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Vol.59 No.11 | November 2010

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Reaching a Broader Audience

Stearman fly-in celebrates 39 years

THIS MONTH, *EAA SPORT AVIATION* welcomes an aviation icon to our editorial staff—J. Mac McClellan. Mac was editor-in-chief at *Flying* magazine for many years and is considered one of the most respected aviation journalists of our time.

You may ask, "How does Mac McClellan fit with EAA?" My short answer: Magnificently! To understand why I say that, it's important that you know some facts about our membership. For example, 75 percent of EAA members are aircraft owners; 61 percent own type-certificated, production aircraft, according to our Survey of the Average Aviator (see p. 46).

You probably already know of Mac's expertise in bringing the latest information regarding aircraft ownership, flying experiences and techniques, weather and the latest cockpit technology to aviators who use airplanes for personal transportation. In *Sport Aviation*, he will continue to do so under his longtime Left Seat column title, and he will be a regular feature writer for the magazine, as well as for our e-publications and website.

What is less known about Mac is that he is "one of us." Mac is an active participant beyond his column topics. He has attended AirVenture every year for most of his adult life, and he enjoys airplanes of all types. For several years, Mac wrote a guest column for *AirVenture Today,* the convention's newspaper, and during AirVenture Oshkosh 2010 he wrote a daily news column for the newspaper and *e-Hotline*. He understands EAA's unique place in the aviation community and our organization's important role in general aviation's future.

As we implement EAA's vision to provide a broader and deeper coverage of aviation, including the subjects you tell us you want more information about—flying techniques and better piloting skills—Mac's experience and involvement is a welcome addition toward meeting that goal.

I'm excited about Mac contributing to EAA as we reach even more of the diverse aviation community and grow aviation through participation. Welcome aboard, Mac!

STEARMANS OVER GALESBURG FOR THE 39TH YEAR

In this issue you will read about a unique aviation happening—the National Stearman Fly-In, better known among Stearman pilots as "Galesburg."

Sport Aviation is looking to provide our members and aviators even more in-depth coverage of fun and interesting events taking place in the exciting world of aviation. I'm happy to welcome you along this month as we explore one of the most active groups of fliers you'll ever meet.

For a magical week each September, more than 100 Stearman biplanes from across the country gather in Galesburg, Illinois, to enjoy the camaraderie, competition, and aviation lifestyle that has to be experienced to be believed. As a Stearman owner, I'm admittedly a little biased, but there's something for everyone at this event, whether it's competitions such as flour bombing, spot landing, aerobatics, or formation flight, the fly-outs to Wolford's grass farm strip for a country lunch, or the pre-dawn launching of dozens of beautiful Stearmans for the Dawn Patrol.

And guess what else? There are no airport fences to prevent the many children and families from getting up close and personal with airplanes and aviators. How cool is that? I hope you enjoy the journey through our pages this month as much as we have enjoyed bringing it together for you.

Now, let's go aviate! EAA

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A PUBLICATION OF THE EXPERIMENTAL AIRCRAFT ASSOCIATION

STEVE SAINT

"As the car, it can drive more than twice as fast as it can fly. This is truly a car that flies, not an airplane that drives."

FEATURES

For additional information on many of the topics in this issue visit *www.SportAviation.org.*

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A PUBLICATION OF THE EXPERIMENTAL AIRCRAFT ASSOCIATION

ROD HIGHTOWER

"You can park a beautiful Stearman in a broad row of airplanes, and they'll go to the Stearman first every time."

DEPARTMENTS

Calendar of Events

www.EAA.org/events

View and submit EAA Chapter Events Online

ON THE COVER
Lon Dienst's replica Chester Jeep racer is silhouetted by the setting sun. Photographed using a Canon 500mm lens by EAA Chief Photographer Jim Koepnick from a Cessna 210 piloted by Bruce Moore.

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Is Aviation Still Relevant?

How strong is the passion for flight?

IS AVIATION STILL RELEVANT? That is a provocative question. For most of you, the answer is a resounding "Yes!" For those who have been involved with flying for decades, your response might be, "How can you even ask such a question?" But for new entrants to the aviation community, how strong are your feelings?

Today, with the wide variety of activities competing for our time and money, is recreational aviation still relevant? Is the passion for flight as strong as it was 30 or 40 years ago?

Let's address a few facts:

- The number of active pilots today is down 25 percent (more than 200,000) from previous highs.
- Aircraft sales and deliveries have dropped significantly.
- Aircraft manufacturers are facing challenging and difficult economic conditions, which include reduced workforces.
- Few, if any, new airports are being built, while the list of current airports gets smaller.

On top of this, the airline industry will be facing a severe shortage of pilots in the next five to 10 years. The current training infrastructure and stifling government regulations will make it difficult, if not impossible, to fulfill the demand.

What's happening to aviation? Is there apathy regarding aviation's value, which, compounded by the economy, has led to this severe downturn? Or is there a deeper cause that we are overlooking? If there is, what are we going to do about it...and more importantly, who will do it?

I want to clearly state—aviation is relevant and important! We cannot let the current state of affairs continue. Is there a magic answer, a silver bullet that will solve everything? No. But to turn things around, we have to be focused on an outcome that we all believe in. That outcome is a growing and engaged aviation community.

That sounds good, but how are we going to do it? Why haven't we done something already? This column will be the start of a dialogue over the next few months on a subject of great importance to you and me: aviation's future.

Let me set the stage by saying that EAA AirVenture Oshkosh 2010 was a major example of the importance and relevance of aviation for all of us. This year we faced the most challenging weather conditions in our history. On opening day I observed something that in my wildest dreams I could never imagine. Literally, there were no airplanes in the general aviation parking area where normally there would be 1,500 to 2,000! "Oshkosh" was in jeopardy, but the passion and dedication of EAA members, pilots, enthusiasts, volunteers, and the industry overcame insurmountable obstacles to make Oshkosh 2010 a success. Your actions demonstrated aviation is valuable and that it needs to engage new participants. That is one of the primary missions of AirVenture.

Let's go back to the beginning and evaluate the issues and how we are going to either solve them or develop alternatives that will offset the negative perceptions that are hindering aviation's growth. There are going to be many opinions and ideas. That's good, because these ideas will spawn solutions. The answers will come from those who are willing to expend the dedicated efforts and resources needed to make a difference.

That's where EAA steps in. We are an organization that has invested in the future. Young Eagles is a prime example. Today, expectations placed upon EAA by members and the industry are greater than ever before. Our resources such as Oshkosh, EAA chapters, and a dedicated membership have demonstrated that we can make an impact, but we must do more.

Next month I will share insights on why aviation participation has declined and what investments EAA has made to counter this trend. I will review how these investments will impact the future.

In the future I will ask you to share your thoughts and opinions. We can no longer sit on the sidelines. We need to grow participation in aviation. EAA and its members will play a leading role in doing that! EAA

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KEN GRIFFEY JR.
COMMENTARY / GUEST EDITORIAL

Flying and Baseball

You get back what you put in

THE FIRST TIME I REMEMBER flying in a small airplane I was 12 or 13 years old. I went up a couple of times with my dad, but when he signed with the New York Yankees, he was not allowed to fly, and I never thought about flying after that. It was never something I really wanted to do.

But as I got older, and my wife and I had kids, I started thinking about it. I was 36 when I decided to take flying lessons. My kids were getting older, and I saw flying as a way to see new places. When they went off to college, I could fly wherever they were, spend the day with them, and be home in time for dinner. I earned my pilot certificate in February 2007 at age 37. I had 93 hours of flying time with my instructor, Mark Griffin, before I flew by myself.

For me, learning to fly was similar to going through spring training to prepare for the regular season opener, when you get your first at-bat. You know it's going to come, and you have to prepare for it the best you can.

But I'm not sure I was as prepared for my first solo flight as I was for my first big-league at-bat against Dave Stewart, a big right-handed pitcher for the Oakland Athletics. But that first at-bat was nothing compared to my first solo flight. We were taxiing to the runway when Mark stopped the plane and told me, "You're ready for your first solo." When I get nervous, I laugh. When he jumped out, I started laughing. I regained my composure, taxied to the runway, and made my call-out, still laughing.

You never really know how much an instructor helps you until he's not sitting beside you, his hand always on the yoke. I was by myself, and I had to go around the flight pattern and make my first touch-and-go landing. I did a second, and then a third, which was my best of the three, maybe because I knew I was stopping. One of the things I still remember thinking was how light the plane, a Cirrus SR22, really was.

I ask a lot of questions. I don't pretend to know something I know little about; therefore, it took me longer than most students to earn my certificate. I am fortunate to be in a financial situation where I didn't feel rushed. Many people are in a rush to get their certificate and do not take the time they need. I also knew my instructor would tell me when I was ready for the next step. When that time came, I was ready.

Flying my own plane is all pleasure for me. I will fly to Hilton Head from Orlando in the morning and be back at night. I enjoy getting up in the morning, looking at the weather, going to the airport, looking at the weather again, starting the plane, and doing all the preparations that build up to the flight.

It's like preparing to face a pitcher. You watch film of him, watch him warm up, and then go to the hitting coaches to ask them questions to reassure your own thoughts. The situation in a baseball game can change from pitch to pitch, just like it does when you're flying and talking to air traffic control. Things change, and you have to be prepared to adjust.

I spend most of my time reading about flying. I am still learning. I like to know what's new and available. I am not a professional pilot, but I can train like one and keep up with the latest technology.

The more I know about flying, the better pilot I'll become, so flying is lot like baseball: You get out of it what you put into it. EAA

Ken Griffey Jr., EAA 1037788, was a Major League Baseball player for 21 years. He hit 630 home runs, was a 12-time all-star and was the 1997 American League Most Valuable Player. He owns and flies a Cirrus SR22.

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TOP STORY

A Foot in the Slamming Door

EAA, lawmakers stand up against FAA's through-the-fence policy

IT'S A PERFECT MORNING; the sun is just beginning to glow in a cool blue sky, and there is not a wisp of wind. It's a great day for flying, you think, as you step out of your house into your hangar, do your preflight, and taxi directly to the runway.

The ultimate dream for many EAA members and other aircraft owners is to have instant access to their airplane and a runway, just as drivers do to their car and the street. Imagine, then, if you backed out of your driveway one morning, turned the corner, and found a gate smack across the road that led to the highway out of town.

U.S. Rep. Sam Graves (R-Missouri)

That's the situation aircraft owners who currently have or might want future access to the nation's publicly owned airports could face. The FAA's proposed through-the-fence policy (TTF) would cut off the ability to connect with the very transportation system that enables the freedom of flight. The FAA originally wanted to end all current TTF agreements on public-use airports and ban any future ones.

EAA's advocacy staff and many members quickly made it known that was not acceptable. EAA even created a plan that would allow the FAA to give local jurisdictions the option of writing such agreements, while maintaining prudent safety and security precautions.

The FAA then proposed to allow current TTF arrangements to remain in effect until the existing agreements came up for renewal; then those TTF operations would be banned, too—eventually allowing the FAA to slam the door on that dream completely. Did the FAA hope that by quieting the most vocal opponents they could eventually accomplish their long-term policy direction?

Cutting off local TTF arrangements also slices the economic opportunities available to many airports through aviation-related growth, not to mention the freedom to use the aviation infrastructure created for all pilots. In addition, blocking such arrangements may allow non-aviation developments to encroach on local airports. Such developments often lead to calls for airport closures or create land-use and noise disputes.

In late September, U.S. Rep. Sam Graves (R-Missouri), a longtime pilot and EAA member, and Rep. Tom Petri (R-Wisconsin), who represents the Oshkosh area, scheduled a public hearing before the House Transportation Subcommittee. Rep. Graves directly told the FAA that a one-size-fits-all approach to local airport issues is not the way to go.

In addition, EAA member Dr. Brent Blue, a longtime member of EAA's Aeromedical Advisory Council, testified how his Wyoming airport benefits from these arrangements and how aviation access would be crippled by the FAA's new policy. EAA fortified his testimony with written comments included in the hearing's record. For a link to EAA's comments, visit *www.SportAviation.org*.

Banning all future TTF arrangements makes as much sense as shutting off local streets from access to highways. EAA designed a plan that would allow local control of TTF access but still makes these significant aviation opportunities possible.

It's always less work to issue a blanket "no" rather than work to find solutions. But finding solutions is always EAA's goal. After hearing the same thing from EAA members and Congress, it should be the FAA's goal as well. EAA

ADVOCACY ISSUES ON OUR RADAR

THE LONG-AWAITED GUIDANCE regarding training—a letter of deviation authority (LODA)—was finally published by the FAA, but the guidance does little to improve training availability for experimental light-sport aircraft (E-LSA). Critical compensated transition training is allowed in experimental amateur-built aircraft, but primary instruction in E-LSA is not. EAA continues to work with FAA on this issue.

IMPROVING THE SAFETY RECORDS of homebuilt and light-sport aircraft remains a top priority for EAA's advocacy team. A recent EAA webinar highlighted the importance of transition training for pilots moving from higher performance aircraft to LSA. Visit *www.SportAviation.org* to listen. EAA Government Advocacy Specialist David Oord will speak on this subject at the AOPA Summit, November 11.

SAFETY IS KEY

By Earl Lawrence, EAA Vice President of Industry and Regulatory Affairs

SAFETY IS KEY FOR PRESERVING the flying and building privileges we have and those we wish to gain. There was an exponential increase in amateur-built safety in the 1990s, and with that came a corresponding increase in the privileges amateur-built aircraft owners and builders earned. This improvement also furthered the development of the sport pilot/light-sport aircraft regulations, the first set of aviation regulations written solely to support fun flying.

After years of enjoying increased privileges for our members, we are now entering a phase of consolidation and re-evaluation by the FAA. Current FAA management is focused on significantly reducing general aviation accidents and implementing the new airspace management structure, that is, automatic dependent surveillance-broadcast (ADS-B).

In reading safety reports and comments from both government and industry, there is basic agreement on a dominant cause of aircraft accidents today—human factors or decision-making. There are no new ways to crash an airplane; we just continue to repeat the same errors.

Each time there is a rise in the accident rate, there is a corresponding increase in focus on safety forums, education, government meetings, and a string of new legislative and regulatory mandates.

We must all be willing to put safety first and keep safety in the forefront of our flying activities. It is not fun to fly through, or under, a thunderstorm, so why do pilots do it? We need to find a way to improve our culture so that we think about safety first while we enjoy our segment of the flying community. Why do we choose not to get transition training for a new aircraft? Why do we choose to go on a flight and not check weather first? Why do we choose to not fix items on our aircraft the way or when the manufacturer says the item needs to be fixed? Why do we choose to buzz houses? Why do we...?

The privileges we gain through advocacy efforts are linked to the actions of our community. What are your thoughts? How can we improve our safety record?

Reno 2010

RECORD QUALIFYING RUNS, MULTIPLE engine failures, and canceled races made the 2010 National Champion Air Races in Reno, Nevada, a rollercoaster event.

Records were set during qualifying runs for four of the seven classes, including Nick Macy's T-6 (T-6 Class), *Six-Cat*, at 244.539 mph; Jeff LaVelle's Glasair III (Sport Class), at 362.481—which was faster than all the Super Sport Class entries; Curt Brown's L-29 Delfin, *Viper*, ran an astounding jet course record at 543.568; and Tom Aberle's *Phantom* was the fastest biplane ever, breaking his own record with an official 260.805 mph.

Early favorites, rookies, and veterans alike fell by the wayside, with engine failures: the all-new George Pereira-designed GP-5 Super Sport racer *Sweet Dreams*, which made its debut at Reno 2010, as well as two-time Unlimited champ *Dreadnought* and the T-6 *Six-Cat*. John Parker's record-setting *Blue Thunder II* Super Sport started the week with two holes in the block, but a spare engine got it back in the race. Kevin Eldredge's NXT *Relentless* sat out the race after losing a prop in flight. He managed a smooth-but-fast dead-stick touchdown.

As happens a lot in racing, the official fastest qualifiers in each class did win: Steve Senegal, in the David Hoover-built *Endeavor*, took the international Formula One Class. Aberle mopped up the Biplane Class in *Phantom*. LaVelle won the Sport Class, and Brown's *Viper* was so fast, and so well flown in the high winds, that no jet could touch him.

For the first time in Reno history, no Unlimited Class Gold Race was run because of high winds; Steve Hinton and Tiger Destefani's Mustang, *Strega,* repeated as winners, based on winning the last Gold Heat. Likewise, the T-6 Class scrubbed its Gold Race, leaving Dennis Buehn and *Midnight Miss III* the declared winner.

For more information on the 2010 Reno Air Races, visit *www.SportAviation.org*. Look for a feature story on Reno in an upcoming *Sport Aviation*.

George Pereira's GP-5

SPACESHIPTWO COMPLETES FIRST MANNED FLIGHT

***VSS ENTERPRISE*, SPACESHIPTWO,** made its first manned free flight on October 10. The spaceship was released from its WhiteKnightTwo mother ship at 45,000 feet and in 11 minutes glided safely to the Mojave Air and Space Port.

The flight crew, Scaled Composites pilot Pete Siebold and co-pilot Mike Alsbury, achieved the two main goals of the flight: to carry out a clean release of the spaceship from its mother ship, and for the pilots to free fly and glide back and land at Mojave.

Other objectives achieved during the flight included the evaluation of handling and stall characteristics; stability and control of SS2 against design and simulation work; lift-to-drag ratio of the spaceship during glide; practicing a landing approach at altitude; and the landing itself.

Virgin Galactic CEO George Whitesides stressed that the challenge now was "to complete our experimental program, obtain our FAA license, and safely bring the system into service at Spaceport America, New Mexico."

For a video of the first flight, visit *www.SportAviation.org*.

HUMAN-POWERED ORNITHOPTER FLIGHT

TODD REICHERT, A DOCTORAL student at the University of Toronto, completed the first continuous flight of a human-powered ornithopter. Reichert said his flight, launched by a towline attached to an automobile, sustained both altitude and airspeed for 19.3 seconds over 475 feet at a top speed of about 16 mph.

The aircraft, named *Snowbird*, weighs less than 94 pounds with a 105-foot wingspan. It's made of carbon fiber, foam, and balsa wood. It works by pumping a set of pedals attached to pulleys and lines that make the wings flap. When the pilot pushes the pedals, they go down, and aerodynamic forces pull them back up, creating the thrust.

For more information visit *hpo.ornithopter.net*.

PHOTOGRAPHY BY **TIM KERN; COURTESY EUROCOPTER AND *ORNITHOPTER.NET***

HARTZELL'S NEW THREE-BLADE PROP FOR C-180/185 AND EARLY C-210/205

HARTZELL PROPELLER INC. has developed a new three-blade Top Prop performance conversion for Cessna 180 and 185, as well as early 210 and 205 aircraft. This is the first time Hartzell has offered a propeller for Cessna 185 owners with a TCM IO-470 engine, and the first three-blade prop to be offered for use on early Cessna 210 and 205 models. This propeller is also compatible with a range of powerplant modifications common to these aircraft.

For more information visit *www.HartzellProp.com*.

HYBRID "HELICRAFT"

EUROCOPTER UNVEILED AN all-new design—a hybrid "helicraft" it calls the X3. The prototype demonstrator, which made its first flight on September 6, has two turboshaft engines that power a five-blade main rotor system and two propellers installed on short-span fixed wings. The company says this will offer the speed of a turboprop-powered aircraft and the full hover flight capabilities of a helicopter. There is no tail rotor; X3 instead incorporates a conventional empennage with twin vertical stabilizers.

For more information visit *www.Eurocopter.com*.

MAF RECEIVES $1.7 MILLION CHALLENGE GRANT

Mission Aviation Fellowship, a nonprofit organization that brings aid to people in remote regions of the world, received a $1.7 million challenge grant to fund the purchase of a Quest KODIAK. The donor is providing the grant with the condition that another donor commits to a grant of the same amount by the end of 2010. MAF has also received a grant for up to $750,000 toward a sixth KODIAK. According to MAF President and CEO John Boyd, the organization deployed one of its new KODIAKs to Haiti in response to the earthquake disaster. Boyd said MAF hopes to acquire seven more KODIAKs over the next two years.

For more information visit *www.MAF.org*.

BRIEFLY NOTED...

// The sixth edition of *The Pilot's Manual: Instrument Flying* and the fourth edition of *The Pilot's Manual: Instrument Rating Syllabus* are now available from ASA. *Instrument Flying* provides full-color illustrations and photographs to help simplify the aeronautical knowledge and practical skills needed to earn an instrument rating and operate under instrument flight rules conditions. *Instrument Rating Syllabus* can be used in coordination with the textbook or adapted to any study program. For more information visit *www.ASA2Fly.com*.

// Dynon Avionics has introduced software version 5.4 for its EFIS-D10A, EFIS-D100, and FlightDEK-D180 units. The upgrade features enhanced autopilot pitch control, as well as user-adjustable parameters to optimize autopilot performance for each aircraft. These improvements are said to offer passenger comfort and expand support to a wider range of airframes. For more information visit *www.DynonAvionics.com*.

// ASA has unveiled NASA App HD, a new mobile application designed for the iPad. The app features live streaming video from NASA Television, an interactive map with links to all the agency's field centers, quick links to feature stories and launch schedules, a scrolling "alerts banner," and a "NASA Featured" link. The NASA App is available for free through the iTunes App Store.

// Sporty's has introduced its *Complete Lesson Plan Guides*. Developed by the certificated flight instructors at Sporty's Academy, the guides help flight instructors organize every ground and flight lesson and are broken down into three comprehensive titles: the *Training Course Outline*, the *Ground Lesson Guide*, and the *PTS Study Guide*. *Complete Lesson Plan Guides* are available for private pilot and instrument rating training. Each guide is approximately 250 pages and includes diagrams and illustrations. For more information visit *www.Sportys.com*.

// After reaching an agreement with the Thunder Builders Group, Dean Holt Construction of Mount Vernon, Washington, reports it has purchased the Thunder Mustang molds and intellectual property and will begin production of the P-51 replica kit soon. After gaining experience from the builders of the 17 flying Thunder Mustangs, the company said the time required to restart operations and deliver a quality kit will be reduced significantly. For more information, call Dean Holt at 360-202-6271 or e-mail him at *sales@thundermustang.com*.

iPhone App Identifies, Tracks Planes

THE PLANE FINDER AR application for the Apple iPhone allows users to track the speed, altitude, and destination of airplanes in the sky by simply pointing the phone in the plane's direction. Developed by Britain-based Pinkfroot, the application uses signals from ADS-B-equipped aircraft and the phone's GPS receiver to identify the planes. The information is displayed through "augmented reality," which overlays virtual imagery generated from the ADS-B signal on a real-world environment captured through the iPhone's camera.

The app, which retails for $2.99 in the Apple App Store, was first developed for the European market where the presence of ADS-B equipment is more prevalent than the United States. If you want to use it in the United States, we suggest you first download the free version (Plane Finder Free) to see how well it works for the planes flying in your area.

For more information visit *my.Pinkfroot.com*.

AEROINNOVATIONS highlights developments that have potential to impact the future of aviation. EAA does not necessarily endorse the ideas, products, services, or views stated. For more information and direct links to all the AeroInnovations stories, visit *www.SportAviation.org*.

AUTO-LAND FOR UAVS IN ROUGH AREAS

NASA RESEARCHERS ARE using light detection and ranging (LIDAR) sensors to allow aero-vehicles to safely land in autonomous-control mode. One device detects three-dimensional hazardous terrain, another checks the aircraft's velocity and altitude, and the third monitors altitude to correct flight trajectory for the final approach to the landing area.

100-YEAR-OLD IDEA POWERS VSTOL PROTOTYPE

RESEARCHERS ARE DEVELOPING aircraft cross-flow fan technology, a VSTOL propulsion system first patented in 1892. The team at Propulsive Wing has a STOL flying prototype with a 4-foot wingspan, and researchers at the U.S. Naval Postgraduate School believe their VSTOL technology prototype will fly in several years, leading to a safer alternative to the helicopter.

ELECTRIC ANTARES H3 CLAIMS 50-HOUR ENDURANCE

LANGE RESEARCH AIRCRAFT and the German Aerospace Center are developing the next-generation electric aircraft operated by a driver and powered by a hydrogen fuel cell. The Antares H3 will have an increased flight time of 50 hours and a design range of 6,000 km (3,728 miles), up from five hours and 750 km (466 miles) for the H2.

NASA TO USE MAGNETS TO LAUNCH SPACECRAFT

NASA IS DEVELOPING a rail-launching system for spacecraft using magnetic levitation and existing technology, such as electric tracks and scramjets. The concept of a rail launcher is to reduce the amount of "fuel" carried onboard the spacecraft by imparting a lot of energy to the vehicle before it leaves the ground.

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Water, Water Everywhere

How to ditch in an overwater emergency

BY GREG LASLO

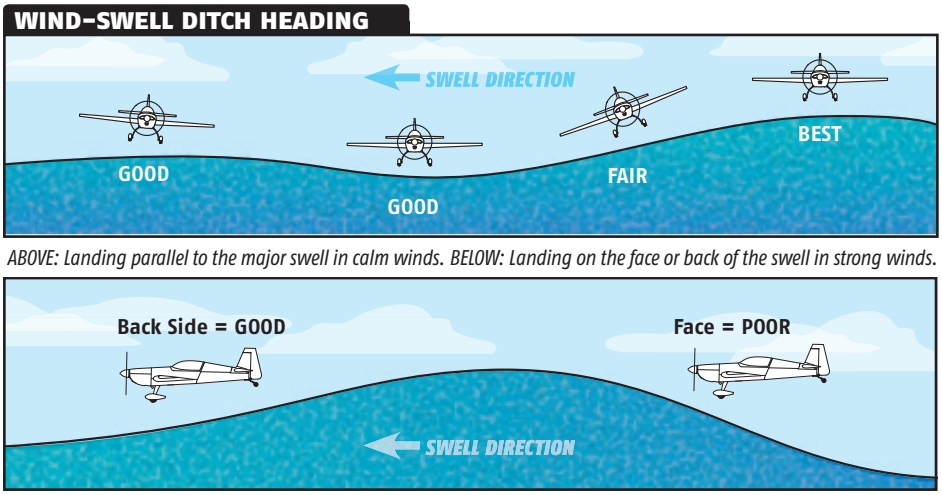
UH-OH. SUDDENLY THAT LAKE down there looks really big, and it's getting bigger.

This is it: You're about to earn your water wings by ditching your airplane. A trial run would've been nice, but, well, here you are.

Relax, you've got this—as long as you follow a couple of important steps, say our three survival experts: John Heiler, Amy Laboda, and Doug Ritter. They say it's a matter of planning, preparation, and proficient piloting, and it's a lot like managing any other emergency you'll encounter as pilot in command—only wetter.

ARE YOU SERIOUS? LANDING IN *WATER*?

Sure, and it can be in just about any kind of water—including that river on downwind at your local airport; after all, getting wet may be a better choice than the other option: trees. That's why preparation begins before you even start your engine.



ABOVE: Landing parallel to the major swell in calm winds. BELOW: Landing on the face or back of the swell in strong winds.

Plan your flight, John says. Altitude is your friend; it provides you a better view, better radio range, and more time aloft, but if you can't gain altitude fast enough, consider planning a longer route for less time over water.

Before takeoff, review your ditching checklist—and make one if you don't have one, John says. (You can download a template at *www.SportAviation.org*.) File your flight plan, and include your survival gear in the remarks, Doug says. Then brief your passengers. "You can't expect the passenger to know what to do," Amy says.

Show them how to don a personal flotation device (PFD) and how and when to inflate it. Show them where they'll exit, how the door works, and how the seat belts work, too. Amy even assigns each passenger a seat—and a role. Kids don't get to sit near the door, nor do they get to carry the 20-pound life raft. Lastly, she says not to wait for the pilot—get out immediately. The ditching is usually survivable; the sinking isn't.

LET'S BACK UP—'SURVIVAL GEAR'?

Yep. Over water, you should wear a PFD. While you're at it, carry personal survival gear on your person, including matches, an emergency blanket, a knife you can open with one hand or a seat belt cutter, and maybe a window punch. If you have to grab for it, you won't, Amy says.

Pick a raft that's appropriate for your conditions, and order it packed with other survival gear as well, including medicines, fresh water, desalination kits or water stills, energy bars, signaling devices such as mirrors and whistles, a pump, a bailer or sponge, a radar deflector, a flashlight, and even a fishing kit. You may also want a 406-MHz personal locator beacon with GPS, which works after the emergency locator transmitter (ELT) sinks, Doug says. Likewise, a waterproof pouch for your VHF radio and cell phone keeps those tools dry and functional.

SO HOW DO I ACTUALLY PULL THIS OFF?

First, announce that you have a problem as soon as you recognize it, John says. Declare mayday and transmit your position, altitude, course, and speed—in the blind if you have to, Doug says. Turn on your ELT, and set your transponder to 7700.

ILLUSTRATION BY **PHIL NORTON**

Then fly the airplane. Trim to your minimum sink rate, and once you're within 1,000 feet, resume a normal glide for landing, Doug says. If you're ditching in a river, your best bet is to point downstream to minimize the landing speed. On a small- to medium-sized lake, head into the wind; look for whitecaps, the drift of the airplane, or even smoke along the shore, John says.

On bigger lakes, watch the swells. Land along (that is, parallel) to them, preferably on top. This is your best choice in light winds, John says. If that's not an option, land in the trough between them. If the wind is stronger, say, more than 15 knots but less than 30, plan for a crosswind landing.

Landing perpendicular to swells should be reserved for only those conditions where the wind is especially potent; in that case, land on its downwind side, so you don't pitch into the rising face. Review the FAA Aeronautical Information Manual if you want to brush up on this. And if you have the option, land near boats, platforms, or other inhabited structures to expedite your rescue.

HOW DO I SET IT DOWN?

Ditchings are rare, so there are few hard-and-fast rules. Unless your pilot operating handbook (POH) says differently, slow to 5 or 10 knots more than your stall speed, John says. From there, it depends on what you're flying. A retractable-gear aircraft should ditch gear up, and you should fly it onto the water in a 200- to 300-fpm descent, John says. With fixed-gear, Amy recommends trying to make a full-stall landing so the tail smacks first; that way, you won't plow the gear into the water, which may cause you to flip.

Before then, though, open a door, and jam something into the gap—again, unless your POH says otherwise, John says. Make sure loose articles are stowed so they don't wedge somewhere inconvenient, and unplug and stow your headsets so you don't get tangled.

When you're approaching touchdown, brief your passengers to tighten their seat belts and lock their shoulder harness inertial reels. Advise them to brace; usually, that's upright in their harnesses. If they want to grab something, they can cross their arms and grab their shirts, John says. If they grab part of the airplane, they could break their wrists.

High-wing aircraft are typically ditched with flaps deployed, unless that prevents you from opening the doors. Low-wing aircraft are typically ditched without flaps. In both cases, avoid dragging a wing, and as you touch down, pull back to keep the nose up, like a soft-field landing, Doug says. If the airplane skips, keep flying. When it stops, prepare to go, and ignore the water that may be rushing through your windscreen.

EAA Checklist: DITCHING PROCEDURES

You'll probably never get the chance to practice a ditching; that's why it's so important to have a thorough ditching checklist. If you don't have one in your pilot operating handbook already, here's a suggestion from John Heiler of Pro Aviation Safety Training.

- ✔ Transmit mayday with location, altitude, course, and speed.
- ✔ Fly the aircraft. Fly minimum rate-of-descent or best endurance speed. At 1,000 feet, trim for a normal approach speed.
- ✔ Set your transponder to 7700.
- ✔ Turn on your ELT.
- ✔ Configure the aircraft for ditching. High-wing aircraft should be ditched with full flaps to reduce speed. Low-wing aircraft should not extend flaps. Retract landing gear. Make a shallow approach over the water at 5 to 10 knots above stall. Avoid a full stall prior to ditching.
- ✔ Brief passengers.
- ✔ Don life preservers if not already wearing them.
- ✔ Unlock or open exits.
- ✔ Secure loose articles. Unplug and stow your headsets.
- ✔ Lock seat belts.
- ✔ Close ram-air vents.
- ✔ Locate a landing area, considering swells.
- ✔ Brace for impact.
- ✔ Exit aircraft.

For a printable checklist go to www.SportAviation.org.

DO WHAT? GET ME OUT OF HERE. NOW.

Calm down. Once the airplane stops, release your seat belt; find it by sweeping a hand to your hip. Second, grab a reference point. Third, find the door; aim low and run your hand up to the latch, Doug says. When the door opens, pull yourself out. Don't kick; unless you're solo, someone may be behind you. Once out, head to the surface, put a hand over your head to protect yourself from pointy airplane parts, and inflate your PFD, he says.

In a high-wing airplane, you may have to wait until the airplane floods before you can open the door. "Calm yourself," Doug says. "There's plenty of time to get out, as long as you don't panic." You can hasten the process by opening vents. On aircraft with a canopy, you might also use a window punch, Amy says.

Get clear of the aircraft, gather together, and take a head count before you inflate the raft; otherwise it may drift away without someone, Doug says. Deal with your first aid issues, and prepare to wait. You're safe.

You earned that sigh of relief. EAA

Greg Laslo, EAA 9004198, is a pilot, writer, and editor in Kansas City, Missouri.

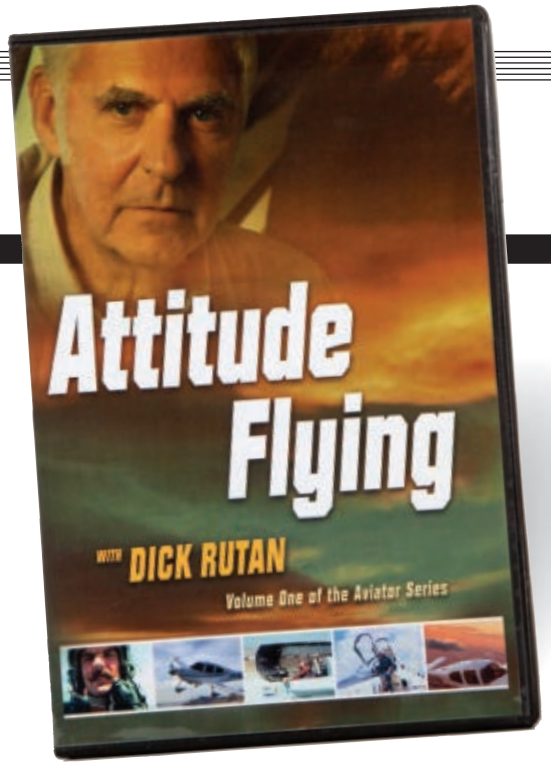
MEET the PANEL

John Heiler *is a former Sea King helicopter crew commander and Canadian Coast Guard pilot. He's chief instructor of Pro Aviation Safety Training, which teaches aircraft ditching and survival in Surrey, British Columbia.*

Aviation journalist ***Amy Laboda*** *ditched her Cessna 210 on June 14, 2001, during a climb-out from Key West, Florida, on the Cayman Caravan, when her engine failed.*

Doug Ritter *is a consultant and speaker on survival equipment and practical survival techniques. He publishes the website Equipped To Survive,* www.Equipped.com.

ATTITUDE FLYING WITH DICK RUTAN



A DVD FEATURING DICK Rutan discussing new techniques for precision instrument flying, spatial disorientation, kinesthetic inputs, task saturation, and the "other pilot."

MEMBER REVIEWS

Rutan did a fine job explaining things. He's a good teacher. I liked the combination of casual hangar talk, classroom, and flying—give a story, talk about the issue, then go fly. He was entertaining and informative, and humble, too. It shows we all can make mistakes. It's a practical lesson for all levels of flying. ... *John Papp, EAA 525968*

This is a great video for both experienced and novice pilots of all types of aircraft. Dick Rutan takes a unique and engaging approach to teaching instrument flying concepts. His personal accounts of when he has had spatial disorientation and how he reacted bring clarity to the concepts that are often only taught on a basic level. The in-air demonstrations of how such problems occur are excellent illustrations of how quickly a pilot can get into trouble. I would highly recommend this video. ... *Mary E. Holtschneider, EAA 771379*

I am a 3,000-plus-hour former Air Force pilot. I liked the fact that this was not an introductory course even though I feel that new pilots would find it of value. Having Dick use his real-life flying experience added a dimension that made the video both interesting and valuable. I appreciated Dick's willingness to share his mistakes to allow other pilots to learn valuable lessons that may save them in a future difficult situation. ... *David Love, EAA 431619*

The video moves along nicely, with personal insights and entertaining video from Dick's historic aviation adventure. It is as if you are there and he is speaking to you and tutoring you personally. I can hardly wait for the next installment. ... *Steve Snyder, EAA 1024692*

MSRP: $59.95 • Web: *www.FlyRightFilms.com*

Number Tested	12
Would you recommend this product?	Yes—92%
Overall, how satisfied were you with this product? (0–10, 10 being highest)	8.8

HAYNES *MESSERSCHMITT BF109 OWNERS' WORKSHOP MANUAL*

FULLY ILLUSTRATED WITH ARCHIVAL photographs, color images, and technical illustrations from Luftwaffe wartime servicing manuals, and coverage of restoration projects.

MEMBER REVIEWS

I liked the book. A close look at what it takes to restore, maintain, and fly such a rare piece of history. The format is fun. It makes a good addition to my other Haynes manuals. ... *Gary Manning, EAA 561380*

For anybody who enjoys learning more about these old warbirds, I highly recommend this book. ... *Russell Zimmerman, EAA 292524*

Enjoyable and informative without being overly technical. I think anyone with even a little interest in the Bf109 would appreciate the book. ... *Mike Luellen, EAA 856369*

MSRP: $32.95

Web: *www.Haynes.co.uk*

Number Tested	19
Would you recommend this product?	Yes—100%
Overall, how satisfied were you with this product? (0–10, 10 being highest)	8.7

GEE BEE THE LITTLE RACER AND FRIENDS IPHONE GAME

FLY GEE BEE ZEE and his airplane friends through different environments gaining points by delivering packages, racing the clock, dropping watermelons, and popping small balloons with your propeller, all while dodging obstacles like hot air balloons, birds, and terrain.

MEMBER REVIEWS

The game looks like it would be for children, but I can guarantee that it becomes addictive to see how well you do at each level. It is a good way to pass some time or to challenge family and friends. ... *Michael Van Deventer, EAA 654474*

Fun game! Even my 13-year-old liked it. Controls are somewhat challenging (and might be too challenging for a small child). Overall, a good and inexpensive diversion to have available on your iPhone. ... *Rusty Barnett, EAA 345135*

The game has a good premise, and the graphics are well-executed, but the controls are so difficult to use that it is frustrating and not fun. I have played it probably 40 times over nearly a week and still cannot finish level one. I also gave the game to two kids who play these games all the time, and they didn't like it either (and gave up much sooner than I did). ... *Heather Cook, EAA 854307*

MSRP: $1.99 • Web: Available through iTunes App Store

Number Tested	13
Would you recommend this product?	Yes—62%
Overall, how satisfied were you with this product? (0–10, 10 being highest)	6.1

CORRECTION: OCTOBER'S MEMBER TESTED SHOULD HAVE INCLUDED THESE PRICES: FOR AEROCINEMA, THE INTRODUCTORY PRICE IS $9.95 FOR THREE MONTHS, THEN $19.95 QUARTERLY THEREAFTER. THE FLYVIE LITE INSTALLATION KIT IS $55, WITH A $9.90 MONTHLY OR $99 ANNUAL MEMBERSHIP.

PHOTOGRAPHY BY **JIM KOEPNICK**

BY BUDD DAVISSON

Racer Replica

THE CHESTER JEEP FLIES AGAIN

TRUTH IS, ONCE HE had seen his first model of Art Chester's 1930s racer, Jeep, Lon Dienst, EAA 104891, couldn't *not* build a replica of the airplane. Although it took a decade or two to get the project underway, it was going to happen. The aircraft of the so-called Golden Age of air racing seem to have that effect on a lot of people.

For slightly more than a decade, beginning just as the '20s were ending, America reverberated to the beat of piston engines straining to pull tiny airframes at ever-increasing speeds around air race pylons. Every one of those machines was a shining example (okay, some weren't so shiny) of the homebuilder's art. As the '30s began and racing literally took off, amateur-built airplanes kept getting better until the military stopped competing in the races altogether because backyard builders were blowing its socks off. It was an exciting era in which pilots saw races like those in Cleveland as the equivalent of the fabled Western shootout. May the fastest win.

Other than the sure knowledge that the biggest engine dragging the smallest airplane had a good chance of winning, the technology for going fast hadn't really been perfected. Much of the streamlining and aerodynamics were worked out by individuals who had no experience and no right to be going faster than the military or professionally fielded race teams. A clear indication of the times is that the first land-based airplane to break 300 mph in level flight was the Wedell-Williams Model 44 (304.98 mph, in 1933). It was literally designed in chalk on the floor of Jimmy Wedell's hangar in Patterson, Louisiana.

As the Great Depression gripped the nation, entertainment like movies and baseball soared higher than ever as people sought to escape reality, but nothing grew as fast as air racing. Race pilots like Roscoe Turner and Steve Wittman were as well-known as any Major League Baseball player. And when put against the backdrop of the country's economic plight, the purses offered for even the lowest-powered races were substantial enough to draw an ever-growing number of technically adventurous pilots onto the race course.

THE CHESTER SPECIAL

One of those was Art Chester, an auto mechanic from Downers Grove, Illinois, who, having raced stock aircraft for a few years, was convinced he could design an airplane that would be just as competitive as any in the air.

The Chester Special, later named Jeep after a Popeye cartoon character, first took to a racecourse in 1933, eventually setting a class record of 237 mph.

Using a four-cylinder, inline, supercharged Menasco engine eventually producing nearly 200 hp, Art applied his inventive mind to the creation of shapes that go fast. At the same time he had to design the structures that formed those shapes and that could withstand high *g*-forces while twisting around the racecourse pylons in ground-level turbulence. Many of his concepts were unique, and through his race-design experience, he became recognized as one of those people who just seem to "get it." He had an intuition others didn't.

The Jeep was designed to compete in the 375-cubic-inch class (although it often won or placed well in the 550-cubic-inch class), and by the time air racing was suspended because of World War II, it had won a total of more than $30,000, not an inconsequential amount given the times.

After the war, the airplane was completely modified into a Formula One/Goodyear racer with a C-85 engine, only racing a few more times before disappearing. In 1977, its remains surfaced and were purchased by Art Kilps and donated to the EAA AirVenture Museum, where it's now on display, completely restored.

Art's Jeep in the cream and green trim paint scheme Lon and Steven replicated.

Chester's plane was named after "Eugene the Jeep," a pal of Popeye the Sailor.

PHOTOGRAPHY COURTESY **EAA ARCHIVES**

The three-view drawings gave the brothers good outlines for the wings. Lon says they were obviously overbuilt, but they duplicated them as exactly as they could.

Before beginning, Lon and Steven agreed the engine had to come first. A Menasco would be hard to find and they didn't want to build an airplane and not have an engine.

The nosebowl for the cowling was profiled off of the original part, stored in EAA's hangar prior to the restoration of Art's original Jeep for the museum.

(All that remained of the original was the rear of the fuselage and tail.) Art Chester's Jeep had flown its last flight, always something of a bittersweet situation for a famous aircraft. Enter Lon Dienst, of Poplar Grove, Illinois, homebuilder and incurable race plane junkie.

LON'S REPLICA

"I've been in aviation in one way or the other since I was a teenager," Lon says. After getting his private certificate at 19, he crop dusted on the side for eight years and ran a glider school for 12.

"I got my first airplane when I was 19," he says. "A Champ, and it was the kind of airplane 19-year-olds usually have, a little rough around the edges, so patching became a way of life." About eight years later Lon bought a Pitts S-1C as a rebuild project. During that time, a friend of Lon's stopped by with a model kit for the Jeep. "There was a booklet on the history of the airplane, and I remember thinking, 'Man, that's gotta be a great airplane to fly,'" Lon says. "I didn't know that it would be over 10 years before that happened."

In many ways, Lon had a bigger project in front of him than Art Chester had when he built the Jeep in the first place. Among other things, Art started with a clean piece of paper and could make the airplane look any way he wanted; the only constraint was the size of the engine. Lon's situation was almost exactly the opposite of Art's: He not only had no plans, but also had zero flexibility in terms of how he built it—it had to look as much like the original as possible. Where to begin?

"There was a booklet on the history of the airplane, and I remember thinking, 'Man, that's gotta be a great airplane to fly.'"

"I guess everyone who builds a replica goes about it in almost identical ways," Lon says. "You start looking for every photo you can find of the airplane. As you're doing that, you begin to notice little details you hadn't seen before, and you realize that the airplane changes in almost every photo, especially those shot in different years. There will be a bulge in the cowling one year and none the next."

Designers were constantly working on their aircraft, so the airplanes would even change between races, and each of the racers was almost completely rebuilt between seasons. Therefore, Lon had to pick a configuration from a given point in time, so Lon and his brother, Steven, chose the configuration from the start of the 1936 race season, when the Jeep was cream-colored with green trim. "I just happened to like that look," Lon says.

In looking for photos, Lon says he could never have enough. "Each one is a different angle and shows something else. Also, you try to find a single part on the airplane that you pretty much know how big it is—a wheel, for instance. Then you can use that dimension and some comparative geometry to try to size everything else."

Lon got lucky. John Sunyak, a Cleveland photographer, had many photos of the Jeep, and the Cleveland Air Racing Society was offering three-view drawings of the airplane, done by W.F. Kerka around 1960. After comparing the dimensions on the drawing with his calculations from measuring photos, Lon verified that the drawings were accurate and used them for the outlines.

Before starting to build, Lon and Steven agreed that the engine had to come first. "Menascos are getting pretty hard to find, and we didn't want to build an airplane for which we couldn't find an engine," Lon says. "We could probably have used a more modern engine, like a LOM, but then it wouldn't be a Jeep."

The brothers didn't expect to find a supercharged C4S like Art Chester used, but

PHOTOGRAPHY COURTESY **LON DIENST**

Lon Dienst squeezes into the 16-inch-wide cockpit.

Replicating the cockpit was a challenge because the only photos available of the interior were from the left side.

they did find a 134-hp D4-87, almost identical to the C4, that Menasco exported to Canada when it didn't have enough Gipsys for the Tiger Moths during World War II. After seeing the engine listed for sale in Oklahoma, Lon called Al Ball at Antique Aero Engines in Santa Paula, Texas. "He told me not to pay more than $2,000 because every one he'd seen was rusted junk," Lon says. "When he opened this one up, however, he couldn't tell it had ever been run, and Cosmoline had totally protected it. It even had the right spray bar or jet for that carb, which they usually don't. Talk about being lucky!"

With their double-tapered planform, the wings for the Jeep were one of the more identifiable features, so Lon had to get them right. Originally, there were two different length wings, and Lon and Steven chose to build the longer version.

"The three-views gave us good general outlines, and the construction photos helped a lot," Lon says. "It was obvious the wings were very overbuilt, but we duplicated them as exactly as we could." The original spars were a three-ply lamination of spruce-birch-spruce, but the brothers used straight-grain maple instead of birch. The ribs are made of 1/8-inch mahogany with routed spruce cap strips. They didn't cut any lightening holes because the original didn't have them, which is one of the reasons the airplane is so heavy for its size: It weighs 900 pounds empty and holds 19 gallons of gas, which lasts two hours.

The fuselage has six longerons aft of the seat, and the tubing at the wing attach points is square, forming a trapezoid from the top of the fuselage to the bottom. "We're not sure why the fuselage is structured the way it is, but we followed the photos and the EAA's example exactly," Lon says.

Lon says looking at EAA's Chester Jeep also helped them figure out the construction of the tail. "Among other things, while [Chester's team] was fine-tuning the Jeep in the '30s, they modified the horizontal stabilizer and moved the leading edge forward a couple of inches," Lon says. "They left the old leading edge and main spar where they were and made a dummy leading edge ahead of everything. I did it the same way, although where the airfoiled surfaces originally had spruce fairing strips laced to the tops of the ribs, I glued them in place."

As for the struts, they are made of round tubing with plywood ribs covered in fabric, like little wings, which gave the Jeep the wide profile the designers felt was necessary for low drag.

Among the parts of the original airplane that were stored in EAA's hangar before the restoration was the nosebowl for the cowling. "I pulled the profile off the original, then started beating aluminum into a beanbag," Lon says. "It's made out of eight pieces gas-welded together, and I produced a lot of scrap—I mean a lot of scrap."

When it came to the cockpit, the men had photos of the inside, but all were from the left, so they only knew what was on the right side of the cockpit. "We just built it like a normal airplane and hoped we were right," Lon says.

In addition to the cockpit, Lon says there are still some mysteries about the Jeep. "The photos don't show an airspeed indicator, and none of the dozens and dozens of photos I've collected show a pitot tube. Is it possible it had no airspeed? I

PHOTOGRAPHY BY JIM KOEPNICK

Art Chester's original Jeep was donated to the EAA AirVenture Museum in 1977 as a collection of parts. The aircraft was restored and put on display in 1983.

Performance Data

Aircraft Make & Model:
Dienst/Chester Special
Certification: Experimental

Length: 15 feet
Wingspan: 17 feet, 2 inches
Height: 4 feet, 6 inches

Empty Weight: 900 pounds
Fuel Capacity: 19 gallons
Seats: 1

Powerplant Make & Model:
Menasco D4-87
Horsepower: 134
Propeller: Ground adjustable Hamilton Standard
Cruise Speed/Fuel Consumption:
160 mph/6 gallons per hour
Wing Loading:
21 pounds per square foot

V_{NE}: 210 mph
V_{SO}: 65 mph

don't know, but I wasn't going to take a chance—I have one."

Every project eventually arrives at the point where there's nothing left to do but fly. The Jeep replica's day came in September 2009. "I'd been flying the Pitts for preparation, which was a big help, but it didn't prepare me for the takeoff," Lon says. "Although it accelerated really well, it didn't want to leave the ground. It finally staggered off, but it wasn't really happy until it accelerated to 90 mph. Now I just leave it on the ground until it's doing 90 mph, so it's more solid and has a good rate of climb. For a while, I would rather land it than take it off."

Before making even one turn on the first takeoff, Lon decided the Jeep needed a skid ball. "The airplane has absolutely zero stability on any axis," Lon says. "You can feel it sliding around through neutral, and a ball would have been great to have on that first flight."

Since the airplane felt so unstable, Lon says he didn't have the nerve to full stall it, so he slowed to 80 mph to feel it out, figuring he'd have it on the ground by that time. "As it turns out, the landing was no sweat," Lon says. "After I put some lead up front to move the CG [center of gravity] forward, it became a much easier airplane to fly. And, by the way, it stalls at 65 with a very slight left roll."

In the end, the airplane cruises at 160 mph. On final, Lon says he flies at 100 mph and tries to have at least 90 mph showing when he comes over the fence, as well as using power on every approach. "Otherwise it's just coming down too fast."

Within the narrow niche populated by those willing to build "hairy" airplanes with no plans or structural information, it is seldom an individual will build only one of the racers. Is there another in Lon's future?

"I can't say for sure," he says, "but I've been looking over my Chester Goon photos pretty carefully these days and even find myself pulling out the magnifying glass for a closer look—and we all know what that means."

Budd Davisson is an aeronautical engineer, has flown 300 different types, has published four books, and has written more than 4,000 articles. He is editor-in-chief of *Flight Journal* magazine and is a flight instructor. Visit him on *www.AirBum.com*. For videos of the Jeep replica's first engine run visit *www.SportAviation.org*.

PHOTOGRAPHY BY **STEVE CUKIERSKI**

EAA President and CEO Rod Hightower flies over the cornfields of Galesburg, Illinois, in the Stearman he restored.

PHOTOGRAPHY BY **JIM KOEPNICK**

LLOYD'S LEGACY

LIVING WITH A HISTORIC WWII TRAINER

BY JIM BUSHA

THE UNMISTAKABLE SOUND of multiple radial engines caused me to take my eyes off the road. I gazed up toward a morning sky awash in a deep shade of cobalt blue. Four Stearman biplanes flew in perfect formation, bobbing up and down, passing slowly overhead.

As **I turned onto** Lloyd Stearman Drive, an array of brightly colored aircraft greeted me—yellows and blues, sprinkled with oranges, reds, and greens. The canvas for this cornucopia of color: 105 Stearmans attending the 39th annual National Stearman Fly-In. If there was ever a Stearman heaven, Galesburg, Illinois, has to be the place. Some of them represented the Army Air Corps and the U.S. Navy and Coast Guard, while others sported civilian paint jobs with checkerboard tails. Whatever the paint scheme, they all came here for one reason: to celebrate an airplane that trained a generation of pilots and continues to pull at heartstrings.

"It is a visual delight," said EAA President and CEO Rod Hightower, who flew his Stearman in from Creve Coeur Airport near St. Louis. "When the airplane is on static display at an air show, the children and the families that come up want to learn more about it. You can park a beautiful Stearman in a broad row of airplanes, and they'll go to the Stearman first every time."

Rod, EAA 357443, has been been flying his Stearman, sporting the blue and yellow U.S. Army Air Corps colors, since 1997 after a seven-and-a-half year restoration. His love affair with the plane began 20 years earlier.

"A gorgeous Navy Stearman landed at Excelsior Springs airport in Missouri where I was working as a line boy," Rod said. "It was the first time I had been up close and personal with a Stearman."

The then 18-year-old was struck by the beauty and solid construction of the plane, but what really drew him in was the pilot. "It wasn't just the airplane. It was the guy who flew it in that day," said Rod. "He took the time to show me the airplane. He didn't mind my questions. It was a very positive experience."

AN AVIATION AFFLICTION

Rod's "affliction" with aviation began at an early age. Growing up near Naval Air Station Dallas, "Navy jets would come screaming over our house, and back then sonic booms were still allowed," he said. "The windows in our house would rattle, and the dishes would shake on the table; My mom hated it, but my little brother and I loved it!"

By the time Rod was 16 his family had moved to Missouri where he introduced himself to a local flight instructor, Jerry Short. According to Rod, Jerry sized him up not only to see if he had the ability to pay for lessons, but also to see how serious he was about flying. Before the day was done, Rod was at the controls of a Cessna 150.

From that day forward Rod was focused on becoming a commercial pilot. He majored in aviation at Central Missouri State University, and to earn a few extra bucks Rod hauled skydivers at Lexington Municipal Airport. When he graduated in 1982, thousands of pilots were looking for work. Rod remained in the business world, knowing that flying would forever be a hobby. Although he enjoyed flying Cessnas and Pipers, he knew he wanted to own his own airplane; he wanted a Stearman.

STEARMAN EVOLUTION

Lloyd Stearman, the designer of the original biplane that bears his name, learned to fly in the Navy during World War I before going on to a successful career as an engineer working with the likes of Matty Laird, Clyde Cessna, and Walter Beech. In 1927 he formed the Stearman Aircraft Corporation, and with a series of successful biplane designs under his belt, the company became part of the aviation conglomerate known as United Aircraft and Transportation Corp., owned by William Boeing.

Lloyd's first attempt at designing a military trainer was the Model 6 Cloudboy. With the Depression gripping the country, fewer than 10 Cloudboys were manufactured. The

PHOTOGRAPHY BY **JIM BUSHA**

Army Air Corps rejected the design in 1931 and went looking elsewhere. Lloyd followed suit, resigning from Boeing to join the Lockheed Aircraft Company.

The Cloudboy easily might have become just another failed and forgotten airplane. Instead, it formed the genesis of the most famous biplane ever produced: the Boeing Stearman Kaydet. Although Lloyd was out of the picture, Boeing still had the drawings of the Cloudboy. A trio of adventuresome designers—Mac Short, Harold Zipp, and Jack Clark—knew the plane had all the internal characteristics of a good primary trainer. They laid the plans out on a table and scribbled their own refinements, with the goal of making it even better.

WITH A FEW REVISIONS, A LEGEND TAKES FLIGHT

They began by rounding out the tail and wingtips and changed the landing gear from a multiple-strut layout to a single-strut design. The fuselage became rounder and more robust with the use of aluminum frame stringers. To give it a more crisp response, the original movable stabilizer became fixed and pilot-operated trim tabs were placed on the elevator. In the roomy cockpit, the control stick was more akin to a baseball bat, but the extra leverage came in handy, especially during aerobatics.

The fabric-covered airplane was stressed at +12*g*/-9*g*. It was rugged, reliable, and overbuilt. It had to be able to withstand the daily rigors and punishment of new cadets. The Army Air Corps loved it. Boeing did too, and it began manufacturing Stearmans in 1935 for the lofty sum of $11,000 apiece.

There were three different models. The Army Air Corps called its Stearmans the PT-13, which had the 225-hp Lycoming R-680 engine (a few were made with the 225-hp Jacobs R-755), and PT-17 with the 220-hp Continental R-670. The U.S. Navy referred to its Stearmans as the N2S and used both the Lycoming and Continental engines.

With war clouds looming over Europe, the United States began to ramp up production of new high-performance fighters and bombers, and the military needed pilots to fly them. To get a seat in one of these hot rods, a new cadet had to first conquer the mighty Stearman.

"There were a few things that made the Stearman challenging for most of these new student pilots," said John Lohmar, longtime Stearman owner and former National Stearman Foundation president. "The Stearman had narrow landing gear, a 46-gallon fuel tank that sat dead center on the top wing, along with a big radial engine out front. All of this weight made for a high center of gravity. Combine that fact with a large wing and fuselage surface area, and you had the makings of an airplane that wanted to quickly swap ends during a crosswind landing and chase its tail round and round. This was where the 'men were weeded out from the boys,' and only the best of the best moved on to basic training."

The National Stearman Fly-In drew 105 airplanes.

POSTWAR

By the time the last Stearman rolled off the assembly line in February 1945, a total of 8,428 had helped teach a nation how to fly. With the war over, thousands of military airplanes of all shapes and sizes were

The narrow, long-legged gear and top-heavy design make the Stearman intolerant of poor flying skills.

destined to be melted down. The Stearman, however, was spared the cutter's torch and was drafted for a different kind of war.

"Had it not been for crop dusting, the Stearman might have become extinct," said Robert Novotny of Dusters and Sprayers Supply Inc. of Chickasha, Oklahoma, the largest Stearman supply house in the United States. "They were cheap to buy, some for under $500 bucks with full fuel."

Most were converted to crop dusters by placing a hopper in the front seat as they sprayed our nation's bread basket throughout the 1950s and 1960s. Air show performers also took note, and many of them installed larger engines to excite crowds.

By the early 1970s many of the Stearman dusters were retired and cast aside; some were abandoned in old dilapidated barns and sheds or left to rot outside in the elements. But the Stearman's story was far from over as a new group of individuals, "restorers," emerged to give the plane new life. Today, an estimated 1,000 Stearmans are still registered, with flyaway aircraft starting around $70,000 on up. A far cry from the surplus Stearmans that sold for $500 after the war.

"It is a pretty easy airplane to fly once it's airborne, but bringing it back to earth requires a deft touch on tailwheel flying."

ROD'S RESTORATION

Rod is one of those restorers. When he bought his project he had never flown in a Stearman, but he was passionate about the airplane.

"Maura and I were married in 1988," said Rod. "Maura loves to fly also, and I told her about the history of the Stearman. I told her how it trained tens of thousands of aviators and how it was such a venerable design; legendary in strength and ruggedness, yet elegant and simple. She agreed it's the type of airplane we would enjoy, and we ended up buying a basket case later that year."

The Hightowers' Stearman was built in 1942 and served with the Royal Canadian Air Force in Winnipeg, Canada. It was mustered out of service in 1945 and went on to tow banners over the beaches of Cape May, New Jersey. In April 1967, the Stearman lost power on takeoff and crashed inverted into a group of pine trees. The pilot walked away, but the aircraft was a complete mess. It was taken apart and tossed into a tool shed, where it languished undisturbed for more than 20 years.

"The first thing I did was catalog what I had and what was usable," Rod said. About 80 percent of the parts were there, but many had to be scrapped because he wasn't comfortable with the quality.

"I don't begin anything without having a good idea of how it's going to end," Rod said. "Once you've established the standards of quality of the outcome, then everything you do from that step forward you have to apply that standard. I wanted as high a quality restoration as I was capable of producing with the advice and the assistance I was getting, with me doing most of the work."

Restoring an aircraft has a lot of parallels to the business world and life, Rod noted. You have to manage complexities, and the

PHOTOGRAPHY BY **JIM BUSHA AND JIM KOEPNICK**

many interdependencies require you to become dependent on other people's expertise and skills to have a successful outcome.

"One of the key things in doing a restoration with any aircraft is to 'learn your way through' the airplane type. In my case I reached out to the Stearman community for guidance, and what I received in return was open arms, a wealth of knowledge, and a great willingness to help me get my project flying."

Rod began work on his project in his garage, with the only rule being that there had to be room for Maura's car every night.

"My vehicle didn't see the inside of a garage for over seven years," chuckled Rod.

As he got to know his project, he realized that there were some skill sets he needed to learn and others that were above his experience level. "The one regret I have is that I did not completed my A&P [airframe and powerplant] rating during the project," said Rod. "As I acquired other skills along the way, like painting and sand and bead blasting, my confidence level would go up at each stage of the restoration."

Woodworking was one of the most difficult parts, but he got help with the complex areas in the center section and gained enough confidence and skill to build the upper wings. "The lower wings were another story," he said. First of all,

Rod has more than 1,000 hours in Stearmans.

THE NATIONAL STEARMAN FLY-IN

All around, multiple Stearmans were in a state of constant movement. The airfield was filled with the popping and belching of radials being coaxed to life as they taxied out in unison, resembling a parade of circus elephants waltzing by. Rides were offered, and often the only form of payment was a hug or handshake as old friends reacquainted themselves with one another in front of their favorite airplane.

"For some particular reason the Stearman has always been my favorite airplane," said Tom Lowe, co-founder of the National Stearman Fly-In. "I bought my first one, a Navy N2S-3 model, in 1968. In 1970, I met another Stearman owner, Jim Leahy, who flew a stock Stearman in an air show routine that would knock your socks off! We became good friends and talked about getting a bunch of Stearmans together."

The talking turned to reality in 1972 as Tom and Jim sent out 2,500 letters to Stearman owners, asking them to fly to Galesburg. "That first fly-in we had 27 of them show up," said Tom. "The second year we only had 19, and we decided to try it 'just one more year,' and that turned into 39 years in a row. Since that time, the city of Galesburg has welcomed us with open arms and with great assistance from the local residents, all of whom are volunteers."

Like those at EAA AirVenture Oshkosh, the volunteers at the National Stearman Fly-In are the lifeblood of the event. Most of them take time off work and skip social engagements or other responsibilities just to be a part of the Stearman crowd.

"It is very romantic for most of us to see all these beautiful airplanes and to experience a part of the past," said Diane Stickle, the director in charge of hospitality and a volunteer herself. "Although many have no flying background—myself included—we enjoy the atmosphere, the pilots, and the airplanes, all of them right in our backyard. It's the next best thing to Christmas!"

It's a community of friends who leave the troubles of life behind for a week to share the joys of Stearman flying. At Galesburg, it doesn't matter what your day job is—whether you are a farmer or lawyer, airline pilot, mechanic, or association president—everyone shares the same grassroots spirit. There are daily lunch fly-outs to local airfields, safety seminars, and flying contests that include short field takeoffs, spot landing, message drops, aerobatics, and formation flying.

"Formation flying has always been extraordinarily impressive," said John Ockenfels, president of StearmanFlight.com, an organization dedicated to enhancing proficiency in formation flying. "We teach a strict protocol of safety, how to get into position, how to get out, and how to handle the unexpected. It's never about closeness; it's about symmetry. Flying formation forces you to know your know your airplane, and yourself, as you concentrate with your mind and hands. This type of flying not only builds confidence, it also helps you fly the Stearman better and safer."

It's just another part of the National Stearman Fly-In philosophy that Tom Lowe and Jim Leahy started almost 40 years ago—to have a place where owners and pilots can come to have fun, enjoy one another's company, and celebrate the joys of this historic aircraft.

To see a photo gallery from the 2010 National Stearman Fly-In visit *www.SportAviation.org*.

IS A STEARMAN IN YOUR FUTURE?

Just one look at a Stearman and it's easy to fall for this big biplane. In our "2010 Survey of the Average Aviator" (see p. 46), when pilots were asked what their dream airplane is, the Stearman ranked seventh out of 372, just behind such legends as the P-51, F4U Corsair, and DC-3.

Prices for a Stearman in flying condition range from about $70,000 to $125,000. With more than 8,000 planes produced and 1,000 still registered, parts are readily available, which makes it an appealing airplane for recreational flying. Maintenance and operating costs are reasonable as well, with a fuel burn of about 12 gph. Flying it is within the ability range for most pilots, but your early hours of Stearman time are key.

If you think a Stearman might be for you, here are a few things to consider before you take the plunge.

Fly a Stearman. We're not talking a sightseeing flight; get a few hours with a seasoned Stearman instructor so you can experience what it's like to fly the plane. What's most important is assessing your skills to see if you're up to landing this top-heavy beauty. It's also a good opportunity to see if you enjoy open-cockpit flying. Not everybody does, and it's best to know that before you invest in a Stearman.

Join the Stearman Restorers Association (SRA). It's a powerful resource to connect with other Stearman owners and pilots. The discussion board is filled with questions and answers about things like rib drawings, magneto overhauls, and landing techniques. There also is a classified ads section with lots of parts.

Get a Hangar. This is a must, as for any wood and fabric airplane. The Stearman is a classic, and it needs to be protected from the elements.

Keep It on the Grass. Insurance companies usually require 25 hours of dual instruction before solo, although much more time is recommended to master the landings. "My advice to new Stearman pilots is keep it on the grass for the first 100 hours," said EAA President and CEO Rod Hightower, who restored and flies a Stearman.

"The Stearman is an easy plane to fly, but it's a hard airplane to fly well," said Rod. "It is a completely different level of skill required to fly a Stearman really well." Its long-legged, narrow gear; big tires; and the fuel tank in the center section of the upper wing create a top-heavy design that is prone to swapping ends on landing.

The SRA has a list of 15 highly experienced Stearman instructors spread out in 12 states across the country who can properly transition you to a Stearman. Once you do, you'll be in a special club, owning one of aviation's true treasures.

"They are a joy to fly, a joy to own, and a joy to bring out in public," said Rod. "It's a magical airplane."

—Steve Schapiro

PHOTOGRAPHY BY **JIM BUSHA**

there are more ribs and they vary in size, and plywood is needed for the wing walk. Adding to the complexity are the aileron controls and connections. "I knew I was over my head," Rod said.

Rod sought the assistance of Larry Kampel and Matt Parr to build the lower wings, and when they were finished, he resisted putting on the fabric. "They were works of art!" Rod said. "It was a shame they had to be covered, because they were so beautiful."

With the project taking shape in his garage, Rod's neighbors thought he was building a boom for a crane; that was until the mighty airframe sat upright on its long gear legs with an engine mount sitting up front.

90 PERCENT EQUALS HALFWAY DONE

"I made the mistake of thinking, 'Gosh, this can't be many more months away until I get it flying.' But then I remembered what a wise old airplane restorer had told me: 'When you're 90 percent complete, you're halfway there!'" said Rod. The last 10 percent took about three years as Rod worked on the complex series of aluminum stringers and cowling pieces that have to match up from the firewall to the tail. He also had to design the electrical system, as Stearmans originally didn't have them.

"My advice to those sitting on the fence wondering if they should restore a Stearman is this: If you have a budget in mind, triple it," said Rod. "Whatever timeframe you calculated, quadruple that, as it will be a closer approximation of reality."

In July 1997, after a 30-year hiatus, Rod's Stearman took to the air once again. Rod credits the assistance of countless EAA members who shared their technical expertise, candid advice, and welcomed mentoring. Since that first flight, the Stearman hardly has had time to collect any dust on its wings, as Rod enjoys sharing the thrills of open-cockpit flying with hundreds of people young and old, along with his five children: daughters Hannah, Hillary, Heidi, and Hayleigh, plus son John. In fact, John, age 14, is following in his father's footsteps, as he is in the beginning stages of flight instruction, with the goal of soloing the Stearman at age 16.

"The flight experience in a Stearman is a special thing, and Stearman pilots never take it for granted," said Rod. EAA

Jim Busha, EAA 119684, is an avid pilot and longtime contributor to EAA publications. He is the editor of *Warbirds* magazine and the owner of a 1943 Aeronca L-3.

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A WORLD BEYOND ROADS: The Maverick flying car

BY EARL C. DOWNS AND DANA HEIMOS

POWERED BY A 128-HP, 2.2-liter Subaru engine, it accelerates from zero to 60 mph in just 3.9 seconds. Its compact, industrial design mimics the demeanor of a dune buggy, providing precise maneuverability both off-road and on — and when we say "off-road," we mean *way* off.

Its steel tube frame is covered with a durable, weatherproof slip-on fabric, and the exposed wheel suspension leaves no doubt this machine is meant for rough riding. But the propeller mounted on the back and the airspeed indicator and altimeter installed in the dash add more to the wonder. Inside, three seats face a typical automobile steering wheel—and a peculiar switch. Flip it and a hydraulic actuator connects the steering wheel to a fly-by-wire system that controls a parachute that can be suspended above the vehicle.

"It" is the Maverick flying car.

The concept of a machine that flies and drives is not new, but the design and story of the Maverick are unique from other plane/car combinations. Conceived by Steve Saint, the Maverick's design and ease of operation are products of necessity, not commodity. That's because Steve, EAA 456152, the founder and president of I-TEC (Indigenous People's Technology and Education Center), plans to use the Maverick to give indigenous peoples in remote parts of the world access to ground and air transportation in a vehicle they can operate themselves with minimal training.

1. *The Maverick's cloth wing stows in a zipped up compartment on the top of the vehicle.* ***2.*** *The front end suspension and high ground clearance make the Maverick suitable for off-road driving.* ***3.*** *The Subaru engine that drives the vehicle on the ground and supplies power to the prop in flight is located at the rear of the vehicle.*

EARLY SOLUTIONS

I-TEC's current goal is to provide technology that is suitable to the needs of the Waodani Indians, who live in the Amazon rainforest in Ecuador, without dependency on the outside world. Steve grew up among the Waodani in the 1950s, the son of missionary parents. His father and four other missionaries were killed by the Indians when Steve was 5, yet his aunt and mother continued to work with the tribe. (See sidebar, "End of the Spear.")

Steve faced a daunting task when it came to helping nearly Stone Age people learn how to fly. His first attempt at solving this dilemma was to create a simplified airplane. Through I-TEC, a plane was designed, built, and transported to the Ecuadorian jungle for testing. "Fortunately, the prop failed and I crashed in the jungle," Steve said. "I say fortunately because the plane was not a good idea; it was too complex. I had just taken the technology that works for us and made it smaller."

What the Waodani need is a simple vehicle that can transport them to nearby medical facilities that are difficult to get to on foot because of the rugged terrain. "They needed a technology that was invented for them," said Steve. "They didn't have to go far or fast."

While searching for another solution, Steve spotted a powered parachute (PPC) in operation and tried it out. I-TEC obtained a Destiny PPC, modified it to carry a patient on a stretcher, and transported it to Ecuador. The first Waodani trained to fly the PPC was a man named Tementa, a son of one of the Waodani who attacked and killed Steve's father. It took only two weeks of training for Tementa to become proficient at flying the PPC.

Shortly after the PPC was delivered to the jungle, a little boy was bitten by a deadly snake. The child was in serious condition and needed to get to a medical facility across the river to receive a dose of anti-venom. The facility was not far away, but it would be a six-hour trip on foot because of the nearly impassible terrain. The Waodani made the decision to use the PPC, and Tementa flew the boy to the medical facility in about 15 minutes. The boy survived, but the doctors said he would have died if he had been left untreated for another 10 minutes.

The PPC had proved its worth. The Maverick became the next step in a dedicated quest to help people help themselves.

THE CAR

From the beginning of its development, the Maverick was intended to be a ground vehicle first and an aircraft second. "As the car, it can drive more than twice as fast as it can fly," Steve said. "This is truly a car that flies, not an airplane that drives."

Licensed as a kit-built car, the Maverick is road legal. I-TEC founder Steve Saint cruises around Oshkosh, Wisconsin, during EAA AirVenture 2010.

PHOTOGRAPHY COURTESY OF **I-TEC**, AND BY **BRADY LANE**

The mast system eliminates unfolding the parachute on the ground, as traditional PPCs do, avoiding the possibility of snagging or tearing the chute on rough terrain and reducing the area needed to unfurl the chute.

And drive it does. The Maverick team drove from I-TEC headquarters in Dunnellon, Florida, to EAA AirVenture Oshkosh 2010 without a problem—except when they stopped. Fuel stops take longer than normal because the Maverick draws a crowd, and the team was even stopped by a state trooper who just wanted to get a closer look.

The Maverick is licensed in Florida as a kit-built car. It can also be built in a three-wheel configuration if obtaining a state road license works better by calling it a motorcycle. It can hold up to three people—driver in front, two passengers in back—or the wide rear seat can be folded down to carry cargo. However, to comply with light-sport aircraft (LSA) regulations, it may only fly with two people.

The rear-mounted Subaru EJ22 engine delivers power to the rear wheels through an automatic continuously variable transmission, giving it sports car-like acceleration and a top speed in excess of 90 mph. The Maverick will likely never weigh more than 1,500 pounds. Combine 128 hp with this lightweight car and you get a real screamer.

Its high ground clearance makes it suitable for venturing off-road. Fuel consumption as a ground vehicle averages about 30 miles per gallon using regular auto fuel. In the air, it averages 5 gph, cruising at about 40 mph.

As a car, the front wheels are steered through a typical rack-and-pinion system. A simple flip of a switch kicks in a steering computer that electronically connects the car's steering wheel to the steering lines of the ram-air parachute wing, and Maverick becomes a flying car.

CONVERTING TO FLIGHT

Converting the Maverick from ground configuration to flying vehicle can be performed by one person and accomplished in about five minutes.

With most other PPCs the wing must be laid out on the ground behind the cart. Steve knew that a better wing-deployment solution was needed in rough, limited takeoff and landing terrain, so the Maverick uses a 22-foot telescoping mast to raise the 550-square-foot parachute above the car. The mast only takes a few minutes to assemble and the chute is fully collapsible into a rooftop compartment, keeping it relatively obscure in drive mode.

To keep the chute from draping down the mast, a yardarm (much like the old square rigger sailing ships) is unfolded and extended along the leading edge. As the mast is raised, the extended chute is pulled from its housing atop the car with all rigging and steering lines in place.

The engine that powers the Maverick on the ground also powers the rear-mounted, five-blade Powerfin prop in flight mode. This patented dual-drive system helps minimize weight and further simplifies maintenance and operation. Another design feature that simplifies operation is the integrated controls, using the steering wheel and gas pedal for both driving and flying.

THE POWERED PARACHUTE

While the Maverick's takeoff, landing, and cruise speeds are a modest 40 mph across the board, its real achievement is its ability to hop off the ground in about 300 feet and land in the same distance—the perfect attribute for a vehicle intended to be used in areas with small plots of level terrain.

Once in the air, the Maverick uses a method of control not found in perhaps any other powered parachute: a fly-by-wire system that allows the pilot to control direction with a simple turn of the steering wheel. A computer runs electric servos to control the lateral direction of flight. If needed, the fly-by-wire steering system can be overridden by foot controls. Altitude control is managed with power inputs, like all other PPCs.

Details are still being worked out for initiating the flare for landing. The prototype shown at AirVenture 2010 was flared by using the foot steering control override bars or by just adding a bit of power prior to touchdown. "We have just

A simple flip of a switch ... and Maverick becomes a flying car.

ILLUSTRATION BY **ANKERSON COMMUNICATIONS**

been driving it onto the ground," test pilot and I-TEC Vice President/COO Troy Townsend said. Tests are being conducted on a "flare switch" that will command the steering computer to soften the landing. They are also experimenting with a single Johnson Bar flare lever.

CERTIFICATION FOR THE MAVERICK AND ITS PILOTS

I-TEC expects the Maverick to be used in many countries, and its certification will vary depending on the country. On September 28, the FAA issued an airworthiness certificate for the vehicle as a special light-sport aircraft (S-LSA). This means I-TEC can market the Maverick as a factory-built, flyaway aircraft or as a kit-built experimental light-sport aircraft (E-LSA).

Because the Maverick is being certificated as an S-LSA or E-LSA, you need to be at least a sport pilot with a PPC endorsement. Existing pilots may add private pilot PPC privileges to their pilot certificate by taking an FAA checkride, or they can receive training and progress through logbook endorsements to exercise sport pilot PPC privileges.

The Maverick's straightforward approach has already proven successful in I-TEC's experience. "We can transition sport pilots in the Maverick in about 12 hours," said I-TEC engineer Jonathan Nelson. "We designed the Maverick with the idea that if you can drive a car, you can operate it."

During EAA AirVenture Oshkosh 2010, EAA multimedia journalist Brady Lane and Steve Saint decided to drive the Maverick into town for a fast-food hamburger. The food was fast, but the commotion in the parking lot after they stopped to eat their burger kept them there for more than an hour. To watch the video visit www.SportAviation.org

"End of the Spear"

Steve's desire to help indigenous peoples is deeply rooted in his personal life. In 1956, when Steve was just 5 years old, his father, Nate, an evangelical Christian missionary pilot, set out to make friendly contact with the Waodani Indians of the Ecuadorian rainforest. Since the Waodani were known as a hostile tribe, Nate and four other missionaries began by lowering gifts from a low-flying J-3 Cub. They eventually landed on a nearby beach and tragically, after three days of seemingly friendly contact, the Waodani speared all five men to death.

Several years later, Steve, his sister, mother, and aunt successfully made peaceful contact with the tribe and ended up living with the very Waodani who killed Nate. Steve was even taken into the tribe as an adopted son. The Saint family eventually returned to the United States, where Steve became a successful businessman.

In 1994, Steve's aunt passed away, and he chose to return to his childhood jungle for her funeral. During this trip he was instilled with the spirit to help the Waodani Indians join the modern world through self-sufficiency.

"The Waodani wanted help to become more independent," Steve said, and he knew self-sufficiency meant taking care of their own medical needs, which in turn meant giving them the tools to fly.

The full story of the first contact with the Waodani Indians is told in the movie *End of the Spear* and in the film documentary *Beyond the Gates of Splendor.*

Left to right: Steve Saint, Mincaye, and Tementa.

LOOKING AHEAD AND COMMERCIAL USE

Steve and his team at I-TEC are looking to introduce the Maverick to the general public before selling units to missionary pilots and foreign governments. "We need to first build the Maverick in large enough quantities in a commercial market so we can bring the costs down for the people on the frontier," Steve said. As part of that process, I-TEC is planning to carefully select a cross section of users as its first 10 customers and work with them to develop and finalize the Maverick's design.

As a commercial vehicle, the unique characteristics of the Maverick render it ideal for ranchers and game wardens to drive and fly their territory with one vehicle. It has law enforcement applications and could make the difference between life and death in a natural disaster. It also appeals to the pilot who is simply intrigued by the idea of cruising around in a dune buggy-like vehicle, hopping off the ground to get a view from above and then quickly landing—all with minimal effort.

If all goes to plan—and by the looks of the progress Steve and his team have made thus far, it should—the Maverick may prove successful in both a commercial market and as a tool in helping indigenous peoples in remote regions of the world become self-sufficient. EAA

Earl Downs has been flying since the age of 14. He is an instrument-rated certificated flight instructor, holds an airline transport pilot certificate, and is an airframe and powerplant mechanic. He owns Golden Age Aviation in Cushing, Oklahoma, flies a Luscombe, and is building a Zenair 601 XL. **Dana Heimos** is an Editorial Assistant for EAA Publications.

PHOTOGRAPHY COURTESY OF **STEVE SAINT**, AND BY **BRADY LANE**

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- NHTSA 5-Star Crash Test Rating
- Class-Exclusive Safety Features:
  - BLIS (Blind Spot Information System) with CrossTraffic Alert
  - Adaptive Cruise Control and Collision Warning with Brake Support
  - MyKey™
- Taurus SHO 3.5L EcoBoost™ Engine is the First North American Production Twin Turbocharged Direct Injection V6

Ford LINCOLN MERCURY EAA

partner recognition
VEHICLE PURCHASE PLAN

BY KELLY NELSON

HELICOPTER FLYING

AN INTRODUCTION TO THE WORLD OF ROTORCRAFT

I OWE AN APOLOGY to the rotorcraft community.

I was one of those fixed-wing pilots who perpetuated the notion that helicopters drop from the sky at the slightest sign of engine failure. I've said the words, "They only fly because they're so ugly the earth repels them," and mostly believed it, too.

In my 105 hours of time in 172s and J-3 Cubs, I thought I knew which "side" I was on, and my fierce loyalty required that I scoff at my whirlybird counterparts. *Crazies*, I thought.

Today, I am a changed woman. ▸

Robinson R-44

PHOTOGRAPHY BY **BRADY LANE**

WHAT IS IT ABOUT HELICOPTERS?

I watched one take off after AirVenture and was captivated by the smoothness of it. And I have to admit, I've always loved the sound of rotor blades *chop*, *chop*, *chop*ping through the air.

A dual tachometer indicates the engine rpm and main rotor rpm. In normal flight the needles join together and act as one.

The main rotor is mounted on a vertical mast above the helicopter. The pilot controls the altitude, speed, and direction of the helicopter by using the flight controls to vary the pitch of the main rotor blades.

The tail rotor (or antitorque rotor) is controlled by the antitorque pedals and counters the torque created by the main rotor. This prevents the helicopter's fuselage from spinning opposite the direction of main rotor rotation.

PHOTOGRAPHY BY **BRADY LANE**

My official introduction to helicopters came via my tailwheel instructor, Kandace, a certificated flight instructor in fixed-wing aircraft who also enjoys logging helicopter time and is currently working on her helicopter instrument rating. A few days after the air show, she invited me for a hop in a Robinson R22. She figured I could be converted if I saw just how cool it was to fly inches above cornfields and experience the world from a hover.

She was right. I liked what I saw.

The thing about helicopters is that you can go places you generally can't in a fixed-wing aircraft, and do it at slower speeds than you can usually sustain in an airplane. When you can safely land just about anywhere, the separation rules are a little different, too. You can get closer, go slower, and stand still in the sky. When there's a problem, you can land anywhere your rotor blades and fuselage will fit—no need for runways or long, smooth fields. The visibility is breathtaking and unparalleled.

I went home from my flight with Kandace and started doing some Internet research since I didn't know much about helicopters at all. How many seats do they have? How much do they cost to rent? Where is the nearest place for me to take a lesson? What would it take to get a rating?

GYROPLANES VS. HELICOPTERS

When you first start researching rotorcraft—helicopters and gyroplanes—things can be a bit deceiving. Gyroplanes *are* rotorcraft, covered in the FAA's *Rotorcraft Flying Handbook*, and share a practical test standards booklet with helicopters, but they're a different animal.

In the most basic terms, a helicopter has a powered rotor providing lift and propulsion. A gyroplane has an unpowered rotor that only ensures lift. A traditional propeller provides the propulsion. As such, a gyroplane's rotor is in a constant autorotation, whereas a helicopter only enters autorotation when the engine quits.

The list of differences (and some similarities) is extensive and worth looking into if you're considering what to build or have specific desirable flight characteristics in mind for the type of aircraft you'd like to fly.

More information about gyroplanes and helicopters is available from the Popular Rotorcraft Association; visit them at *www.PRA.org*.

The answers to many of these questions left me with more questions as my mind started warming to the possibility of trying it myself. I called my nearest helicopter flight school (123 miles away) and booked an introductory flight.

PRIMARY VS. TRANSITION

One of the things that intrigued me right away is that, as a private fixed-wing pilot, the helicopter certificate is an add-on rating. This means no written test, as long as you're going for the same grade of certificate, i.e., private, commercial, etc. Once you've soloed, you can exercise all the privileges of a private certificate except carriage of passengers. A note to sport pilots: The definition of light-sport aircraft specifically excludes helicopters, so you would need to obtain a medical and pass another written test to earn a helicopter certificate.

While there are some benefits to transitioning from fixed-wing aircraft, Bill Coolbaugh, owner of Lakeshore Helicopter in Kenosha, Wisconsin, told me it's only a slight advantage over a complete newbie. (Yes, you can *start* with helicopters!) A helicopter is such a different beast that everyone is starting from scratch on the controls. It takes an average of five to six hours to learn how to hover. A private pilot will take an average of 40 to 45 hours to reach the checkride; a new student will take about 50 to 55.

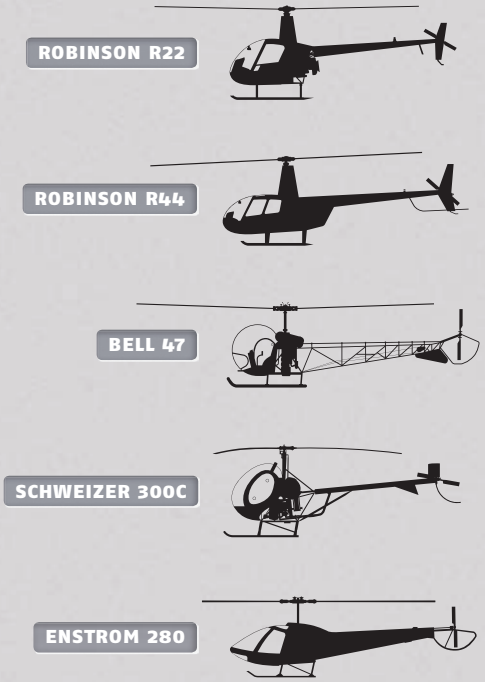
SO WHAT'S ENTRY LEVEL?

My introductory flight was in a four-seat Robinson R44, but Lakeshore also operates a smaller two-seat R22. Talking in terms I understood, Bill compared the R22 to a Cessna 150 and the R44 as more like a 172. The R22 is the most common trainer on the market today and most flight schools charge about $250 an hour for instruction, which varies depending on location. That said, I also found flight schools operating the Schweizer 300C, Enstrom 280, and Bell 47, which all generally cost more because of higher operating costs.

Robinson helicopters have special training and experience requirements before a student or certificated helicopter pilot is able to take the controls. Special Federal Aviation Regulation (SFAR) 73 of Part 61 requires awareness training, including a ground school session conducted by a certificated flight instructor (CFI) who has at least 200 hours in helicopters, 50 of which must be in Robinsons. The ground instruction covers energy management, mast

COMMON HELICOPTERS

TYPE-CERTIFICATED MODELS



HOMEBUILT MODELS

ILLUSTRATIONS BY **PIERRE KOTZE**

bumping, low rotor rpm, low-*g* hazards, and rotor rpm decay. It's the kind of stuff that might scare a newbie ("You mean it *is* possible for the rotor blades to chop off the tail?!"), but it's essential to understand before taking the controls yourself, and it's certainly applicable to more makes and models than just the Robinson line (although it is more uncommon in other types).

The special regulation took effect in 1995 to address safety concerns about the operation of Robinson helicopters by inexperienced pilots, and it's credited with reducing accidents and improving the safety records of helicopters. Lakeshore's Jeff Klatt conducted the awareness training for me, and it took about an hour to cover all five topics, most of which were closely related to one another. The biggest takeaways for me: the names of the different controls (and how they work), and what mast bumping is (when the main rotor "bumps" the main rotor mast) and how to avoid it.

The SFAR also stipulates that a person not holding a rotorcraft category and helicopter class rating have a minimum of 20 hours of dual before operating a Robinson helicopter in solo flight. Pilots already holding a helicopter certificate need to have either 200 helicopter hours (50 of which in the Robinson model they wish to solo) or 10 hours of dual in the Robinson they wish to solo. There is no minimum required dual before solo in any other helicopter make/model, and there is only a five-hour pilot-in-command in make/model requirement to instruct in other makes/models. Lastly, the endorsements for all of these requirements are valid for 12 months and must be renewed with a flight review. The exception is the solo endorsement for a primary helicopter student, which is only valid for 90 days.

With a fresh endorsement in my logbook, I was ready to head out to the flightline and try my hand at helicopter flying.

FIRST FLIGHT

Before getting in, Bill reviewed the R44's controls with me and explained how to exit the helicopter with the

MINIMUM FLIGHT EXPERIENCE (PRIVATE HELICOPTER)

40 hours total flight time, including:

- 20 hours dual instruction including:
  - 3 hours of cross-country training in helicopters
  - 3 hours of night instruction in helicopters
  - 3 hours in helicopters in preparation for the practical test
- 10 hours solo practice in helicopters including:
  - 3 hours of cross-country
  - 3 takeoffs and landings at a control-towered airport

If you do not already hold a private pilot certificate (fixed-wing), you will need to pass a written knowledge test and obtain at least a third-class medical in addition to the oral and practical tests.

HELICOPTER LINGO

ANTITORQUE PEDALS—Foot pedals used by the pilot to rotate the helicopter about its vertical axis (yaw) by controlling the pitch of the tail rotor of a single main-rotor helicopter. Adjusting the thrust of the antitorque rotor offsets changes in main rotor torque that come with changes in power.

AUTOROTATION—Descent of a helicopter without engine power applied to its rotor. If the engine fails, aerodynamic forces cause the main rotor to spin or "freewheel" without power. A landing made in a helicopter without the use of engine power is called an autorotation.

COLLECTIVE PITCH CONTROL—The flight control of a helicopter that changes the pitch of all the rotor blades at the same time. Movement of the collective control increases or decreases the lift produced by the entire rotor disk, allowing the helicopter to rise or descend. Changes in collective pitch require adjustment of the antitorque pedals to balance the change in main rotor torque.

CYCLIC PITCH CONTROL—The control in a helicopter that allows the pilot to change the pitch of the rotor blades individually, at a specific point in their rotation. This changes the direction in which the lift produced by the rotor disk acts, which in turn controls the direction of the helicopter. Tilting the plane of the rotor in effect rolls the aircraft and controls the direction the helicopter moves.

ROTORCRAFT—A heavier-than-air aircraft whose aerodynamic lift is produced by a set of rotating airfoils called rotors. Helicopters and gyroplanes are types of rotorcraft.

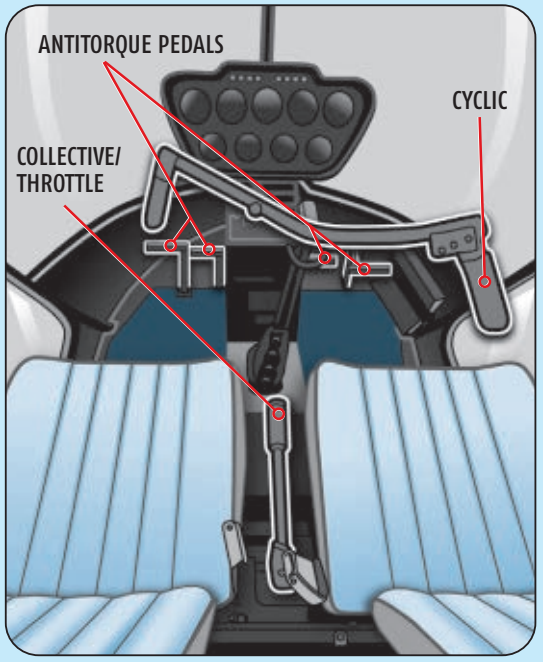


ILLUSTRATION BY **ALAN LEPKOWSKI**

rotors turning should I need to do so. At first glance the controls look similar to a fixed-wing aircraft—pedals, a stick, and a lever that looks like a Johnson Bar in Cherokees to lower the flaps. But helicopters don't have a rudder, or flaps, or ailerons, so what do the controls do?

Your feet control the antitorque pedals, which control the tail rotor, allowing the pilot to rotate around the vertical axis (yaw). The tail rotor counteracts the torque of the main rotor, keeping the helicopter's fuselage from spinning in the opposite direction of the main rotor's rotation.

What looks like a stick is called a cyclic. This allows the pilot to change the pitch of the rotor blades individually as they cycle through their rotation. This tilts the plane of rotation, which controls the direction and speed the helicopter moves. What looks like a Johnson Bar is the collective. It includes the throttle and is the power control. It changes the pitch of all the rotors at the same time (collectively), increasing or decreasing the lift.

Bill had done a preflight while I was in awareness training, so we were all set to go. Once we were all in and settled (EAA multimedia journalist Brady Lane was in the back seat taking photos), Bill explained start-up procedures as he went through the checklist and started the engine. He pointed out the different gauges to watch, just like on an airplane: oil temperature, oil pressure, and rpm. When the blades got up to speed (they're constantly rotating at about 400 rpm in flight), we were airborne and headed east, away from the airport and over the city of Kenosha.

While on a direct course for Lake Michigan, Bill turned the controls over to me. It was instantly apparent how delicate control inputs needed to be. The cyclic required little more than a gentle nudge with my fingertips to maintain a straight and level flight path, and turns didn't require much more than that. By the time I was starting to feel comfortable managing the cyclic and collective in harmony, we had reached the lake, and Bill took the controls to nimbly navigate us up the lakeshore and demonstrate a bit more of the R44's capabilities. The view was spectacular, and the practical advantages of a helicopter for certain jobs like search and rescue were clear.

After I got to play with the controls some more, we headed back to Kenosha Regional Airport for a simulated engine-out and some hover practice.

This was probably the area of helicopter flying that gave me the most butterflies in my stomach. Remember, going into this I was still fairly sure that helicopters plummeted to the ground when the engine stopped, and the little laughs helicopter pilots gave me when I asked about glide ratios didn't ease my mind any. But, Bill assured me, the FAA wouldn't certify anything that would just fall from the sky, so I summoned all of my faith in government agencies and hoped for the best as Bill set up the maneuver over Runway 7L. He talked me through the maneuver as I watched the engine rpm drop while the rotor rpm held (a good thing in this case). Within seconds we settled on the runway with a gentle thunk.

No harm done, no flames or flying parts—pretty darn docile all around. There goes that myth.

Next, we were off to a grassy part of the airport for hover practice. I knew this skill was a hard one to master. I had failed time and again at the "Chopper Challenge" game in the KidVenture area of EAA's museum, and if that was any representation of hovering a real helicopter, we were in for some excitement.

Bill set us in a hover about 3 feet above the ground and offered me the antitorque pedals to get a feel for that control and do some 360-degree turns—first to the left, then to the right. I quickly learned the pedals were also sensitive, requiring little more than a wiggle of my toes to turn the helicopter under the rotor. Next he offered me the collective, putting me in charge of the helicopter's 3-foot hover height—certainly more of a challenge.

Then he handed over the cyclic and the wild ride began! I held altitude fairly well, and for the most part was able to keep the nose pointed at the FBO in front of us, but pilot-induced oscillations were plenty. Bill would chuckle as I tried to regain a stable state, and then he would reset us in a hover over the center of the patch of grass every minute or so. I certainly understand how it usually takes people five or six hours to learn to hover. After about five minutes of me providing comic relief to the folks watching from a nearby hangar, Bill took over the controls and brought us back to the ramp for a landing. He walked through the shutdown checklist, and as the rotors slowed to a stop, my first helicopter lesson came to an end.

I learned a lot that day, and gained much appreciation for another way to fly. Adding a helicopter rating to my private pilot certificate has officially earned its place on my bucket list, and as soon as I can justify the time and money to make it happen, I will.

For now, well, if I'm not at my desk, you might check the KidVenture area in the museum, over by the hovering game. I've got some skills to hone. EAA

HOMEBUILT OPTIONS

While there are a number of type-certificated helicopter designs, it also is possible to build and learn to fly in your own homebuilt helicopter. You might find an instructor willing to teach you in your homebuilt once it's finished and the flight testing is completed. However, most pilots flying homebuilt helicopters prefer instruction in a type-certificated model at a flight school before transitioning to their homebuilt.

Popular homebuilt helicopter kits include:

- RotorWay A600 Talon—RotorWay International
- Hummingbird 260L—Vertical Aviation Technologies Inc.
- Safari—Safari Helicopters
- Mosquito—Mosquito Aviation Ltd.
- SkyBlazer—Phoenix Rotorcraft LLC

Kelly Nelson, EAA 787745, is associate editor for EAA publications. A private pilot, she recently earned her tailwheel endorsement and hopes to add a helicopter rating to her certificate one day. For a video of her introductory helicopter lesson and links to more information on training, visit *www.SportAviation.org*.


46% OWN AVIATOR SUNGLASSES
13% OWN A WHITE SILK SCARF
51% OWN A LEATHER FLIGHT JACKET
THE AVERAGE TIME TO SOLO IS 19.8 HOURS
6.2% OF U.S. PILOTS ARE WOMEN.
*FAA data

2010 SURVEY OF THE AVERAGE AVIATOR

WHAT'S THE MAKEUP OF THE AVERAGE PILOT?

We recently conducted an extensive survey to learn more about our piloting knowledge, flying habits, and what we dream about—and we tried to have a little fun along the way. The findings are based upon 1,267 respondents to a Web-based survey of randomly selected EAA members holding a pilot certificate. Check out the responses and see how you compare to the "average aviator!"

BY STEVE SCHAPIRO

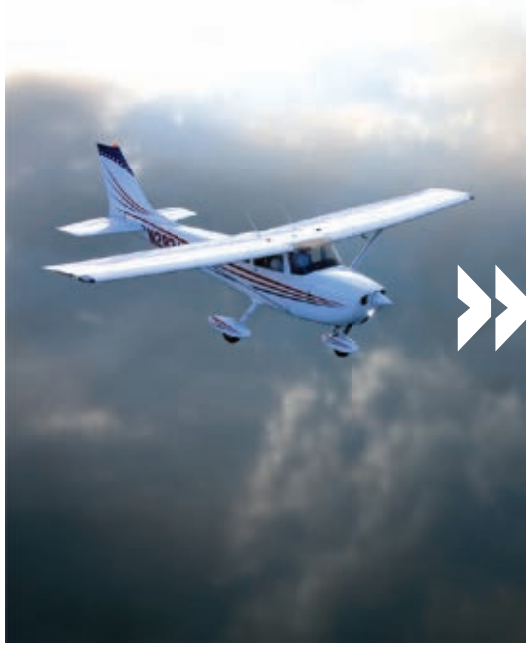
PHOTOGRAPHY BY **STEVE CUKIERSKI**

WHAT WE FLY AND WHEN

2010 SURVEY OF THE AVERAGE AVIATOR

WE FLY AN AVERAGE OF **5.8** TIMES EACH MONTH

79.2 AVERAGE HOURS EACH YEAR



38.3 **PERCENT** OF OUR RECREATIONAL TIME IS DEDICATED TO AVIATION.

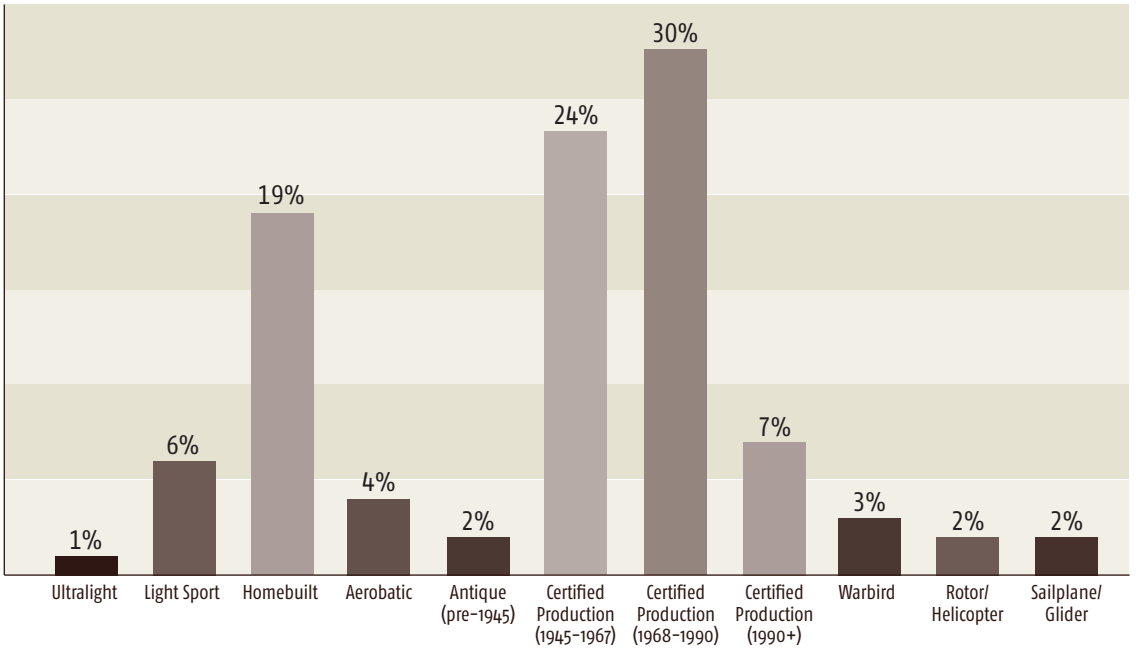
The airplane we fly most has an average of 3.2 seats, and we fly on average with 1 passenger.

25% OF US PREFER TO FLY ALONE

The average cruise speed of the personal aircraft we fly most is:

131.7 MPH

WHAT TYPE OF AIRCRAFT DO YOU FLY MOST FOR FUN?



PHOTOGRAPHY BY **JIM KOEPNICK**

87%

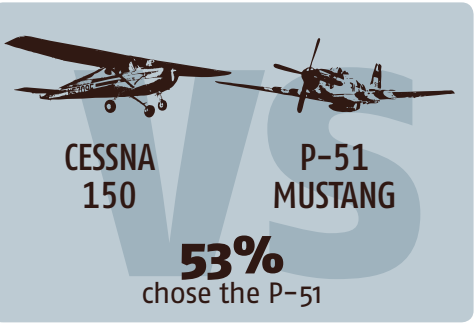
OF US REMEMBER OUR FIRST SOLO MORE VIVIDLY THAN OUR FIRST KISS.

"Solo: October 2, 1992, N1765Q, a C-150L at Waukesha County. I can't even remember the girl's name!"

$10,569

The amount the average pilot spends on aviation each year.

Would you rather fly a Cessna 150 with your best friend or a P-51 with your worst enemy?



53% chose the P-51

"I can always pull their mic out of the intercom."

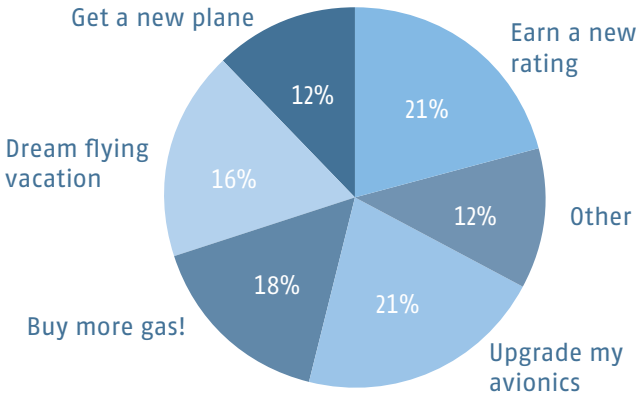
HOW OLD WERE YOU ...

When you got the desire to fly? **13**

When you soloed? **28**

The oldest person to solo in our survey was: **75**

IF YOU HAD AN EXTRA $10,000 TO SPLURGE ON AVIATION, HOW WOULD YOU SPEND IT?

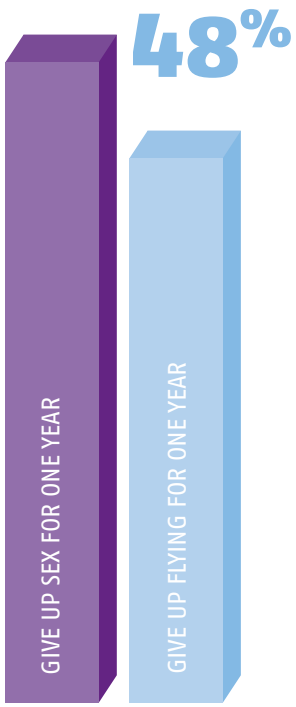


What song captures the spirit of flying? There were 226 different suggestions.

HERE ARE THE TOP FIVE

1. **"Air Force Anthem"** – *Off We Go Into the Wild Blue Yonder*
2. **"Danger Zone"** – *Kenny Loggins (from the movie Top Gun)*
3. **"Learning to Fly"** – *Pink Floyd*
4. **"Up and Away in My Beautiful Balloon"** – *5th Dimension*
5. **"Wind Beneath My Wings"** – *Bette Midler*

IF FORCED TO CHOOSE...



NOSE TO NOSE

Given a choice between one or the other you picked:

63%	37%	Cessna 172 / Piper Cherokee
52%	48%	Tailwheel / Tricycle
53%	47%	Sound of a Radial / Sound of a Merlin
53%	47%	Steam Gauge / Glass Panel
51%	49%	Wheel Landing / Three-Pointer
66%	34%	Closed Cockpit / Open Cockpit
60%	40%	Side by side / Tandem
70%	30%	Metal / Fabric
66%	34%	Lindy / Amelia
72%	28%	Sideslip / Crab
77%	23%	Stick / Yoke
79%	21%	Burt Rutan / NASA
59%	41%	Grass / Pavement
68%	32%	Blue Angels / Thunderbirds
54%	46%	Patty Wagstaff / Sean Tucker

5X

WHAT IS YOUR DREAM AIRPLANE TO FLY? 372 PLANES WERE LISTED. THE P-51 GOT FIVE TIMES MORE VOTES THAN ANY OTHER AIRCRAFT.

HERE ARE THE TOP 5

1. P-51
2. F4U Corsair
3. P-38
4. DC-3/C-47
5. Spitfire

92% OF US DRIVE BY A FIELD AND THINK ABOUT LANDING IN IT.

You're at the controls of Flight 1549 *("Miracle on the Hudson").*
—How do you think you would do?

7% *I'd have gotten it closer to the dock*

13% *As good as Sully and Skiles*

57% *Not bad, but maybe some wet passengers*

23% *No survivors*

84% of us have been on an airliner and fantasized that the pilot takes ill and we land the plane safely.

"All the time. Serve him the fish."

Fly in space?
8% said yes

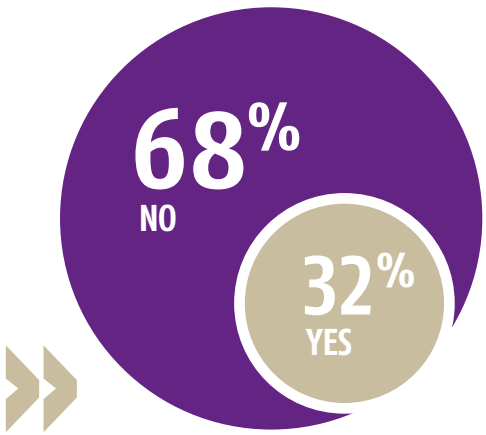
Fly an electric airplane?
48% said yes

See a person on the moon again?
46% said yes

See a manned mission to Mars?
33% said yes

See another supersonic airliner?
51% said yes

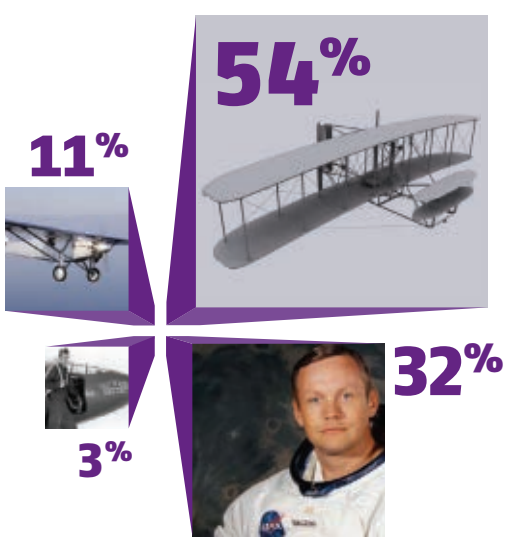
See a pilotless airliner?
25% said yes



If you had the time, money, and equipment, do you think you could make the national aerobatic team?

OF THESE FOUR EVENTS, WHICH IS THE GREATEST ACHIEVEMENT?

Wilbur and Orville —*the first flight*
Charles Lindbergh —*first solo flight across the Atlantic*
Chuck Yeager —*breaking the sound barrier*
Neil Armstrong —*the first moon landing*



WHAT GRADE WOULD YOU GIVE THE FAA?

40% of you have not used an E6-B since your checkride.

58% have taken off or landed downwind unintentionally.

37% have used a relief tube in flight.

32% have been asked to call the tower after a flight.

28% have never spun an airplane.

63% said weather close to your minimums makes you most nervous.

Paul and Audrey Poberezny

Who is your dream co-pilot? There were 190 suggestions. 23.5% said a spouse or significant other. None of the others got out of single digits.

HERE ARE THE TOP 5

1. Spouse/Significant other
2. Chuck Yeager
3. Bob Hoover
4. Patty Wagstaff
5. Dad/Father

HOW COMFORTABLE ARE YOU FLYING OVER WATER?	
Nothing wider than a river	2%
I'd cross a small lake	36%
I'd cross one of the Great Lakes	45%
Lindy's got nothing on me—Bring on the ocean!	17%

HAVE YOU HAD THE BEST FLIGHT OF YOUR LIFE OR IS IT STILL TO COME?

77%

"Every flight is the best flight of my life."

J. MAC MCCLELLAN
BETTER PILOT / LEFT SEAT

It's All About the Flying

What will I contribute?

ALTHOUGH I SPENT THE last 34 years on the editorial staffs of *Flying* and *Business & Commercial Aviation (B/CA)* magazines, I have also spent those decades admiring EAA. I first came to Oshkosh in 1976 and haven't missed a year since.

While it is impossible for anything or anybody to be all things to all people, EAA comes close to that elusive goal for pilots and aviation enthusiasts. If you don't believe me, you have never been to AirVenture Oshkosh. For one show to have displayed the world's largest airliner—the Airbus 380—and one of the smallest homebuilts—the Sky Baby—is astonishing and proves the unmatched breadth of aviation interest of EAA members.

What EAA does best is celebrate and preserve all types of aircraft and the people who design, build, and restore them. And that is vital because aviation, more than any other activity, is evolutionary. Airplane design evolved and improved as expensive and often tragic events uncovered flaws in previous aircraft. The best of the proven characteristics of past aircraft designs are the basis for improvement going forward.

PHOTOGRAPHY BY **CRAIG VANDERKOLK**

THE BEST SOFT FIELDS ARE SCOTTS FIELDS.

Every pilot dreams of having a grass strip of their own. The Scotts Company has the variety of advanced grass seed you need to construct a superior-performing grass strip, no matter your location or conditions. Plus, Scotts has a team of experts who will help you select the right seed and maintain it properly.

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J. MAC MCCLELLAN

I love learning about, studying, and understanding all aspects of aircraft design, aerodynamics, and construction, but I also am passionate about flying airplanes. And that's why I am so excited to contribute to the EAA team. The organization has been spectacularly successful and comprehensive in supplying information about the aircraft themselves, but it has not provided the same level of information on flying, owning, and maintaining airplanes.

It's not what kind of airplane you fly, or for what purpose, that interests me, but the activity itself. Understanding weather is vital to all pilots. So is a solid foundation in the Federal Aviation Regulations. Pilots want to know what's new in terms of airplanes, engines, avionics, and accessories, and so do I. It's all part of being an active and competent pilot.

I have experienced all of the delights and anguishing surprises of airplane ownership.

Over the decades at *Flying* and *B/CA* magazines I logged more than 10,000 hours traveling across the country. Most of the hours were spent in a series of Mooneys, a V35B Bonanza, and for the last 10 years a Baron 58. I have experienced all of the delights and anguishing surprises of airplane ownership. And I have been lucky enough to be able to try many of the new avionics and accessories in my own airplane and then write about how they work.

It is these years of experience gained from immersion in the broad span of general aviation that I bring to EAA. I know the people at the companies who make general aviation work and will keep you up to date on new developments. Through years of study of the accident records, with the guidance of Richard Collins, I know where the most significant risks in flying are. Scaring myself a few times, and surviving, helped add to that awareness.

When people ask me what I do, I usually say that my job is to fly airplanes and then write and talk about them. And I think that sums up my role now at EAA. I'll keep flying all types of airplanes and will write about the experience in *EAA Sport Aviation* and on EAA's websites, make videos on topics that we think will interest EAA members, and talk about airplanes and flying to anyone who wants to listen.

EAA is not in any way turning away from its roots, but is instead expanding yet again to provide members with more, not less, information. Actually, my life in aviation is pretty typical for an EAA member. My father was trained as an aeronautical engineer and had his airframe and powerplant (A&P) mechanic certificate while still in high school—it was called an A&E back then, with E for engine instead of P for powerplant. Airplane talk, building and flying model airplanes, and studying aviation history were a big part of growing up.

I learned to fly when I was young and bought a Cessna 140 that was built in 1946, three years before I was born. I was lucky enough to find a career in aviation through writing, but my airplane ownership path was pretty typical, with a variety of piston singles and then the Baron as the years went by. Although I never built an airplane or restored one, my interest in all types of airplanes never waned.

EAA is one of the bright spots in what has been a dismal period for all of aviation. Membership is growing, enthusiasm for AirVenture is stronger than ever, and the association's ability to influence government in areas that interest us is demonstrated every year by the top-level officials who spend time at Oshkosh. I'm excited to contribute to an organization that is on the move.

USED PISTON PRICES STABILIZE

Fletcher Aldredge, editor of the *Vref* used aircraft value guide, reported in his third quarter newsletter that prices of used piston singles and twins appeared to be stable, and down a comparatively small amount following the market crash of 2008. In fact, he found that the value of an index of used piston singles was actually up a percentage point or more in the most recent quarter.

But it's a totally different story for turboprops, where some popular models are off 30, 40, and even more than 50 percent in value from their pre-recession highs. And the trend in used turbine airplane prices is still sinking, although at a much slower pace.

PHOTOGRAPHY BY **RUSSELL MUNSON**

What could explain this divergence in demand, and thus value, for used piston versus used turbine airplanes? In a perverse way, I believe it is the technological advances in turbines compared to the maturity of piston airplanes that is making the difference.

Piston airplanes have not seen gains in performance, efficiency, or reduced maintenance costs because of new technology. It's not for lack of trying that piston advances have slowed, it's just that we have known so much about the aerodynamics and drag of flying at 100 to 200 knots for so long there are few, if any, major breakthroughs ahead. Improvements come in increments of a couple of percent, or in making different design trade-offs. I think many of us can agree that the P-51 Mustang designed 70 years ago was near the peak of piston airplane performance.

What new technology that is available for piston airplanes is mostly portable, and that helps support used piston prices because existing airplanes can benefit without being replaced. For example, my Baron has the same engines as a newly manufactured one even though my airplane left the factory with a less powerful and slightly less efficient version of the Continental. When it came time for engine replacement, I upgraded for only a small incremental cost. There have been measurable improvements in propeller technology over the past several years, and new design propellers are approved for installation in many existing piston airplanes. You don't have to buy a new airplane to get the advantage of greater efficiency and smoothness from a new prop.

PHOTOGRAPHY BY STEVE SCHAPIRO

The same is true for advanced avionics where Aspen, Garmin, Avidyne, and others make flat glass primary flight displays that are certified for nearly every piston airplane and are cost-effective compared to the total value of the airplane. The fully integrated systems that are common in new production pistons have some advantages over most retrofit installations, particularly in how the autopilot functions are automated, but still a huge percentage of any avionics advance is available to install in older piston airplanes.

Some types of piston airplane technology cannot be retrofitted, such as composite airframe construction. The ballistic recovery system parachutes are also a costly and somewhat complex retrofit. And, of course, many find more recently designed piston singles to be more sleek and modern looking than those that trace their roots back decades.

While some may find it unsatisfying that there have been only incremental gains in piston airplane performance and capability, for airplane owners, or those shopping for a used piston, this is nothing but good news. Because an airplane can fly on almost forever with proper maintenance, the only absolute threat to existing airplanes is large improvement in new models that make the older airplanes economically obsolete. That hasn't happened in piston airplanes, and in my opinion, it can't. So the existing fleet will continue to hold its value, which then supports the sale of new airplanes because they depreciate more slowly, and then level off at a pretty high value support level.

When we all know that the value of our piston airplanes is stable, it encourages us to invest in new-capability avionics, or even engines. And it ensures that there is a market for the airplane when it's time to sell. Sometimes slow progress is a good thing, and that is evident when you look at used piston values. EAA

J. Mac McClellan, EAA 747337, has been a pilot for more than 40 years and holds an airline transport pilot (ATP) certificate.

ROBERT N. ROSSIER
BETTER PILOT / STICK & RUDDER

Flight Over Water

Looking beyond the regulations

ONE OF THE EASIEST mistakes for a pilot to make is confusing what's legal with what's safe, smart, or otherwise a good idea. Being professional in our approach to flying means we apply our knowledge, experience, and judgment to a situation to ensure a safe outcome. While regulations serve as a guide, they really shouldn't be thought of as a "target."

Flight over water is just such a case. FAR 91.205 (b) (12) tells us, "If the aircraft is operated for hire over water and beyond power-off gliding distance from shore, approved flotation gear [must be] readily available to each occupant and, unless the aircraft is operating under part 121 of this subchapter, at least one pyrotechnic signaling device." If we're not carrying a passenger for compensation or hire, then we don't have to worry about carrying flotation devices unless we're flying over water for more than 30 minutes, or farther than 50 miles from shore. Once crossing these thresholds, we must meet the requirements of FAR 91.509, Survival Equipment for Overwater Operations. This regulation requires not only approved flotation equipment when venturing more than 50 miles from shore, but also a life raft and other equipment when more than 30 minutes or 100 miles from shore.

While it may be perfectly legal to fly beyond gliding distance from shore without a flotation device for our passengers, to do so wouldn't be considered reasonable, responsible, or professional. After all, neither the airplane nor the water knows whether we're being compensated or hired, and we're just as likely to end up ditching with a friend or family member as we are with a paying customer.

PHOTOGRAPHY BY **BONNIE KRATZ**

CHILLING HAZARDS

At this time of year especially, we should pay attention to the consequences of a good flight gone wrong. Should we end up in the water in the wintertime anywhere but in a tropical region, our flying career could be cut tragically short. As shown in Table 1 on page 60, time is limited when we're floating around in cold water. After a mere 15 minutes in near-freezing water, we can't help ourselves, let alone anyone else. If we find ourselves floating rather than flying, it does little good to be able to say, "Well, I was following the regulations." Being legal isn't the same as being safe or smart, and perhaps we should err on the side of conservatism when it comes to survival equipment and overwater flights.

A few years back on a warm July day, a charter pilot in a Piper Cherokee Six (PA-32-300) experienced an engine failure while carrying a passenger from Block Island, Rhode Island, to Groton, Connecticut. Unfortunately, the pilot was not within gliding distance of shore, and his best option was to ditch in open water near a barge. The water was warm and calm, and the pilot made a "good" water landing. He and his passenger exited the aircraft without incident, but having no flotation devices aboard, they used 5-gallon buckets to remain afloat and made it to the barge, where they waited for help. The aircraft sank within two minutes.

All too often, such an emergency doesn't have such a happy ending. Sometimes the challenge of extricating ourselves and assisting our passengers from the wreckage before it sinks is overwhelming.

THE GREAT ESCAPE

Safe egress from an aircraft in the water can be extremely challenging, especially if the aircraft flips over or injuries occur. Without emergency egress training, mistakes are likely in an attempt to escape. With water rushing in and the aircraft in an unusual attitude, an individual who unbuckles his harness and attempts to exit can quickly become disoriented, with fatal consequences.

ROBERT N. ROSSIER

TABLE 1: SURVIVABILITY IN WATER

Water Temp (°F)	Time to Exhaustion or Unconsciousness	Survival Time
32°	Less than 15 minutes	45 minutes
32-40°	15-30 minutes	30-90 minutes
40-50°	30-60 minutes	1-3 hours
50-60°	1-2 hours	1-6 hours
60-70°	2-7 hours	2-40 hours
70-80°	3-12 hours	3 hours to indefinite
Over 80°	indefinite	indefinite

SOURCE: University of Minnesota Sea Grant program.

As part of emergency egress training, pilots should learn and practice the techniques that make the difference between safe egress and the end of the story. Such courses teach proper seat belt positioning and preparation that make it less likely that we will be injured in a ditching, and more likely that we will find and operate the release. Physical referencing techniques that help us maintain orientation as we attempt to egress are critical to survival. Perhaps the most important benefit of the training is the psychological edge of having "been there and done that."

The challenges of ditching and egress highlight the prudence of avoiding the situation, especially when water temperatures are low.

GLIDING TO SAFETY

One way to hedge our bets on an overwater flight is to maintain an altitude from which we can glide to shore. For a typical light aircraft, we'll need at least 1,000 feet of altitude for each mile we venture from shore. The pilot's operating handbook can usually give us some guidance, but a number of variables can increase the altitude requirements.

When planning an overwater route, consider if there are reasonable landing areas at the nearest shore. Consider the effects of aircraft weight, density altitude, and winds aloft on the glide distance. If a problem develops, immediately head for shore and configure for the best glide at the current weight.

In many cases, a slight change in our route can improve safety dramatically. Rather than a straight line over the water, we can often opt for a dogleg route that might cost us an extra few minutes, but avoids the prospects of swimming if the situation runs amok.

BACKYARD DANGERS

It's easy to overlook the water hazards often found nearby on the approach or departure. Even a pond, river, or canal can be difficult to avoid when an emergency arises at low altitude. Here again, consider minor adjustments to routine procedures that might mitigate the risks. On an overwater arrival, fly higher than normal to maintain gliding distance to the runway, or adjust the pattern entry to maintain a safe position. On a departure over water, consider an early turnout, climbing at best angle (V_x) or best rate (V_y), or gaining altitude over the airport before setting off across the water.

DON'T FOOL YOURSELF

Ditching isn't the only concern in flights over water. Water crossings, especially in reduced visibility or at night, provide ample opportunity to wrestle with visual illusions. Even in visual flight rules conditions, the lack of visual cues and references over water can make it difficult to keep the shiny side up unless flying by instruments.

Even if the chances of an engine failure or other emergency are no greater when flying over the water than when flying over land, we should always look at the consequences that would follow such an event. With careful forethought and planning, we can make better choices than simply being legal, and navigate closer to safety. EAA

Robert N. Rossier, EAA 472091, has been flying for more than 30 years and has worked as a flight instructor, commercial pilot, chief pilot, and FAA flight check airman.

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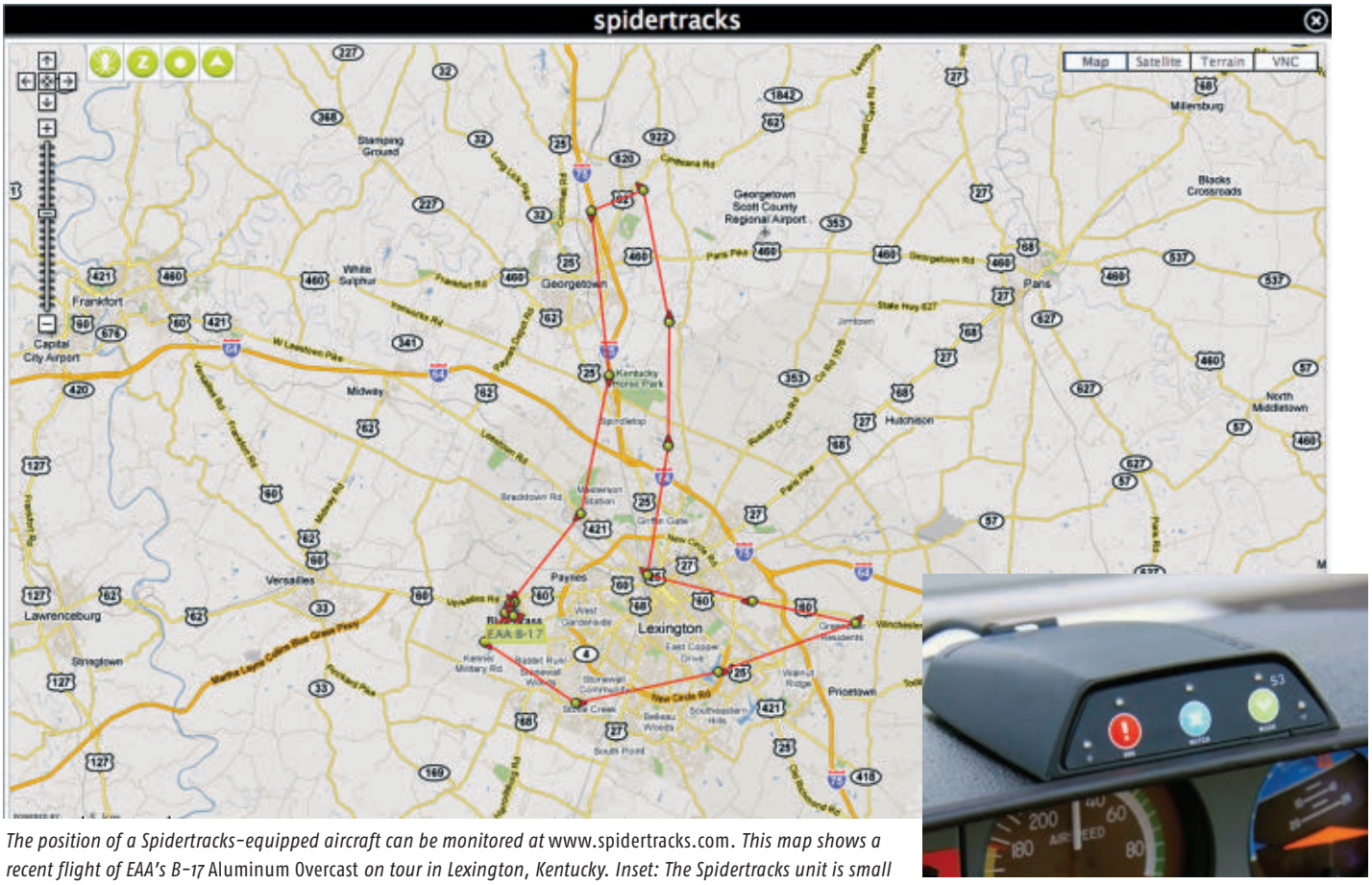


The position of a Spidertracks-equipped aircraft can be monitored at www.spidertracks.com. *This map shows a recent flight of EAA's B-17* Aluminum Overcast *on tour in Lexington, Kentucky. Inset: The Spidertracks unit is small enough to fit on top of an instrument panel.*

Spidertracks and Dreams

Strategies for getting found

I DID IT—I BOUGHT an airplane again, and it feels really good. Best of all, it is opening up a new aviation avenue, putting me back on a steep new learning curve. And I'm loving it.

I was intrigued by the Lake LA-4-200 Buccaneer long before I added the words "single engine seaplane" to my airline transport pilot certificate a year ago. That checkride involved flying multiple instrument approaches and then circling to land in a lake. It was hard to imagine having more fun.

Apparently I'm not the only one to dream of owning an amphibious aircraft. As I flew my "Buc" across the country to AirVenture 2010, I found the plane drew attention most everywhere I landed. People invariably told me they had always dreamed of owning one. I hope they do someday.

Besides pushing me to become more knowledgeable about hydraulic systems, aircraft lubrication, and water flying techniques, the plane was the catalyst for rethinking survival strategies. After all, a seaplane can fly to remote locations without cell phone service or a mechanic on call. Worse yet, I often fly below an altitude where I can get flight following, so if I were to crash, no one would know.

My plane has a 121.5 MHz emergency locator transmitter (ELT), but satellite monitoring of that frequency ceased in

February 2009. Its signal might be heard by an airliner passing overhead or eventually by a Civil Air Patrol (CAP) ground team homing in on its signal, but it could be a very long wait. According to CAP data, average time to rescue is 11.5 hours if an IFR flight plan was filed and 18.2 hours if a VFR flight plan was filed. But if no flight plan were filed, you would need several good books, as the average time to rescue in those cases is 62.6 hours!

In a significant number of crashes, the ELT doesn't activate. If I were conscious after a crash, I might be able to manually activate the ELT or possibly activate the SPOT 2 Satellite GPS Messenger that I wrote about in my February 2010 column. But if I were unconscious, or trapped and couldn't reach those devices, I couldn't initiate a call for help. Enter Spidertracks.

At AirVenture 2010, I talked with Spidertracks General Manager Rachel Donald about the new Spider S3 tracking device. It combines a GPS receiver with a satellite transmitter for the Iridium satellite network into a palm-sized box that sits on the top of an aircraft's instrument panel. It is powered by a cigarette lighter plug and is significantly smaller than the company's original tracking device, letting you easily move it among aircraft.

Once the unit is powered on, its basic tracking feature automatically begins sending your aircraft's position, speed, and altitude every few minutes via the Iridium satellites to a website. Family, friends, and, yes, even bosses can potentially watch the progress of your flight. If they notice your flight track stops where it shouldn't have, they can notify search and rescue.

AUTOMATIC NOTIFICATION

The big difference between Spidertracks and other tracking systems like SPOT 2 is that Spidertracks has an optional active tracking mode called Spiderwatch that can automatically notify search and rescue for you. There's no additional cost for Spiderwatch, but you do need to contact Spidertracks to have your account enabled for this feature. Then you can go to a website and set up contact phone numbers for text message alerts sent by the system.

With Spiderwatch enabled, the Spider S3 sends out one position message when the system powers up, but no further messages are sent until the aircraft ground speed exceeds 40 knots. It continues to send messages every two minutes until you cancel the Spiderwatch mode. If you were to crash and the Spider S3 stopped sending messages, the

system sends preprogrammed text messages to the mobile phone numbers you've designated for tier one alerts.

A pilot should include his or her own cell phone in the tier one contacts, so if there is a false alert, he or she can reply with a text message to cancel further notifications. If no cancellation is received within 15 minutes, the system sends out tier two alert text messages. Designating tier two contacts during the initial setup requires some thought. You'll need to determine what organizations you'd like notified, and you need to get their cell phone numbers, since alerts are sent only as text messages. Once notifications go out, help should be on the way much faster than if you relied upon someone to occasionally check a website to monitor your progress.

I asked Rachel about "saves" by Spidertracks. In one incident, a Bell 206 LongRanger helicopter crashed, but the ELT failed to transmit. A Spidertracks alert was generated, and a search and rescue team was able to reach the site quickly. The pilot survived, but, unfortunately, the passenger died.

In another save, a crash occurred in a remote jungle region in Central America. Spiderwatch was not being used, so alert messages weren't sent. But when the employees of the company realized the aircraft was overdue, they went to the Spidertracks website to get location data, and the pilot was rescued.

Spidertracks can provide other benefits besides search and rescue. For the past year, EAA has used an earlier version of Spidertracks to monitor and report the position of its B-17, *Aluminum Overcast,* as it gives rides at AirVenture and tours around the United States. Sean Elliott, director of aircraft operations, says it's used as a simple way to verify aircraft position and to estimate arrival

PHOTOGRAPHY COURTESY MAX TRESCOTT

times on repositioning flights. "The pilots lovingly call it the 'ankle bracelet,' but they understand its value to the operation."

Elliott says that EAA may try using Spidertracks to analyze how to get more people to sign up for flights. "We have discussed using it to track certain flight paths at tour stops and compare that to passenger walk-up performance. It could be an interesting way to see which neighborhoods yield the best passenger interest after seeing the B-17 fly over."

For pilots interested in social networking, Spidertracks is about to debut its Aviator website, where pilots can post photos and details about flights and share them with friends. Logbook entries, based upon the first and last Spidertracks position reports for each flight, are automatically added to the site.

The Spider S3 sells for $995, though you can get a rebate of up to $200 if you're a heavy user of the system and commit to a three-year service contract. Contracts, which cover the cost of sending position reports through the Iridium satellites, vary with usage. For a weekend pilot flying fewer than five hours per month, a 12-month contract costs just $10 per month. With today's technology, there are a variety of ways to make sure that you get help when you need it. Take time now to figure out the strategy you want to use to make your flying safer, then go out and pursue your aviation dreams. Who knows, you could end up with a seaplane, too! EAA

Max and his Lake Buccaneer at the Clear Lake Splash-In, held each fall in Northern California.

Max Trescott, EAA 531980, is an aviation author and publisher and was the 2008 National CFI of the Year. For more of his articles, go to *www.MaxTrescott.com*.

BRADY LANE
BETTER PILOT / AB INITIO

Class C Airspace

Facing the monster under my bed

THERE ARE PLACES I'VE been avoiding because I've been afraid of them. For example, one of the monsters under my bed was Class C airspace. I've been avoiding those bold magenta circles on my sectional chart, which kept me from flying to some fun places. I confessed this revelation to another pilot and learned this monster lurks under the beds of other pilots of all experience levels.

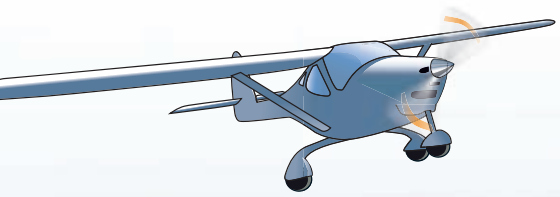


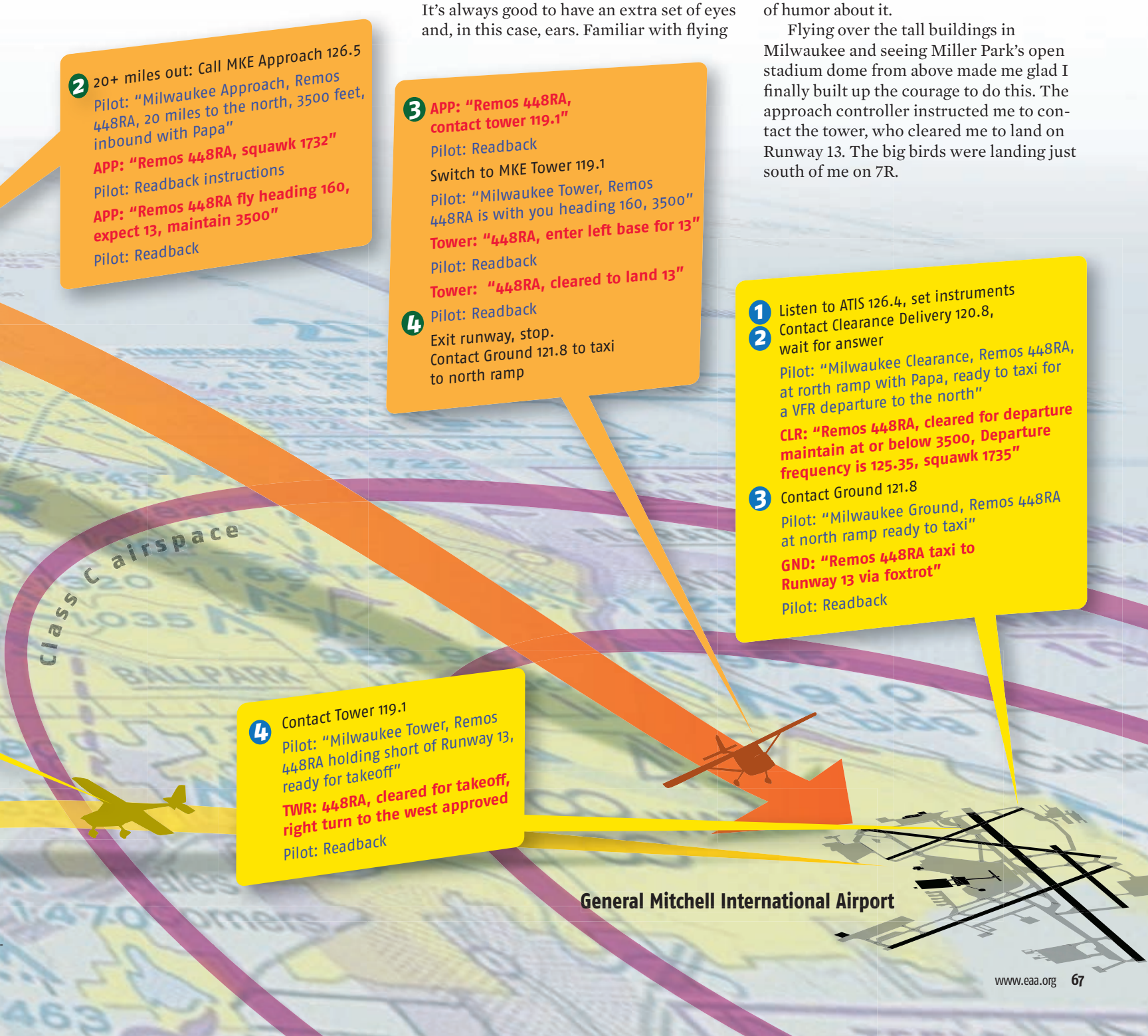
ILLUSTRATION BY **GARY COX**

To overcome my fear, I decided to fly into a busy Class C airport. The real monster wasn't Class C airspace, but my unfamiliarity with it. To prepare, I started listening to Milwaukee's General Mitchell International Airport (MKE) approach frequency on *www.LiveATC.net*. The controller blurted out a long string of information, and I thought, "He's talking too fast. How can anyone make sense of that, especially while flying?"

After listening for a few hours, I could understand most of it. I decided to make a script for what I could expect to hear along my flight, because if I knew what to listen for, I was more likely to hear what was being said. Brian O'Lena, EAA's youth programs manager, came along on the flight. It's always good to have an extra set of eyes and, in this case, ears. Familiar with flying in the Greater Milwaukee area, Brian wasn't intimidated by Class C airspace, which was an added bonus.

About 25 miles out from Mitchell, I called Milwaukee Approach. It went just as I had planned, except for when the controller asked how many engines my little REMOS had. He was poking fun at my 90-mph groundspeed, and I was glad he had a sense of humor about it.

Flying over the tall buildings in Milwaukee and seeing Miller Park's open stadium dome from above made me glad I finally built up the courage to do this. The approach controller instructed me to contact the tower, who cleared me to land on Runway 13. The big birds were landing just south of me on 7R.



BRADY LANE

MKE is a large airport, but I was focused only on my part. It felt no different from landing at any other towered airport, and I was surprised by how relaxed I was. After landing, I contacted ground and was cleared to the north ramp. I was prepared to ask for progressive taxi directions, but with the airport diagram on my lap, I felt confident navigating the taxiways on my own.

As I taxied, all the pilots standing next to their jets turned to see what this little airplane was—I was the only non-jet on the ramp. We walked across the street to a great little mom-and-pop burger and ice cream shop called Nite Owl Ice Cream Parlour and Sandwich Shoppe, which made me feel like we just landed at a quaint country airport. As I slurped down my malt, I admitted to Brian that my stereotype of big airports was grossly misaligned.

. . . all the pilots standing next to their jets turned to see what this little airplane was . . .

With full stomachs, we climbed back into the plane, and I again referenced my script. I listened to the ATIS (automatic terminal information service), called clearance delivery, then ground, and taxied to the end of Runway 13. I called the tower and was instructed to position and hold while a jet cleared the runway. This was the first time I had ever been told to "position and hold," and I knew it would be the last since only a few days later it would change to "line up and wait."

As we climbed away from Milwaukee, it didn't feel like the busy airport I use when flying the airlines. From the pilot's seat, it felt like any other airport. Many of the monsters lurking under our beds as aviators probably aren't as scary as our imaginations make them out to be. So whether it's flying over the mountains, soloing a plane, or flying into AirVenture, I hope you choose to make friends with your monster, too. EAA

Brady Lane, EAA 808095, is a multimedia journalist for EAA and a sport pilot.

Dealing With Crosswinds

Crab, sideslip . . . or both?

INADEQUATE CROSSWIND SKILLS ARE one of the primary pilot deficiencies observed most often during pilot certificate checkrides, according to a panel of designated pilot examiners at the flight instructor refresher clinic last year at Rantoul, Illinois.

Although crosswind landings are an enjoyable challenge for some pilots, others view them like a recent flight review candidate who said, "I try to avoid crosswind landings like the plague!" Realistically, flying an approach and landing during crosswinds is inevitable. When it happens, pilots have a choice of which technique to use during final approach to eliminate side drift: the sideslip or the crab.

Both techniques are acceptable; however, if the crab is used, it must be removed prior to touchdown for most general aviation aircraft designs, according to the FAA Airplane Flying Handbook.

Which method do EAA members prefer? According to the recent "2010 Survey of the Average Aviator" (see article on p. 46), 72 percent prefer the sideslip. To help determine which method should be used on final approach and when, consider the following.

SIDESLIP

The sideslip eliminates left or right drift by lowering the upwind wing with aileron, while using rudder to maintain aircraft heading (longitudinal axis) alignment with the runway centerline. To set up the sideslip after turning to final approach, the upwind wing is lowered as necessary to stop the drift (i.e., if drifting left, lower the right wing, etc.). However, when a wing is lowered, the aircraft tends to turn in that direction, requiring prompt input of opposite rudder to compensate and to align the aircraft with the runway. The sideslip requires constant aileron and rudder control inputs throughout the final approach, round-out, touchdown (often made on the upwind wheel first, then the downwind wheel in strong crosswinds), and roll-out.

Using the sideslip increases the aircraft's rate of descent, which shortens the final approach unless power is added. After touchdown, particular attention should be given to maintaining directional control with the rudder or nose wheel steering, while following through with the aileron to full deflection to prevent the upwind wing from lifting.

CRAB

The crab is executed by turning to a heading that incorporates a wind correction angle (crab) slightly toward where the wind is coming from so that the aircraft's ground track remains aligned with the runway centerline throughout the final approach.

If the crab is used, it must be removed before touchdown by applying rudder to align the aircraft with the runway. At the same time, the upwind wing must be lowered sufficiently to prevent side drift. This requires a timely and accurate action that pilots sometimes attempt during their round-out when a lot is happening. Safer, more effective timing would be to convert to a sideslip before short final (several hundred feet above ground level), not during round-out. Failure to properly convert from a crab to a sideslip could result in severe side loads being imposed on the landing gear, which, on a tailwheel aircraft, could also cause a ground loop or worse, because its center of gravity is located behind the main landing gear.

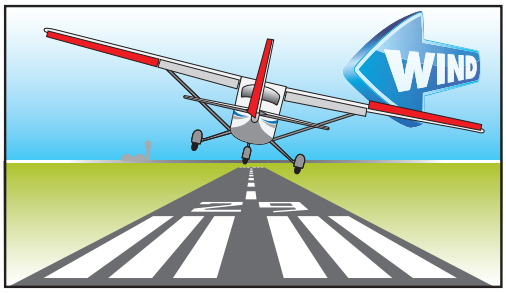
The crab method is preferred on a long final approach, partly because significantly less control inputs are needed, and partly for passenger comfort as the wings remain level.

Although sideslips are recommended most frequently, a combination of crab first, then sideslip is usually preferred.

So if you haven't already learned the sideslip, how long does it take? Everyone learns at a different rate, but two months after his flight review, the pilot who previously said that he "avoided crosswinds like the plague" e-mailed to report how much fun he was having in 9- to 10-knot direct crosswind landings! EAA

Robert O'Quinn, EAA 742434, is a part-time certificated flight instructor whose primary focus is on tailwheel training. He enjoys sharing those skills and other pilot improvement techniques through newsletter articles and presentations to his local EAA Chapter 790 in Barrington, Illinois.

SIDESLIP APPROACH



CRABBED APPROACH

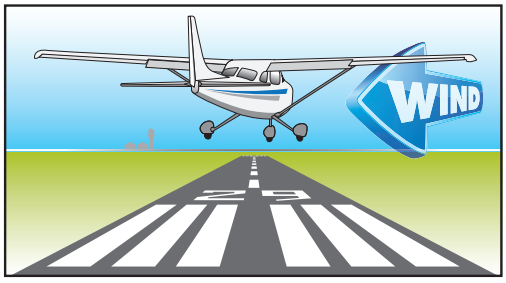


ILLUSTRATION BY **PIERRE KOTZE**

Like Juggling With Hand Grenades

Some risks aren't worth taking

A VIDEO WAS CIRCULATING on the Internet not long ago. Some guy—or possibly some woman, but my money's on a guy—installed a video camera, pointed forward, on top of the instrument panel. In the video, we see, coming at us very fast, a mountainside with an elongated vertical hole through it. We know that he's going to fly through that hole, if only because the pilot thought it was worth making the video. A moment before entering, he rolls the airplane inverted and a second later flies through the hole.

It must have been incredibly exciting to do, and challenging, and a deeply satisfying stunt to have pulled off—but it was also a horrible risk. Whatever his skills, and they are there in abundance, a puff of wind could have nudged him into the mountainside. He made it through that time, and he probably would another time, and another. But it's like juggling with hand grenades: Sooner or later the pin is going to fall out of one. And let's see—uh, why were we juggling with them in the first place?

MANY REASONS

Twenty years ago, I probably would have done that stunt if I'd had the chance. These days, no. It isn't that I've lost either the skills or the fire in the belly; it's that I've gained a tiny bit of wisdom and have realized that it's not just me up there when I fly. Even when flying solo (which I almost always do), I have a family—a wife and children who love me and two cats who pretend they don't care but really do—and an awful lot of flying I have not yet done, stories I have not yet written and illustrated, friends to be with, stories to hear, and books to read.

So that's what's on the scales: On the one side, life and all its rewards; on the other, an adrenaline rush and the (possibly posthumous) admiration of many, not to mention a very messy cleanup for some

ILLUSTRATION BY **DAVE MATHENY**

other people if we make the smallest miscalculation. It should be an easy choice, but it isn't always.

There's this problem that so many of us have: a desire to give air show performances when there's no air show going on. If we pause and reflect on why the pilot was not content to just fly through the hole in the mountain but also made the video of it, we realize that it wasn't enough for him just to do it—he recorded it so he could put it out there for all to see. While you have to admire his skills, the making of the video raises a question about why it was done in the first place—to prove it can be done, or just to dazzle? In the first case, there's no doubt that, if the hole is wide enough, it can be done. In the second, well, dazzle is just dazzle. Its value is slight, but still present.

JUST GOTTA DO IT

It's in our blood to try new stuff, and frequently that stuff can injure us, or worse. Risk-taking is both good and bad. Without it, we'd still be living in caves and eating only small, defenseless animals, or the occasional big, scary one that happened to fall off of a cliff or got hit by lightning.

Because our predecessors so often took risks, sometimes dying in the process, we now live in great comfort. As just one example, we travel thousands of miles in a few hours, enclosed in an aluminum tube many miles above the earth because Orville and Wilbur and many other pilots took risks. We take a risk, to use the cliché, every time we get in a car. We also take one every time we fly.

We have far more choices as pilots than we do as drivers.

We like to tell people that the danger really begins when you put the airplane in the hangar and get into your car and out on the highway. That may be true—exact numbers are elusive—but there's another factor in our favor, a vital difference denied to drivers, and that is our ability to control risk. We have far more choices as pilots than we do as drivers.

When flying, we are generally almost alone in the sky, except near airports. But when we get out on the road in a car, we routinely pass—almost head-on, at closing speeds of 120 mph—other cars driven by people who may be impaired or distracted. Intersections take a great toll, too, as drivers crisscross through them, not always missing each other.

Any pilot who had to make head-on, wingtip-to-wingtip passes with streams of other aircraft, and fly intersecting courses as close as motor vehicles pass each other through intersections, would probably succumb to ulcers within a year or two.

As pilots flying for recreation, and particularly those of us flying lighter, more

sport-oriented aircraft, we can choose to fly only on good-weather days and in stretches of the sky where almost no other aircraft goes. If the weather is poor, if we don't feel well, if we are doubtful about any aspect of the coming flight, we can elect to stay on the ground. As pilots, we usually don't have to fly; as people with busy lives, we often have to drive.

As pilots...if we are doubtful about any aspect of the flights, we can stay on the ground.

CHOICES, INTELLIGENT AND NOT SO

There are intelligent ways to take a risk. Air show pilots are highly trained, they stay current, their aircraft are meticulously maintained, and they work out their routines in great detail. They would be the first to tell you that the risks they take are minimal, or as minimal as possible.

Test pilots, who seemingly do the most hazardous flying there is, control as many elements that can be managed as possible, systematically reducing each predictable variable, so that only the new or unknown portion is isolated for study. The only time flight tests involve a completely new aircraft are the first few initial flights. After that, usually just one aspect is new: for example, spin-testing an aircraft with a different fuel loading from any that was used before. That can be risky, but all the surrounding risk is held to a minimum, and the aircraft will probably be equipped with a spin-recovery parachute, and the pilot will usually be wearing a parachute and start the test at sufficient altitude to use it if the spin becomes unrecoverable.

The result of such planned, controlled risk-taking is nearly always an advance in knowledge.

Unfortunately, it is impossible to write stuff like this without sounding like a scold at a picnic by the beach. ("You kids don't go near the water. You might drown!") But it is also impossible to see how humanity takes a step forward when somebody flies through a hole in a mountain (or juggles with hand grenades). We're glad he made it, but let's hope nobody else is inspired to take that kind of risk. EAA

Dave Matheny, EAA 184186, is a private pilot and an FAA ground instructor. He has been flying light aircraft, including ultralights, for almost 30 years. He can be reached at *DaveMatheny3000@yahoo.com*.

To see a video of the inverted flight through the hole in the mountain, visit *www.SportAviation.org*.

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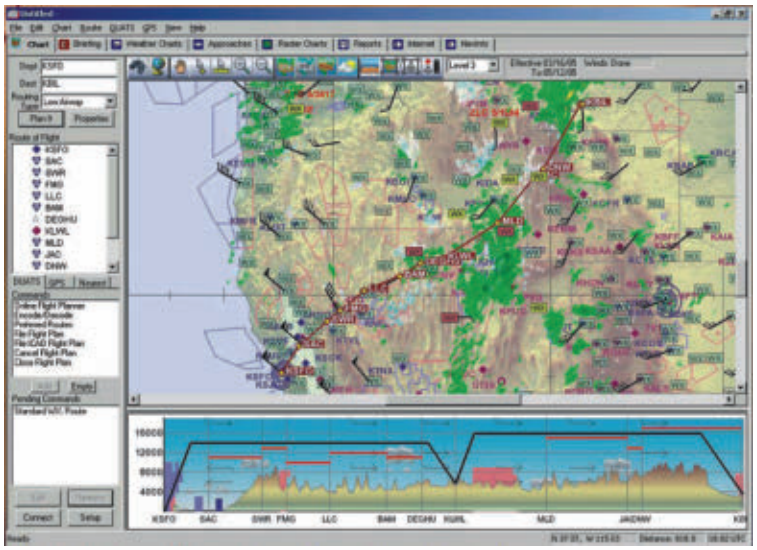

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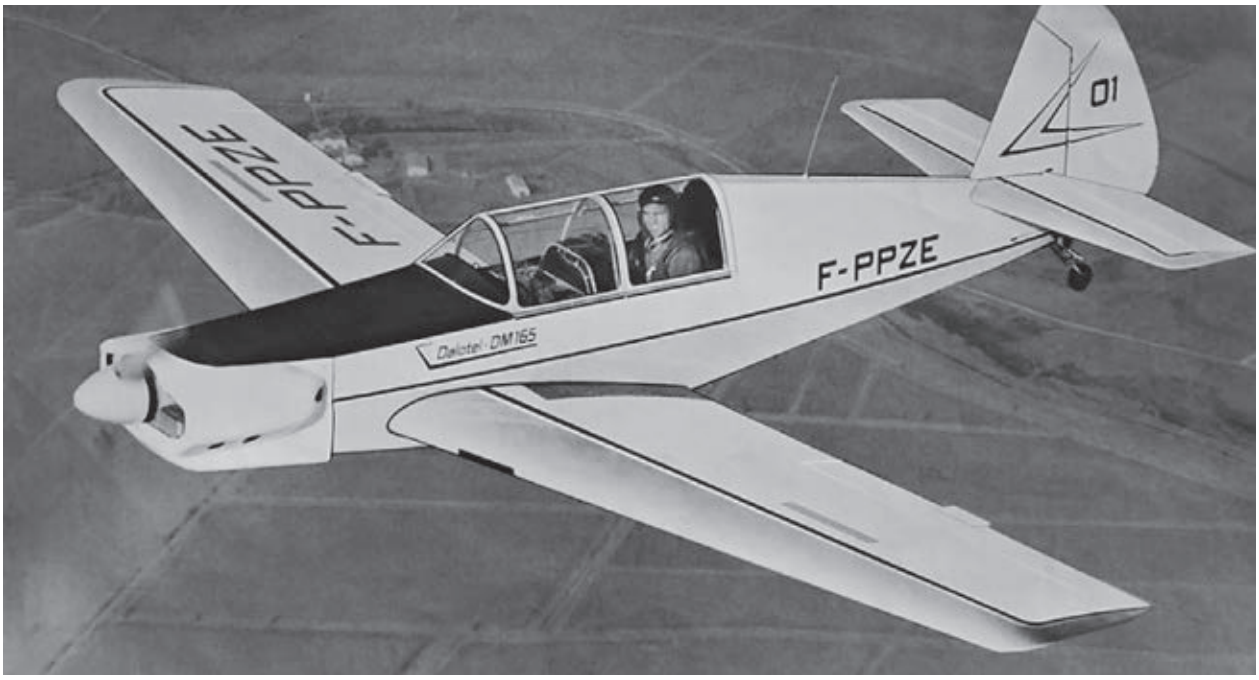

Resurrection of the Dalotel

Restoring the prototype

BY RAY ORDORICA, EAA 882055; NORTH FORK, IDAHO

I AM REBUILDING THE Dalotel DM 165, a French tandem-seat, low-wing monoplane with full aerobatic capabilities and retractable gear. The only prototype ever built first flew in 1969. It was vetted by the French aviation authority to be type certified, but financial and other limitations prevented that from happening.

In the late 1970s, the prototype was sold to British aircraft collector Robs Lamplough, who, in 1983, had a forced landing in it. Years later I found a small ad for the airplane being sold out of England as a "project." I was able to buy and import the airplane, jumping through all the shipping and importation hoops required to get the one and only Dalotel DM 165 from England to Idaho.

The airplane arrived in late 2006 as a collection of broken wings, relatively intact tail structures, a decent steel-tube fuselage covered with rotting fabric, and bags of wood scraps recovered from the crash site. The Continental IO-346-A engine, with only 300 hours, was on a pallet sans prop. I brought the engine and fuselage into my living room, stored the rest in various outbuildings, and began the immense task of deciphering the various components.

The elevator and stabilizer were largely intact, and the engine seemed to be serviceable. The original wood prop was shattered when the airplane nosed over, despite the fact that the engine was not running at the time. As noted, the fuselage had most of its covering intact, which I carefully stripped off and preserved to be able to duplicate the color scheme on the new covering.

The fuselage is tube and rag. The wings are built with wood spars, plywood ribs, and plywood covering, with an overlay of fabric. The ailerons are fabric-covered aluminum. Each wing includes a tricky aluminum fork embedded into the main spar. This fork incorporates a huge knuckle that plugs into notches in the sides of the fuselage where large steel bolts, two per wing, hold it. The spars do not continue through the center of the fuselage, but instead are connected there by two machined aluminum plates. Torque tubes with splined interconnections drive the ailerons. The fabric-covered elevator is driven by another tube off the tandem sticks, and the big rudder is moved conventionally by cables. The landing gear is retractable by means of a one-direction-of-rotation electric motor.

One wing needs to be rebuilt entirely, including new spars. The other one has good main and secondary spars, but will need some new ribs and all-new plywood covering. I used a router set to the thickness of the wood skin and routed down through the skin, following the rib and spar lines. The original pencil marks were still visible, and I

PHOTOGRAPHY COURTESY **RAY ORDORICA**

1) The "collection of parts" Ray recieved in 2006 included the Dalotel's steel-tube fuselage covered with rotting fabric, which Ray removed. When it comes time to paint, he'll use that fabric to replicate the Dalotel's original paint scheme.

2) Ray considered redesigning the vertical fin but instead chose only to beef up the bottom rib.

3) A long drill was used to poke a hole through the new skin on top of the stabilizer, and then used as a probe to find the original mounting holes in the fuselage tubing. Four long bolts secure the stabilizer.

4) Because of damage to the wing, Ray has had to make several new ribs.

could also follow the path of the staple holes used on the original build. After this was done the old wood popped off easily, leaving undamaged ribs and spars beneath.

To date I've torn a lot of the airplane apart, made many pencil sketches, took thousands of photos of all the details, made some detailed computer-aided design (CAD) drawings, and made a precise quarter-scale drawing of all the components, ribs, spars, and gear mounts of one wing. This let me plan the wood I'd need to buy to duplicate the wing.

I have also done some redesign and reassembly of the tail surfaces. I took off the top plywood from the stabilizer and found failed glue joints on the blocks that held the hinge mounts for the elevator. I beefed them up by adding reinforcing gussets and thicker backing plates. I sent the nut plates and hinges and some other metal parts to The Robar Companies' Coating Technologies Inc. for NP3 plating. I finished by adding new plywood to the outside of the stabilizer. I'll put a thin coat of fiberglass cloth and epoxy on the leading edges of the stabilizer, fin, and wings to help prevent the damage they sustained to their formerly all-wood leading edges.

I made a CAD drawing to redesign the rudder. The old one failed with time, humidity, and the use of non-waterproof glue. My new design incorporates aluminum plates instead of wood block to hold the control horns for the foot-pedal and tailwheel links.

The fin is a key part of this aerobatic airplane in that it has to translate all the rudder forces to the fuselage. It attaches to the fuselage at the bottom rear with two stout bolts and through the stabilizer at the front. There is a single large bolt connecting the front of the fin to a bracket, which in turn is bolted to the stabilizer. The big bolt attaches to a nut plate inside the fin. This forward attach point was, in my eyes, the weak point of the aircraft. With a huge rudder suddenly jammed into a brisk 200-mph breeze, lots of force was put onto the attachment on the front of the fin. A redesign seemed to be in order.

The original system worked as long as the glue held, so I made a new bottom rib for the fin along the original lines. My new rib is thicker with more glue area and includes gusset reinforcements. West System epoxy does the bonding.

Sensenich has agreed to build me a wood propeller for my home field's altitude of 4,000 feet. I found an Australian-built spinner much like the original. The instrument panel is mighty small, and you solo this airplane from the rear seat. I'll need to use the tiny UMA gauges and other space-saving "steam" gauges.

Progress is much slower than I'd like, as you might expect when doing such a job alone. The good part is I can do some of the work indoors, and that's important during the long Idaho winters. I recently acquired my private pilot certificate. I was not fond of renting nosedraggers, so I managed to acquire a Citabria with the controls in the same place as on the Dalotel. It will provide excellent training for the happy day when I have the Dalotel ready for its first test flight. EAA

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OKLAHOMA RV-6A

THE CONSTRUCTION OF N85KC began in 1999 and was completed in 2004. Construction was slowed due to a military activation after 9/11, but many parts were built while sitting in an Air Force Alert Facility and others were manufactured in our dorm rooms while deployed to the Middle East during Operation Iraqi Freedom. An Aero Sport Power O-360 engine and Sensenich prop power the aircraft. Built before all the latest glass panels were available, the "old school" panel consists of a Century 2000 attitude indicator/horizontal situation indicator and autopilot, RMI micro encoder and micro monitor, Garmin GNS 430, and WX-950 Stormscope. Calvin Gillis of Tuttle, Oklahoma, did the paint. The tail design comes from the Montana Air Guard 186th Fighter Squadron, a nod to our home state. Thanks to Van's for a great design, and thanks to my wife, Carol, for putting up with the "garage plane" for all those years.

Kurt Klewin, EAA 481036; Oklahoma City, Oklahoma; E-mail: *kurt.klewin@gmail.com*

KANSAS NIEUPORT 17

MY PLANS-BUILT 7/8-SCALE NIEUPORT 17 was signed off on May 17, 2010. N117NP began as Graham Lee's aircraft design from plans issued by Circa Reproduction Inc. It started out as an ultralight Nieuport 11, but as I further researched the design, I decided to convert the project to the experimental classification. After nearly 12 years of tinkering and 550 hours of logbook entries, it is ready to fly. It sports a 2180-cc VW engine with a 12-volt electronic ignition. The battery is charged by a 40-watt solar panel mounted just under the machine gun. I would like to thank my son, Evan, for his assistance in completing this project. Now it's time to move on to completing my Glasair I.

Tom Mahoney, EAA 404496; Dorrance, Kansas; E-mail: *tom.mahoney@proboundsports.com*

TEXAS SONEX

I EARNED MY PRIVATE pilot certificate in December 2003. The following year I went to EAA AirVenture Oshkosh to learn about homebuilt aircraft. I found the Sonex, among others, and later concluded it was the best fit. I started the build from plans in January 2005. I chose a Jabiru 3300A for power and an MGL Stratomaster Enigma for the primary instrument. I flew the first flight without a hitch on March 29, 2009. Since then, I have flown more than 170 hours in 15 months in the Sonex. I would like to thank the great folks at Sonex, with special thanks to Mike Singleton, whose help and guidance made the build and test flight smooth and safe, and of course my wife, for putting up with aluminum shavings in the house for four years.

Robert E. Barber, EAA 743665; Bryan, Texas; E-mail: *rbarber@suddenlink.net*; Technical Counselor: Roy Tribbey

DELAWARE AERONCA 11AC

ON MAY 2, 2010, after a 19-month restoration, my 1947 Aeronca 11AC Chief, NC3449E, took to the air once again. Under the cowl, a new M20 air oil separator was installed along with new STC'd spring-loaded push rod tubes in an attempt to stem a few oil leaks. The most exasperating task was getting the new engine baffling, nose bowl, top and bottom cowls, and stacks to fit together to my satisfaction. Brand new straight stacks replaced the decaying muffler system. Almost every nut and bolt that was loosened during the process (airframe and engine) was replaced with new AN appropriate hardware, which cost a small fortune. On the first flight, it flew pretty much hands-off. The Superflite System VI looks great! Many new parts will keep it in the air for years to come. Thanks to Tony and Pat Markl for their great fabric work, and Dan O'Donnell for the paint job. Thanks to my friends Bill, Sue, Lauren, Carol, and Patricia, without whom I'd still be putting this together in 2012!

E.C. Connor, EAA 774893; Greenwood, Delaware;
E-mail: *cconnorrn@gmail.com*

INDIANA FLY BABY

MY TANDEM FLY BABY is fitted with all-metal wings I had used on two previous aircraft I built, one being my own design. A 110-hp, six-cylinder Corvair engine powers this aircraft. It is outfitted with all new internal parts except for the crank. I believe this is one of the first all-metal Fly Baby designs. The plane has a glass floor, and the wings have glass inspections covers. I made two major changes from the Bowers plans: Peter Bowers made his landing legs with laminated wood, whereas both of my Fly Babys had 1/4-inch by two inch spring steel landing gear. Also, Bowers' gas tank was in the nose of the fuselage, whereas I incorporated a 10-gallon gas tank in each wing.

Don Taylor, EAA 680418; Evansville, Indiana;
E-mail: *don.jen451@insightbb.com*

OREGON SPARROW

I DESIGNED AND BUILT this Sparrow over a period of three years—one year to design it and two years to build it. It's the third experimental scratchbuilt/homebuilt design I have completed. (The other two were amphibians.) The Sparrow, a two-place side-by-side with a 28-foot wingspan and a gross weight of 1,550 pounds, was conceived along the lines of a Vagabond, but 18 inches longer. It has a 230-12 airfoil and an O-235 Lycoming engine with a 76-by-53 inch Sensenich propeller. It indicates about 115 mph at cruise and climbs about 700 fpm at gross weight. I received my airworthiness certificate in May 2007 and have more than 100 hours logged. Special thanks to Zi Shadzada, my longtime friend and authorized inspector, who passed away in December 2008.

Tom Pileggi, EAA 14373; Portland, Oregon;
E-mail: *sparrow0502@gmail.com*

INDIANA SONEX

WALT TARR AND I met in the early 1980s while flying radio controlled (R/C) airplanes. We both drifted away from R/C modeling over the years. I had been attending EAA AirVenture Oshkosh for many years as a private pilot, but said I could never build an airplane. In 2003, I walked by the Sonex display, and a pretty yellow bird reached out and grabbed me. When I got home I called Walt and said, "I need help in building an airplane." He responded, "What scale?" I said, "Full," and the silence was deafening! We took the Sonex Builder's Workshop in October 2003 and received the kit that December. We completed the bird and received the FAA sign-off on September 28, 2007, and I made the first flight on October 28, 2007. The engine is a Jabiru 3300L, and the instrumentation is a Stratomaster Enigma by MGL. I would like to thank Walt, Jon Ogle, Lou Owen, and many members of EAA Chapter 67. I would also like to thank my wife, Adele, for putting up with the mess in the garage and aluminum shavings I tracked in the house.

Bill Carr, EAA 438245; Carmel, Indiana; E-mail: *wm.carr@sbcglobal.net*;
Flight Advisor: Larry Jacobi

Flap Position Indicator

Simple, inexpensive addition

BY J.L. RIFFEL

I LIKE SIMPLE. THE flap indicator on my RV-7A was four pieces of tape on the flap showing how many degrees are dialed in. There was nothing to break, and it was almost foolproof. I pushed the flap toggle switch down for a couple seconds, looked out the window, and verified the tape marks—done.

But a recent night flight got me thinking: *Can I see that tape if it's a really dark night? If I'm slogging through a night instrument approach, will I be distracted by fumbling around for a flashlight during the landing sequence? What if I forget to raise the flaps?* (Not that I'd ever forget to raise the flaps, mind you.) Clearly my simple flap indicator needed some rethinking.

There are sensors and indicators on the market that do exactly what I want (and more), but they're sort of pricey for me. Because I like frugal solutions, I decided to see what I could engineer.

After discarding a number of approaches and spending a number of days searching the Internet, I finally discovered a simple electronic circuit that drives an LED bar graph based on voltage levels. I am not an electronics guy—far from it—but when you build an airplane, you learn about all sorts of topics. On my trips to a local surplus electronics store while building my panel, I learned about potentiometers. They can be used as variable resistors (for dimming LEDs) and also as voltage dividers.

Eureka! I could use a slide potentiometer to sense flap position and the LED bar graph circuit as a display. It's still pretty simple, only has a couple inexpensive components, and is easy to build.

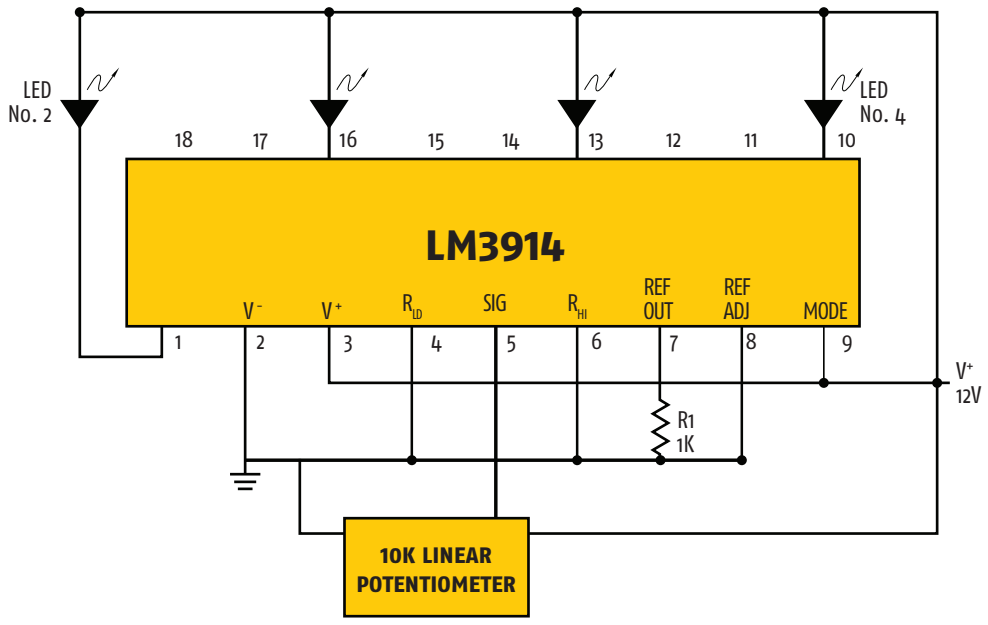
Figure 1 shows the circuit diagram, and Figure 2 shows my assembled circuit board. The only places to go wrong (assuming you are reasonably careful when you solder) are connecting to the wrong integrated circuit (IC) pins and getting the LED's polarity reversed.

First, I'd recommend you scan through the connection diagrams in the datasheet (visit *www.SportAviation.org* for a PDF) to see how the IC pins are identified. As you can see in Figure 2, pin 1 is located on the lower right when the "notch" at the end of the IC is pointed down.

Second, identify the LED's polarity. Connect one LED lead to the positive post of a 12-volt battery. Then connect the 1K

FIGURE 1

Circuit diagram from the document available on www.SportAviation.org.



resistor between the other LED lead and the negative battery post. Don't forget the resistor, or the LED will be ruined. If the LED doesn't illuminate, reverse the leads. When you get it right, mark the positive side. Double-check the LED polarity and IC pin orientation before you solder and you shouldn't have any trouble.

A couple notes: The datasheet shows that the LM3914N integrated circuit will drive up to 10 LEDs, so you could add LEDs to pins 18, 17, 15, 14, 12, and 11. I chose to use only four (for 10-40 degrees of flap). Also, the resistor on pin 7 controls the LED brightness. A 1K-ohm resistor gave me an acceptable brightness, but you can experiment with others. While you could replace the fixed 1K-ohm resistor with a variable resistor to dim the LEDs, it seemed like overkill to me. They aren't (or shouldn't be) on for more than a few minutes each flight. I found a nice four-LED assembly at my surplus electronics store—but any LEDs seem to work.

The PC board (see parts list) that I chose gave me a convenient set of connections, so I didn't have to solder in a lot of extra wires. I laid out the parts on the board and trimmed it to size with my jigsaw. By soldering in a retention socket for the IC, I could just plug in the IC rather than risk overheating it by soldering it directly onto the board. Remember to protect the soldered side of the completed board from shorting out when you mount it in your panel.

Make sure that the potentiometer is linear (versus an audio taper) so that the voltage adjusts evenly as it slides. The one I found has 60 millimeters of slider travel. I made a bracket to mount the potentiometer and a clamp for the flap arm and then connected them with model airplane ball links and 4-40 rod. I moved the clamp up or down the flap arm until there was slightly less than full throw on the potentiometer (enough throw to get the LEDs turned on but not enough to "bottom out").

Finally, connect 12-volt power/ground to the outside leads on the potentiometer and to the power/ground on the circuit board. Then connect the middle potentiometer terminal to the "signal" lead (the yellow wire in Figure 2 that is connected to pin 5). If the potentiometer has two center terminals, then either should work.

Voilà! Better than my tape solution, easy to build—and inexpensive! A little shopping should allow you to buy all your parts for less than $25. EAA

PARTS:

For links to suppliers for some of these parts and a PDF of the datasheet, visit *www.SportAviation.org*.

- One integrated circuit LM3914N Dot/Bar Driver
- Datasheet
- Four (up to 10) LEDs
- One 18-pin retention contact (Radio Shack 276-1992)
- One PC board (Radio Shack 276-168)
- One 1K-ohm resistor
- One 10K-ohm linear slide potentiometer, 60 millimeters of travel
- Two Dubro heavy-duty 4-40 ball links (Dubro 497)
- One model aircraft 4-40 rod
- Connectors (your choice)

Jerry Riffel, EAA 703052, is a retired IBM software engineer/manager. He's a private pilot with an instrument rating. His RV-7A (night/instrument flight rules) took him four years to build, and he flies it weekly.

FIGURE 2

Jerry's assembled circuit board installed on his panel.

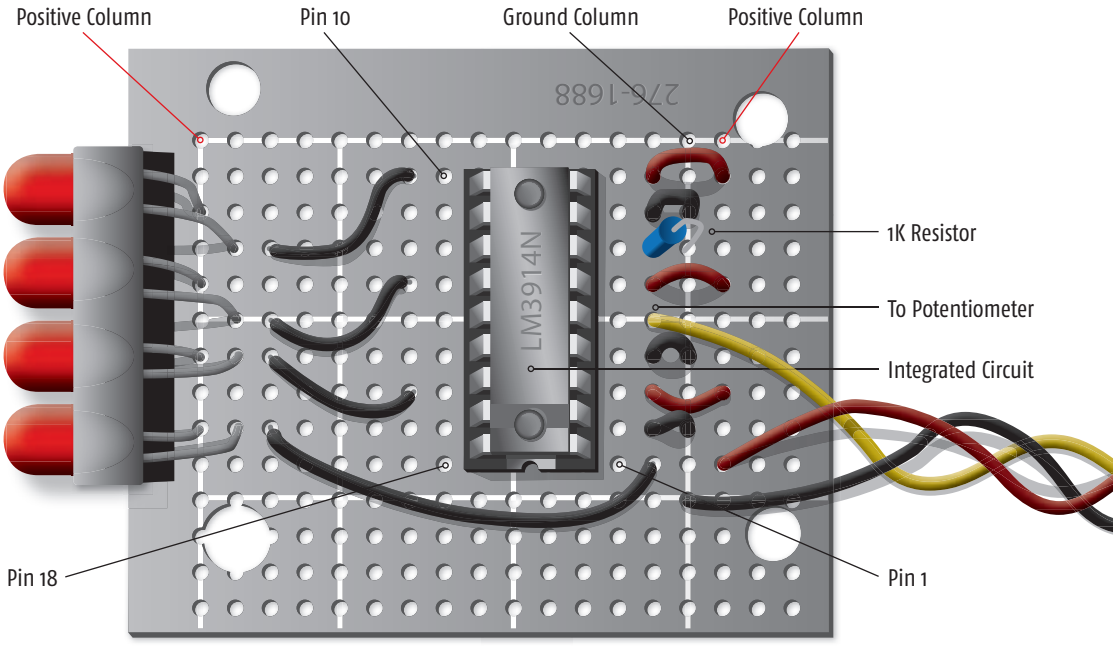


ILLUSTRATION BY **PHIL NORTON**

Drill Press Dimpler

BY JOE NORRIS

IF YOU'RE BUILDING A sheet metal aircraft, you will undoubtedly run into a situation where a flush head rivet is required. In order to get the rivet head flush with the surrounding metal, you'll need to either dimple or countersink as appropriate. For thin material (less than 0.04-inch thickness), dimpling is required. If the rivet location is close to the edge of the part, you can use dimple dies in your hand rivet squeezer to accomplish the dimpling. If the location of the flush rivet is farther from the edge of the part, there are a couple of solutions.

If you have only a few holes to dimple, you can use your hand pull rivet gun and dimple dies that use a nail as the mandrel for the gun to pull. But if you have a whole wing or fuselage skin to dimple, this hand method can get old quickly, not to mention use up a bunch of nails. There's a better way.

Many aviation tool vendors sell a tool that is designed to dimple holes away from the edge of the part. These bench-top dimplers can cost more than $200. Sometimes a number of builders will share one or maybe your chapter tool crib includes one. If you can't find one and you need to get some dimpling done, you may have the perfect tool in your shop already—a drill press!

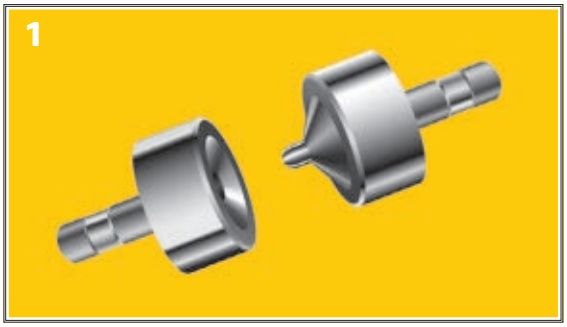
You'll need to make a slight modification to the table of your drill press to use it for dimpling. Drill a small hole in the table that will accept the stem of the dimple die. Just put the appropriate drill bit in the chuck, move the table up close, and you're set to drill the hole. Make sure to pick a spot that will allow you to get at this hole from the underside of the table. This allows for easier removal of the dimple die when you're finished with your dimpling. The hole should be a snug fit for the dimple die stem, but not so tight that you have to drive the die into the hole.

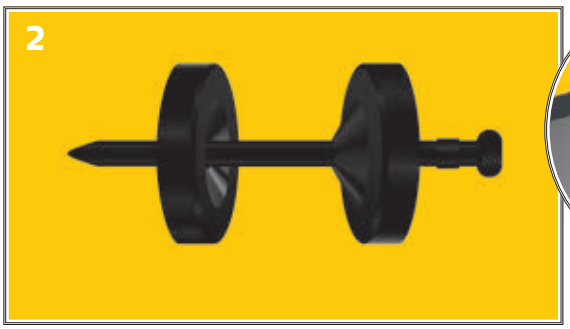
For dimpling operations you'll use the "press" portion of your drill press. Do *not* turn the drill motor on! Simply put the female dimple die in the hole you drilled in your drill press table and chuck the male die in the drill chuck. Now, by turning the feed wheel, you can use the drill press spindle as a press for dimpling. It's self-aligning and works like a champ! Thanks to EAA member Lance Logan, EAA 526828, for submitting this hint.

1) Dimple dies consist of a male and a female die to form the "dimple" that will accept a flush head rivet.

2) Special dimple dies can be used in a hand "pop rivet gun." A simple finishing nail is used as the mandrel.

3) Drilling a hole in the table of your drill press to accept the dimple die will allow your drill press to become a long-reach dimpler.





ILLUSTRATIONS BY JOHN A. JOHNSON

USING TIE WRAPS IN THE ENGINE COMPARTMENT

BY JOE NORRIS

EVEN ON THE SIMPLEST homebuilts the builder will be faced with routing and securing wires and lines for various systems. There are many ways to do this, but most builders these days opt to use tie wraps (aka zip ties or cable ties). These handy little items make quick work of organizing the systems on the aircraft. However, when used in the engine compartment, tie wraps have the potential to cause problems when they are used to secure wires or lines to the engine mount.

The issue stems from the environment found in the engine compartment. The combination of heat, vibration, airborne liquid mist, and dust or dirt can cause the wire tie to become a great little sanding block if there is any slippage at all between it and the engine mount structure. This happens because many times it is not possible to get the tie wrap pulled tight enough to eliminate slippage on the tube around which it is wrapped. Vibration combined with some fluid for

Uniwrap comes on a roll with a protective plastic layer to keep the tape from adhering to itself while sitting on the shelf. The plastic is discarded when using the tape.

PHOTOGRAPHY BY **JOE NORRIS**

The best way to keep the wire tie from slipping on engine mount tubing is a product called Uniwrap.

Uniwrap in place under a wire tie.

lubrication and some dust or sand for abrasive will cause the wire tie to begin cutting into the structure it's secured to. There have been cases where the wire tie has worn its way completely through a steel tube engine mount!

There is a simple way to avoid this potential problem. The best way to keep the wire tie from slipping on engine mount tubing is a product called Uniwrap. Uniwrap is a self-adhesive silicone tape. A layer of Uniwrap around the tube before applying the wire tie will eliminate the possibility of damaging the structure.

Uniwrap is available through aviation supply houses such as Aircraft Spruce & Specialty Co. A similar product called Rescue Tape can be found at hardware and auto supply stores, industrial supply outlets, and sporting goods stores. A few dollars for a roll of Uniwrap can save the builder hundreds of dollars in potential repairs. EAA

Joe Norris, EAA Lifetime 113615, is EAA's homebuilders' community manager. He is a technical counselor, flight advisor, certificated flight instructor, airframe and powerplant mechanic with an inspection authorization, and a designated airworthiness representative. To see these Hints for Homebuilders videos visit *www.SportAviation.org*.

PHOTOGRAPHY BY **JOE NORRIS**

GRADE 8 BOLT IDENTIFICATION

BY JOE NORRIS

Far Left: *Grade 8 bolt has radial lines pointing to the corners of the hex head.*

Left: *AN bolt will generally have an "X" somewhere on the head*

I WAS IN A friend's shop and was looking for an AN bolt. While looking through the bins a few bolts caught my eye. Closer examination revealed that some Grade 8 bolts had gotten mixed in with the AN bolts. This is easy to do since the finish on a Grade 8 bolt is similar in appearance to an AN bolt. But you don't want to use a Grade 8 bolt in place of an AN bolt! True, Grade 8 bolts are stronger than AN bolts in tensile strength, but that does not make them better. There are other properties that differentiate Grade 8 bolts from AN bolts that may make them a poor choice in aviation applications. You don't want to use a Grade 8 bolt in your aircraft unless you are specifically directed to do so by the designer or plans/kit vendor.

Fortunately, it's pretty easy to see the difference between a Grade 8 bolt and an AN bolt. The first and most obvious difference is the length of the threads on the shank of the bolt. For any given length, a Grade 8 bolt will have considerably more threads and less grip than an AN bolt. The other difference is in the markings on the head of the bolt. A Grade 8 bolt will have six lines arranged radially, lined up with the six points of the hex head. A standard AN bolt will typically have either a cross or an asterisk in the center of the head. There may be other markings on the AN bolt head as well, but the cross or asterisk will be incorporated into those markings.

Next time you're in your shop, take a look in your AN bolt bins and make sure there are no Grade 8 bolts mingling with their AN cousins!

Note the similar color but much longer thread length of the Grade 8 bolt (on the right in each pair) as compared to the AN bolt.

Metal Corrosion

The stuff that eats at you

BY R.B. "DOC" HECKER

ONE OF THE MOST important inspections we do on our aircraft is to look for signs of metal corrosion. Such contamination may take place internally or on surface structures. Corrosive deterioration of the original metal may change surface smoothness, weaken the underlying structure, or damage or loosen adjacent parts.

Aircraft operated in or around fresh- or saltwater environments (notably, seaplanes) are at high risk for corrosion. Not so well-appreciated is that aircraft operated within proximity to a seacoast are also at risk for saltwater vapor contamination. In addition, chemical agents can initiate corrosion by directly attacking the metal if they are improperly applied or removed, as in the case of oil, grease, or exhaust residues, caustic chemical cleaners, battery acids, or leftover flux agents after structural welding or brazing. Frequent aircraft cleaning removes corrosion-promoting agents and allows for visual inspection of the metal structures to identify potential problems.

There are two general classifications of corrosion: chemical attack and electrochemical attack. In both, the underlying metal is physically converted to a metallic compound such as an oxide, hydroxide, or sulfate. Aluminum and magnesium alloys will suffer surface pitting and etching, usually with a gray or white powdery deposit. Copper and copper alloys leave a greenish or bluish deposit, while with steel- or iron-containing metals, reddish or black deposits are noted.

TYPES OF CORROSION

The many forms of corrosion are dependent on various factors, such as the metal involved, the metal's size and shape, its specific function, the atmospheric condition it resides in, and which corrosion-producing agents are present. Interestingly, thicker metal sections are more corrosion-prone than thinner sections due to the change in physical characteristics after machining. The following are the more common forms of corrosion found in aircraft structures.

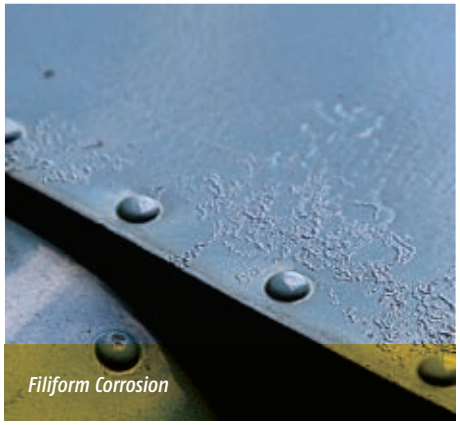
SURFACE CORROSION

Surface corrosion typically appears as general roughening of the surface with pitting or etching, and it may be accompanied by a powdery deposit of corrosion byproducts. If the area of corrosion is beneath the surface coating, the first clue may be the lifting of surface plating or paint in small blisters from the underlying pressure of the accumulating corrosion deposits. Because of the spider-web-type pattern of surface deformity, this is sometimes known as filiform corrosion. Magnesium and aluminum structures showing paint deformities should be immediately inspected for underlying corrosion.

DISSIMILAR METAL CORROSION

In the presence of an electrolyte, dissimilar metals in contact with each other may initiate an electrochemical (galvanic) action that can cause severe pitting and destruction. Typically, this galvanic reaction is hidden from surface view and is found by disassembly and inspection. Review a dissimilar metal chart, typically found in aircraft mechanic handbooks, to guide you in identifying conflicting metal contact. Direct attachment of aluminum to steel surfaces

PHOTOGRAPHY BY H.G. FRAUTSCHY



Filiform Corrosion

Surface Corrosion

Dissimilar Metal Corrosion

Intergranular Corrosion

will begin dissimilar metal corrosion unless protective measures are taken to adequately prepare the mating surfaces, including electroplating, metal spraying, chemical treatments, or special wrappings.

INTERGRANULAR CORROSION

Intergranular corrosion is an insidious problem caused by an attack along metal grain boundaries, and it is commonly a result of a lack of uniformity of the metal grain in the alloy structure. Aluminum alloys and some stainless steels are prone to this form of corrosion. Very severe intergranular corrosion may cause the surface metal to exfoliate due to pressure of corrosion products within the grain boundaries that leads to delaminating of the surface metal or causing the metal to flake off.

STRESS CORROSION

Stress corrosion occurs because of the combined effects of sustained tensile stresses in a corrosive environment. Although stress cracking occurs in any metal system, it is especially prevalent in aluminum, copper, stainless steels, and high-strength (greater than 240,000 psi) alloy steels. This corrosion may be either transgranular or intergranular in nature and usually follows cold-working stress points. Areas of concern include aluminum alloy bell cranks with pressed-in bushings, landing gear shock struts with coarse (pipe) thread grease fittings, shrink fittings, and overstressed B-nut fittings. Inspection of the radius of bends in cold-worked metals should be included in your corrosion check.

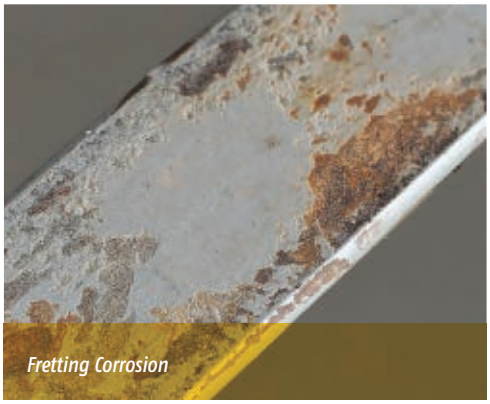
FRETTING CORROSION

Fretting corrosion may be particularly damaging when two surfaces normally mated together begin to undergo motion relative to each other. The mated surfaces accumulate fine debris that causes further abrasion. The debris particles typically

Stress Cracking Corrosion

PHOTOGRAPHY BY **STEVE CUKIERSKI**

cannot escape the abrasive environment, and in the presence of water vapor, the destructive process is accelerated. Deep grooving resembling Brinell marks or pressure indentations may be noted. The so-called "smoking rivet" indicates rivet loosening with the "smoke" consisting of a metal debris trail. This smoke trail signals inadequate metal-to-metal fixation with potential underlying corrosion that should be investigated within a short (25-hour or less service time) maintenance period. Smoking rivets should always be replaced.



Fretting Corrosion

CORROSION LIMITS

Corrosion, no matter how slight, is physical damage to metal. This damage is classified under four standard types: (1) negligible damage, (2) damage that is repairable by patching, (3) damage repaired by insertion of new materials, and (4) damage that requires part replacement. The term "negligible" does not imply that no action is necessary—the corroded surface needs to be cleaned, treated, and coated (e.g., painted) as appropriate. Negligible damage is defined as a change of a metal surface that is scarred or has had the protective coating eaten away, and the metal has noticeably begun to etch.

INSPECTION

Cleaning an aircraft and keeping it clean is important to detect evidence of metal corrosion. Any change in the usual color of a metal, or a change in a coating or paint finish, signals that metal corrosion may be occurring. Depending on the aircraft, there may be recurring problems noted with a particular make and model that lead you to do more frequent visual inspections. Examples of these types are seaplanes, conventional gear aircraft in which moisture collects in the tail section, and Cessna 200-series aircraft with foam core elevators and trim tabs.

Hard to reach structures may require mirror inspection or the use of a flexible fiberscope. Mechanical methods such as a "coin tap" to detect a change in the "ringing" of the metal (dull report or thud) or the use of a sharp device (awl) can be helpful in detecting a change of integrity of a metal's soundness. Non-destructive testing measures such as dye penetration methods can be used if hidden corrosion or metal damage is suspected. These advanced inspection methods are best left to use under the supervision of a qualified airframe mechanic.

PHOTOGRAPHY BY **H.G. FRAUTSCHY**


Magnesium Corrosion

REMOVAL

Corrosion removal is necessary to preserve the metal structure, and it requires that the surface covering the area of corrosion also be removed. Cleaning of the affected area to expose all of the suspected damage is necessary as extensive corrosion on any panel surface may necessitate treating the entire panel. The following five steps are essential during the removal process: (1) cleaning and stripping of the corroded area, (2) removing as much of the corrosion products as practicable, (3) neutralizing any residual materials remaining in pits and crevices, (4) restoring protective surface films, and (5) applying the temporary or permanent coatings or paint finishes.

TREATMENT

The treatment of corroded surfaces is based upon the type of metal that is being attacked. Consult an aircraft mechanic's manual prior to treatment of ferrous metals, anodized surfaces, magnesium and titanium alloys, stressed steel components, and aircraft structures and surfaces with specialized coatings (e.g., Parco lubrizing). For the treatment of unpainted aluminum surfaces, a typical aluminum corrosion treatment is as follows:

- Remove oil and surface dirt with a mild cleaner using a stiff fiber brush prior to abrasive cleaning. Do not use steel- or ferrous-containing bristles when cleaning aluminum surfaces as these bristles will leave dissimilar metal residue on the cleaned aluminum surface.
- Hand polish with a fine abrasive or quality metal polish. If a surface is particularly difficult to clean, a metal cleaner and brightening compound for aluminum can be used to accelerate the process for a clean, bright finish.
- Treat any area with an inhibitive material such as alodine or one of the commercially available products. Wipe the area with a clean cloth.
- Treated unpainted aluminum areas should be finish-protected with a coating of a quality waterproof wax.

Aluminum surfaces that are to be painted can be exposed to a more severe cleaning procedure that includes the application of a solution of phosphoric acid (etching) and chromic acid (alodining) prior to the restoration of paint coatings.

CORROSION INHIBITORS

Trademarked products such as LPS 3, ACF-50, and CorrosionX are marketed as corrosion inhibitors for all refined metals. These products penetrate joints, rivets, seams, and hinges and chemically neutralize the corrosion prone environment by immediately removing moisture. All of these agents are touted to have the capability to remove saltwater, but they will not loosen any rivets or secured joints. These compounds are safe on metals, plastics, paints, and seals, and they can be used to treat your metal surfaces in all types of environments. All are clean and free of toxic and greasy residues. A single treatment will neutralize (not remove) ongoing corrosion and continue to protect your affected structures for up to two years. EAA

R.B. "Doc" Hecker, EAA 789419, is an FAA senior aviation medical examiner. He is a private, instrument-rated pilot with more than 3,000 hours and has restored three aircraft and built an RV-8. He is a member of EAA Chapters 35 and 92. Much of the information in this article was adapted from Chapter 6, "Aircraft Cleaning and Corrosion Control," of the Aviation Maintenance Technician Handbook, FAA Publication FAA-H-8083-30. Visit *www.SportAviation.org* for a direct link to the online document.

PHOTOGRAPHY BY **H.G. FRAUTSCHY**


> No Hand Propping Exclusions.
Insurance you swear by, not at.
Now is not the time to find out you bought second-class coverage. The small print of the EAA Aircraft Insurance Plan* doesn't contain sneaky exclusions that leave you to fend for yourself. How about your plan?
Visit www.eaa.org/insurance or call 866-647-4322 to find out how the EAA Aircraft Insurance Plan is different from the rest.
EAA Aircraft Insurance Plan
When you support the EAA Aircraft Insurance Plan, you're supporting EAA's efforts to grow participation in aviation.
*Administered by Falcon Insurance Agency. Coverage available for experimental and production aircraft.

The pilot loaded up the aircraft with his girlfriend and two young children and headed over water to Friday Harbor for a $100 hamburger on the first flight after an engine teardown and installation of a new propeller.

Return to Service

You're a test pilot—act accordingly

BY MIKE BUSCH

A CLIENT OF MINE had been searching for months for a Bonanza A36 to buy. He'd narrowed his search to two promising candidates. One of them had recently suffered a "forgot to remove the tow bar" prop strike. This necessitated an engine teardown inspection and prop overhaul, both paid for by insurance. The seller was appropriately upbeat in his communications with my client:

All internal engine airworthiness directives (ADs) were completed. The starter adapter was overhauled. All new crank shaft bearings, connecting rod bearings, and some other bearings (all replaced as a normal course of teardown). Twelve new hydraulic lifters (these were found to have excessive wear and were recommended to be replaced). New three-bladed prop. Newly overhauled hub with all new hub seals. New de-ice boots. Engine completely cleaned internally (all residue and sludge deposits removed). Lots of new parts, pins, gaskets, bolts, etc. No damage of any type was found related to the tow bar incident. As I stated above this plane is in great shape and now a completely known commodity. This plane won't require a pre-buy, because more information than one could ever dream of getting in a pre-buy is already available.

Less than a week later, my client received this downbeat follow-up from the seller:

I wanted to let you know the Bonanza is off the market—permanently. On the test flight after the new prop, teardown, etc., the prop had an overspeed situation and the engine blew up while my partner was on the way to San Juan. No one was injured in the accident. It is kind of sad; she was such a nice aircraft!

ACCIDENT FLIGHT

The local newspaper carried an interesting story and some dramatic photos of the crash scene on Lopez Island just east of the intended destination of the San Juan Islands.

According to the newspaper account and the National Transportation Safety Board (NTSB) preliminary report, the 50-year-old owner of the 1996 Bonanza A36 loaded his 43-year-old girlfriend and her two young sons into the airplane and took off from Paine Field in Everett, Washington, for the 30-minutes-over-water flight to Friday Harbor.

The Bonanza overflew Whidbey Island Naval Air Station airspace at 5,000 feet and began to descend over water as the craft headed toward the San Juan Islands. Shortly thereafter, the pilot observed rpm increasing. He pulled back the prop control, but

PHOTOGRAPHY COURTESY OF **MIKE BUSCH**

rpm continued to rise. He then throttled back in an attempt to control the propeller overspeed, but he heard a loud bang from the engine followed by smoke in the cockpit and loss of engine power.

The pilot was now over Lopez Island and attempted to reach a small airstrip but quickly determined he wouldn't make it. He initiated a forced landing on a nearby road, had to pull up at the last minute to avoid a vehicle, then landed on the road. The left wing struck a wooden fence post, resulting in substantial structural damage and twisting and buckling of the empennage.

The pilot and passengers were treated for scrapes and bruises by the Lopez Island Fire Department. The sheriff was quoted by the newspaper as saying, "The aircraft's fortunate landing was due in great part to the pilot's composure and skill."

WHAT WAS THE PILOT THINKING?

What possessed this pilot to conduct his initial post-maintenance test flight (immediately following an extensive engine teardown and propeller overhaul) on an overwater flight with a cabin full of passengers, including children? Could he possibly have been oblivious to the extremely high risk associated with such a flight?

Unfortunately, the FARs aren't particularly helpful:

§ 91.407(b) No person may carry any person (other than crewmembers) in an aircraft that has been maintained, rebuilt, or altered in a manner that may have appreciably changed its flight characteristics or substantially affected its operation in flight until an appropriately rated pilot with at least a private pilot certificate flies the aircraft, makes an operational check of the maintenance performed or alteration made, and logs the flight in the aircraft records.

This regulation requires a post-maintenance test flight to be made (without passengers) and logged after any maintenance to the aircraft "that may have appreciably changed its flight characteristics or

The pilot and his three passengers walked away with only scrapes and bruises, but the Bonanza was a total loss.

MIKE BUSCH

The Mooney owner elected to fly 160 nautical miles from the Bahamas to Florida with an engine producing only 50 percent power, an uncontrollable propeller, and a landing gear that wouldn't fully retract. Amazingly, he made it.

substantially affected its operation in flight." But the reg leaves quite a bit to the imagination. Exactly what kind of maintenance meets this definition? Who makes the call whether or not a post-maintenance test flight is required? The regulation doesn't say.

In a perfect world, a conscientious mechanic would have counseled the owner to perform a test flight without passengers and near the airport, but that didn't happen. Or if it did, the mechanic's advice was ignored. I can find nothing in the FARs to suggest that the mechanic had any regulatory obligation to offer such counsel. Because §91.407(b) is located in Part 91 Subpart E (which speaks to owners) rather than in Part 43 (which speaks to mechanics), it's pretty clear that the FAA looks to the owner, not the mechanic, to make the call.

Certain kinds of maintenance—horsepower increase, speed modification, STOL (short takeoff) and landing kit, etc.—obviously require a post-maintenance test flight, since these alterations are specifically intended to "appreciably change flight characteristics." But what about an engine teardown or prop overhaul? Could these be expected to "appreciably change flight characteristics" or "substantially affect the aircraft's operation in flight"? In our real world, mechanics and technicians make mistakes! As I've discussed in previous columns, NTSB data clearly demonstrates the risk of a catastrophic engine failure on the first flight after a teardown or overhaul or rebuild is alarmingly high. More generally, the first flight after maintenance is by far the most likely time for an equipment failure that can compromise safety.

In my view, a test flight should be made every time an aircraft is returned to service after maintenance. The test flight should be made without passengers, under daytime visual flight rules, and conducted in a safe environment in close proximity to an airport in case something goes wrong. The FARs don't require this, but it's common sense.

NOT AN ISOLATED CASE

Two days after I learned about the A36 crash, I received a phone call from the owner of a 1966 Mooney M20C who wanted to put his aircraft under professional maintenance management with my company. "I feel compelled to warn you," he told me, "that this aircraft hasn't flown for two years." He then proceeded to tell me the backstory.

It seems that the owner had flown his aircraft to Nassau, Bahamas, and while there he suffered a prop strike involving an object at the airport. His aircraft went into the shop at Nassau, he contacted his insurance agent, and ultimately the underwriter issued the shop a check for $25,000 to pay for the engine teardown, prop replacement, and minor airframe repairs.

Unfortunately, receipt of this advance payment relieved the shop of any real incentive to get the Mooney repaired quickly. Much to the owner's frustration, things progressed at a glacial pace. The shop ultimately shipped the engine to Florida for teardown, ordered a

PHOTOGRAPHY COURTESY OF MIKE BUSCH

replacement prop, performed some airframe repairs, reinstalled the engine, and installed the prop. By the time the aircraft was approved for return to service, a full year had elapsed.

The owner took an airline flight to Nassau, hopped into his Mooney, and launched overwater for the 160-nautical-mile flight to Fort Lauderdale, Florida. Within minutes, the owner discovered that his fuel pressure gauge was reading far below normal, his engine was unable to produce more than about 50 percent power, the propeller pitch was uncontrollable, and the landing gear wouldn't fully retract. Despite all these discrepancies, the owner was apparently so desperate to get his airplane back to the U.S. mainland that he continued the flight over the high seas and miraculously managed to make it to Fort Lauderdale, where the Mooney remained in a repair facility for the better part of another year while the multiple discrepancies were troubleshot and resolved. The Florida phase of this ordeal involved a second engine teardown; replacement of the prop governor, carburetor, fuel pump, fuel selector valve; and extensive airframe repairs.

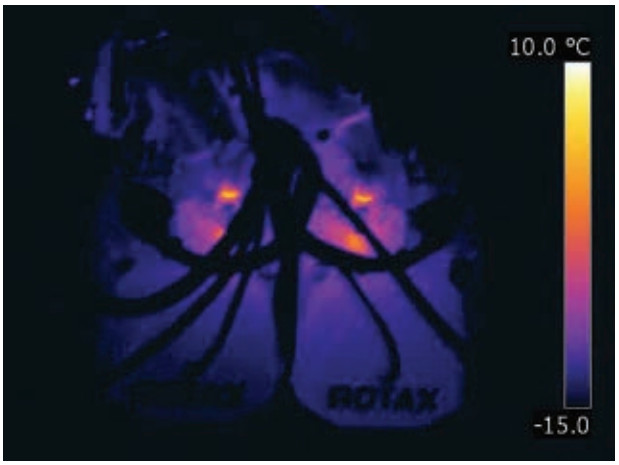
When my firm finally took over maintenance management responsibility for this aircraft, we called the director of maintenance of the shop in Fort Lauderdale to inquire about the condition of the aircraft. He said, "Let me put it this way: I'm sure glad he didn't fly over my house!" The director made it clear that after inspecting the Mooney, he found it quite astonishing that the owner/pilot managed to make it from Nassau to Fort Lauderdale without winding up in the ocean.

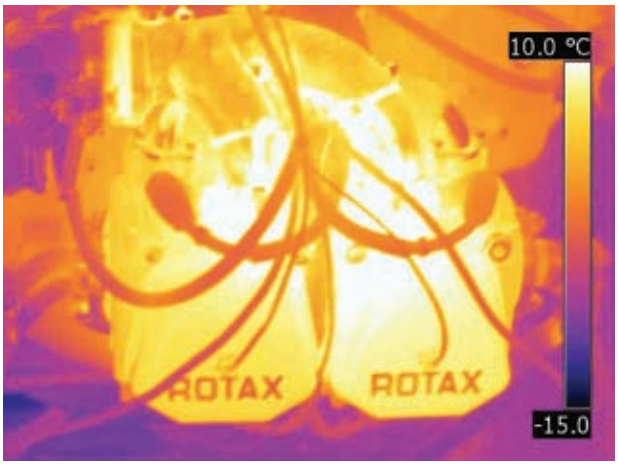
Not long ago, I received an e-mail from another client, a brilliant engineer and owner of a Cirrus SR22. My firm just finished managing his annual inspection, and he was making arrangements to pick up the airplane from a Cirrus-authorized service center in Southern California. He'd mentioned that he needed to pick up the airplane Friday, because on Monday he was leaving on a three-week transcontinental trip. His e-mail:

"Should I ask the mechanic to fly with me around the pattern for an in-flight test? I have never done this; mostly I just preflight the plane and then fly away. What are your thoughts?"

What advice do you suppose I offered him? EAA

Mike Busch, EAA 740170, has been a pilot for more than 44 years, logging more than 7,000 hours. He's a certificated flight instructor and an airframe and powerplant mechanic with inspection authorization. E-mail questions to Mike at *mike.busch@savvyaviator.com*. Mike also hosts free maintenance webinars on the first Wednesday of each month at 8 p.m. (Central). To sign up or access the archives, visit *www.SavvyMX.com/Webinar*.





These thermal images are from a Rotax 912 ULS that was cold soaked and sustained in a -20 degree Celsius environment. On the left is the engine after a half hour of preheat time. On the right is after 5 hours of preheat time.

Shaking Off the Chill

Preheating solutions for winter flying

BY TIM KERN

IT ISN'T JUST US; cold weather is uncomfortable for our airplane engines, too. Not only do the metal parts shrink, but the oil also gets "thicker" (more viscous) at low temperatures. Cold decreases power available from the battery and increases the load on the starter motor, even as it reduces the amount of oil available for lubrication. Cold oil takes longer to coat surfaces, leading to higher wear at start-up and during warm-up. In cold weather, everything works against you.

Even with multi-viscosity and more-stable synthetic oils available, cold-starting presents plenty of problems, and solutions run from old-tech to modern, with some downright dangerous practices.

When I was in college, I would drain the oil from my car and bring it into the dorm, placing it on the room's heater overnight. In the morning, I'd pour the heated oil back into the old Renault and have a friend run the anemic starter motor, as I helped by turning the crank at the rear of the car. If the engine started, I'd keep it warm all day. If I parked during a class, I'd throw a blanket over the engine. If I parked close enough to an outlet, I could avoid the mess of draining the oil by using a "trouble light" with a 100-watt bulb under the sump. Later, I discovered the "dipstick heater" and stopped draining the oil daily. Then spring came and I got rid of that car.

At the airport, a walk down the ramp in cold weather will reveal a number of solutions: infrared-heated hangars, blankets and light bulbs, counter stools with flaming cans of Sterno sitting under engines (don't do this!), dipstick heaters, guys with hair dryers (okay) or heat guns (be careful), heat blankets, home-style electric space heaters, and dedicated "proper aviation engine heaters" of several types. All raise the temperature of the engine and oil; not every one is a good idea.

Assuming you run the proper oil for your engine and climate, what else can be done to make cold starts less destructive to the engine and easier on batteries, starters, and yourself? A cold battery delivers less power; this can lead to starter damage, as well as failure to start. For this reason, Teledyne Continental Motors (TCM) advises, "Always use an external power source when attempting to start your aircraft engine in cold weather."

Of course, you can also warm your battery, too. If your battery is in the engine compartment, an under-the-cowl heater will heat the battery as well as the engine. For batteries located elsewhere in the aircraft, separate battery heaters are available from Tanis Aircraft Products, Wicks Aircraft Supply, and other aircraft supply houses,

WHAT TO CONSIDER

First, assess your environment. Whenever you add heat to anything, there is the danger of fire. (Is your hangar clean? Are you storing combustibles properly? Are your shop rags properly managed?) Consider how often you will need to preheat your engine. Although you may need to preheat

PHOTOGRAPHY COURTESY OF THE ROTAX OWNER ASSISTANCE NETWORK

occasionally in Tennessee, you'll need to do it more frequently in places like Minnesota and North Dakota. How much preheating you do and how much you spend on equipment or services depends on your geography and flying plans. Be realistic, and keep your solution simple and practical, but don't do anything dangerous.

First, be sure that your airplane is in good condition. Hoses should be replaced at least every five to 12 years. Loren Lemen, TCM's manager of service engineering, warns that you shouldn't tolerate any fuel or oil leaks; though liquids may not flash on your engine, they may drip on places where fire is a danger. Don't allow any sludge buildup on exterior surfaces.

WHAT NOT TO DO

Don't use open flames. Loren says, "Don't rely on a 'dragon' propane-fired type heater; it will build hot spots. You need to preheat all the oil: in the sump, the cylinders, the case—and the oil tank. Keep an eye on your temperature, too. Keep temps even and not too hot." And don't preheat unless you're going flying. "Constant preheating will cause condensation that will cause rust," Loren says.

How much preheating you do and how much you spend on equipment or services depends on your geography and flying plans.

Hot-air room heaters often used to blast warmth into garages can cause hot spots around the engine. When hot air is directed at the aircraft rather than generally throughout the hangar, the resulting high temps can damage cowlings, paint, and especially wood or composite propellers. The obvious fire hazard should need no mention.

Loren warns about using a dipstick heater, too: "These build up cooked, caked oil on the heater portion of the dipstick. That stuff scrapes off and goes into the sump. If you use them, change your oil and filter often. You'll be upset if your caked-up dipstick reduces your resale value—and the buyer then finds out that the only buildup was really just on your dipstick!"

WHAT YOU CAN DO

"If the temperature is mild, say, 30-40°F, you may get by with just a light bulb and a blanket," Loren says.

Change your oil more frequently in cold weather, particularly if you fly infrequently. The *Lycoming Flyer* notes that "... operation in ... cold climates ... will require proportionately more frequent oil changes despite use of the oil filter." The publication warns against buildup of other contaminants: "The oil filter does not remove contaminants such as water, acids, or lead sludge from the oil. These

contaminants are removed [only] by changing the oil."

There is good advice contained in the service bulletins and service information letters (SIL) of the major engine companies. TCM's SIL 03-1, for example, specifically addresses engine preheating. For operations below 20°F (7°C), TCM says, "Failure to properly preheat a cold-soaked engine may result in oil congealing within the engine, oil hoses, and oil cooler with subsequent loss of oil flow, possible internal damage to the engine, and subsequent engine failure."

TCM emphasizes that preheating must be comprehensive—not just sump oil or a dipstick heater. "Superficial application of preheat to a cold-soaked engine can cause damage to the engine. An inadequate application of preheat may warm the engine enough to permit starting, but will not decongeal oil in the sump, lines, cooler, filter, etc." TCM warns, "The engine may start and appear to run satisfactorily, but can be damaged from lack of lubrication due to the congealed oil blocking proper oil flow through the engine. The amount of damage will vary and may not become evident for many hours. However, the engine may be severely damaged and may fail shortly following application of high power."

If you live in or frequently fly in cold environments, there is just no substitute for a dedicated preheat system.

Lycoming's Service Instruction No. 1505 also cautions against high-power applications and offers an explanation for possible "faulty" oil pressure readings: "Allow up to one minute for oil pressure to stabilize, since lines to the gauge may remain cold."

If you have a high-volume heater/blower (not that little space heater from your office), TCM says you can "apply preheated air directly to the oil sump, oil filter, external oil lines, oil cooler, coolant radiator, and cylinder assemblies" for at least half an hour. Once the engine is running, keep its rpm low until the oil temp is at least 75°F, because running even moderate rpm "before reaching minimum oil temperature may result in engine malfunction, engine failure, injury, or death." All undesirable outcomes.

If you're "on the road," you may want to check ahead to see which fixed base operators offer preheating services. When you do find one, watch their line personnel to be sure they know what they're doing!

HOW TO DO IT YOURSELF

Keep your aircraft in a heated hangar for several hours prior to start-up, or you can purchase a portable preheat system like the SureFire and SureStart Pro (around $500 from Sporty's) that fit in steel "toolboxes," using standard propane cylinders and 12-volt accessory plugs for their fans. They may not work in Alaska in February, but they can make a huge 50,000- to 100,000-BTU difference, actually too hot for some applications. Note: Don't drain so much of the airplane's battery running the blower that you don't have enough juice to start the airplane. These units have clips for use with a different battery (say, your rental car), or you can use a complete 115-volt AC system.

E-Z Heat ($149.95 from Aircraft Spruce) weighs less than a pound and sticks to the sump of your engine. The company says it will heat "12 quarts of oil from -40°F to +60°F in one hour, using 300 watts of electricity."

The clever Northern Companion ($549) weighs 6.5 pounds and burns gasoline (leaded or unleaded), kerosene, jet fuel (JP-4 or -8), or diesel. It produces 20,000 BTUs, stores in its own stainless steel container, and, most importantly, requires no electricity.

The AeroTherm Deuce ($499) is a 6,500-BTU, 110-volt, AC plug-in, all-electric heater that warms up cold engines by blowing heated air through the cowl ducts.

Design Logic Inc. makes lightweight aluminum multi-point heat systems ($189-$199) that use house current and adhere permanently to engine parts.

Automotive solutions (e.g., 110-volt heating pads for batteries or sumps, or dipstick heaters), are cheap and available

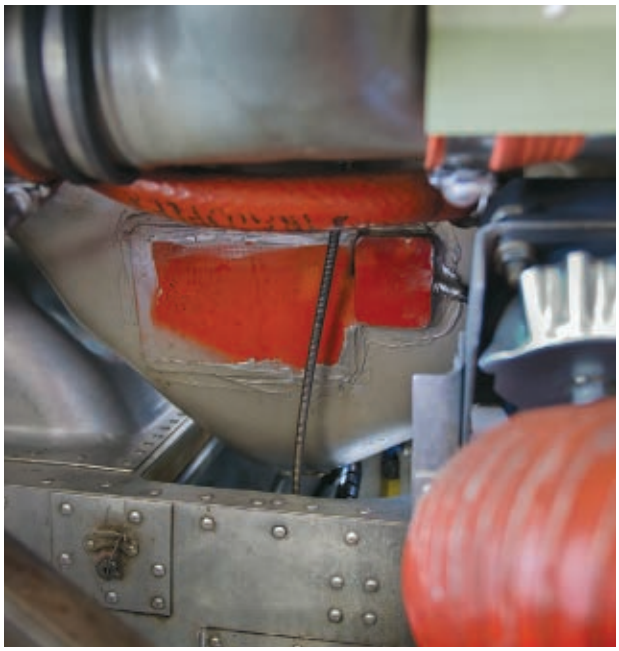
Blankets and forced air heaters are one way to warm an airplane engine, but that's "inexact science"; some parts of the engine/aircraft will warm quicker than others. Specialized preheaters offer the best option.

anywhere, but most require 110-volt AC. Aviation-grade variants (Reiff Hotstrip, $189) are rugged and can be used in combination with other pads and even your sump or, in a pinch, dipstick heater.

Or you can go full-boat and use a professionally developed preheat system, like those available from Tanis Aircraft Products. Tanis even makes preheat systems for the Rotax 912/914 series ($649), and it has one model that will work with virtually all common aircraft piston engines. Prices for Tanis systems vary depending on the airframe and engine (and cost of the STC). For a typical four-cylinder Lycoming engine, for example, preheaters range from $420 to $720.

Though not cheap, these engineered, dedicated systems do the best job, properly heating the oil and all parts of the engine while remaining safe for cowls, baffle seals, propellers, electronics, etc. If you live in or frequently fly in cold environments, there is just no substitute for a dedicated preheat system. Tanis, for example, has been developing weather protection systems for more than 35 years. It offers complete winter protection packages for piston-powered aircraft as well as preheat systems for turbine aircraft and helicopters.

PHOTOGRAPHY BY **EARL DOWNS**



A Tanis heater installed on a Cessna 210.

INSTALLATION REQUIREMENTS

For experimental aircraft, no paperwork is generally required to add a preheater to your engine. Just be sure that your installation is airworthy. Pay special attention to possible hot spots, places where wires can get tangled, and interference with your cooling or exhaust system.

For certified aircraft and light-sport aircraft (LSA), systems that do not stay attached to the engine or airframe—heated dipsticks replaced before flight, external blowers, most blankets, and the many pad heaters—require no paperwork. Some simple pad systems (e.g., Design Logic's glue-on pads) require only a one-time FAA Form 337 (Major Alteration or Repair). Dedicated systems (e.g., Tanis) usually require a supplemental type certificate. For these last two items, remember that LSA regulations are more restrictive than Part 23; there is no Form 337 for LSA, and any supplemental type certificate needs the airframe (and/or engine) manufacturer's approval.

While you're waiting for that engine to warm up, don't forget to thoroughly de-ice the airframe! EAA

Tim Kern, EAA 852075, is a private pilot and certified aviation manager as well as an aviation writer and consultant based near Indianapolis. You can find him online at *www.TimKern.com*. For service instructions and sources for preheat equipment, visit *www.SportAviation.org*.

PHOTOGRAPHY BY JIM KOEPNICK

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LAURAN PAINE JR.
COMMENTARY / SPIRIT OF AVIATION

Grumman Wildcat

Fighter Combat

A day in the life

EVER WONDER WHAT IT'S like to fly a fighter in combat? Well, today you're going to find out. It's World War II. You're on Guadalcanal, and you're the pilot of a Grumman F4F Wildcat. It's not sleek or pretty, but it's tough and it's your bird against the enemy; bring it on!

You have about 25 total hours in the airplane, the first operational aircraft you've flown since completing pilot training. You're starting to get the hang of it, and you think you're ready to fight. But you've never actually been in combat before. At 21 years old, you figure you're almost indestructible—but ya ain't really been shot at yet.

At the bar with your buddies, you're pretty confident, as are most. In private, you sometimes wonder how you'll do. You shake that thought; you only want to think you'll do well, even with bullets flying. Your squadron mates need you, and there's no way you're going to let them down. There's no way you won't make your family back home proud. But the din and confusion of combat has its own initiation: Will you keep your wits? Your skill? Your courage?

The objective is clear. Islands in the Pacific are a valuable resource; they're stepping stones to Japan. Both Japan and the United States want them. You and your F4F are needed to help secure Guadalcanal.

PHOTOGRAPHY BY **JIM KOEPNICK**

The F4F has a reputation for being "Grumman tough." Great engine, Pratt & Whitney 1830, twin-row radial, 1,200 hp. Pretty good visibility, but no bubble canopy, so it's a little harder to see directly behind you. You can't blow the canopy; you have to manually slide it back to bail out, and canopies can jam, especially damaged ones.

After takeoff, you change hands on the stick and crank the gear up with the help of pulleys, levers, chains, and pivots. *You* are the hydraulics; it's kind of complicated, but it works quite well and is strong. The gear is also quite narrow; it works okay on carriers because the tail hook grabs and holds you before the airplane gets squirrely, but on land, get it straight before you touch down or it'll try to swap ends. Add to that the sometimes cruddy runways of combat operations—muck, ruts, dust, and bomb craters—and you have your hands full. It's pretty obvious you're not on concrete in Kansas anymore.

The din and confusion of combat has its own initiation: Will you keep your wits? Your skill? Your courage?

Conditions on Guadalcanal are brutal: jungle living, hot, humid, filled with bugs—all mixed with combat. Dinner is always dehydrated potatoes, Spam, cold hash, and rice. Almost everyone has some degree of malaria. Shake it off—the mission is all that matters. It's the same for every man in the unit: Everybody works hard and everybody faces danger. It's a way of life; you don't have a lot of time to think about it, and you don't want to. You have a job to do, for your buddies and your country. That's just the way it is.

You'll be at Henderson Field. Recently captured from the Japanese, personnel there are hanging on by a thread. The Japanese want Henderson Field back, or they want to destroy it so you can't use it. Either way, they're coming after you with Betty bombers from Rabaul and Zero fighters to protect them. To your advantage, that's a long haul, so they don't have a lot of fuel to spare. The fights will be furious, but probably brief. With allied "coast watchers" on the outlying islands and radar, you'll usually get some warning that they're coming. Still, you've never been in combat. You want to kick some butt, or at least you think you do.

After launching from the carrier *Long Island*, you land at Henderson just days after it is captured from the Japanese. The field is muddy, 3,500 feet long and 150 feet wide, with crude revetments bulldozed around it. Troops there are glad to see you. Japanese Betty bombers and the Zeros are bombing and strafing almost daily, and Henderson is basically uncovered. Your band of pilots and F4Fs are Henderson's salvation. It's a great responsibility, and you don't take it lightly.

By noon the next day, airplanes are fueling up from 55-gallon drums. There wasn't enough time to get yours fueled, so you stay behind. The Bettys and Zeros drop 50 bombs on Henderson. It's a mess. You feel the bombs and think, *Damn!*

A Grumman F4F Wildcat at Henderson Field, Guadalcanal, on February 2, 1943.

This is for real! I gotta help my buddies! Your plane is undamaged; you'll get your chance tomorrow.

The morning comes, and your plane is ready. You will be on 1st Lt. Meeker's wing. You brief; then you wait for four hours. No word from the coast watchers or from radar. You feel some apprehension, but keep it to yourself. The warning finally comes: "Inbound Japanese aircraft, 30 or 40 of them." You run to your airplane, climb up, step over the canopy rail, plop down on the seat, and hit the starter. The Pratt sputters, starts, and rumbles. You fasten your belt and harness and pull on your helmet. Meeker pulls out and you follow him. He goes directly to the runway and powers up; you do the same, and just like that, you're off.

You're airborne, in your familiar little cocoon of stick, rudder, throttle, guns, and clatter. You fly a loose formation while you crank the gear up, and then settle in off Meeker's wing. He looks out at you. This is it—combat! Your squadron mates are forming up around you. Some P-39s take off after you. With no oxygen, they'll climb to 12,000 feet and be low cover; you'll climb to 15,000 feet and be high cover.

Where are the Bettys and Zeros? You rubber-neck looking for them. They like to be high and pop out of clouds. The radio crackles: It's the P-39s. "Zeros over us! Jumping us!" The fight is on! Meeker dives and you follow to protect his tail. Damn, there are airplanes all over the place! Some are in and out of the clouds. Other Wildcats are diving on the Bettys with high, side-angle passes to avoid the tail guns. You see the Wildcats fire and one Betty explodes like a tin can full of gasoline. They told you the Zero would do the same if you hit it; it's maneuverable but it isn't tough like the Wildcat.

Meeker fires on a Zero and pieces fly off, but no explosion. The Zero rolls slowly left and goes into a cloud—you're pretty sure he's hit bad. You follow Meeker under the cloud; your aircraft shudders and you feel some pings—pieces from the Zero. You both pull up and head to the left, toward the fight, with your head turned as far as possible to see if anyone is behind you. There's a Zero, but he's pointed toward a Wildcat on your right. Those two are head-to-head and no one is blinking! They both fire, miss, and immediately turn to try to gain advantage.

You get back to covering Meeker. You haven't once looked at the engine gauges, because you don't need to: If the engine is running, you're in the fight. Throttle has been to the firewall most of the time. Meeker spots another Zero to the right and goes after him. Some Bettys fly under you, heading for Henderson. You're off Meeker's wing to the left, covering him, when you see him wave toward a Betty, pointing down. You take the cue and dive on the Betty, figuring Meeker senses the fight thinning and he can take care of business alone the rest of the way.

The Betty is right in front of you now. It isn't good to be right behind those tail guns, but he's a target and he's headed toward Henderson and a bunch of your fellow GIs. You close to within 700 feet and he fills your gun sight. He knows you're there and starts firing, so you give him a burst and see pieces coming off his right wingtip. He goes into a cloud. You look around: Where did everybody go? Man, this gets confusing fast. You probably won't get credit for a kill, but the odds of a badly damaged Betty with pieces coming off its wing making a four-hour flight back to Rabaul are fairly slim. All you care about is that you flew into the beehive, kept your wits, fought back, and now know, deep inside, the content of your character. You are an American fighter pilot and you passed the first test.

One Wildcat appears to be heading toward Henderson—might be Meeker, so you head that direction, too. Two Zeros are strafing the field, but a Wildcat is right behind them, waiting for his shot. The Zeros pull up; the Wildcat keeps up with them initially, but the space widens. They get away and don't come back. You suddenly realize you're drenched in sweat.

Other Wildcats are landing. There are lingering plumes of smoke around the field. You take a position in the pattern, slow, and crank down the gear. The engine is still running strong, maybe only a little damage to the airplane from the debris you hit. Slowing to 75 knots, you come around the corner and land on ruts and bumps in a cloud of dust.

You taxi over to the other Wildcats, afraid to count them, and see Meeker's airplane. Shirtless mechanics are already crawling all over the airplanes. After shutting down, you crawl out of the cockpit and head for the debriefing. You're one of the boys now. Later you eat some fake potatoes and Spam and try to get some sleep. The Bettys will be back tomorrow, and you'll be there to meet them. Each day you and your buddies beat them back is a day closer to victory. EAA

Lauran Paine Jr., EAA 582274, is a retired military pilot and retired airline pilot. He built and flies an RV-8 and has owned a Stearman and a Champ.

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FROM THE DESK OF...

CHARLIE BECKER, DIRECTOR OF MEMBER PROGRAMS

ONE OF THE GREAT THINGS about EAA is the amazing people that you meet at a chapter meeting or at AirVenture. Oftentimes, you'll know the person for awhile before it finally spills out that, "Oh, by the way, I was the pilot on Marine One," or "I designed and built my own aircraft," or "I hold the world record for sailing solo around the world," or "I'm the heli pilot for the *Survivor* TV show." (All true, by the way.)

They are not pretentious. They don't want special treatment. Usually, you have to pull it out of them to get their story. The best part is that they are just like you or me—they love airplanes. In EAA, everyone is equal because we have that fundamental love of aviation.

Don't Know Much About... EAA LIFETIME MEMBERSHIP

SOME EAA MEMBERS KNOW right away that they will be members for life, so it makes sense for them to become Lifetime Members. It's their way of showing a commitment to EAA and the future of aviation. It could make financial sense as well.

Because of the upfront financial commitment ($975, plus $245 to add a Lifetime Spouse Membership), Lifetime Members receive some extra benefits on top of their current member benefits. These include access to an EAA Lifetime Member concierge, an annual invitation for two to the EAA Lifetime Member dinner during AirVenture, an endless subscription to *Sport Aviation*, and recognition on EAA Lifetime Member Roll of Honor and Oshkosh365, not to mention a ton of free gifts, including a custom embroidered Lifetime Member jacket, personalized engraved oak plaque, Lifetime Member gear bag, and much more.

Most importantly, by becoming a Lifetime Member, you're helping grow aviation through participation.

To learn more about EAA Lifetime Membership, visit *www.EAA.org/Membership/Lifetime.asp*.

Name: David Oord, EAA 999626
Position: Government and Advocacy Specialist

WHO'S WHO AT HQ

Describe what you do: I provide support on government issues and regulations, acting as a liaison to government entities on behalf of EAA members.

Before EAA: I worked in airport operations and aircraft rescue firefighting at Westchester County Airport (HPN) in White Plains, New York.

Introduction to aviation: My dad used to take my brother and me to Flo's Airport Café at the Chino Airport (CNO) in California for breakfast. I fell in love with the sights and sounds of planes and haven't stopped looking up since.

Fun aviation story: My wife, Emily, and I flew to Mackinac Island to celebrate our fourth anniversary. Due to rough weather on the return trip, we landed at the Mackinac County Airport. The owner of the FBO, Paul Fullerton, EAA Lifetime 99412, offered to let us use the courtesy car to go into town to get a hotel and eat. Great example of the EAA and GA communities.

PIC moment you'll never forget: Having the heater go out in a Piper Seminole in the middle of winter in North Dakota. The vents were stuck open, and I was forced to go around due to traffic.

What are you building right now? A Gee Bee pedal plane for my niece. Would love to build a full-size plane like Glasair's Sportsman TC someday.

Yet Another Next Step Grad Earns His Wings

Daniel Manzani shows off his temporary pilot certificate after passing his checkride September 20.

DANIEL MANZANI, EAA 875736, of Temecula, California, passed his private pilot checkride on September 20, 2010, his 17th birthday. Daniel was among the first students to use the Sporty's Complete Online Pilot Training Course offered to Young Eagles to help him become a pilot.

At age 15, Daniel went on a Young Eagles flight—his first-ever general aviation flight—with Gary Timbs, EAA 796894, in his Cessna 180. The flight inspired the teen to take the Sporty's online course, which prepares student pilots for the FAA written exam and is provided free by EAA and Sporty's. Daniel, who soloed on his 16th birthday, also applied for and received an EAA flight-training scholarship to help pay for flight lessons. His goal is to become a flight instructor and, eventually, a commercial pilot.

"Daniel is more proof that EAA is helping to create the next generation of pilots," commented Brian O'Lena, EAA youth programs manager. "With the Young Eagles flight, Sporty's online course, a free first flight lesson, flight scholarships, and the upcoming free EAA student membership, EAA is truly providing a flight plan for the student to move into the left seat."

More than 4,700 Young Eagles are enrolled in the free Sporty's online course. In addition, upon completing the course, students can apply for flight scholarships generously provided by Rolls-Royce, Jim and Angela Thompson, and Harrison Ford.

Learn more at *www.YoungEagles.org*.

FIRST BAHAMAS LSA/GA FLY-IN HAS OSHKOSH ROOTS

NEXT MONTH, THE BAHAMAS MINISTRY OF TOURISM will sponsor the first Light-Sport and General Aviation Aircraft Bahamas Fly-In, and Bahamas officials are cordially inviting EAA members to participate. Pilots will depart as a group from Florida's Fort Lauderdale Executive Airport (FXE) on December 10 and fly 83 nautical miles to Grand Bahama International Airport (MYGF) for the two-day event.

As was announced at AirVenture this year, the Bahamas became the first country outside the United States to accept the U.S. sport pilot/light-sport aircraft regulations, allowing sport pilots to use their driver's license as evidence of medical certification.

Pilots who wish to participate must complete a registration form. The Light-Sport and General Aviation Aircraft Bahamas Fly-In is supported by EAA and the Light Aircraft Manufacturers Association. Additional information can be found at *www.SportAviation.org*.

B-17 TOUR WRAPS UP THIS MONTH

IF YOU WANT TO TAKE a flight this year on one of history's most storied aircraft, the Boeing B-17 bomber, time is running short. EAA's annual *Aluminum Overcast* tour is winding down this month and has only a few stops remaining before the aircraft heads back to Oshkosh.

To reserve one of the remaining spots left in 2010, visit *www.B17.org* or call 800-359-6217.

REMAINING TOUR STOPS IN 2010

- **November 9-10**, Jackson, Mississippi, hosted by EAA Chapter 276
- **November 12-14**, New Orleans, Louisiana, hosted by EAA Chapter 261
- **November 16-17**, El Dorado, Arkansas, hosted by EAA Chapter 626
- **November 19-21**, Tulsa, Oklahoma, hosted by Vintage Airplane Association Chapter 10

A WEEKEND TO REMEMBER: FIRST EAA CANADIAN FLY-IN

THE INAUGURAL Wings Over Gatineau/Canadian EAA Convention and Fly-In in Gatineau, Quebec, drew nearly 15,000 EAA members, flying enthusiasts, and local residents, as well as scores of airplanes. The event, held on September 17-19, was part EAA fly-in, part air show, and part commemoration of the 70th anniversary of the Battle of Britain.

The Vintage Wings of Canada museum sponsored the Victoria Cross air show on Saturday, followed by the Battle of Britain dinner. Featured guest speaker was Rob Erdos, chief test pilot for the National Research Council of Canada and someone who has flown all the key British and German fighters used in the battle: the Hurricane, Spitfire, and Me 109. Not surprisingly, the Spitfire is his choice as "the best of the best."

The gathering concluded at nearby Rockcliffe Airport for the Battle of Britain re-enactment and the solemn ceremony honoring Canadian World War II veterans. The finale was the historic fly-by of the Lancaster bomber, with the Hurricane and the P-40 Tomahawk on its port side, the Corsair and the P-51 Mustang on its starboard.

The view on final approach to the inaugural Wings Over Gatineau/Canadian EAA Convention and Fly-In. Nearly 15,000 people attended.

Among the many warbirds on display was the Canadian Warplane Heritage Museum's majestic Lancaster bomber.

EAA MEMBER HOPES TO START CHAPTER IN INDIA

AT AN EAA CHAPTER LEADERS ACADEMY in September, a quick scan of the seating markers showed chapter members from Illinois, Texas, California...and India. Veena Pillai, EAA 1014639, is in the United States to complete her advanced flight training and also wants to start an EAA chapter in India.

Veena Pallai and her mother, Sarojini, at the fall EAA Chapter Leaders Academy.

She began flying in college when she joined the Indian National Cadet Corps No. 2 Bengal Air Squadron, from which she received a Defence Ministry of India scholarship to begin her initial flight training. With the support of her family, she moved to Grand Rapids, Michigan, and has completed private and commercial certificates as well as instrument, multi-engine, and advanced ground instructor ratings.

"No one in my family is involved in aviation, but my mother has been very supportive because she says that if you are interested and believe in it, anything is possible," Veena said. Her mother, Sarojini, attended all the chapter leaders sessions with Veena, as well as AirVenture 2010. Veena is finishing her certificated flight instructor training and eventually wants to fly for an airline in India, where she says there is a pilot shortage.

EAA'S 1911 BLERIOT XI TO FLY SOON

AT THIS WRITING, EAA'S REPRODUCTION of a 1911 Type XI Bleriot aircraft is almost ready to make its first flight—in plenty of time to commemorate the 100th anniversary of the first official airmail flight in the United States.

The EAA Bleriot project has been underway for the past four years and includes an original three-cylinder Anzani engine, dated 1910, acquired from a French museum. "The plan is to get a first flight in the airplane yet this fall," said Sean Elliott, EAA director of flight operations.

EAA's Type XI Bleriot reproduction was recently painted in a scheme derived from Earle Ovington's famous Queen Airplane Company's Bleriot monoplane of 1911, which made the first airmail flight from Grand Estates to Mineola, New York.

EAA's completed Bleriot XI project at the Kermit Weeks Hangar.

The conditions have to be perfect for the first flight, said John Hopkins, EAA manager of aircraft maintenance. "We'll wait for a really nice day to fly it, probably from Pioneer Airport," he said. Meanwhile the airplane will be on display in the AirVenture Museum.

The 100th anniversary of the first airmail flight will be commemorated during AirVenture 2011, at which is planned a major gathering of historic airmail aircraft.

CALENDAR OF EVENTS

U.S. Sport Aviation Expo
Sebring Regional Airport (SEF), Sebring, Florida
January 20–23, 2011
www.Sport-Aviation-Expo.com

Sun 'n Fun Fly-In
Lakeland Linder Regional Airport (LAL), Lakeland, Florida
March 29–April 3, 2011
www.Sun-N-Fun.org

AERO Friedrichshafen
Messe Friedrichshafen, Friedrichshafen, Germany
April 13–16, 2011
www.AERO-Friedrichshafen.com/html/en

Virginia Regional Festival of Flight
Suffolk Executive Airport (SFQ), Suffolk, Virginia
April 30–May 1, 2011
www.VirginiaFlyIn.org

Golden West Regional Fly-In and Air Show
Yuba County Airport (MYV), Marysville, California
June 10–12, 2011
www.GoldenWestFlyIn.org

Arlington Fly-In
Arlington Municipal Airport (AWO), Arlington, Washington
July 6–10, 2011
www.ArlingtonFlyIn.org

EAA AirVenture Oshkosh
Wittman Regional Airport (OSH), Oshkosh, Wisconsin
July 25–31, 2011
www.AirVenture.org

Colorado Sport International Air Show and Rocky Mountain Regional Fly-In
Rocky Mountain Metropolitan Airport (BJC), Denver, Colorado
August 27–28, 2011
www.COSportAviation.org

For details on upcoming aviation happenings, including EAA chapter fly-ins, Young Eagles rallies, and other local aviation events, visit www.EAA.org/calendar.

SCHOLARSHIP SPOTLIGHT: HARRISON FORD EDUCATION SCHOLARSHIP FUND

WHEN ANDREW GUNDERSON TOOK his first Young Eagles flight, he quickly realized he was meant for the sky. With the help of the Harrison Ford Education Scholarship Fund, he can pursue his aviation dreams, beginning with earning his pilot certificate.

"After my Young Eagles flight, I wanted to continue my flight training," Andrew explains. "I started flight lessons with money I saved during the summer but didn't have enough to finish. This award will help me continue taking lessons and achieve my dreams of flying."

Andrew's winning scholarship essay detailed how he became interested in aviation through watching a local aviation group fly radio-controlled airplanes. He wondered what it would be like to control a real airplane. Soon, he was flying in a homebuilt aircraft, enjoying the view from above.

"My first flight was incredible," Andrew remembers. "I really liked seeing things from a different perspective. It was cool to control the airplane, because it's much more maneuverable than a car."

Andrew believes winning the award will give him confidence in the future. After high school, he endeavors to build on his aviation interest with a career in aeronautical engineering.

"If I can win a scholarship like this for college, I know I can be successful in my life," Andrew says.

Andrew Gunderson (right) received a Harrison Ford Education Scholarship that allocates up to $7,500 toward flight lesson fees. Andrew is shown here with his flight instructor, Matthew Kurtz.

DRIVING YOUTH DREAMS

Rod Lewis, Lewis Energy Group

WHEN ROD LEWIS MADE HIS winning bid for the custom-built Ford SR-71 Mustang at the 2010 Gathering of Eagles Live Auction, he was bidding on more than just a custom hot rod. His unbeatable bid secured both the unique muscle car and a future in aviation for many youth.

Founder, president, and CEO of Lewis Energy Group, Rod has long been dedicated to inspiring youth. Whether it be sharing his extensive warbird aircraft collection or directly supporting Young Eagles, he believes organizations like EAA are crucial to sparking an interest in aviation in children and growing it for a lifetime.

Like many, Rod became fascinated with aviation at a young age. His father was a fighter pilot and instructor, so his family moved often, from one Air Force base to the next. Rod fondly remembers playing with airplane parts and tools that mechanics would leave around. This hobby eventually led him to build models of World War II fighters and bombers and, today, to fly and collect the "best of the best" WWII fighters, such as the P-38 *Glacier Girl*.

Rod, his wife, Kim, and Carroll Shelby at EAA's 2010 Gathering of Eagles.

Collecting mint-condition warbirds is a huge commitment for Rod, one he is passionate about. But even more important to him is honoring the veterans who flew the aircraft, as well as inspiring younger generations to become more involved in the world of flight. He believes that through aviation education and involvement with EAA programs, today's youth can achieve their dreams of tomorrow.

OPENING DOORS TO AVIATION

WHEN WE THINK BACK to the first days of EAA's Young Eagles program in 1992, it's hard to believe those 8-year-olds have reached an age where they might actually pursue careers in aviation. How time flies! This generational benchmark truly reminds us how crucial our support for talented youth is in paving the way for their futures.

Since the beginning of EAA's Young Eagles and Next Step programs, we have strongly believed that moving Young Eagles into the pilot's seat is made easier with the help of our members, programs, and scholarships. These support mechanisms are fueled by individual and corporate contributions, such as Jim and Angela Thompson's 2009 challenge gift to launch the Harrison Ford Educational Scholarship Fund and Rod Lewis' 2010 Gathering of Eagles donation that will directly benefit EAA's youth programs.

Without their support, students like Andrew Gunderson would not be able to achieve their goals, moving on to secure the future of flight. We need to continue empowering younger generations today to ensure they remain motivated participants and advocates for our industry tomorrow.

The time is now to open the door to aviation for deserving, hard-working youth. Let's inspire them to achieve their wildest dreams. Contact Elissa Lines, EAA vice president of donor and business relationships, today at 800-236-1025, or e-mail her at *elines@eaa.org* to make your contribution.

Meet Dr. Joe Masessa.

He was introduced to flying by his father, a Korean War veteran and private pilot. Joe envisioned his career as a fighter pilot, but less-than-perfect vision disqualified him from military flight training programs. Fast-forward one medical degree and 17 years, Joe took his first flight lesson at 35. "It was a long time coming!"

Joe's daily driver is a twin turboprop Cheyenne II. "I have several dermatology offices in New Jersey. It's a long state, so I fly it twice a week to work and to meetings. It saves me four hours each day commuting."

Joe started going to Oshkosh 15 years ago. "I hung around the Warbird group and started thinking about preserving one. I feel EAA meets the needs for the majority of pilots, especially pilots into Warbirds. I also found out that it wasn't enough to come a couple days. Now I go for nine."

In 2008, Joe became the owner of an OV-1D Mohawk 958. It needed lots of TLC, which Joe delivered in spades. "Owning the Mohawk is having a piece of history. It was very rewarding to preserve it, and to now make it available to others, especially veterans. I think my Dad would be proud that I'm doing something to preserve history and that makes a difference in veterans' lives."

Why Joe reads *EAA Sport Aviation*...

"It's really for a variety of aviation interests. I like to see what everybody else is doing, especially the avenues that people take on restoring their aircraft. It's interesting to read what the innovators are up to and what's in store for the future of aviation."

On average,

80%

of EAA Sport Aviation readers are looking to make 3 or more aviation purchases other than fuel in the next 18 months.

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IPAD IN FLIGHT

MY JULY AND AUGUST Trends Aloft columns about the iPad drew many responses. Also, since writing the columns, I've had 30 more hours of experience with the iPad flying to and from AirVenture. Users should turn off Cellular Data and Wi-Fi when in flight to extend battery life and to reduce system hang-ups with some apps. One reader wrote that having Cellular Data on in flight violates FCC regulations.

Do not turn on Airplane Mode in flight as this disables the GPS receiver. Occasionally in flight the iPad's GPS receiver won't work. Rebooting the iPad will often solve this problem. While I expected the iPad to be a complete portable GPS replacement, I've found that, especially for longer flights, I prefer using a portable GPS for course guidance while using the iPad for information look-up.

Max Trescott, EAA 531980
Mountain View, California

More Thoughts About Alternators

THANKS FOR THE GOOD article on alternators ["Alternator or Generator," p. 84 in the September issue]; lots of good points were made. I'd like to add another element to consider for an aircraft flying instrument conditions with electronic displays.

While a dual-alternator system may serve us well in business and commercial aviation, the added complexity, parts count, weight, and expense would not be worth the benefit for those of us in the game just for recreation and education. A large majority of experimental aircraft carry lead-acid batteries rated from 12 to 25 amp-hours (Ah). The electrical loads necessary to continue from IFR conditions to VFR are only about 5-10 amps. This means that even the 12-Ah batteries can support this equipment for one to two hours.

Many of the handheld GPS units have internal batteries good for about one hour. Some of the EFIS units incorporate internal batteries and can also operate for extended periods without aircraft electrical power. The batteries give us a backup power source for communication, navigation, and attitude/altitude/airspeed reference. A simple voltmeter (or electronic monitor) is a good indication of the state of charge of a lead-acid battery.

Seems to me that most of us can "keep it simple" and depend on our stored electrical energy to get us from IFR to VFR and then to a safe landing. Those flying multi-engine aircraft probably have a good case for dual alternators.

Keep up the good work on these topics.

Don Saint, EAA 469785
Granbury, Texas

Stars Represented 100 Veterans

I APPRECIATED LAURAN PAINE and Jim Busha's touching and insightful article on the Honor Flights taking WWII veterans to Washington, D.C., and the memorials there. But something about my brain makes numerical errors stand out, and when I read "...a wall of 4,000 gold stars, one for every thousand American lives lost in the war," it didn't add up. A little research found that "...the wall has 4,048 stars each representing 100 Americans who died in the war." (Wikipedia, "National World War II Memorial.")

David B. Thomas, EAA 646900
Kenai, Alaska

SUBMISSIONS

Letters intended for publication should be addressed to EAA/Letter to the Editor, P.O. Box 3086, Oshkosh, WI, 54903, or e-mailed to *Editorial@EAA.org*. Please include your EAA number, city, and state. All letters are subject to editing. Unpublished letters will not be returned.

Thank You, Young Eagles Pilots

I HAVE AN EAA STICKER on my car window. Recently, while loading groceries at the store, a woman came up to me to thank me for giving a Young Eagles flight to her Boy Scout son. I explained that I was not a pilot and shouldn't receive her gratitude, but she countered, "But you do belong to EAA, so you have a right to be proud of your organization!"

I am, but I want to transfer this special tribute to Harrison Ford and all you women and men who have made the Young Eagles flights happen all over the world. So, along with her thanks, add mine, too.

Doug Skare, EAA 399433
Long Beach, California

Great EGT Info

THANK YOU FOR PUBLISHING Mike Busch's great educational article "EGT Myths Debunked." I was perfectly happy with my exhaust gas temperatures until I installed a probe on each cylinder and began to worry about the spread on my carbed O-360. I wish I knew this info three years ago. Thanks again; keep up the good work!

John Adams, EAA 536114
Snohomish, Washington

Corrections:

Robert Miller's airplane was incorrectly identified in the October 2010 issue of EAA Sport Aviation. *His airplane is a Hummel Ultra Cruiser, not a Hummel Bird, as was reported in "What Our Members Are Building & Restoring." We apologize for any confusion.*

In our Flightline article about the electric-powered Sonex Waiex (September, page 12), we incorrectly listed the capacity of the battery as 14,500 kilowatt-hours. In fact the battery is 14,500 watt-hours or 14.5 kW-h. We apologize for the error.

OSHKOSH 365

Could Meigs Field Return?

When it was announced that Richard Daley would not seek re-election to a seventh term as mayor of Chicago, pilots everywhere quietly asked a single question: Would this have any effect on Meigs Field? Greg Pinnell kicked off an interesting discussion on Oshkosh365 about a possible future for the lakefront airport that is so sorely missed.

Here are a few highlights from this ongoing discussion:

So, Mayor Daley is not going to run again. Does anyone out there have a feel for who might be GA-friendly toward a possible revisitation of the Meigs Field idea? **–Greg Pinnell**

Meigs Field was the default field in subLOGIC's and later Microsoft's Flight Simulator. As such, it...has a small, but real worldwide emotional appeal. **–Greg Long**

I think it would be awesome if Meigs could be rebuilt and called Daley Field, just to cheese off the idiot. **–Andy Gamache**

The Meigs Field travesty is so far down the list of priorities for the locals...it could just as well be off the radar until next century! I hate to bear bad news, but Meigs is gone. **–Ried Jacobsen**

I think we should put some runway lights around the park and make it a grass field! Then they will want it paved and voilà! Meigs is back! **–Bill Colleran**

I don't expect to see a runway on the old Meigs site in my lifetime. Glad I can say I did log a landing there before the bulldozers showed up! **–Joe LaMantia**

I would love to see Meigs reopened, I never had a chance to fly there and would absolutely love to go... But I think this is a bit of a pipe dream. **–Neil Glazer**

An interesting note, WGN-TV has a poll on the Meigs issue, and it's running 62 percent to 38 percent in favor of rebuilding Meigs! As of right now, I'm sticking with my original post and won't bet on landing at Meigs in my lifetime. Then again...maybe we'll luck out! **–Joe LaMantia**

This will take a lot of work, but if Meigs can be reopened, it would be a historically precedent-setting action. It's likely up to EAA/AOPA/GA-community members to keep the story in the headlines through sharing the story on social networking sites, with mainstream journalists, etc. **–Greg Long**

The fact that the Friends of Meigs still exists as an organization is a positive sign. I'm still doubtful Meigs will reopen, but who knows. I have been wrong before, and I would love to be wrong this time! **–Ried Jacobsen**

If you'd like to see Meigs reopened, join the Facebook group Bring Back Meigs Field! (For a link to this group, visit *www.SportAviation.org*.

Harold (Hal) Weekley

7/17/1921–9/22/2010

COL. HAROLD (HAL) WEEKLEY (RET.), EAA 169329 and Warbirds of America 2651, died at age 89 in Austell, Georgia. Hal, a U.S. Army Air Forces B-17 pilot during World War II, flew many missions over Germany before being shot down over occupied France. After bailing out at 20,000 feet, Hal successfully evaded capture for several weeks while hidden by the local French people until he escaped to friendly lines and was returned to the United States.

After training B-17 and jet fighter pilots during the Korean and Vietnam wars, Hal retired from the Air Force and worked with the FAA as an operations inspector and accident investigator for 14 years. He retired in 1981 and served as captain with the "Skylarks," a worldwide travel club, concurrently working for several years as an aviation consultant and as a volunteer pilot on EAA's restored B-17 *Aluminum Overcast*. Overall, Hal amassed more than 20,000 hours in almost 100 types of aircraft.

Survivors include his wife of 67 years, Wilma Jeanne Weekley, sister Maxine Herha, two sons, one grandson, and two granddaughters. EAA

Friends and family are invited to post obituaries and sign a memorial guestbook online for Hal and other EAAers who have "gone west" at *www.EAA.org/obituaries*. The names and stories of each person enshrined on EAA's Memorial Wall in Oshkosh, Wisconsin, are also available here.

IN MEMORY OF

"Not alone into the sunset but into the company of friends who have gone before them."

Dennis Anderson (EAA 96212), Pearland, Texas

Russell Anderson (EAA 80390), Boerne, Texas

Romeo Begin (EAA 12097), Aguanga, California

N. Bohl (EAA 773196), Northfield, Illinois

James Calhoun (EAA 522236), North Palm Beach, Florida

Carl Carr (EAA 8020), Rockford, Ohio

John Christenson (EAA 1010619), Cincinnati, Ohio

Alan Clark (EAA 440221), Nampa, Idaho

Lawrence Crawford (EAA 659575), Douglas, Georgia

David De Carle (EAA 537245), Punta Gorda, Florida

Joseph Dooley (EAA 178162), Hutchinson, Minnesota

Edwin Eckert (EAA 376696), Peoria, Illinois

Homer Ertenberg (EAA 29449), Punta Gorda, Florida

John Feustel (EAA 440732), Pine Island, Minnesota

Raymond Field (EAA 7008), Tipp City, Ohio

Harold Frankel (EAA 302712), Lake City, Florida

James Freeman (EAA 755778), Phoenix, Arizona

Arnold Good (EAA 725781), Jacksonville, Florida

James Goodrich (EAA 595601), Livonia, Michigan

William Haynes (EAA 734466), Rancho Palos Verdes, California

Bernard Higley (EAA 489616), Sterling, Illinois

John Hilger (EAA 665241), Bend, Oregon

Alan Jenny (EAA 603981), Raleigh, North Carolina

Tom Jense (EAA 485026), Provo, Utah

Douglas Koss (EAA 138985), Waukegan, Illinois

Robert Krueger (EAA 488459), Lewiston, New York

Dominic Macera (EAA 373653), Westminster, California

Gilbert Malacarne (EAA 789410), Tunnel Hill, Illinois

Bob Marie (EAA 358606), Washington, Iowa

Robert Markland (EAA 17012), St. Petersburg, Florida

Frederick Mudge (EAA 79680), Flint, Michigan

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Dan Parsons (EAA 636324), San Antonio, Texas

John Patterson (EAA 132631), Nacogdoches, Texas

Jim Penland (EAA 30396), Newport News, Virginia

Andrew Phillips (EAA 811743), Carp, Ontario, Canada

Alfred Preissner (EAA 287036), Chicago, Illinois

Robert Reandeau (EAA 697336), Sequim, Washington

George Reisinger (EAA 484868), York, Pennsylvania

F. Rogers (EAA 13361), Paw Paw, Illinois

Bruce Sawyer (EAA 111057), Dunwoody, Georgia

Lyle Shelton (EAA 376637), Van Nuys, California

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Harry Smith (EAA 10825), New Castle, Pennsylvania

Dr. Neal Thorpe (EAA 535088), Vancouver, Washington

Mario Tonelli (EAA 366810), Borgaro, Italy

Raymond Ward (EAA 180385), San Antonio, Texas

S. Whitehead (EAA 1010301), North Huntingdon, Pennsylvania

Kathleen Winters (EAA 756678), St. Paul Park, Minnesota

Robert Zanella (EAA 229315), Orlando, Florida

George Zion (EAA 85181), Greenfield, Indiana

Lee Zuver (EAA 72062), Hiram, Wisconsin

Aviation Day Highlights WWII Wrecks

EAA Chapter 654 offers a glimpse of aviation's past

ON AUGUST 21, GUESTS AT Montague Airport-Yreka Rohrer Field in California celebrated Aviation Day, organized by EAA Chapter 654, with a look at Siskiyou County's aviation history. In the 1940s, two airplanes crashed separately in the area, but the crash site locations were somewhat of a mystery. Aviation Day included displays of pieces from each aircraft, a B-24 and a Grumman F6F Hellcat.

Chapter members aided in confirming the June 11, 1943, crash of a B-24E, tail number 42-7199. In 2009, a resident found bullet casings and advised the location. Artifacts were recovered by EAA Chapter 654 and put into the Sisson Museum. The chapter also assisted in identifying the 10-man crew, six of whom died in the crash. Stacy Churchwell, brother of the B-24's co-pilot, George Churchwell Jr., who died in the crash, traveled from Florida to attend Aviation Day with his family.

The second crash occurred in 1945. Coast Guard and U.S. Air Force search units tried unsuccessfully in 1946 to locate the wreck of a Hellcat piloted by Lt. R.A. Hopen. The pilot's father, Jens Hopen, set up camp in the area after leaving his home in New Jersey with his life savings of $900 to search for his son's remains. He hired guides to assist him, but after 32 days, Hopen left without success. Later that year, a resident found the wreckage, and Lt. Hopen's remains were transported to Arlington National Cemetery.

Nancy Ballard Hopen, niece of Navy Lt. R.A. Hopen, traveled from Arkansas to see her uncle honored at Aviation Day. EAA Chapter 654 is trying to gather information regarding Jens Hopen's search for his son's remains to memorialize Jens' actions.

Attendees to EAA Chapter 654's Aviation Day converse on the tarmac at Montague Airport-Yreka Rohrer Field.

Artifacts such as what they think is the tailwheel pivot from a wrecked Hellcat were on display.

PHOTOGRAPHY COURTESY OF **KAREN DEROSS, MT. SHASTA AREA NEWSPAPERS, AND BRUCE BATCHELDER**

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AVIATION CHARTER SCHOOL TO OPEN IN INDIANA

WITH THE HELP OF VOLUNTEERS from EAA Chapter 1354 in Greenwood, Indiana, the Indiana Aerospace Junior/Senior High School will open to seventh- and eighth-grade students in August 2011. A grade will be added each year until the school covers grades seven through 12, for a total of 690 students. With opportunities for courses that count for college credit, students will be able to specialize in such areas as piloting, air traffic control, aviation administration, aviation mechanics, logistics, aerospace engineering, safety and security, and aerospace medicine. For opportunities outside the classroom, the school has partnered with Embry-Riddle Aeronautical University, Indiana State

University, Rolls-Royce, and more. The school is believed to be only the second junior/senior high school devoted to aviation, the first being Aviation High School in Des Moines, Washington.

The tuition-free school began with EAA Chapter 1354 volunteers Roger Tomey, EAA 607484, Penny Ratliff, and Rusty Nichols, EAA 703635, who began conversations with Indianapolis Mayor Greg Ballard's charter schools office in 2008. "From the time the school's leadership approached my office with the idea of creating an aviation-focused school, we immediately saw potential," Mayor Ballard said. For more information, visit *www.IAHSEagles.org*.

CHAPTER 1093'S KIDS TO OSHKOSH PROGRAM

EVERY YEAR, EAA CHAPTER 1093 in Midland, Michigan, sends three young people and an adult chaperone to EAA AirVenture Oshkosh for a day, all expenses paid, as part of its "Kids to Oshkosh" program. The program has been in operation since 1992.

This year, the leaders chose Aaron Angell; David Kohnert, EAA 1005639; and Travis Depcinski; the chaperone was Ray Senesac of the Midland Airport Advisory Commission. As he has for many years, chapter member Jack Hallett, EAA 594905, transported the group with his twin-engine Cessna 310. On July 30, the group left Midland's Jack Barstow Airport at 7 a.m. Upon arrival at Oshkosh, the group enjoyed a home-cooked breakfast in the campground from chapter members Dave Schmelzer, EAA 526557, and Mike Klele. After a tour of the grounds from Ford Tri-Motor pilot Cody Welch, EAA 115675, the kids were given free time before regrouping for the air show. As soon as the show was over, they returned home.

"Going to Oshkosh is a thrill for anyone who has the slightest interest in aviation," Ray said. "These kids had a great experience that they will remember the rest of their lives, and it made them even more determined to become pilots."

In addition to its Kids to Oshkosh program, EAA Chapter 1093 organizes the annual Jack Barstow Airport Aviation Camp for ninth- through 12th-graders, gives Young Eagles flights the second Saturday of every month, and holds yearly scholarship awards for deserving young people. For more information, visit *www.EAA1093.org*.

Left to right: Ray Senesac, Aaron Angell, David Kohnert, Travis Depcinski, Jack Hallett, and Jacklyn Hallett

SON FULFILLS CUB DREAM

ON AUGUST 31, 2010, Gilberto "GG" Guitarte, EAA 455332, fulfilled a dream when he took his father, Gilberto "Tito" Guitarte, EAA 455334, flying over the Carolinas in a J-3 Clipped Wing Cub. Former "presidente" of the Aero Club Rio de la Plata near Buenos Aires, Argentina, 91-year-old Tito learned to fly Cubs and Luscombes at his family's cattle ranch, and later became an instructor at the Aero Club. Tito also was excited to fly in a yellow Cub with Kent Misegades, EAA 520919, out of Cox Field in Tabor City, North Carolina.

Tito and GG Guitarte with the clipped-wing Cub owned by Craig Winkelmann, EAA Lifetime 453450.

Tito also flew with Kent Misegades (shown with him here) in Don Johnson's J-3 Cub.

THREE GENERATIONS OF ERCOUPE PILOTS

THREE GENERATIONS OF CAMPBELLS have learned to fly in Ercoupes. Grandfather Dan Campbell, EAA 1024664, first received his private pilot certificate in Utah in 1946. He didn't fly again for 63 years, but passed a flight review in 2009 just before his 80th birthday. Both Dan's 51-year-old son, John, EAA 1032970, and his 23-year-old grandson, Brad, are private pilots. Brad is studying aviation at Utah Valley University, hoping to work for an airline someday. Two other grandsons, Brendan, 18, and Braden, 16, are working toward their pilot certificates, and both hope to have aviation careers as well. They all fly Ercoupe N94798 based in Long Beach, California.

Left to right: Dan, Brad, Brendan (in the cockpit), Braden, and John.

WELCOME, NEW LIFETIME MEMBERS

Penny Bowman (EAA 308889), Topsfield, Massachusetts
Raymond Bowman (EAA 298488), Topsfield, Massachusetts
Mark Cannon (EAA 355273), Melbourne, Florida
Craig MacArthur (EAA 433327), Collierville, Tennessee
Petri Munukka (EAA 844557), Helsinki, Finland
Richard Plumb (EAA 572780), Bowling Green, Ohio
Andrew Powers (EAA 498205), Onalaska, Wisconsin
Todd Snaza (EAA 438000), Fountain Valley, California
Rye Thompson (EAA 1009606), Chicago, Illinois
Jennifer Ware (EAA 343550), Oxnard, California
Michael Wolf (EAA 460022), Cincinnati, Ohio

FIRST SOLO

LOGAN ST. JOHN, OF MONETA, VIRGINIA, soloed in three different airplanes on April 27, 2010—his 16th birthday. Logan started flying lessons when he was 13, but since he was too young to solo, he kept practicing while his father, David St. John, EAA 860424, earned his certificate. When Logan's day finally came, he soloed at Smith Mountain Lake Airport in a Cessna 150, a Piper Cherokee 180, and his father's 1977 Piper Warrior.

Flight instructor Brant Howell cuts Logan's shirt.

MILLVILLE AIRPORT CELEBRATES WITH FLY-IN

ON SATURDAY, SEPTEMBER 25, the Millville Army Air Field Museum at the Millville Municipal Airport in New Jersey hosted an aviation celebration, displaying World War II and other military aircraft, classic airplanes, and homebuilts. Featured WWII fighters included an original P-47 Thunderbolt, a P-51 Mustang, a Supermarine Spitfire, three B-25 Mitchell Bombers, several North American AT-6 Texans, a U.S. Coast Guard Widgeon, and many more. Many of the WWII planes were shown by Tom Duffy, a warbird collector who stores his nine airplanes at the airport.

As a new element at the event this year, EAA Chapter 1376 hosted an EAA fly-in, adding dozens more aircraft to the display. The museum has held events for the past 17 years; next year's event will include a show by the U.S. Navy Blue Angels.

EAA INSIDER

THIS MONTH'S SPECIAL OFFERS, OPPORTUNITIES & EVENTS

For a more complete EAA shopping experience, visit www.EAA.org/MegaMall and be sure to check out the Deal of the Week for EAA Members-only savings on your favorite aviation products & services.

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MEMBER PHOTO OF THE MONTH

LOCATION: OSHKOSH, WISCONSIN
PHOTOGRAPHER: JONATHAN APFELBAUM, EAA LIFETIME 222561

MELLOW MERLIN

Sundown at AirVenture's Mustang Corral

WHILE THE SUN SET at EAA AirVenture 2010, Jonathan Apfelbaum, of Parker, Colorado, walked among the warbirds while a friend taught him to take better photos with his Canon T1i Rebel. The P-51 Mustang *Dixie Boy*, with patina from the exhaust gases down the side, reflected the setting sun. "I was very fortunate to be able to capture a beautiful Mustang and, I hope, some of the magic of Oshkosh," Jonathan said.

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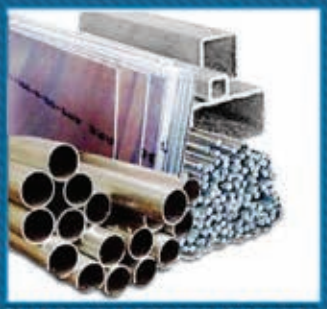

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