, there are some downsides to belonging to a flying club. One is that another member might have already booked an airplane you want to fly — or worse, none are available. You're also bound to have personality clashes in a large club, and possibly even political infighting among members or factions. That's all about learning how to get along with people, and not everybody will. You might also run into members who are serial troublemakers

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Unusual Attitudes

BY MARTHA LUNKEN



Once I Built an Airline (Part II)

EVERY SUMMER WEEKEND through most of the '60s, Midwest Airways flew its original northern Michigan route from Cincinnati to Traverse City and Harbor Springs as well as the weekday Cleveland and Detroit schedule. So on Friday evenings from June through August at least one Lockheed 10 came to roost on the grass runway at Harbor Springs — unless the weather was so rotten we needed the ILS at Pellston, Michigan.

After the passengers left, Capt. Ebby Lunken and I would clean up the cabin while the copilot was dispatched with the honey bucket. We assumed he disposed of its contents in the terminal building restroom until an irate neighbor stormed over one night with a dreadful tale about his garden. I can't remember if it was a flower garden or a vegetable garden, but I think I'd better move on somewhere else with this story. ...

We'd take the liquor with us to the Harbor Inn, where the staff — a bunch of college kids — entertained the mostly geriatric clientele in the lounge after dinner. What fun it was to swagger into the lobby of that old resort hotel, hot and disheveled, strolling between the

assembled guests and the cellos and violins with an assortment of liquor bottles hanging from our pockets and bags. Ebby always frosted the cake by setting his "50-mission-crush" cap at a disreputably rakish angle.

Saturdays we just messed around or worked on the airplane, and on Sundays after Mass at the 1828 vintage Church of the Holy Childhood, Ebby would take me to brunch out on Harbor Point. How casually elegant it all was; 50 years later Marty Leyman is still to me the quintessentially attractive, perfectly groomed, gracious hostess. Since you couldn't drive on Harbor Point we'd leave early enough to walk back to town and pick up sandwich trays at Juilleret's for Flight 101, leaving MGN at 6:30 p.m.

This particular Sunday would be a dark and stormy night. Yeah, I know, "There she goes again," but it really was — or at least it was going to be. We knew there was weather down the line, but it was classic northern Michigan clear when we departed Harbor Springs Airport on time with eight passengers. An hour later, still daylight

but with a high overcast, we climbed out of Traverse City with 2½ more "SOBs." Capt. Lunken may have looked calm and cool in his pressed khakis with wings (his own design) on the lapel, a sleeve full of gold stripes and the aforementioned crushed hat, but he was pissed.

The Electra was now packed with 10½ passengers plus a crew of three: Ebby, a new copilot named Larry McLeod and *moi* in back, keeping everybody in the cabin happily well oiled. Sunday night passengers were mostly men going back to the city after a weekend with the family, so the hooch flowed freely, unlike on Fridays, when they were expected to arrive at least somewhat sober.

Tonight's "half" passenger was an elderly raccoon carried on board in its cage by a Traverse City passenger. After much glowering and muttering, Ebby finally acquiesced; I reminded him that otherwise we'd lose a fare, which was critical with only 10 revenue seats. So we jammed the cage in the rear aisle, blocking the "blue room" as well as the cabin door, which wouldn't pass

>>> Midwest Airlines served its passengers, human and otherwise, well.



muster on today's airlines.

Well, everything went pretty smoothly until a "perfect storm" near Grand Rapids. In those days without radar you stayed low and punched through, aiming for the light spots, and weather around here was nothing new; there seemed to be a permanent front lurking across the middle of Michigan every Sunday evening. But tonight's lightning show and rain were pretty spectacular, plus you could hear, even feel, claps of thunder over the drone of the R-985s. My solution to most of life's problems at the time was to dispense libations more freely, but the strategy backfired when a too well-served passenger announced he needed to use the potty. That damned raccoon cage — its occupant blithely riding out the storm — was blocking the door, and no attempt to pry it open met with any success. As minutes passed the passenger agonizingly reminded me he really, *really* needed to go.

I should have just handed him a sick sack and told everybody to avert their eyes, but instead I crawled forward over the spar and ducked into the cockpit. Ebby had his hands full keeping the Lockheed 10 level and Larry was staring glazy-eyed out the window, mesmerized by the lightning. I can't repeat what Ebby said when I described the dilemma in back, but he roused Larry from his semicatatonic state and told him to hold the attitude as steady as possible. Then he fished out his leather roll of tools and we lurched to the back end. The only option was to remove the hinges from the potty door and try working it sideways just enough.

The picture from my perch on the forward wing spar will forever be etched in memory: the elegant, debonair Capt. Lunken sweating and cursing as he straddled and contorted himself over and around the raccoon cage; the raccoon, thinking this was some fun new game, grasping through the bars with both paws to play with his ankles and pant legs as he unscrewed the door hinges; the airplane bucking like a bronco while First Officer McLeod struggled to keep the greasy side down.

Finally, we wrenched the door off and our by-now-desperate passenger

made it, followed by everybody else except the raccoon, which didn't require special "amenities" but just peed in the cage. Ebby retreated to the relative sanity of the cockpit and, as usual, things smoothed out south of Fort Wayne, Indiana.

Of course, it wasn't always husbands and fathers (or raccoons) riding in the cabin. Kids, wives and grandmothers, houseguests and even "the help" flew with us, and I was always amused at their utter confidence in "our pilot, Ebby." But occasionally somebody else would fly the trip; if it was Capt. Carl Hilker you could pretty much count on, well, "Katie bar the door."

Ebby fired Carl regularly but always hired him back. You couldn't accuse him of being undependable — exactly — but

Recently, somebody cleaning out an old hangar gave me a cardboard box of Midwest Airways files. Among thick files of petitions to the Civil Aeronautics Board for an exemption to use DC-3s (which we won ... too late) and hundreds of canceled checks (most signed by me with "Ebby's" signature), there were manifests from several years of northern Michigan flights. I sat in the basement and, yeah, cried. All those guys, especially the "youngsters" Ebby hired as first officers: Bill Anderson, who finished law school and became corporate counsel at Sporty's; Kurt Fromme, who Ebby and I feared threw himself in Little Traverse Bay one night when he disappeared — despondent over a girlfriend (he didn't); Larry McLeod, a very young, tall and gawky

>>> Tonight's "half" passenger was an elderly raccoon carried on board in its cage. After much glowering and muttering, Ebby finally acquiesced; I reminded him that otherwise we'd lose a fare, which was critical with only 10 revenue seats.

you were never sure he'd actually be there at flight time. It could be a nail-biter, but everybody knew Carl would get the airplane to the destination without fail — just not without drama.

I was along one weekend with Capt. Hilker and FO Kenny Weber when we boarded 10 passengers in Harbor Springs to depart the (as I recall) about 3,100-foot sod runway — not today's 4,700 feet of concrete. It was hot and we were full of fuel, and Carl wisely decided we needed every foot of runway. Unwisely, he shut both engines down on the runway and herded everybody — including a couple of elderly dowagers — outside to push the Lockheed as far back as possible. Then, amazingly, everybody climbed back inside and we roared off to Cincinnati.

Carl was a staunch proponent of pilotage and dead reckoning in place of new-fangled, sophisticated innovations like radios, ATC and instrument charts. So when Kenny unfolded a chart in the cockpit Capt. Bligh-Hilker snatched it from his hands, opened the side cockpit window and flung it out into the night.

kid we called "Orange Grove" because of his family's business in Florida; Kenny Weber, who would retire after many years as a captain for the Proctor and Gamble Co.; Dave Cory, a small guy with a deeply resonant voice who went on to retire from Delta Airlines; Bob Clutter — where are you, Bob?; and Ed Foss, still here in Cincinnati, in the photography business.

Probably my favorite of all was Dave Smith, a tall, handsome young guy with a huge sense of humor, especially when describing his former job selling vacuum cleaners door to door. Dave flew for Midwest until he was picked up by Delta Airlines, and very occasionally over the years we'd talk or run into a common friend.

Writing this, I've been thinking of these guys a lot. Today there was a message that Dave lost his son, Aaron, in May. Aaron was only 48, a pilot for Atlantic Southeast Airlines and then for American Airlines. He looked so much like his dad.

Damn. ✈

FLYING OPINION
Gear Up

BY DICK KARL



Getting Rusty

// IF I DON'T PRACTICE ONE DAY, I know it; two days, the critics know it; three days, the public knows it." So said Jascha Heifetz, the legendary violinist. Lately, I can relate. Last spring our Cheyenne turboprop sat, lonely and forlorn, in the hangar at Landmark Aviation in Tampa, Florida (our home base), for six weeks without so much as an engine start. The airplane was not down for maintenance. Its idleness was occasioned by other distractions in life and the price of fuel.

were other commitments on my part and the sudden appearance of a new first officer; young, handsome (I am told) and hungry. I'd had spates of Lear experience, but they were grouped in sudden bursts separated by months of inactivity. In the Cheyenne this is less of a problem than it is in the jet. There are two reasons. I have 1,600 hours in the Cheyenne and am familiar with its every noise, quirk and stunning attribute. The other reason is even more simple: The jet is twice as fast. Where

In my day job as a cancer surgeon, the same rules generally apply. If I've been gone for a week, I have more anticipatory anxiety about a big surgical procedure the next day. Once in the OR, I can feel the little tiny things that signal that I've had a layoff. My hands reach for the instruments with slightly less authority, and instruments don't feel quite as much like an extension of my hand. Though I've been doing this kind of work for more than 40 years, there is still a price to pay for inactivity. This is when I am more likely to hurt someone by sticking a finger with a needle or, rarely, having my own hand nicked with a knife. (By the way, I have never heard the word *scalpel* spoken in an operating room. It is always called a "knife," unless some neophyte has been watching too much TV.)

What's interesting is that most people in the OR can't tell. I work with a marvelous surgical tech named Cindy and she swears she can't tell that I've lost a step. Same with the Cheyenne. My wife, Cathy, swears she can't tell when I complain of inelegant power management after a layoff.

There are some happy consequences for all this inactivity. For one, I am way more focused on performance. For another, I savor it more. No second in either airplane is taken for granted. I relive the last flight as I fall asleep in greater detail than I would if my memory bank were full of recent activity.

My last Lear trip was a vivid example of this concept and my hagridden state of mind. It was my leg (no passengers on board!) to Pickens, South Carolina (KLQK), from St. Petersburg, Florida. It had been several weeks since I'd been in a Lear. The runway is 5,000 feet ... ish. My captain, Jason Hepner, cautioned that the runway isn't all that long and that a solid arrival and aggressive use of brakes and thrust reversers were superior to a finessed landing in every



>>> Running the after-shutdown checklist in Pickens, South Carolina (KLQK).

Concurrently, my Learjet career was subjected to similar disuse. First typed in the type almost a year prior, I'd managed to accumulate only 33 hours in Elite Air's Lear 31As. Elite Air, an aircraft management and charter company, has changed my life by giving me the opportunity to learn the Lear. The reasons for the paucity of hours

I've got a few dropped steps in the taxi checklist in the turboprop, I've really been slow to relearn what I once knew in the jet. Add to that my years of auditory acclimation. For 13 years I've listened for ATC communications ending in "58 Whiskey." Now I have to be alert for "Juliet Hotel" and "Fox Fox." It is a slow process.

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way. From the left seat it looked like things were lining up nicely. A two-light PAPI arrangement was there to help me with glidepath, and the speed was stable at VREF plus 10.

The touchdown was sweet, I do think. With spoilers out and the thrust reversers modestly powered, Jason was soon calling out 60 knots. We made the turnoff in front of the FBO about halfway down the runway. Damn, that was fine. After he finished mock applause, Jason snapped the accompanying photo of the happy pilot as he ran the after-shutdown checklist.

Pickens is a getaway home to an old friend of mine, JC Hanks, a retired 747 driver. I asked the lineman if his Cessna 310 was in the hangar. He didn't know, so we both went to the adjacent hangar to see.

"Nope, he's not here," said the young man. "But that there is his vehicle [pronounced VEE-hickle]."

I left a note on the windshield.

Our owner arrived and we were soon en route to New Orleans (KNEW) at

>>> I have 1,600 hours in the Cheyenne and am familiar with its every noise, quirk and stunning attribute. Where I've got a few dropped steps in the taxi checklist in the turboprop, I've really been slow to relearn what I once knew in the jet.

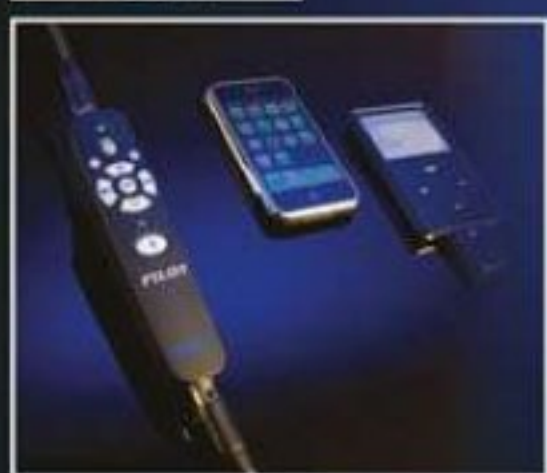
Flight Level 410. Our plans for direct Greene County were waylaid by the instructions to join the SLIDD arrival, but that only added a minute or two. Jason greased us on at KNEW and we were in a cab in time for lunch.

I couldn't resist taking Jason to Galatoire's for dinner and introducing him to some friends of mine. It was a late night for an old first officer. The next morning I was shocked awake by a phone call just before 7 a.m. It was JC. He had arrived at KLQK about 30 minutes after we had departed. We chatted for almost an hour. This is just one more savory occurrence that can happen when you go flying. You've got to make yourself

available. If you are not flying, these things just don't happen.

The ultimate rust period in my own logbook occurred early on, probably the worst part of one's flying career in which to have a prolonged layoff. As a medical student in New York City in the mid-1960s I had neither money nor time. Though I had a Private certificate, I had, maybe, 60 hours of flying experience. So, renting an airplane at Teterboro required celestial alignment of huge proportions. I had to have a Saturday or Sunday free. I had to have VFR conditions. I needed at least 25 dollars and I needed the courage or insanity, depending on how you

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look at it, to entertain the possibility of flying a Cessna 172 after several months of inactivity.

I remember the all-day ritual to accomplish the rust debridement. It began with a call to Flight Service Station; the current weather and forecast had to be unassailable VFR. If that obstacle was out of the way, I would try to round up an accomplice. Not every one of my classmates thought such a death-defying caper was in their best interest. Undeterred, I'd take the subway to Grand Central Station, take the shuttle to the west side, and take another subway to the Port Authority building. There I'd board a bus to New Jersey. An hour after the beginning of this trek, I'd come out of the Lincoln Tunnel and have my first personal assessment as to whether the forecast was correct. It wasn't always.

Once deposited at the northwest corner of the airport, I had a short three-quarters of a mile walk to the FBO. "Are you current?" was the question I dreaded most. Once through the thicket of rental fees, insurance and pre-flight, I'd fire up and try to find my way to the active. Sometimes this simple task revealed the abyss of my ignorance. Sometimes I'd need help with the concept of a straight-out departure. Most times I would head down the Hudson River; that landmark I could find.

The hardest part was finding the airport on return. I knew that Teterboro was hard to find, especially in haze, especially as the sun began to set. My aggressiveness about heading for the airport was not prompted by fuel considerations; it was purely motivated by concerns that the rental period would be only one hour total. That was definitely a bad way to fly.

Now, these many years later, it had been six weeks since I'd been at the controls of the Cheyenne. Thanks to Jason, though, I got a leg in the Lear to Sanford, Florida, a grand total of 93 nautical miles. In my mind were my friend Rob's words of wisdom. When I asked him — a pilot for Southwest with a very enviable seniority number — about his six-week hiatus, he reported that his first leg, from Orlando to Fort Lauderdale, was a perfect re-entry: "I had to get in the game quickly on a trip that short."

Finally, as any airplane owner, renter, mechanic or lover knows, six weeks of idleness isn't just bad for the pilot; it is bad for the airplane. Sure enough, as I brought the power up on a short trip to Key West, Florida, the Cheyenne swerved to the right, then to the left. The torque gauges told the story:

The right engine was lagging the left as the power came up. By the time I got symmetrical power up, we were about to rotate. Good thing the runway at Tampa is wide and the training at SimCom for just such a nuisance is good.

Every good airplane deserves to fly. So do you and I. It is good for all of us. ✈



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FLYING OPINION

Technicalities

BY PETER GARRISON



Making Range

IT OUGHT NOT TO BE TRUE, but it is: In every pilot's life there comes a moment when he wishes he had a little more fuel.

Perhaps the headwind was stronger than forecast; the gauges have dropped below a quarter sooner than you hoped they would; the descent and climb for an en route stop to drop off a passenger used up more fuel than you expected; you took a detour around weather; or your planning was careless in the first place. Whatever the

no intermediate place with suitable weather; you may have told someone to meet you at a certain time. And there is always the reluctance to lose time, and to give up altitude and then to have to claw it back — a reluctance so strong that many a pilot has run out of fuel rather than overcome it.

But nothing can be done about extreme pigheadedness. Let us stipulate that there are situations in which a pilot of normal maturity, competence and regard for safety might feel

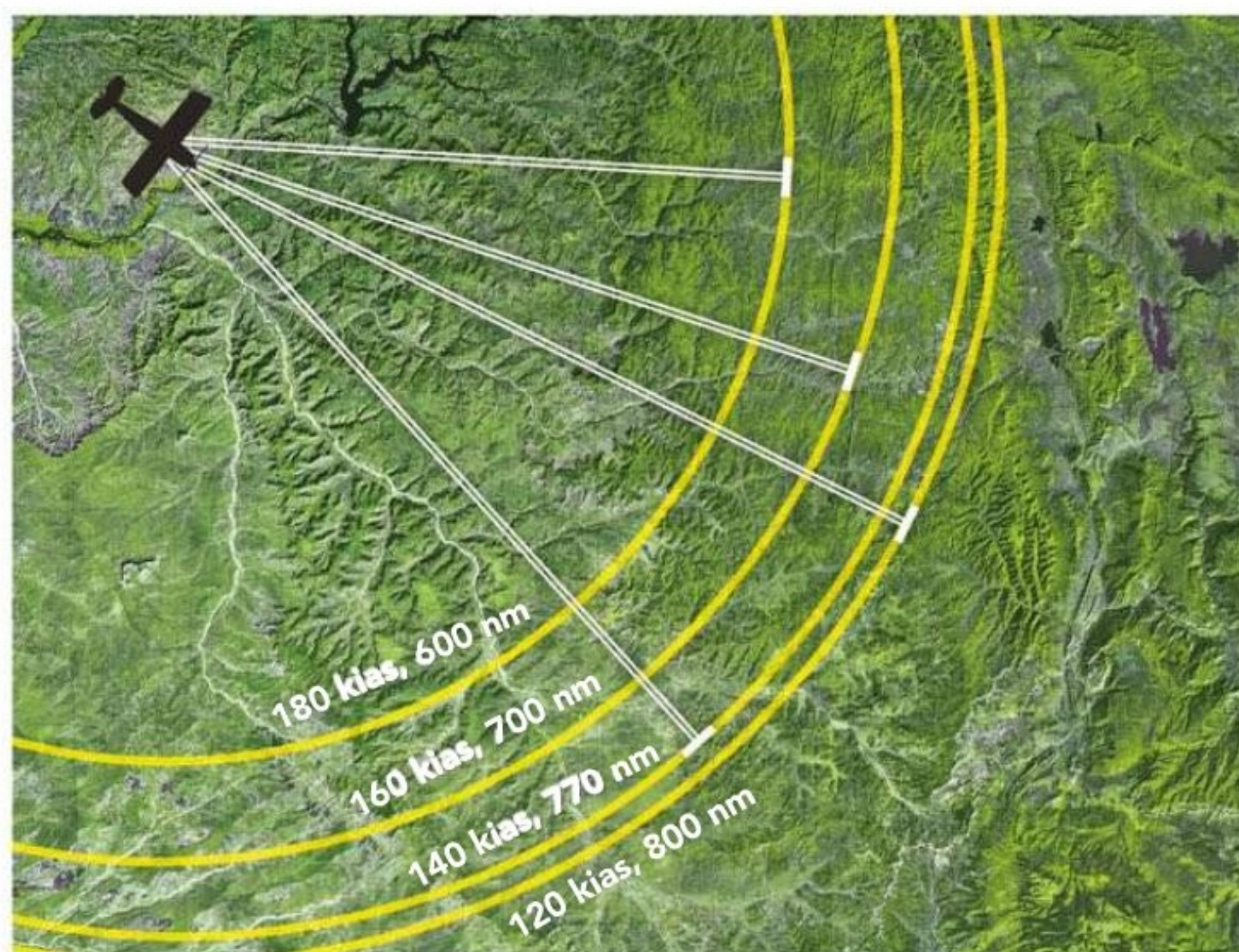
efficiency, fuel consumption, speed and wind.

The role of wind is obvious. Any headwind, and even a side wind, increases the time to fly. The chart of wind components is familiar to pilots, though roofers, who have to cut their two-by-fours to match the run and rise of rafters, are more likely to remember the precise numerical relationships. But in the era of GPS no chart is needed; the wind component is obvious from the groundspeed.

Your flight time will be lengthened in roughly the same proportion as the headwind component stands to your airspeed. If you cruise at 150 knots and the wind component is minus 15 knots, your flight time will be increased by about one part in 10; it will take you 66 minutes — actually, 66 minutes and 40 seconds — to go as far as you would normally go in an hour. That is not likely to be a problem. But a component of 30 or 40 knots might be. To maximize your range you want as little headwind as possible, and so you should pick an altitude — if you haven't already done so — where the wind component is least.

A headwind component works against you in two ways. First and more clearly, it increases the time needed to go a certain distance. Less obviously, it complicates the choice of a speed to fly.

Speed is a pilot's most powerful tool for increasing range. The amount of speed you get in exchange for a given fuel flow — in other words, your miles per gallon — varies across the speed range. It is worst at very high and very low speeds, owing at the high-speed end to parasite drag and at the low-speed end to lift-related induced drag. Parasite drag increases with speed, and induced drag increases with slowness; they are equal at the speed for minimum drag. This is the speed at which



>>> The best way to stretch fuel is to slow down. It can be a case of diminishing returns, but sometimes a few extra miles means a lot.

reason, you find yourself in that awkward spot: a certain distance from your destination, with a certain amount of fuel and with a nagging worry about where those needles will be pointing when you arrive.

The cautious thing to do is to land at the next opportunity and get more fuel. But that is not always possible or convenient. There may be

concerned, even conflicted, about his or her remaining fuel, but in which a decision to continue might depend on rational analysis rather than, say, how lucky he or she was feeling that day. These are the situations in which it is not irresponsible to “stretch” range.

How far an airplane can go on a given amount of fuel is principally determined by four factors: propeller

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the least power is needed to stay aloft, and therefore it is the speed for greatest endurance. It is typically about a third greater than the clean stalling speed.

You might guess that the minimum-drag speed ought naturally to be the best range speed as well, but it isn't. The reason is that, as you increase power from the minimum required to stay aloft, speed at first increases more rapidly than fuel flow does. Just how much higher the best-range speed is than the minimum-power speed depends on airframe, engine and propeller characteristics, but it's going to be somewhere around 40 or 50 percent above the clean stalling speed. Like most aerodynamic curves, the speed-power curve is pretty flat at the bottom, and so you might as well err on the high side and call it 50 percent, especially because "half again" is easier to calculate in your head than "four-tenths more." An airplane with a 54-knot clean stalling speed would have a best-range speed — this is an

indicated, not a true, speed — of 54 plus 27, or 81 knots, and one with an 80-knot stalling speed, 120 knots. Most single-engine airplanes have clean stalling speeds below 70 knots, and so the best-range speed of the faster ones would be around 100 to 105 knots.

reduced speed you choose in order to conserve fuel. In any case, a strong headwind is going to take a painful bite out of a reduced cruising speed.

As I mentioned before, the speed-power curve is quite flat at the bottom, and so the difference in range between the theoretical best-range speed and a

>>> If you're down to the last hour of a trip and you're doing 180 knots at 75 percent power, even the most drastic slowing will gain you only 60 extra miles.

This is an indicated airspeed, and it is intolerably slow. That is why the choice of a speed to fly is complicated by a headwind: A low cruising speed is more strongly affected by wind, and for a longer time. A common rule of thumb is that the best-range speed should be increased by a quarter of the headwind component. Something analogous would apply to whatever

speed 10 or 20 knots above it is comparatively small. In fact, even the difference between the mileage you get at best-range speed and what you get at maximum cruising speed is less than you might hope. The gain in miles per gallon between 75 percent power and best-range speed is typically around one-third; it's something like the difference between city and highway

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mileage in a car. The greatest gains will be seen by pilots who habitually cruise at 75 or 80 percent of power. Reducing power from 75 percent to 55 percent might yield them a 20 percent improvement in miles per gallon for only a 10 percent loss in speed. On the other hand, the difference between cruising at 110 kias and at a throttled-back 130 kias, in an airplane capable of 150 kias, will be just a few percent.

The important number to remember is one-third. Take that as the absolute outside limit of what you can gain by slowing down. You cannot double your range, or even increase it by half; just to improve by a full third will require a huge sacrifice in speed. If you're down to the last hour of a trip and you're doing 180 knots at 75 percent power, even the most drastic slowing will gain you only 60 extra miles.

Besides wind and speed, another means the pilot of a nonturbine airplane has to increase range is leaning the mixture. How effective leaning can be depends on how the pilot normally does it; if you normally cruise as lean as possible, there's nothing left to gain.

There is, and has always been, a great deal of mythology about mixture. Many pilots believe that they can harm an engine by leaning past peak EGT, and they consequently run on the rich side, blowing some unburned fuel out the exhaust pipe. It is generally untrue that lean operation is harmful, and it is particularly untrue at the kinds of reduced power settings you would use to extend your range. A pilot who habitually leans to 50 degrees F on the rich side of peak can save a gallon or two an hour, for the loss of a few knots, by leaning to 50 degrees on the lean side. Contrary to widespread belief, the cylinders will run cooler, not hotter.

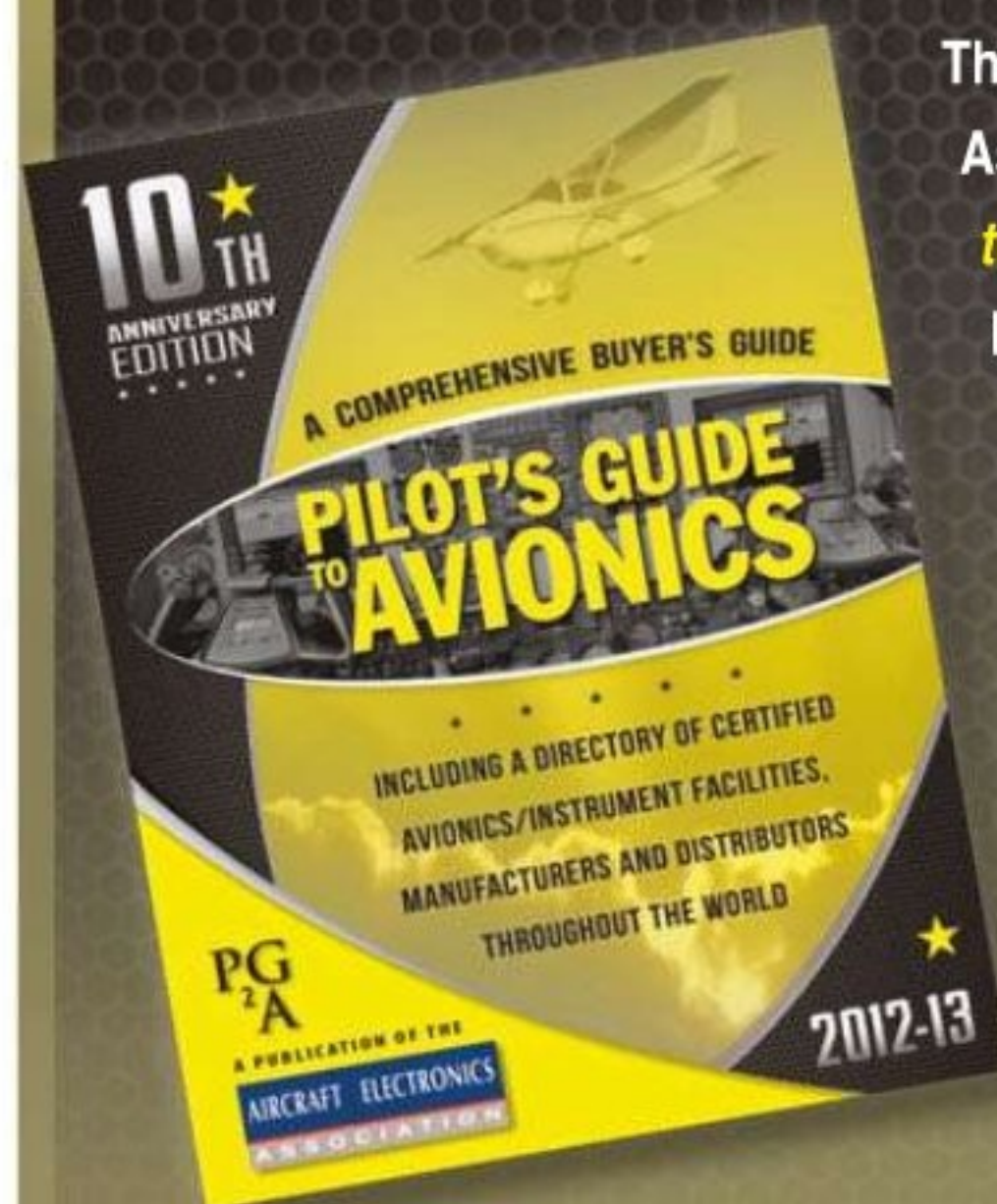
When reducing power on airplanes with constant-speed propellers, reduce rpm as much as possible; at reduced power there is no problem with going "oversquare" — that is, setting the manifold pressure higher than the first two digits of the rpm. Reducing rpm both improves propeller efficiency and reduces friction losses in the engine, but these gains are comparatively slight.

A well-planned flight should not

require stretching range. But in the context of modern general aviation operations, legal fuel reserve requirements — 30 minutes at cruise power VFR, 45 IFR — are minimal. At the same time, most airplanes are designed in such a way that payload and range must be traded off against one another,

creating, on occasion, a powerful temptation to either overload the airplane or skimp on fuel. While it is generally best to go by the book, the potential consequences of being too heavy at the start of a flight are not nearly so grave as those of being too light at the end. ✈

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Incapacitated

WHILE THE COPILOT AND I began the process of preparing our 757 for a trip from JFK to Montego Bay, Jamaica, my stomach prepared itself for an attack. I was beginning to feel a mild churning sensation. The frou-frou coffee I had ordered at the airport from a franchise chain that will remain anonymous was not agreeing with my system. Quite frankly, its coffee has never agreed with my system. Despite the event that I am about to describe, I have been brave enough (or foolish enough) to try its product again — minus the flying part. Although not as severe, the results have produced similar effects.

After departing the gate, I had considered a brief stop on the taxiway. But I chose to tough it out. The majority of my stomach malfunctions had always dissipated over time. Besides, how would it appear to passengers for the captain to make a mad dash from

the cockpit into the lavatory? Answer: better than it appeared later.

Not expecting a slightly uncomfortable condition to affect pilot performance, and considering that my copilot was new to the airplane, I had briefed the takeoff to be my leg. Another mistake. I rotated the airplane skyward off Runway 31L just as my intestines began a rotation of their own. Accelerating through the turn and climbing via the assigned SID, I was having serious doubts as to my abilities of keeping my insides from coming out.

Up until about 1,500 feet, I had minimized the situation to my copilot. I vowed to remain in control of my bodily functions at least through 10,000 feet. When the altimeter read 9,990, I simply said, "You've got the airplane and the radios."

Although my copilot's raised eyebrows expressed his concern for my future absence, he understood the

urgency. I reached for the intercom handset. My announcement to the No. 1 flight attendant in the first-class cabin that I would need immediate access to the lavatory was greeted with mild astonishment ... and justifiably, a little irritation. After all, we had barely been airborne for five minutes. The flight attendant complied, and I was off to the races while the copilot flew solo.

Usually, close encounters of this kind had me operational after one trip to the throne. I hoped this would prove to be true. It would be a long three-hour flight otherwise. Unfortunately, the coffee had other plans. It would take five more trips and five more eye-rolling episodes by the No. 1 flight attendant before I considered myself anywhere near the definition of normal. In the small favors category, I appreciated the fact that, other than an occasional bout of nausea, nothing exited my body from the upper end.

Thanks to a professional copilot, a patient flight attendant and a subsiding of my symptoms, we were able to complete the turnaround back to JFK that day. Why do I bring this red-face episode from my past to light?

Recent events have brought the subject of incapacitation to the surface. In my situation, incapacitation rendered me unable to perform duties as a flight crew member on a consistent basis. Should we have returned to the airport?

Maybe ... but that was a tough call. I wasn't unconscious. My cognitive abilities weren't impaired. Should my copilot have asserted his authority and made the decision to return himself? That would have been a really tough call.

Just imagine how tough a call it would have been for the JetBlue copilot that locked his own captain, Clayton Osbon, out of the cockpit. Assuming that the witness reports and sketchy cell phone videos of the



>>> At what point is a pilot incapacitated, and when does it warrant intervention?

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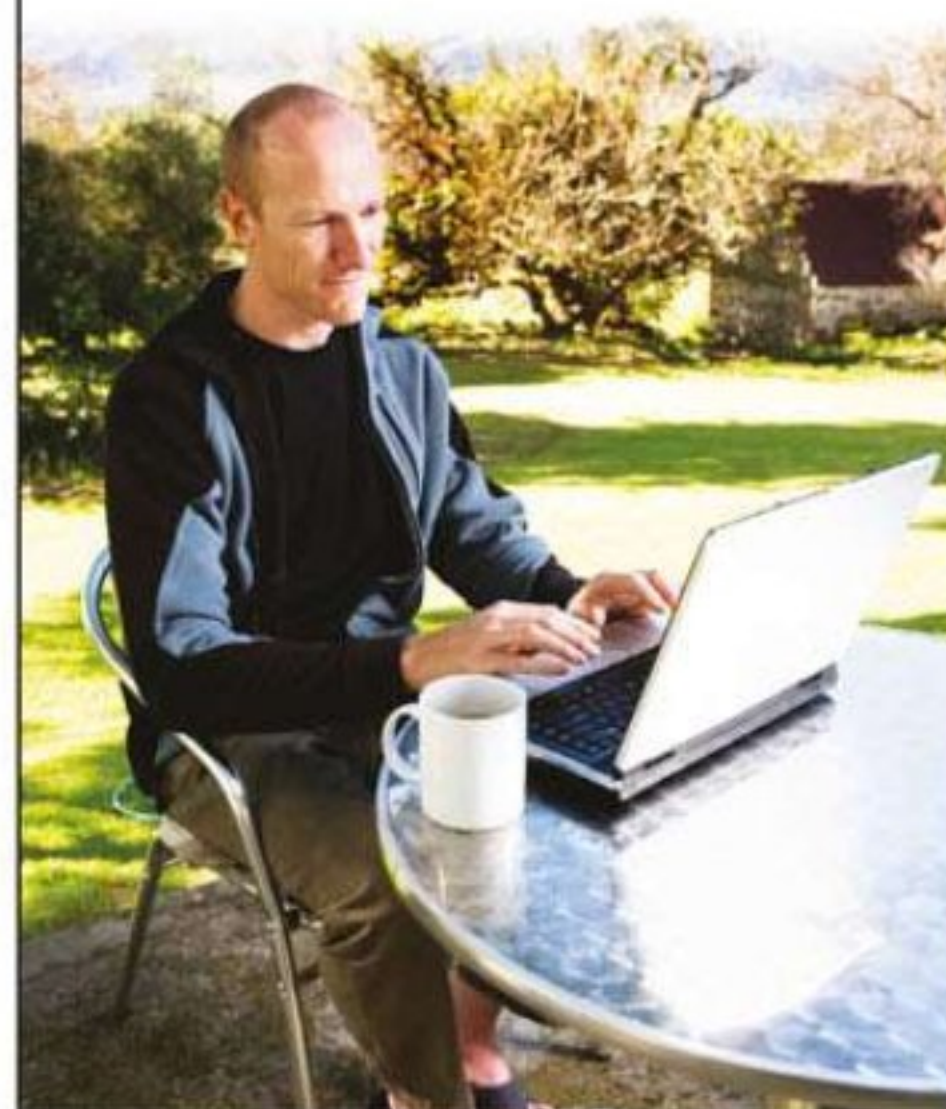
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event are accurate reflections, some of you may consider the decision a no-brainer. After all, it appears painfully obvious that this man was mentally incapacitated and incapable of performing his duties as PIC. What copilot wouldn't immediately prevent this lunatic from being within close proximity of the flight deck?

If the frightening outburst had occurred in a sudden explosion of craziness, no doubt the copilot would have reacted with a rapid response. But this most certainly wasn't the case. More than likely, a series of uncomfortable interactions led to the final moment for the copilot to ring the alarm bell. These interactions probably began at the first moment the two pilots made each other's acquaintance prior to departure.

mentally incapacitated. The icing on the cake probably became the operational erratic behavior that forced him to utilize creativity in order to relieve his boss of command.

Without question, restraint was probably considered by the copilot. The fact that the captain was not a small man may have had an influence on that idea. With or without the cockpit voice recorder transcript, none of us will really know exactly what transpired in that cockpit. Regardless, the appropriate decision was made. The end result was a safe conclusion, albeit a major inconvenience and a major expense for the airline.

So, was this subtle incapacitation or just incapacitation? Honestly, I believe it was both. As an example, almost 25

colleagues are up to the task.

In that regard, does experience assist in dictating the appropriate response? My answer is yes ... but. None of us are specifically trained to recognize all but obvious incapacitation. We have to exercise our best judgment. And the only real method to exercise that judgment is through vigilance by monitoring our fellow professional's performance on each flight.

I watched my well-respected colleague, Sully Sullenberger, comment on the JetBlue episode via a network TV news channel. One of the issues Capt. Sullenberger mentioned was that this incident reinforces the need for copilots of Part 121 operators to have the equivalent of an ATP certificate or 1,500 hours. This is part of an FAA-proposed rule that has come as a result of the now-famous Colgan Airways crash in Buffalo, New York.

Although I agree in principle with the experience goal, 1,500 hours of flight time would not have assisted the creative decision process that the copilot made to relieve his captain. Nor do I believe that a copilot with less flight time would have been incapable or at least lacking in comfortable ability to land the A320 without assistance. As I am sure Capt. Sullenberger would agree, the quality of experience is as important as the quality of the training. This is a topic that deserves more than just a paragraph.

In any case, it is my sincere wish that Capt. Osbon receives help. Charging him with a federal crime of interfering with the duties of flight crew members seems counterproductive. Yes, I understand that the experience was terrifying for the passengers, but prosecuting this man is just a punitive measure. It would make sense if he was of sound mind at the time, but it's obvious he wasn't.

I am familiar with the very strict program that assists our alcoholic pilots in recovering from their disease of addiction. Capt. Osbon should be treated in a similar manner. His wife may be the wisest of us all. She stated that there is always another side to the story. I agree.

Let's not be armchair quarterbacks until all the facts are available ... incapacitation or not. ✈

>>> My announcement to the No. 1 flight attendant in the first-class cabin that I would need immediate access to the lavatory was greeted with mild astonishment ... and justifiably, a little irritation.

Although crew pairing is different for different airlines, it is not uncommon for pilots to have never flown together. This may or may not have been the case for JetBlue Flight 191. It doesn't matter. Crew members have expectations of their fellow professionals.

Operational standardization maintains the expectation that flight crew members will perform their duties consistently regardless of who is occupying a particular seat for that trip. The expectation that the other pilot is competent and safe is a given. And the expectation that the other guy will react to normal and abnormal circumstances as trained is another given. And for the copilot, the expectation that the PIC has attained his or her left seat status because they have met the standards set by the airline and the FAA is a natural assumption. Remember, Capt. Osbon was also a check airman. That status commands a different level of competence and a different level of respect.

With those basic expectations in mind, it had to have been a careful evaluation process for the JetBlue copilot to conclude that his captain had become

years ago one of my airline's copilots landed a DC-10 at Newark Airport with a captain who had suffered a cardiac arrest.

The copilot's account involved the captain slumping over the control wheel at approximately 50 feet agl. Until that moment, the only indication of problems was an unusual grunt from the captain. It was not until touchdown and the activation of reverse thrust that the copilot took control, eventually taxiing the airplane to the gate from the right seat. With the copilot focused on nonpilot flying duties during the last few seconds prior to landing, the incapacitation went almost unnoticed. Was it subtle, definitive or a combination of both?

Subtle incapacitation has to be the most difficult to evaluate. As a classic example, how long would it take a crew member to react if he observed the other pilot descending through DH without verbal or nonverbal acknowledgement of his action? The evaluation and appropriate course of action has to occur in a matter of seconds. I would like to believe that my



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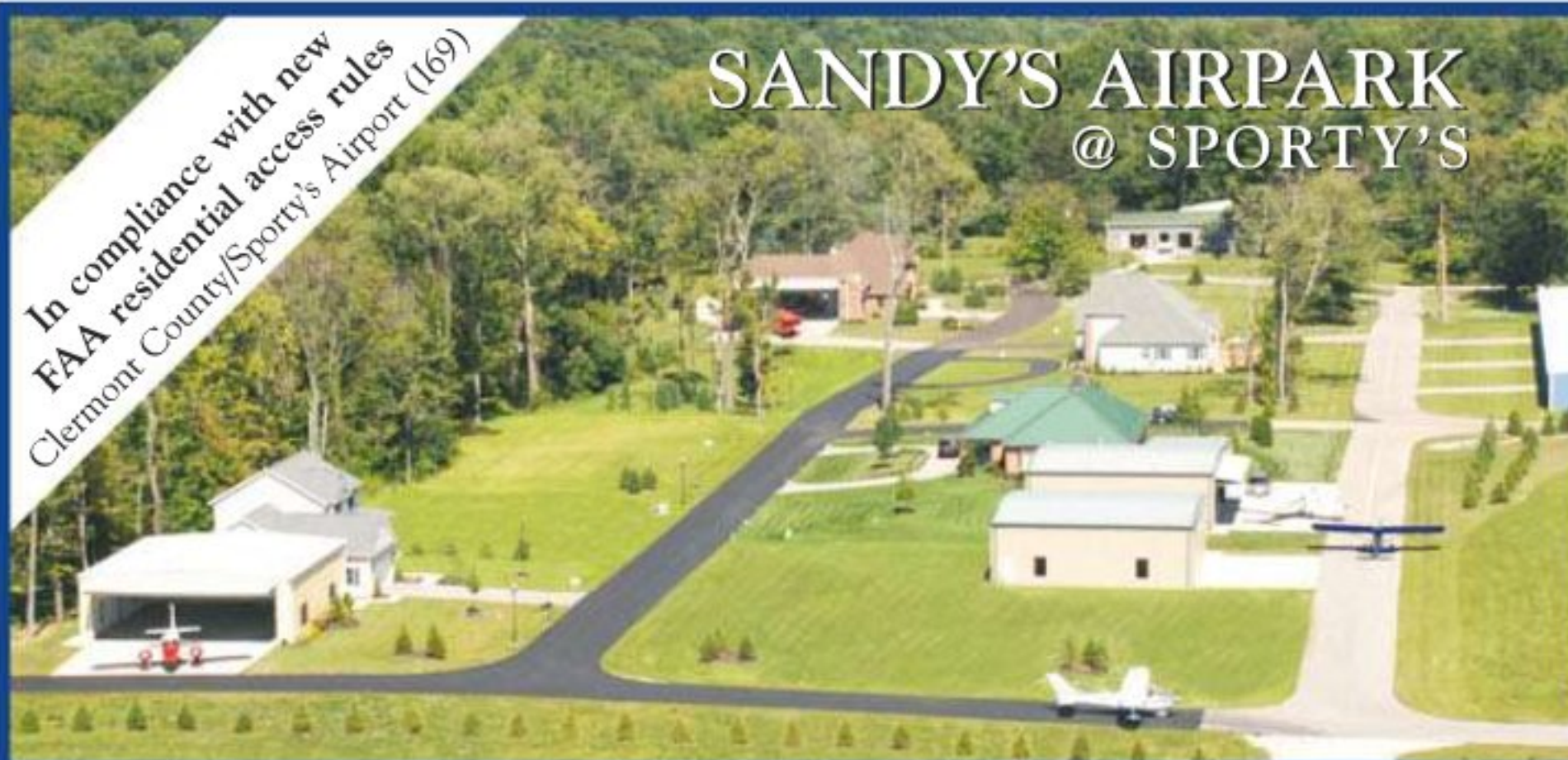


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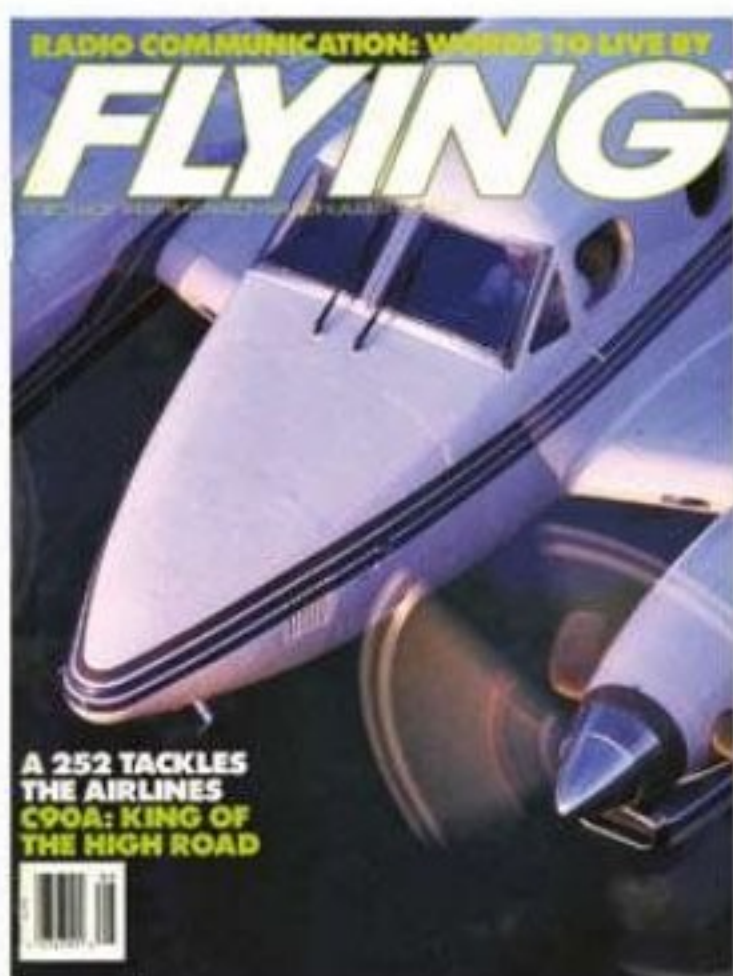


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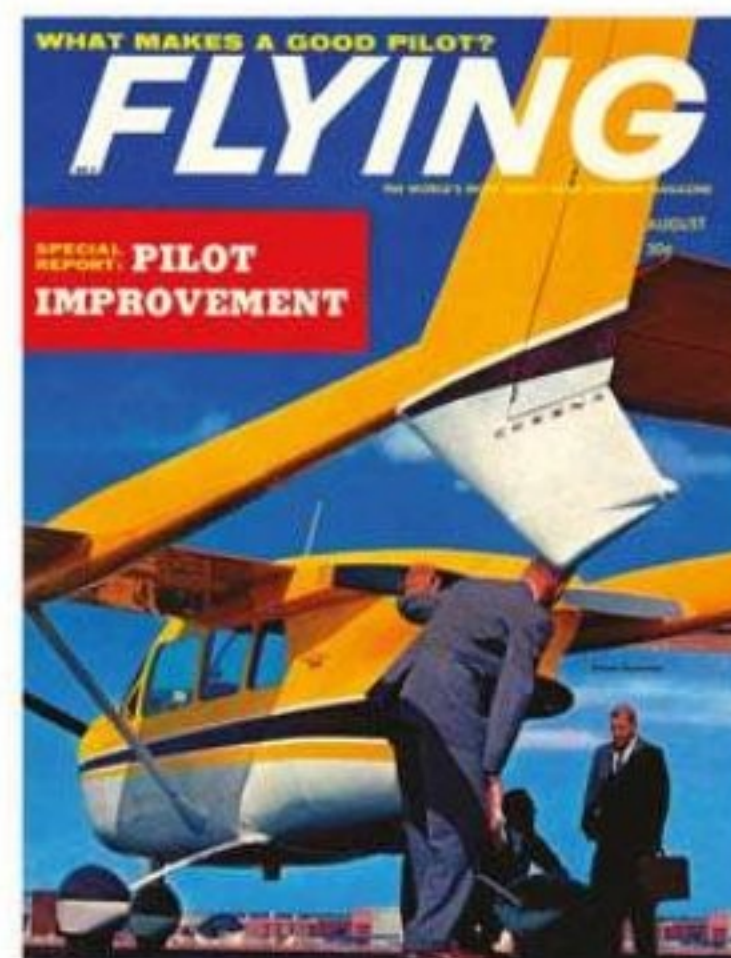
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FLASHBACKS

BY CONNIE SUE WHITE



25 YEARS AGO



25 YEARS AGO

we featured on our cover a Beech King Air C90A for our pilot report on the turboprop. Introduced in 1964, it was still going strong 23 years later — thanks to its lasting virtues such as the Pratt & Whitney PT6 engines, a big-airplane feel and “delightful” handling qualities.

> We took a ride in the Fanstar 200, one man’s idea of the trainer of the future. Basing it on the German-born Fanliner concept, the builder had hopes to sell “300 a year for the first five years” of the two-seater jetless jet to flight schools in the United States and Canada. Price tag: \$50,000 unequipped to \$70,000 for a full IFR version.

> Peter Garrison wrote about how VFR flying had changed since the “scarf-and-goggle” days and pondered whether or not the art of pilotage had vanished.



> Our “Air Show and Tell” feature went behind the scenes to take a look at the pitfalls and pleasures of getting an airshow off the ground. The article detailed the complexities involved in organizing everything from volunteers to aerobatic performances.

50 YEARS AGO

we featured on our cover the Cessna Skymaster. Designed to give single-engine simplicity and multiengine performance, the four-place aircraft with two 210 hp Continental engines in a push-pull configuration had been certified four months prior.



50 YEARS AGO

> We wrote about the Link Model 60 as a low-cost general aviation simulator that gave realistic instrument and navigation training in an up-to-date composite of lightplane characteristics, including side-by-side seating that allowed the instructor to teach from the cockpit.

> We featured a 24-page special report on pilot improvement. Topics included how motivation and attitude can lead to increased proficiency; a guide to self-teaching instructional material; how to select the best aviation school for your needs; a list of FAA-approved colleges offering pilot training; and tips on efficient flight planning and cockpit management.



> We evaluated the Avigator, a mechanical flight progress indicator that used a groundspeed-gear drum to give the VFR and IFR pilot a running log of trip ETAs in minutes and miles. The easy-to-install nonelectronic Dupont-Sangamo clock-type computer sold for \$150.



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