

Vol. 3 No. 6 | June 2014



EXPERIMENTER

The Spirit of Homebuilt Aviation | www.eaa.org

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A motorcycle of the air

Paradise City 2014 «

Reviewing new products and planes

A Star Celebrates

20 Years

A GlaStar, that is



Show and Then Tell

BY JACK PELTON

I AM VERY PLEASED that our members and volunteers will once again build an airplane during the week of our fly-in and convention at Oshkosh. We have done it in the past, and the One Week Wonder project is a great demonstration of how an airplane is built. This year we will build a Zenith CH 750 Cruiser in just seven days.

Across the hundreds of acres of show ground at AirVenture Oshkosh there will be dozens and dozens of programs teaching people every essential skill needed to build their own airplane. And many forums and seminars will help people restore antiques and warbirds. And still others will instruct owners about how to best maintain and operate their standard airplanes. The week of Oshkosh is one huge educational experience.

But I'm getting ahead of myself. A real-time demonstration of how a modern airplane kit goes together is a great educational tool. But before we can educate people about personal aviation we have to wow them.

The people who attend the many how-to classes and forums during Oshkosh are already converts. They already own an airplane or a building project—or plan to buy one soon—and are focused on doing the best work possible. These people are already sold on whatever aspect of personal aviation they have chosen to participate in.

However, there are thousands, actually many thousands, of people who visit our fly-in that are clearly intrigued by aviation but haven't made the commitment to participate. They come to look at the airplanes on display, inspect the new products the industry shows off, and marvel at the skill of the pilots flying in the air show.

That's why it is crucial that Oshkosh continue to feature the best of all types of private aviation. We can't know exactly what segment of personal aviation the curious but not yet committed visitor is most interested in. Every part of the huge and diverse EAA family needs to put its best foot forward so every

AirVenture Oshkosh visitor feels welcome and believes he or she can join in our aviation activity.

The one-week Zenith build project is a great example of how we can showcase kit airplanes and the enormous amount of progress they have made. People at Oshkosh can see for themselves how the modern kit is very complete, needs little in the way of specialized tools and skills, and comes with excellent support from the manufacturer and other kit builders.

An Oshkosh visitor can watch work on the Zenith project for a relatively short time and easily grasp how he could build his own kit. I believe the one-week build will “sell” many people on building their own airplane, and after that we will continue with our terrific educational programs that teach them the special techniques they need to do so.

Similar efforts happen during Oshkosh in the Vintage area where airplane owners describe the history and restoration and maintenance of their classic airplanes. Visitors can learn what it's like to own their own antique.

The Warbirds area also features daily presentations about the airplanes and the people who flew them. Nothing could be more effective to attract new people to preserving our military aviation history.

There are similar programs going on in the light flight area and at the aerobatic display. Visitors can learn about the fun of flying and then find the specific forums and courses they need.

The aviation industry does a great job of explaining the value of its products with excellent displays and the entire range of information on what their airplanes and equipment can do.

We've all heard the old line about selling the sizzle not the steak. There is some truth in that, but at Oshkosh we do both, and I think we are doing a pretty good job at keeping things in the right order. We have everything necessary to teach people to weld, work with fabric, and carve a propeller, but before that we put on a show that sells that aviation sizzle. **EAA**

On the cover: An original GlaStar...the design is celebrating its 20th anniversary at EAA AirVenture Oshkosh 2014. (Photography by Mike Steineke)

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Homebuilding Ambassadors Wanted

Help with the One Week Wonder project

BY CHARLIE BECKER

THIS YEAR AT EAA AirVenture Oshkosh, one of the focal points will be the “One Week Wonder” project, where volunteers will transform a standard Zenith CH 750 Cruiser kit into a flyable aircraft in the seven days of Oshkosh! This activity will take place in a tent on the “EAA Square” at the corner of Celebration Way and Knapp Street Road, right smack in the center of the convention.

Now you might think that the main goal of the project is to have a finished aircraft in a week. That is why you build an aircraft, right? In this case, you would be wrong. The goal is to show people who walk through the gate at AirVenture 2014 that:

- Homebuilding is something they can do.
- Aircraft building, while challenging, is within the capability of just about anyone who wants to put his mind to it.
- The skills needed are ones anyone can learn with a little help from EAA and its members.

My hope is that “build an aircraft” gets added to literally thousands of people’s bucket lists by the end of the week.

Now to make this project happen, we are going to need volunteers to build the aircraft. There is a lot of work that needs to be compressed into seven days. When I’m working on our [staff-build CH 750 STOL](#), I often wonder how we are going to build this kit in seven days! I know it can be done, but I’m not entirely sure I’ll believe it until it actually happens. For those of you interested in being a part of this project, Sebastien Heintz of Zenith Aircraft is rounding up the

volunteers. Just [click here](#) and fill out the form to volunteer. And get ready to have fun.

Just as important as the hands-on builders, though, we need volunteers—whom I’m calling “homebuilding ambassadors”—who will be willing to talk to people who wander into the tent and answer their questions about the project. We’re looking for people who are passionate about the many benefits of building an aircraft, who want to evangelize for the homebuilding movement. We need people who are welcoming and enthusiastic and who can help others along the journey from “That is a crazy idea,” to “I’m going to do this!”

For our homebuilding ambassadors for the One Week Wonder project, I’m looking for people who are actively building or who have finished a homebuilt. I guarantee that this is going to be a fun project and one you’ll look back on and be happy to say, “I was a part of it.” If you are outgoing and positive about homebuilding and the future of aviation, why not volunteer?

This is the best opportunity we have to convince thousands of people that homebuilding is right for them. Let’s all pitch in together and grow the homebuilt movement.

If you would like to volunteer to be a homebuilding ambassador, send me an e-mail at cbecker@eaa.org, with your name, EAA number, what you have built or are building, and why you want to be a part of this project.

Volunteering is a great way to feel more involved with AirVenture, make new friends, and have fun, and the One Week Wonder project will be a great volunteer opportunity. *EAA*

MV-22 Osprey Tilt Rotor

*Opening Night Concert
featuring Kenny Loggins
Presented by Ford Motor Company*

Valdez STOL Demonstrations

**U.S. Air Force
Thunderbirds
August 1-3**

ONE WEEK ONE OSHKOSH

*Daily World-class Air Shows
PLUS Two Night Air Shows—
Wednesday & Saturday
Presented by Rockwell Collins*

*One Week Wonder:
7-day Zenith CH 750 Cruiser build*

*Salute to Veterans and
Big Bad Voodoo Daddy on Friday, August 1
Presented by EAA Warbirds of America
and Disabled American Veterans*

*It's the planes that bring you here.
It's the people that bring you back.
Reignite your passion.
Oshkosh—you gotta be here!*

BUY NOW AND SAVE

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OSHKOSH
2014**

The World's Greatest Aviation Celebration

July 28-August 3



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EAA Seeks Volunteer Nominations

NOMINATIONS ARE now open to recognize great EAA volunteers at this year's Volunteer Park ceremony on Sunday, July 27, the day before EAA AirVenture Oshkosh 2014's opening day. EAA will add names to the Volunteer Park recognition bricks alongside 2013's honorees:

Paul and Audrey Poberezny, and Jack and Rose Pelton.

Making a nomination is simple. Just go to the [online application form](#) and complete it before May 31. And it's just not for Oshkosh volunteers. If there's someone who has contributed a lot to

your EAA chapter or the entire organization, nominate him or her as well.

EAA's Volunteer Advisory Committee will review the nominations and make its recommendation by mid-June, and it will invite honorees to Oshkosh for the July 27 recognition program.

EAA/ForeFlight Offering Two \$7,500 Flight-Training Scholarships

EAA AND ForeFlight, creator of the popular ForeFlight Mobile flight planning and electronic flight bag app for Apple iPad and iPhone, are teaming together to award a pair of \$7,500 flight-training scholarships that will help two people fulfill their dreams of flight.

The scholarships are open to anyone at least 15 years of age who meets the [application requirements](#). The deadline to apply is June 30, 2014. Recipients will be announced during EAA AirVenture Oshkosh 2014.

Complete requirements include:

- a 500-word essay on "How I Will Use My License to Fly" via written document or video (.mov and .mp4 video format)
- Recipients will remain engaged with ForeFlight and EAA with updates on their flight training experience.
- The scholarship will be awarded in \$2,500 increments to the recipients and the flight schools of their choice. Recipients also will receive a one-year ForeFlight subscription and a one-year EAA membership.

Ultralight Day Returns to Pioneer Airport



EAA'S PIONEER AIRPORT will be transformed into a fun fly zone on Saturday, June 14, as up to two dozen ultralights and light aircraft fly to the grass airstrip for Ultralight Day 2014.

Members of EAA Ultralight Chapters 1 (Southern Wisconsin) and 75 (North Central Wisconsin) will fly their ultralights and light planes to EAA's [Pioneer Airport](#) to show the public what fun flying is all about.

"This will be a great opportunity for anyone visiting the EAA museum to learn more about this fun, affordable

segment of aviation," said Timm Bogenhagen, EAA Ultralight and Light Plane Community manager.

Two mass arrivals will take place between 9 a.m. to 10 a.m. At about 1 p.m., pilots will conduct several proficiency events such as accuracy landing, torpedo runs, and beanbag drops. Those scoring in the top three of each event will receive a special plaque.

Admission to Pioneer Airport is included with regular [museum admission](#). There is no charge for EAA members.

EAA AirVenture 2014 NOTAM Now Available

EAA'S AIRVENTURE Oshkosh 2014 Notice to Airmen (NOTAM) features arrival and departure procedures for the 62nd annual fly-in convention scheduled for July 28 to August 3 at Wittman Regional Airport in Oshkosh, and you can download it now. You can also order a printed copy at www.AirVenture.org/NOTAM or by calling EAA Membership Services at 800-564-6322.

The NOTAM is in effect July 25 to August 4 and outlines procedures for the many types of aircraft that fly to

Oshkosh for the event, as well as aircraft that land at nearby airports.

This year's NOTAM cover features a photo of Van's RV aircraft on the runways of Wittman Regional Airport. It was designed by the FAA, in partnership with EAA, to assist pilots in their AirVenture flight planning.

For additional arrival and departure hints, visit www.AirVenture.org/atc.

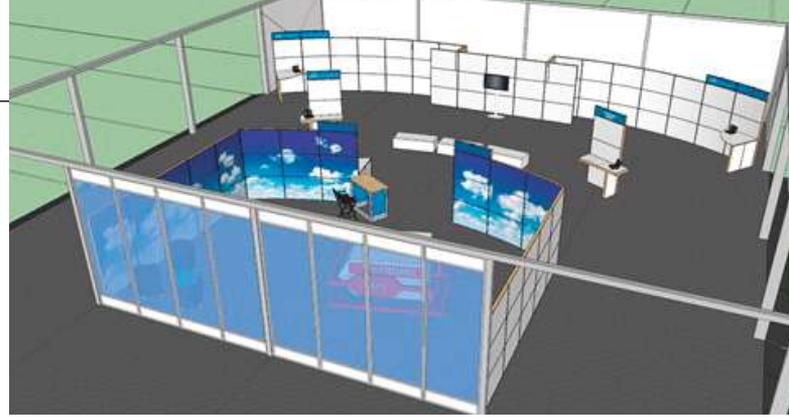
Learn More About EAA at the AirVenture 'Square'

WHERE ELSE OTHER than EAA AirVenture Oshkosh can you discover all that EAA has to offer members, learn about EAA's extraordinary youth education initiatives, help build an airplane, and find great merchandise offerings and aircraft insurance options...all on one corner? Welcome to the EAA Square, located at the intersection of Knapp Street Road and Celebration Way.

At the northeast corner, you'll find the EAA Welcome Center, a place to join and renew a membership, get questions answered, become a Lifetime member, register for the Runway 5K, pick up a WomenVenture T-shirt, and much more. There's also an area where members can relax and cool off. This year's main feature will be a special tribute for EAA Founder Paul Poberezny, chronicling his life and the history of EAA through the exhibit "Paul: In His Own Words."

On the southwest corner, visitors can participate in the [One Week Wonder](#) project in which participants will build a Zenith CH 750 Cruiser from start to finish during the week of AirVenture. All AirVenture visitors will be welcomed to pull a rivet, deburr a part, or help out in some other way. Participants will receive a One Week Wonder commemorative pin and the satisfaction knowing they had a "hands-on" role in the project.

On the northwest corner, EAA's Pathways Pavilion showcases the EAA programs and communities dedicated to



aviation engagement. These include Young Eagles and the EAA Flight Plan, Eagle Flights, EAA chapters, the EAA Air Academy, and EAA's special interest groups, including EAA Warbirds of America, the International Aerobatic Club, EAA Vintage Aircraft Association, as well as EAA homebuilder and ultralight communities. Also represented will be the Academy of Model Aeronautics.

Volunteers and staff will be on hand to meet with visitors and provide more information about each of these programs and communities.

EAA's Pathways Pavilion also will feature flight simulators, including a full-motion Redbird flight simulator, with staff and volunteers available to provide general information about learning to fly. The Young Eagles GlaStar will be parked outside of the pavilion, with volunteers providing daily walk-around tours.

On the southeast corner, visit the EAA Merchandise tent for great collectibles, and next door will be the EAA Insurance Solutions tent. Inside, visitors can learn more about available plans through the EAA Aircraft Insurance Plan from representatives of Falcon Insurance Agency.

Aviation Records Fall Before Mojave Fly-In

ON APRIL 19, the second annual Mojave Experimental Fly-In at Mojave Air & Space Port in California's high desert welcomed about 250 airplanes and more than 1,000 attendees.

Airport figures showed well more than 500 operations, making it one of the busiest days in the airport's history.

In addition, during the days before the April 19 fly-in, a number of new aviation records were established in speed and time-to-climb categories.

Five aircraft attempted to break nine world aviation records, and in the end, seven new marks were set. The National Aeronautic Association had represen-

tatives on-site to witness the record attempts, but the records won't become official until approved by the world sanctioning body Fédération Aéronautique Internationale (FAI).

"This was a true grassroots aviation event," said main organizer Elliot Seguin of Scaled Composites.

Two Volunteer Photographers Needed for Homebuilt Area at AirVenture Oshkosh

EAA IS SEEKING TWO volunteer photographers for EAA AirVenture Oshkosh 2014 to assist with photographing the activities that take place in the Homebuilt Area. You will need to have your own photo equipment and be willing and available to take assignments throughout the week. These volunteers will be photographing activities in the homebuilt area of the convention grounds, including the homebuilders corn roast, homebuilder's dinner, volunteers

in action, as well as the homebuilts that are awarded perseverance awards. A keen interest in homebuilt aircraft is required.

If you are interested in this volunteer opportunity, please e-mail Charlie, cbecker@eaa.org, outlining your photography experience, the days you will be at AirVenture Oshkosh and include a link to your photo portfolio or a gallery of your images. *EAA*

Desser Tire Introduces New Tundra Tire

DESSER TIRE & Rubber Company has a new line of backcountry tundra tires. The first new tire is the Aero Classic LSA/Experimental 8.50-6 4-ply rating smooth tire.

This tire has essentially the same dimensions as the TSO 8.50-6 tires that currently are in use, but it is rated at 4 ply instead of 6. It has a smooth tread profile, which is designed not to pick up pebbles and rocks and damage the skin of the aircraft. It also is highly deflected to absorb larger river rocks and gravel. This tire incorporates a tube and will be one of the lightest tires in its class, and it has a high speed rating of 120 mph.

Designed for use on most light-sport aircraft (LSA) tailwheel aircraft using Cleveland, Grove, or Matco 6-inch wheel and brake packages, the tire features a generous 5/32-inch-plus tread depth for extended wear. It retails at less than \$200 per tire and is manufactured in the United States.

The next tire in this series will be a fully sanctioned FAA/TSO 8.50-6 4-ply tire that will be for type-certificated aircraft use. Larger 27-inch and 31-inch Aero Classic tires will follow in midsummer of 2014.

For further information, please check out the website at www.Desser.com.



Powering Imagination/Embry-Riddle Create Ambitious Electric Flight Program

EMBRY-RIDDLE Aeronautical University and Powering Imagination LLC have entered into an agreement to create an electric flight program focused on reducing aircraft emissions and noise through development of electric propulsion systems.

Erik Lindbergh, CEO of Powering Imagination, and Dr. Richard (Pat) Anderson, director of the Eagle Flight Research Center at Embry-Riddle, noted that commercial aviation powerplants emit a significant amount of pollutants into the atmosphere, and aircraft noise is an increasing issue that restricts access to airports and inconveniences neighboring communities. Electric and hybrid-electric power systems offer the potential to significantly reduce both noise and emissions, making aviation more sustainable and opening new possibilities for operations in noise-sensitive areas.

Powering Imagination's Quiet Flight Initiative will join with Embry-Riddle's Green Flight Program to enable development of a test aircraft to be used jointly by their programs to accelerate the growth of the electric flight industry. The students and faculty at the Embry-Riddle campus in Daytona Beach, Florida, will convert a Diamond HK36 motorglider to electric power. This aircraft will be used for testing in noise-sensitive areas to demonstrate the potential benefits of electric or hybrid-electric

propulsion for significantly reducing noise. The aircraft also will be used for testing new components of electric propulsion systems to provide real-world evaluation under flight conditions. This airborne test lab will enable more efficient R&D on electric power systems, by creating an aircraft that can be reconfigured to test new innovations from different companies and development teams.

Embry-Riddle and Powering Imagination estimate that the aircraft will make its first flight in the middle of 2015 at the Embry-Riddle campus in Daytona Beach, Florida. Fundraising for this multiyear initiative is under way and will enable the purchase of the HK36 airframe, the conversion of the aircraft to electric power, and the operation of the plane for testing methods of reducing emissions and noise. Corporations and individuals interested in supporting this research program and the development of the electric flight industry are encouraged to contact either Powering Imagination (Eric Bartsch, ericb@poweringimagination.com) or Embry-Riddle Aeronautical University (Lyndse Costabile, costabil@erau.edu).

For regular updates, follow [www.Facebook.com/PoweringImagination](https://www.facebook.com/PoweringImagination) or www.PoweringImagination.com.

Bearhawk Takes First Place at Texas STOL Roundup

BEARHAWK AIRCRAFT'S Bearhawk four-place aircraft scored a first-place finish at the Texas STOL Roundup held April 11 to 13 in Llano, Texas (KAQO). The winning aircraft, a kit-built Bearhawk four-place manufactured by AviPro of Austin, Texas,

competed in the heavy touring class (gross weight from 2,500 to 3,600 pounds). Wayne Massey, Bearhawk Aircraft demo pilot, flew the aircraft to a combined takeoff and landing distance of 445 feet.

The contest was organized using the same rules as the familiar Valdez (Alaska) Fly-In and with more than 200 aircraft present in Texas. A short 2-minute video of the winning Bearhawk can be viewed [here](#).

Quicksilver Sport S2SE Earns S-LSA Approval, Entering Production

QUICKSILVER AERONAUTICS Sport 2S model has been verified as a special light-sport aircraft (S-LSA), and the model will be marketed as the Sport S2SE, the company announced.

The company is ramping up production, said Will Escutia, Quicksilver Aeronautics president. The company is taking a new approach to production by creating “extensions,” or manufacturing locations other than the headquarters factory. In accordance with the LSA regulations, these extensions require Quicksilver to maintain

full quality control while putting production closer to customers.

This is the first time a company has opened multiple extension facilities, and Quicksilver plans to open two new facilities at Air-Tech Inc. of Reserve, Louisiana, and in Rochester, Minnesota.

The Sport S2SE will be available for \$39,999. Quicksilver reports it is one of the lowest-priced S-LSA models on the market. Amateur-built kits are also available. For more information, visit www.QuicksilverAircraft.com.



Sunseeker Duo Makes First Powered Flights



SOLAR FLIGHT ANNOUNCED that test flights of the Sunseeker Duo, the first solar-powered airplane with a passenger seat, have been ongoing since it first flew on December 17, 2013, at the company’s facilities in Voghera, Italy.

The company aims to have the aircraft tested and ready to offer passenger flights by summer.

The Sunseeker Duo is Solar Flight’s third solar-powered airplane. Thanks to improved technology, this latest addition to the lineup features lithium batteries with seven times the capability of the company’s first effort, Sunseeker I. That aircraft made history in the summer of 1990 when Solar Flight’s Eric Raymond flew it across the United States—the first solar-powered aircraft to do so.

The Sunseeker II was notable in its first crossing of the Alps. The project is led by Raymond and his wife, Irena.

Briefly Noted...

China using Zenith CH 750 aircraft for pilot training—Zenith Aircraft recently shipped its 45th kit for a STOL CH 750 to China. Once they arrive in China, AGRHA Corporation assembles the Zenith kits on a production line, fully assembling the aircraft to factory specifications that include the Rotax 912 ULS engine and Dynon SkyView avionics. The aircraft are then test-flown and tweaked to perfection before delivery to flight schools around the country.

ProCub Lite demonstrates 350-fpm climb at 3,900 feet density altitude—James Wiebe of Belite Aircraft recently posted a short blog

entry demonstrating the climb performance of the ProCub Lite on a hot day. Climbing out in 90-degree weather and with the enormous 21-inch tundra tires, the Polini Thor 250 pulled up at 350 feet per minute climb rate. Click [here](#) to read James’ blog.

ICON announces plant location—In mid-May, ICON Aircraft announced it has selected Vacaville, California, as its new home. Later this year ICON will begin moving into a 140,000-square-foot facility adjacent to the airport in Vacaville. This facility will consolidate all company functions, including aircraft design,

manufacturing, sales, training, service, and corporate headquarters.

Just Aircraft ships 500th kit—Just Aircraft recently shipped its 500th kit, a SuperSTOL, to James Coonan in Ransom, Illinois. Kits have gone to all 50 states and more than 20 foreign countries. Although the company is still shipping kits for the Highlander, the majority of sales in the past year have been SuperSTOLs. Since the SuperSTOL was introduced last year, kit sales have more than doubled, and the company has added a second shift to keep up with demand. **EAA**

A STAR WAS BORN 20 YEARS AGO

A Star Was Born 20 Years Ago

A GlaStar, that is BY DAVE PRIZIO



A GlaStar on floats is a common sight at the EAA Seaplane Base. The GlaStar and the Sportsman make great floatplanes, with no structural modifications required.

A STAR WAS BORN 20 YEARS AGO

IN 1992 THE PEOPLE at Stoddard-Hamilton, makers of the Glasair line of airplane kits, were riding high. They were the kings of “fast glass,” but as everyone knows, the crown rests uneasily on the head of any king. Lancair and others were closing in on them, and insurance companies were pressuring them to offer extensive transition training courses or make their planes less challenging to fly.

As a response to these pressures, Stoddard-Hamilton concluded it needed a plane that most pilots could handle, not just a fast few. What it needed was a Cessna 172, only better. A separate company with many of the same players—Arlington

Aircraft Development Inc.—took up the challenge. Arlington would design the plane, and Stoddard-Hamilton would produce and sell it.

The Arlington team consisted of Ted, Tom, and Mike Setzer, with Tom doing most of the detailed design work. Engineer Bud Nelson and fabricator Dick Anderson also joined the team. Tom Hamilton, a founder of Stoddard-Hamilton Aircraft who had since moved on, came back in his spare time to help with the development of the concept, and outside engineer Paul Robertson made important design recommendations, including the strakes and vortex generators that would help to make the GlaStar fly so well at low speeds.

Unlike so many other airplane designs, this one did not start with a pretty picture. It started with a set of parameters to be met—design goals that would shape the ultimate appearance of the finished product. The plane needed to hold two people of good size in comfort; it needed to fly well and land slowly, plus cruise at a good speed and hold plenty of baggage. In addition to performing well, it needed to be economical to operate. This requirement pushed the design team toward the Continental IO-240 engine, which was later swept aside by customer demand. Lastly, but certainly not least, safety was a major concern, so great effort went into making the new plane stall- and spin-resistant.

Out of this process emerged the GlaStar. Its outward resemblance to a Cessna could hardly be called accidental, but it embodied features Cessna never even thought of embracing—



Former KITPLANES editor Marc Cook works on the wing of his new Sportsman at Glasair's Two-Weeks-To-Taxi program.



Glasair recently introduced Super Cub-style “tough terrain” gear for the Sportsman. This will greatly enhance the Sportsman's off-airport capabilities.



All of this Cabela's camping gear fits into the back of a Sportsman. This plane was made for flying and camping!

folding wings, a steel cage, and a composite fuselage. Only its traditional metal wings could be called Cessna-like. The folding wing feature probably caused the most design compromises, but the Arlington boys felt strongly that it also afforded the GlaStar a great economic advantage in that it could be stored in half the space of a normal airplane.

To make the plane "trailerable," it had to fold down to no more than 8 feet, 6 inches wide; thus the wing chord really couldn't exceed 4 feet. That also constrained the span of the horizontal stabilizer unless it was to be removable. In the end the horizontal stabilizer became removable and grew to 10 feet, and a higher aspect ratio wing emerged as the best solution. Interestingly, the "trailerability" of the GlaStar was a great sales tool, but one that customers seldom used afterwards. That said, there were a number of GlaStars with wings folded that were loaded on trailers and driven around the country.

The miserly but underpowered Continental IO-240 was quickly replaced with the Lycoming O-320 and then the parallel-valve O (IO)-360 engines. The larger 360 engines barely fit inside the GlaStar cowl, but their popularity could not be denied. The much-improved power of the larger engines really woke up the GlaStar and enabled short takeoffs that could match its short landings a reality. Of course, bigger engines needed more fuel, so auxiliary tanks were soon forthcoming as an option.

One feature of the GlaStar that proved to be immensely popular was the ability to build the plane either as a tricycle gear or a taildragger, and if desired, to switch back and forth



The GlaStar also makes a great skiplane, and EAA outfitted the GlaStar it uses for flying Young Eagles with skis.

in a minimum amount of time. Of the 948 GlaStar kits sold, it is hard to say how many used each type of gear, but an eyeball check of past EAA AirVenture Oshkosh flightlines revealed about an even split, with a fair number spending at least some time on floats.

If there is an airplane that just naturally fits on floats, it is the GlaStar. The big rudder and stout fuselage bracing mean that no added airframe work is needed to install floats. The engine mount even comes from the factory with a removable spacer that allows for the installation of the front float attachment. With the 180-hp engine and a big prop, the GlaStar on floats never fails to impress. While it can't quite match a Super



The author's first airplane building project—a GlaStar completed in 2002.



With wings folded it is not too hard to trailer a GlaStar or Sportsman from place to place. This is Dave Ammenti's Bronze Lindy-winning GlaStar.

Cub for takeoff and landing distances, it far exceeds it in cruise speed and overall comfort.

In a short 18 months the airplane had moved from a clean sheet of paper to a flying prototype, with the first flight coming in late 1994. The first tail kit was sold at the Sun 'n Fun Fly-In in 1995, and the completed factory demonstrator made its first appearance at EAA Oshkosh 1995. The design was off and running. With his work now finished, principal designer Tom Setzer moved to Germany to work with OMF Aircraft on the certificated version of the GlaStar, the Symphony—a plane that sadly did not retain all of its charms after going through the certification process. It has since passed into obscurity.

Orders for new GlaStar kits were pouring in, and things looked great; but Stoddard-Hamilton's management team stumbled. Expensive R&D projects that did not pan out and had nothing to do with the GlaStar robbed the company of much-needed cash, and by 1999 Stoddard-Hamilton was bankrupt. Many customers ended up with partial kits, and many more lost deposits on kits that never got delivered. It was a real mess. If not for the strong builder network formed by the GlaStar Association International, it is doubtful that the brand would have survived.

After much wrangling and a number of false starts, a real buyer finally emerged in the person of Tom Wathen. He is well known to EAAers for his many fine works and his rescue of Flabob Airport in Riverside, California, but GlaStar owners remember him most for saving their favorite airplane.

Wathen hired an outsider, Mikael Via, and an insider, Ted Setzer, to turn things around at New Glasair LLC and New GlaStar LLC, as the new companies were originally called. Via, a former practicing attorney, was the perfect guy to wade through the legal troubles and hurt feelings that plagued the new entities. As a Glasair builder himself, he was no stranger to the issues of amateur airplane builders. He made the tough calls necessary to right the ship and clear up the old problems. Setzer was the hands-on guy who knew how to put planes together better than anyone. He had been there from the beginning and knew the ins and outs of each product. Together they made it happen, and within three years they had not only restored faith in the GlaStar and Gla-

sair names but also had developed a much-improved GlaStar, the Sportsman 2+2.

PROOF IS IN THE FLYING

If the proof of any airplane is in how it flies, the GlaStar does pretty well. Using the Cessna 172 as a benchmark, the GlaStar lands more slowly, cruises much faster, and is much more roomy and comfortable for two passengers than any 172. It does, however, lack rear seats. It is a lot less expensive, too, although admittedly some assembly is required. Early GlaStars were heavy on the ailerons, and to this day GlaStars have flaps that require more than a little arm strength to activate, especially if you are a little fast coming in. A very effective aileron anti-servo tab retrofit has solved the heavy aileron issue, but the flaps remain a bit of an annoyance that owners simply learn to live with.

The GlaStar pioneered the leap from drawings to assembly instructions and added match-drilled wing skins—a first—to their kits right from the beginning. No more laying out rivet holes on blank skins. The holes were already there and perfectly placed. And no more interpreting drawings. The instructions told you what to do, how to do it, and in what order. These features are standard on kits today across the industry, but in 1995 they weren't standard at all. The GlaStar paved the way for these innovative techniques that made building so much simpler.

For a plane that started out as an economical alternative to the basic Cessna 172, the GlaStar was soon graced by no end of expensive upgrades as builders tried to outdo each other in

creating the best GlaStar ever. Dual Garmin 430s, HSI, and two-axis autopilots found their way into many 'Stars. While Van's RV builders seemed to be waging a battle to see who could build the cheapest RV-6, GlaStar customers were heading in the opposite direction. Today, in a used airplane market that has shown a marked preference for the Sportsman over the older GlaStar, there are some very nicely equipped examples for very reasonable prices.

Many GlaStar builders were not content to build basic airplanes. They were similarly unwilling to be confined to flying tricycle-gear airplanes off of paved runways. Early on, a number of builders put their GlaStars on floats with great success,



Missionary Tom Needham used his GlaStar to access remote villages as part of his work in Cameroon. Needham has since passed the GlaStar on to another missionary and replaced it with a Sportsman.



Glasair Aviation's Ted Setzer does some fishing after landing this Sportsman on a sandbar.

A STAR WAS BORN 20 YEARS AGO

and many others ended up on conventional gear with big tires bouncing off rocks in sandbars and rough strips in the backcountry of Africa, Australia, Canada, and Alaska. The GlaStar also attracted a surprising number of European builders.

If the GlaStar was the best utility airplane available in kit form in the late 1990s, it was soon surpassed by its big brother after the company emerged from bankruptcy. The Sportsman 2+2 was everything the GlaStar was and more. It truly realized and exceeded the dreams of the original designers. The cabin was larger with more headroom, and rear seats were added. The backseat was only suitable for children or small adults, but a large person could use it in a pinch. With a larger cabin came a longer fuselage, which helped to improve elevator effectiveness as a bonus. The flaps were redesigned to be larger, easier to deploy, and more effective. No more muscling up flaps with the Sportsman. With an increase in size, the Sportsman also brought with it a much higher gross weight and the potential to use the more powerful Lycoming IO-390 engine.

Sadly for the GlaStar, the Sportsman pretty much rang the death knell for the trusty 'Star. It was hard to sell a kit for the smaller and less capable plane for almost the same price as the new Sportsman 2+2. Some foreign buyers still wanted a

two-place GlaStar, but the Sportsman could just as easily be built without a backseat; so only a few such kits were ever sold. Glasair Aviation still has the capability to supply new, complete GlaStar kits, but there are simply no takers to be found. Parts support is still good and should remain so for some time, but Kit Number 948 may be the last one ever sold.

There are still a number of GlaStars under construction since build times seem to run from 15 months to 15 years. First-time builders typically complete their GlaStars in somewhere around 2,500 hours, but many spread out those hours over more years than they had ever imagined. Fortunately, when completed they will still provide their owners with years of enjoyable flying.

Not to be satisfied with simply offering a better airplane, Glasair Aviation, as it is now called, also wanted to find a better way to build an airplane. From this was born the Two Weeks to Taxi program. This concept was not universally applauded when it was introduced, but there is no denying that it has had a profound influence on the amateur-built airplane market. This program inserts the builder into what can only be called a manufacturing process with the end result being a fully assembled and ready-to-taxi airplane, only needing the proper inspections and paperwork to get in the air. This introduced a whole new type of builder to the experimental market, and there is no denying that these builders do and learn a great deal in this accelerated building process.

No longer are years of time and effort required to build an airplane. The FAA has looked at the Two Weeks to Taxi program, and while not officially blessing it since it really has no way of doing so, the FAA accepts the resultant planes as complying with both the spirit and the letter of the law. Since Glasair's pioneering effort, other companies have put together similar but less ambitious programs, but the Sportsman remains the only airplane that can be built by an amateur builder in two weeks.

The Glasair folks are never content to rest on their laurels, so they have been developing a host of options and improvements to increase the gross weight and decrease the empty weight of the Sportsman with such innovations as a carbon-fiber fuselage and Super Cub-style bush landing gear. There is even a Continental diesel-powered Sportsman under development and set to debut at AirVenture 2014.

What began as a simple concept 20 years ago has grown into a truly outstanding utility airplane that almost anyone can build. To be sure, it is not inexpensive, but with the price of a Cessna 172 climbing toward \$400,000 and beyond, a new, well-equipped Sportsman for less than half of that looks like a pretty good deal. More than 400 builders have built or are working on a Sportsman 2+2. If you still don't believe in what the boys from Arlington have created, go fly one. You'll never look at a Cessna the same way again. *EAA*

Dave Prizio is a member of the EAA Homebuilt Aircraft Council and a regular contributor to *Kitplanes* magazine. He finished a GlaStar in 2002 and a Sportsman in 2006, which he still flies.



Vortex generators at the root of each wing and in line with the inside edge of each aileron really help the GlaStar and the Sportsman fly well slowly.



Strakes at the horizontal stabilizer help maintain elevator effectiveness at low speeds.

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An Airplane for an Ordinary Person

Randy Bush's
Corvair-powered Pietenpol

BY STEVE ELLS



AN AIRPLANE FOR AN ORDINARY PERSON



Randy says flying the Air Camper is like riding a motorcycle in the air.



Randy used aircraft-grade spruce and mahogany throughout the aircraft. He covered the Piet using the Stewart Systems fabric and water-borne finishing system.



Traditional round engine instruments keep Randy's Air Camper looking like a 1929 design should.

WITH ALL THE COMPOSITE and all-metal airplanes available for today's homebuilder, why would anyone choose to devote years to building a wooden-fuselage, parasol-winged, hang-out-in-the-breeze, two-place airplane that strains to top 75 mph?

That's the question I asked Randy Bush of Lexington, Tennessee, as we stood together at EAA AirVenture Oshkosh 2013 admiring *Miss Le'Bec*, his Pietenpol Air Camper.

"It's like riding a motorcycle in the air—complete freedom," he answered.

He chose a Pietenpol specifically because: "My grandfather knew a man who had built one, and so I recognized the name when I started thinking about building a plane."

Randy had narrowed his choice down to the Pietenpol Air Camper, a 1929 design, and the Hatz Classic biplane, a 1968 design. In the end, two things about the Pietenpol stood out—the smaller parts count compared to the Hatz, and the Brodhead Pietenpol Association (BPA), an enthusiastic owners group dedicated to Pietenpol designs. The mystical grip that the Pietenpol Air Camper has on its devotees is illustrated by the title of the forum BPA presented at AirVenture 2013—"The Zen of Pietenpol Homebuilding"

The Pietenpol Air Camper is a lightweight, tandem-seat, two-place airplane that is plans-built of wood and fabric. Today Pietenpol plans and building manuals are sold by Andrew Pietenpol, the grandson of Bernard Pietenpol, who was the man who created the original Pietenpol Air Camper design in 1929. The 1929 version was powered by a Model A Ford engine. Since these engines still can be found today, Pietenpol purists still use them. Randy chose, installed, and is happy with a modified Corvair automotive engine.

THE BUILDER'S STORY

It's a stretch to understand where Randy found the time to build an airplane since his day-to-day responsibilities include raising his four children as a single parent and working as an over-the-road truck driver. His story is proof that passion always finds a way to express itself. He said, "I built it a little bit at a time."

Prior to buying the plans, Randy traveled from his home in Tennessee to attend one of the Pietenpol reunions held every year at the Brodhead Airport (C37) in Wisconsin. At Brodhead he looked at Air Campers and talked to owners and builders. During that trip, he verified the claim that the Air Camper could be "built by an ordinary man with hand tools and a barn."

Randy met William Wynne (EAA 331351) of FlyCorvair.com at the reunion. William, an acknowledged Corvair engine expert, told Randy that the Corvair engine was an affordable engine that was reliable and durable and performed well after incorporating

a few modifications. It's proved to be a good fit for the Pietenpol.

"I chose the Corvair because I like the look and the sound of it," Randy said. "I listened to William, and everything he said made sense." Randy stressed the economics of the Corvair when he said that he can overhaul the whole engine for \$500 but can't even do one cylinder on a Lycoming for \$500.

The Brodhead visit gave Randy the push he needed, and in December 1999 he sent in the cash for his set of plans. Randy had hand tools and figured he was as ordinary as any man, but he didn't have a barn. So he first built a 30-foot-by-50-foot shop. Randy admits that he's had to add on to his shop a couple of times because he keeps running out of room.

Randy is a straightforward sort of man without guile or pretense. He readily admits that the airplane construction project had to be set aside for a year that he "spent trying to keep a [now] ex-wife happy." They divorced, which allowed Randy to again turn his attention to his passionate pursuit of Pietenpol.

Randy admits he had never welded, or done any sewing, rib-stitching, or sprayed any paint when he started. I asked if he had any mechanical experience. He told me that he had grown up in the country with his grandpa and said, "Like any teenager, I messed with engines and blew things up."

When asked how he learned everything he needed, Randy said, "There's enough educational material out there for any ordinary guy to build an airplane. Anyone can learn how." After starting, Randy realized that he really enjoyed the art and craft of working with wood. And even though he had to go at it a bit at a time, he didn't cut any corners.

"I used only aircraft quality spruce and mahogany wood, and every nut, bolt, and screw came from an aircraft supplier," Randy said. Online forums and advice from other builders taught Randy tricks that saved him money. He purchased a set of used Matco wheels and brakes and a set of used wing struts at the Fly Mart at the Sun 'n Fun International Fly-In and Expo. The struts were cut, welded to fit, and painted to match.

Randy covered the wings and aft fuselage with Stewart Systems fabric and Stewart Systems water-borne finishing paints. Getting the paint "right" was a challenge. "It's a good system, but I had to practice," Randy said. "I guess that's why I really respect a good painter. I didn't think I would like rib-stitching, but once I got started, I liked it. It's pretty therapeutic."

Randy said it took 1,910 hours to build his Pietenpol. That doesn't sound like a lot of time spread over six years, but he learned that if he didn't do something every day he wouldn't keep going. "You gotta enjoy the build," he said. "If you don't enjoy building, don't get into it."



Randy chose to power his Pietenpol with a Corvair engine, following the example of Bernard Pietenpol, the aircraft's designer, who installed a Corvair in an Air Camper in 1966.



Randy built his airplane from plans in 513 hours spread over a six-year time frame.



Cub-like "eyebrows" on the Corvair engine help force cooling air over the cylinders.

Another thing that worked for Randy was finishing the task he was working on before starting the next one.

THE CORVAIR ENGINE

In 1960 Chevrolet introduced the Corvair automobile as competition for the Volkswagen Beetle. Both cars were relatively small, and more importantly for the amateur-built airplane world, both had air-cooled engines. Bernard Pietenpol installed a Corvair engine in an Air Camper in 1966.

Randy picked William's brain on the Corvair engine before building his engine. Based on that advice, Randy chose a 2700-cc, 100-hp engine. William recommended other Corvair upgrade modifications by four innovators William calls "The Corvair All-Stars." Randy sent the heads to Mark Petniunas at FalconMachine.net in Fitchburg, Wisconsin, before reassembling the engine.

After 180 hours of flying, Randy returned to William's Corvair College No. 19 in Barnwell, South Carolina, and upgraded his engine by swapping his top end with a bottom end that included a fifth main bearing mod by Roy Szarafinski of Roys Garage.com in Osseo, Michigan, and William's Reverse Gold Oil System. There's a picture on www.FlyCorvair.net of Randy standing in the prop blast of his engine late on a Sunday night as he test-ran his "new" engine on William's engine test stand. William stages four two-day Corvair Colleges a year at various sites around the country.

Randy chose to have his wooden propeller built by Tennessee Propellers Inc. in Rising Fawn, Georgia.

Randy says the engine is very smooth, and although the engine will burn high-octane auto fuel, he has decided to burn 100LL avgas. "With avgas I know what I'm getting," he said. The Corvair-converted engine burns about 5 gallons per hour.

MISS LE' BEC

I asked Randy why *Miss Le' Bec* was painted on the side of his Air Camper. He said that represented the names of his three daughters—Missy, Leslie, and Becky. His son, Chris, is his most willing co-pilot, but at 6 feet, 4 inches tall, he has to fold himself into the front cockpit.

Randy flies *Miss Le' Bec* out of a grass field near his home. A neighbor was thinking about plowing up the strip, but Randy leased it so it would remain an airstrip. He keeps N294RB in a T-hangar on the strip.

He started flying in October 2006, which would have been less than a year before finishing construction. He flies a lot and has put more than 500 hours on his Pietenpol to date.

A ROMANTIC LINK

One day Randy's local newspaper did a story on him and his airplane. Brenda Wallin, whom Randy had dated briefly in high school, saw the article. After high school, they had both married other people, but they were both single when

she saw the article. Now they're together again. Brenda drove the "support vehicle" from Tennessee while Randy flew north to AirVenture in 2013. They stopped at Brodhead to show her why he chose the Pietenpol and to introduce her to other Pietenpol people.

The Piet has a 15-gallon gas tank. Randy stopped for fuel every hour-and-a-half to two hours. "One-and-a-half to two hours is all I want to fly before taking a break," he said. "It's not a comfortable cross-country airplane."

Randy spoke about what he felt is needed to build an airplane when he said, "If you don't have a passion, you won't get it done. It's a lot of work."

It's obvious that Randy got a lot of satisfaction out of building the airframe and engine that carry him skyward—and that the Pietenpol was a good choice. "I could not have asked for a better airplane; it's what I dreamed of," he said.

NEXT AIRPLANE

Today Randy and Brenda are building a Sonex, and they're applying the same pay-as-you-go approach. "I can't afford to buy a \$14,000 kit, but I can go to Wicks or Spruce and buy \$500 worth of aluminum that will keep me busy for 6 months," he said. Although the build is progressing, Randy admits he enjoys working with wood more than with metal. The difference is that now he has a partner.

"Brenda has done a lot of work on the Sonex," he said. "You could say that the Pietenpol brought us together, and now the Sonex is reworking us."

Randy punctuated his satisfaction with his Pietenpol with one last story. He said a friend stopped by and gave him a ride in a Glasair, but according to Randy, "It just didn't feel right; I couldn't hang my arm over the side."

Randy was cited as an example of the fact that it doesn't take a lot of money to build an airplane. The BPA website says a Pietenpol—with engine—can be built for an outlay of \$10,000.

A shop to work in, shot of cash now and then, a set of plans for a 1929 airframe, a converted engine out of a 54-year-old automobile, and a generous helping of passion are the keys that ordinary man Randy Bush used to fulfill his dream of owning and flying his own airplane.

RESOURCES

Brodhead Pietenpol Association:

www.Pietenpols.org

Pietenpol Air Camper Family:

<http://Community.Pressenter.net/~apieten>

William Wynne:

www.FlyCorvair.com and www.FlyCorvair.net

Tennessee Propellers Inc.:

www.TN-prop.com *EAA*



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Taildraggers

A personal essay by a longtime
tailwheel addict BY BUDD DAVISSON

The Pitts biplane may be the ultimate taildragger.



TAILDRAGGERS

IS THERE ANYTHING WITH more of a love-it-or-hate-it reputation than a tailwheel airplane? If so, I don't know what it is. To hear some people talk about taildraggers, you'd think you risk injury just untying them because they instantly ground loop while you're in the process of doing so. The mystique surrounding taildraggers is nothing short of amazing. And it's totally undeserved. Mostly anyway!

FIRST, A FEW RANDOM THOUGHTS

Until the nose wheel became common in the early 1950s with the Tri-Pacer and Cessna 172 (C-172), no one talked about how difficult a tailwheel airplane was to fly. That was just the way airplanes were and had been almost since the beginning. The nose wheel was developed as part of the "If you can drive, you can fly" marketing push at the time. It was a good idea and expanded aviation, but just because a nose-wheel airplane was easier to fly didn't mean the tailwheel was suddenly a devil in disguise.

A good reason to learn to fly tailwheel aircraft is that there is a whole bunch of airplanes you'll never get to fly if you don't, such as a J-3 Cub or a P-51 Mustang and thousands of airplanes in between.

You don't need to be a super pilot to fly a tailwheel airplane. Just get a few hours of good training.

For the final word on how hard a taildragger is to fly, read "Amputee Pitts Pilot: Peter Loeffler" available online [here](#), where Pete talks about his training to fly a Pitts. Pete's right leg is amputated above the knee. That's right. He's a one-legged pilot flying an *unmodified* Pitts. Kind of knocks the stuffing out of the mystique of a taildragger, doesn't it?

STRAIGHT WITH NO DRIFT

What is it about taildraggers that supposedly makes them difficult to land? There are three major reasons why tailwheel airplanes have a bad reputation. By far the most important thing one must understand about taildraggers is the need to make a touchdown that is straight (the tail wheel is lined up behind the nose on the same line of travel) with no drift. If most tailwheel aircraft accidents are analyzed, at least 80 percent of the time the incident got its start in a bad touchdown. Put the airplane on the runway straight with no drift and any tailwheel airplane will roll pretty much straight ahead. If the center of gravity is on the line of travel, the airplane has no reason to turn. Put the airplane on crooked or with a drift and the center of gravity will do exactly what Isaac Newton said it would do: Bodies in motion tend to stay in motion. The center of gravity, which is no longer lined up with the nose, will do its best to continue going in a straight line taking the tail with it. However, landing an airplane straight can be a challenge, if the piloting basics aren't right. This is actually a huge challenge for many.

Why is making a straight touchdown such a challenge? Because it requires the pilot to make a really good approach that enables him to put the airplane in the sweet spot in flare where you know the airplane is in a perfect position. When that happens in any airplane—and every airplane has a sweet spot in flare—you know before it touches down that it is going to be a good landing. It has a feeling that says you're in the right spot, at the right attitude, and at the right speed.

The simplest cure for runway problems is if the sweet spot feeling isn't there and you know it's not quite right, just push



The T-6 helped taught many military pilots to fly Taildraggers.



The SE 5A is just one example of the many antique-era taildraggers.

the throttle forward, go around, and put five more minutes in your logbook. We fly because we love it, so just do a little more lovin' while you come around and make a better approach.

Still, that doesn't answer the question about why making a good approach in a taildragger is so difficult.

NOSEDLAGGER/TAIHDRAGGER: THE APPROACH DIFFICULTIES ARE THE SAME

First, when it comes to the approach, the fact that the airplane is a taildragger is neither here nor there. Making a truly good approach in any airplane can be difficult because it takes everything you know about flying and crams it into a couple of short, fun-filled minutes. During the actual approach, the difference between a nosedragger and a taildragger has nothing to do with the airplane. It has to do with the fact that on landing the nosedragger will tolerate less precise flying skills because it doesn't really care if it's landed a little crooked. The tailwheel airplane is more difficult to fly correctly because the definition of "correctly" is much tighter, much more insistent on exactitude being part of the equation, so you don't arrive in ground effect slightly out of shape or off profile.

One of the mistakes you never want to make in a taildragger is to be sitting there in ground effect waiting for it to touch-down, knowing all the while that your set up is flawed. *Never* land when you know you're out of shape thinking you're going to sort it out on the runway. Some taildraggers will let you get away with it; many others won't.

So, the difference is that the taildragger driver *has* to have it right, while the nosedragger guy only *should* have it right. This

puts more skin in the game, and it behooves the taildragger pilot to fly as correctly as he can.

IT'S ALL ABOUT GETTING THE BASICS RIGHT

So there is that word again, "correctly." Exactly how do we define correctly in this application? It really doesn't need defining because virtually every pilot knows in his heart what flying "correctly" means. It's just that some pilots don't. The most persistent basic weaknesses I have seen in nearly 6,000 hours of tailwheel dual given are the following:

1. A general misunderstanding of adverse yaw and the rudder required.

Anywhere in the approach, if an aileron is hanging out even a little, the ball isn't going to be in the middle so the airplane is crooked. If in flare and attempting to work toward the centerline, the higher adverse yaw that is caused by the higher angle of attack is hugely aggravated by even tiny bits of extraneous aileron. So, the nose is moving opposite to the aileron movement, making it impossible to land lined up straight. Lots of rudder is needed when slow and making corrections.

2. No understanding of, or no correction of, P-factor.

On climb-out the nose is trying to move left and the ball is moving right. Right rudder is needed. Power-off in approach, the nose moves right and the ball left, so left rudder is needed through the entire descent. This complicates coordination, but for maximum efficiency and directional control in flare it has to be done.

3. Lack of continual scan.

The pilot's eyes have to continually move across the nose judging it against the horizon and monitoring the aircraft's position on the ground. At the same time the scan should be circling back through the cockpit while the mind says PAST—power, altitude, speed (another way of saying nose attitude), track (meaning the line we're flying across the ground). If we fixate on one thing, we're going to let something else get out of whack. However, the windshield and the view outside is the primary instrument with the instrument panel providing fine-tuning.

4. Lack of precision.

Everything in the air that defines the path to the perfect position in flare has a quantifiable parameter attached to it. Maybe it's distance from the runway on downwind, altitude when power is cut, configuration change position, airspeed on final, etc. The more precisely we control all of those parameters, the more likely we're going to be in the sweet spot in ground effect when we flare.

AS FOR GROUND HANDLING

In more than 40 years of checking folks out in tailwheel airplanes (with an emphasis on Pitts and high-performance taildraggers), I've not found a single person who couldn't land a taildragger in a fairly short time. This includes not one, but three amputees. However, because there are so many opinions and methods connected with teaching actual ground handling, I'm going to make the following statements knowing that there will be those out there who will be jumping up and down saying "No, no, no!" That being the case, I invite them to

drop a note to *Experimenter* (e-mail Experimenter@eaa.org) and, if we get enough good ones, we'll do another article and present the other viewpoints. My techniques have evolved over the years, as I've tried different methods of teaching taildragger landings. So I've experienced most of them and am willing to discuss them.

1. Where do you look when landing: a new view.

This is a point of controversy. The majority of instructors teach the tailwheel student to look straight ahead and use his peripheral vision. For decades I taught that way, too. However, 10 or 12 years ago I changed because the information coming from the edges of peripheral vision is too "soft," and I need more accurate info. To illustrate the problem, try this: Put your index fingers pointing up at arm's length in front of you about 14 inches apart. Turn your head and stare at the left finger. Without moving your eyes, study your other finger in your peripheral vision. See how blurry it is? The FAA says as soon as your vision is 5 degrees off the point of focus, 20/20 vision drops to 20/100 and keeps going down the farther you get from the point of focus. That's why you're advised to scan for traffic clicking across the horizon in narrow visual segments. I find the best information during flare and rollout is where the edges of the runway touch the side of the fuselage at 10 and 2 o'clock (assuming a tandem aircraft). Then the focus is shifted from point to point throughout takeoff and landing. On super slow aircraft (Cubs, etc.), peripheral vision can work, but not on faster, quicker aircraft.

Pilots coming out of side-by-side aircraft have a difficult time keeping from looking at one side when in a tandem.



Most classic-era aircraft were also taildraggers, such as this Stinson 103.

However, tandems are easier because you can compare one side with the other. When flying a side-by-side, take note of the point where the side of the runway hits the side of the nose in landing attitude and keep it there.

2. Happy/dancing feet or move them when needed?

This is another hyper-controversial point. About one out of 10 instructors preaches moving your feet in a rhythmic dance, left and right, the instant you touch the ground. On slow aircraft like Cubs, Champs, etc. that doesn't cause any real problems (other than crosswinds where one foot is going the same direction as the wind). This is because they have a huge dead spot in their tail wheel, so moving the rudder back and forth doesn't do much. In faster, quicker aircraft, like most homebuilt aircraft, every time the tail wheel is moved, the airplane does its best to follow the pilot's foot, and dancing can create problems all its own. Land it straight and react only when the airplane demands it, as indicated by a change in your sight picture.

3. Getting off the rudder is important.

One small aspect of the way a tail wheel works is seldom talked about because within the Cub/Champ category, it makes little difference. That point is the necessity of getting off the rudder very quickly as soon as it has done its job. If you come off a rudder slowly, the aircraft is still getting rudder energy fed

in during the entire time the rudder pedal is on its way back to neutral. It's like pouring sand in a coffee can that's sitting on a scale: you want to put 2 pounds of sand in it, and as the scale says 2 pounds, you slowly stop pouring the sand. The result is 3 pounds of sand. The same is true of coming off the rudder slowly in a high-speed taildragger. Get off the pedal lightning quick, like you're barefooted and the rudder pedal is red hot.

THE SUBJECT IS VERY COMPLEX AND VERY LONG

Books have been written on landing taildraggers, so we've only scratched the surface here. It would take many articles to cover it all. However, if you take anything away from this discussion, take this: tailwheel airplanes are definitely *not* the Tasmanian devils myth would have you believe. *Anyone* can master a taildragger with just a little flight training. Once you can fly a tailwheel airplane, there's an entire world of fun, exciting, historic, and high-performance airplanes opened to you. That alone is worth taking the six hours or so of dual required. Go for it! **EAA**

Budd Davisson is an aeronautical engineer, has flown more than 300 different aircraft types, and published four books and more than 4,000 articles. He is editor-in-chief of *Flight Journal* magazine and a flight instructor primarily in Pitts/tailwheel aircraft. Visit him at www.Airbum.com.



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Christina Mini-Coupe



JIM SMITH, EAA 61535, of Yankton, South Dakota, started building this Christina Mini-Coupe in 1973 and first flew it in the fall of 2013. Yes, that's right; the project was a part of his life for 40 years, with spans of a couple of years where nothing was done on it because of various health issues and surgeries.

Jim admits he kept the project on a "back burner" for much of the time, but he never forgot about it. He started out building the spars in his basement, and then moved the project with him to a house on a farm.

The aircraft is outfitted with just basic instruments. It's powered by a VW engine and has a 13-gallon fuel tank. The only change he made to the plans was that he swapped out the original solid gear for a spring gear from a Sonerai II.

Jim wanted to copy the paint scheme of the old Army trainers, so the aircraft is painted in Ford blue and Construction yellow.

Persistence paid off for Jim, and he's happy with the way the airplane flies, but he said that building isn't necessarily for everyone. "If you don't like to build things, I would recommend getting a second job and buying a ready-to-fly airplane," he said.

Nova Scotia Murphy Rebel

KEN BEANLANDS, EAA 662964, of Beaver Bank, Nova Scotia, was a Cessna 180 floatplane pilot for more than 20 years. However, when he retired, he could no longer justify the high operating cost of the 180. His son, who had already completed his first homebuilt said, "Dad, do you want to fly or own a 180?" When Ken replied, "I want to fly," his son's advice was to build an airplane. Ken said, "I was familiar with the Rebel, which is probably the most popular homebuilt in Newfoundland, where I resided for 42 years. In fact, I had given several Rebel owners their float endorsements and was impressed with the Rebel's performance on floats."

Ken ordered a kit, and it arrived on February 21, 2003. Ken said the manual suggested that the Rebel can be completed in 1,500 hours. More than 4,000 hours later, on July 20, 2012, he carried out his first flight test. He added that he owes a special thanks to his wife, Marina, who has been a plane-builder's widow for the last 10 winters; to his son, Kenny, who is an AME residing in Calgary but was only a phone call away when Ken needed advice; to his brother, Brian, who provided invaluable help when it came to electronics; to his brother-in-law, Phil, who was a great help when it came to the final assembly on floats; and finally to his recent friend, David Comeau, who has the uncanny ability to quickly assess a complex problem and arrive at a simple, workable solution.

Editor's Note: We'd love to share photos of your completed aircraft or your project in process with other members. Send your photos and a brief description to Experimenter@eaa.org. EAA





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Some Screwy Tips

Removing damaged Phillips head screws

BY CY GALLEY

PHILLIPS HEAD SCREWS are great until you round off or cone out the cross recess or socket used to turn the screw. The technical term for this is that the screwdriver bit “cams out.” You can find serrated Phillips screwdriver bits that are stamped ACR-R, which are really designed to aid in the screw removal. Phillips screws are designed to cam out so a screwdriver bit slips out of the head of a screw being driven once the torque required to turn the screw exceeds a certain amount. Frequent camming out damages the screw and possibly also the screwdriver, and it should normally be avoided. Early cam-out is caused by over-torquing damage at installation and by dirt or paint in the screw

socket and can be compounded by a worn or damaged drive bit. Also, the threads of the screw could be corroded as such that the torque necessary to remove the screw exceeds the cam-out limit of the recess in the screw head.

When the recess is damaged, you can try several methods to remove the screw.

1. Get a different screwdriver. Make sure it is the right size with a new bit if possible. A No. 2 Phillips is too large for a No. 1 recess. And although a No. 1 will fit into a No. 2 recess, the tip doesn't have enough area to distribute the force and will cam out early, damaging the recess especially when it is

HINTS FOR HOMEBUILDERS VIDEOS

THE FOLLOWING HINTS ARE JUST A SMALL SAMPLE OF THE MORE THAN 400 HINTS FOR HOMEBUILDERS VIDEO CURRENTLY AVAILABLE FOR VIEWING ONLINE HERE.



Trim for Hands-Free Flight

Many airplanes require some form of a fixed trim tab to achieve that desirable “hands-free” flight condition. Sonex Aircraft chief flight instructor Joe Norris gives some suggestions for simple, but effective fixed trim devices.



Band Saw Tabletop

Cutting very thin material on a bandsaw can be made easier and safer by incorporating this hint. Mark Forss, manager of EAA SportAir Workshops program, shows how to create a new table surface for your bandsaw.



Engine Timing with a Flower Pot

Some engines don't have timing marks, in this video Dick and Bob Koehler show how to use a timing protractor (flower pot) and locator plug to position the engine crankshaft prior to timing the magnetos to the engine.



Repairing Scratched Plexiglas

Dick and Bob Koehler demonstrate the steps involved in restoring scratched plexiglas to like new using commonly available products. Dick and Bob are both A&P mechanics with IA authorization and EAA SportAir workshop instructors.

overtorqued. Throw away the removed screw and replace it with a new screw!

2. Place a small piece of duct tape over the head and force or tap the screwdriver bit into the recess. Many times with this trick, you can generate enough torque to remove the screw. Throw away the removed screw and replace it with a new screw!
3. Add a small amount of valve grinding compound on the screwdriver tip; sometimes that creates enough friction between the driver and the screw socket to remove the screw. Throw away the removed screw and replace it with a new screw!
4. Slot the head with a thin cutoff wheel or even a hacksaw.



ACR-R Driver Bit

5. Then use a straight-bladed screwdriver. Throw away the removed screw and replace it with a new screw!
5. Drill the recess with a *left-hand* drill a little smaller than the screw shank. If the left-hand drill doesn't back out the screw, use an easy-out in the drilled hole to remove it. Throw away the removed screw and replace it with a new screw!

Finally, here's the story that generated this tip. A couple of years ago, a lady pilot came to the Emergency Aircraft Repair at EAA AirVenture Oshkosh. On her preflight, she discovered the spinner on her 172 was cracked, and she wanted to remove it on the ground instead of having it come off in the air. If you have ever had a spinner let loose, you understand her request.

A quick look at the attachment screws revealed that not only were some of the recesses damaged, they were rusty and full of paint. The screws hadn't been removed in years. All the above procedures just made the recesses worse. So I reverted to an old blacksmith trick. I used a hammer and a sharp chisel, not to take off the head but to slowly rotate the head with gentle taps of the hammer on the chisel that is off to one side of the screw head and biting into the head. We threw away the screws! *EAA*

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July 29-30	RV Assembly	Oshkosh, WI
July 31-August 1	Electrical Systems	Oshkosh, WI
August 16-17	TIG Welding	Griffin, GA
August 23-24	RV Assembly	Waco, TX
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The 2014 CAFE Electric Aircraft Symposium

Aircraft, engines, and batteries discussed

BY PATRICK PANZERA, EAA 555743

THE 8TH ANNUAL Electric Aircraft Symposium, presented by the Comparative Aircraft Flight Efficiency (CAFE) Foundation, was held April 25 to 26, 2014, in Santa Rosa, California. According to CAFE President Dr. Brien Seeley, this year's attendance was record breaking. With sixteen 20- to 30-minute presentations on Friday and nine on Saturday, nearly every subject was covered.



An artist's rendering of a proposed multi-passenger hybrid twin-engine aircraft with a high aspect ratio wing, over the Golden Gate bridge.



A full house of presenters and participants at the 2014 CAFE Electric Aircraft Symposium.

This year we were treated to some well-known EAA members presenting their take on the state of electric flight, beginning with Barnaby Wainfan (creator of the [Facetmobile](#)) who spoke on short takeoff and landing (STOL) performance, Brian Carpenter (of Rainbow Aviation and presenter on several EAA "[Hints for Homebuilders](#)" videos) who presented his twin-motor [electric ultralight](#) motorglider, and Mark Beierle (Earthstar Aircraft) who spoke about his [eGull 2000](#) electric aircraft that uses the [Joby motor](#).

Speakers for this year's conference were selected to present on an overall theme of the "air taxi." STOL aircraft are the fundamental basis for Dr. Brien Seeley's "[pocket airport](#)" concept, which in a nutshell is described as a two-acre parcel located in or near residential areas from which autonomous STOL air taxis can land and depart.

Also along those lines, presentations were made on Google's autonomous self-driving cars technology, and on a way to make aircraft propellers quiet using the same technology as active noise reduction (ANR) headsets by using speakers to broadcast sounds out of phase with the source, that being the prop.

Of the 25 presentations given this year, one was of real use to homebuilders who are itching to go out and build something today. This presentation was given by Dean Sigler (CAFE website blogger and writer for *Kitplanes* magazine's "Alternative Energies" column) who spoke on the hardware that's currently commercially available to the homebuilder interested in electric flight.

For those who want to buy a kit or a turnkey electric ultralight, Brian Carpenter presented his Quicksilver EMG-6 Part 103 legal ultralight, powered (self-launch) glider, with deliveries slated for 2015. Mark Beierle, who has been flying his [eGull 2000](#) electric ultralight at EAA AirVenture Oshkosh, Arlington Fly-In, and Sun 'n Fun International Fly-In & Expo, is offering kits as well.

A complete listing of all the presentations can be found [here](#).

In addition to being the past editor of the Experimenter e-newsletter, the current editor and publisher of Contact! magazine, and a regular contributor to Kitplanes, Patrick Panzera is an experienced homebuilder, EAA technical counselor, AirVenture forums presenter, and an instrument-rated private pilot.



Chip Erwin's Zigolo electric motorglider was flown in from South Lakeland Airport.

Paradise City 2014

A roundup of new aircraft and products

BY DAN GRUNLOH

PARADISE CITY, the ultralight and light-sport area at the Sun 'n Fun International Fly-In & Expo in Lakeland, Florida, had a great week. Area Chairman Dave Piper said it was the best weather in 12 years, and a total of 233 pilots registered to fly from the sod runway, up almost 70 percent from last year. It was perfect flying weather all week, and overall the fly-in experienced about a 20-percent increase in attendance.

No major storm systems blocked aircraft arrivals from around the country, as often happens, and some aircraft parking areas were full for the first time in memory. The ultralight flightline hosted more spectators than it has seen in many years. Along with flying all day, every day from the expanded grass runway, the Paradise City Headquarters Tent hosted 14 forums with 161 attendees.

Excellent weather permitted a dawn balloon launch every morning from the ultralight area, which was followed soon by the launch of powered paragliders and ultralights. Helicopter activity was also on the increase as more of those aircraft

moved to Paradise City from the Chopper Town location, which was still used for transient helicopters.

With the major changes to the road that now passes through Paradise City and the inclusion of the LSA Mall, the former little grass runway has become a major hub of activity. Flight operations now use a dedicated aircraft frequency for advisories issued from an elevated observation booth. Observers can inform incoming pilots about the pattern direction or about slow flying aircraft on final approach.

Here is a sample of some of the new airplanes and products seen at Sun 'n Fun 2014.

NEW ULTRALIGHTS

Chip Erwin made the first flight of an electric ultralight that flew into Paradise City; it may be the first electric-powered ultralight to fly into any fly-in in the United States. Chip arrived from his base at South Lakeland Airport just 4 miles away. His Italian-designed Zigolo SSSDR (Single Seat De-Regulated) ul-



Jim Wiebe pushes the Belite ProCub in after a flying session.



The view inside of the aft fuselage of Belite's ProCub showing its foam construction.



The roomy cockpit of the Bede 17L has plenty of headroom with the canopy closed.

tralight can be built with electric or gas power. Cruise speed is 42 mph and stall speed is 22 mph. The SDDR movement in the United Kingdom and Europe is a reaction to the cost and tight regulations on microlights there. Desiring the freedoms we have in FAR 103, Europeans have created new aircraft categories, with empty weights lower than those in the United States. The Zigolo motorglider weighs a mere 220 pounds with a parachute. Learn more and see videos at Aeromarine-LSA.com.

James Wiebe displayed and flew a new Belite ultralight with foam wings and a new engine. It may look a little like Belite's previous models, but nearly everything on his new ProCub is different. The ProCub wings and most of the tail and aft fuselage are constructed of CNC-router-shaped, extruded polystyrene sheet insulation covered with Dacron, followed by the application of the colored Oracal sheeting. No paint is involved. Foam wings are built by stacking and bonding pre-cut and shaped ribs on aluminum or carbon-fiber spars—like making a shish kebab. It's an entirely new way of building a wing.

The ProCub is powered by a water-cooled, single-cylinder, 35-hp Polini Thor 250 two-stroke engine with a gear reduction. Most of Belite's customers want the 1/2-VW direct-drive engine, but the Polini has comparable weight and cost and performs much better on takeoff. Check out the amazing new ProCub at www.BeliteAircraft.com.

Dennis Carley, the new owner of the Aerolite 103, flew a V-twin Briggs four-stroke engine on one of his ultralights at Paradise City. He acquired two of these engines when he bought the company from Terry Raber in 2012. The engines were modified by a German firm for use in ultralights. The engine performed quite well on the Aerolite and was smooth and quiet. The Aerolite will soon be available in Europe as the Aerolite 120, so named because of the 120-kilogram (264-pound) empty weight limit in Europe's unregulated category. Learn more at www.UFlyIt.com.

NEW LIGHT-SPORT AIRCRAFT

Italian manufacturer Tecnam, the world's largest manufacturer of sport class aircraft, revealed its U.S. version of the new low-wing Astore. All other Tecnam models, except for the Sierra, are high-wing airplanes. The Astore uses the same wing as the Sierra but in a more compact and maneuverable airframe. It has the looks and style of luxury. The nose gear casters, and the ground steering is via individual toe brakes. The standard avionics package includes an iPad mini preloaded with a Tecnam Astore owner app with checklists, performance data, and weight and balance calculations.

Tecnam also announced it will open a new assembly plant and service center at the Sebring Regional Florida Airport in Sebring, Florida. Astore specs and details are available at www.Tecnam.net.

Jim Bede designs have returned with the BD-17L single-seat, low-wing, light-sport aircraft (LSA) version of the original BD-17. I climbed in easily with my artificial knee after watching a gentleman climb aboard with an artificial leg. The 23-inch-wide cockpit is roomy and the right-hand side stick control is very nice. The construction is traditional Bede style with bonded 1/2-inch aluminum sandwich panels. The company will soon introduce a new two-seat LSA, called the BD-22, which is based partly on the original BD-4 design. The Bede staff said Jim is still going strong, and they have designs up to number 30 already in the pipeline. Bede kits are sold as experimental amateur-built aircraft. See more at www.JimBede.com.

TRIKE NEWS

Paradise City has long been the place to see and fly weight-shift trikes, and Sun 'n Fun 2014 lived up to expectations. Evolution Trikes, the top U.S. manufacturer of special light-sport aircraft (S-LSA) trikes, celebrated its fifth anniversary by displaying a total of eight Revo trikes at Paradise City. About 60 Revo trikes have been produced. The latest changes include: an angled instrument panel for better viewing of the 8.5-inch MGL touch-screen display, more legroom, a redesigned pod to provide easy access to instruments and wiring, and panel switches moved to a lower position so you never have to reach over the control bar.

The Rival-S wing features advanced geometry that changes with in-flight trim adjustment and an adjusting ring on the keel tube for lateral trim. Revo is experimenting with an in-flight adjustable trim tab on the wheel fins, and designer Larry Mednick revealed he is working on a new design, something "very different and tubular." Get details about the Revo trike at www.EvolutionTrikes.com.

Tony Castillo of **P&M Aviation USA**, importer of the British QuikR and Quik-GTR trikes, is moving his facility from Cummings, Georgia, to beautiful Gulf Shores, Alabama, and partnering with Gary Berdeaux of BeachFlight Aviation (www.BeachFlight.com) at the Jack Edwards National Airport. Tony displayed two Quik trikes but teased the upcoming arrival of the futuristic P&M PulsR with billboard displays. The PulsR features a monocoque, carbon-fiber shell with wraparound windshield and no front strut. The new GTR wing features automatic adjusting washout rods for stability and in-flight roll trim.

SilverLight Aviation of Zephyrhills, Florida, announced the return of the Apollo Delta Jet trike along with the Hungarian-built Apollo fixed-wing airplane and AG-1 gyroplane. Apollo trikes have been successful in competition and record setting, and they have inspired others including the American-made Revo. Company spokesman Abid Farooqui said the Delta Jet components are custom-built to U.S. standards and then shipped to the United States for assembly. The wings are built by North-



Checking out the Apollo Delta Jet with Todd Halver. Photo by Don Feldhake.



Paul Czarnecki begins another successful tandem launch at Sun 'n Fun.

wings. Todd Halver of **Papa Tango Aviation** in North Carolina will handle the sales and service for the Delta Jet trike.

POWERED PARACHUTES AND PARAGLIDERS

The biggest of all powered parachutes, the Maverick LSA Flying Car, flew numerous times during the week, and it flew well. Spectators got a close look at the process of unfurling, raising, and launching the wing, and Maverick deserves credit for willingness to demonstrate the craft in all conditions. Shifting crosswinds at launch are challenging for any parachute wing and even more so when your chute is on top of a carbon-fiber pole. Contact Beyond Roads and see videos at MaverickLSA.com.

Powered paragliders, both foot-launched and those on tricycle landing gear, ruled the sky during the dawn and sunset flying sessions, and they were joined by a few slower ultralights. The activity of the paragliders on the runway is a surefire crowd-pleaser and a great way to attract people to all aspects of light-sport aviation. Nothing does that better than watching Paul Czarnecki of PlanetPPG doing a tandem foot launch with a student. Seeing them running along the



A complete disassembled powered paraglider in a carrying case.

ground to achieve flight captures everyone's imagination. When asked to tally up his total tandem flights this year at Sun 'n Fun, Paul returned a bit surprised to say he had made 35 setups and 33 successful tandem launches. On the other two attempts, the student stopped running or sat down in the harness too soon. PlanetPPG provides year-round training in Cape Coral, Florida, and sells, rents, and leases back equipment. Find them at www.PlanetPPG.com.

A lot of excitement also came from the flights of five powered paraglider pilots flying with Paradralin USA of Phoenix, Arizona, including the owner, U.S. champion and record holder Ryan Shaw. (See www.Paradralin.com.) Spectators were treated to snappy launches, steep turns, foot drags, and knee slides that required very precise flying. Paradralin USA specializes in the Nirvana line of paramotors. It displayed powered paragliders that could be disassembled and packed into a single, hard-shelled carrying case. Nirvana products and training are also available from Eric Farewell in Florida at www.AviatorPPG.com.

M-SQUARED TESTING ZENAIR RETRACTABLE GEAR ON FULL LOTUS FLOATS

Paul Mather, manufacturer of the **M-Squared Breese**, has been chosen as the first dealer to test the new Full Lotus floats with an electric retractable amphibious landing gear. Paul has a lot of experience operating Full Lotus floats in salt water. Full Lotus was sold about two years ago, and the entire manufacturing operation moved to a new plant next to the Zenair Aircraft factory in Ontario, Canada. The new company, Aircraft Floats Manufacturing, works exclusively with Zenair aluminum floats and Full Lotus inflatable floats to provide a wide range of floats for light-sport, experimental, and ultralight aircraft.

The new gear retracts inside the float and behind the step to reduce drag compared to earlier designs. Each main gear has individual hydraulic braking for ground steering. The nose

wheels caster. Full Lotus floats are popular in Canada where they can substitute for skis on snow and be used on partially frozen lakes where thickness of the ice is a concern. The amphibious floats are currently available only in the 1,450-pound LSA size, and the price is \$12,500 for the "landing gear that can go anywhere." Learn more at www.Full-Lotus.com/amphibious-floats.

FLARE ASSIST ULTRASONIC ALTIMETER

Searey specialist Jim Ratte of Recreational Mobility introduced a low-altitude ultrasonic altimeter to help experimental amphibian and sea-plane pilots judge their height when landing on glassy water. Flare Assist consists of a transducer mounted on the outside of the aircraft that uses

pulses of sound waves to measure distance to the surface. The height is announced by software in the pilot's headset through a connection at the intercom, beginning at 15 feet of altitude and then counting down. The unit needs power and a connection to the pitot system so it can sense when you are at flying speed. Even though it was conceived for landing on water, Jim said most of the inquiries at Sun 'n Fun came from land-based pilots. The kit is priced at \$2,450 from SeareySpecialist.com.

NEW BELITE FUEL SENSOR

Belite Electronics introduced a new fuel sensor with no moving parts that threads into the bottom of any fuel tank. It does not protrude significantly into the tank and is immune to temperature, shock, vibration, or the effects of water contamination. The patent-pending new sensor uses micro electromechanical system (MEMS) technology. It's a micro machine with processors and micro sensors sealed in a stainless-steel unit.

The sensor works with any liquid and measures pressure with sufficient dampening to allow for the sloshing of fuel. The unit can be calibrated by the user and works on tanks from 6 inches to 48 inches deep. The sensor includes a control module, programming switch, and connection harness. Available for \$199.95 at BeliteAircraftStore.com/avionics.

Watch for more photos and feature articles about the aircraft at Sun 'n Fun 2014 in upcoming issues of *EAA Experimenter*. Please send your comments and suggestions to dangrunloh2@gmail.com. *EAA*

Dan Grunloh, EAA 173888, is a retired scientist who began flying ultralights and light planes in 1982. He won the 2002 and 2004 U.S. National Microlight Championships in a trike and flew with the U.S. World Team in two FAI World Microlight Championships.

Flight Test Decisions...

...Or flight decisions test?

BY ED KOLANO

LATE LAST CENTURY I watched a fatal mishap at an air show. Not during some aerial derring-do designed to wow the crowd, but during a plain vanilla takeoff. The airplane was an ultralight-like machine, one of dozens getting airborne for local flying.

Airplane after airplane became airborne in little more than a few plane lengths—impressive and not at all unsafe. I heard the two-stroke engine power up and watched the little plane accelerate down the grass strip. While the others became airborne within a few seconds of power-up, this plane kept rolling and rolling. With more than half the runway behind the plane, it rotated, climbed a few feet, then settled back onto the runway.

I wish the story would have ended here, but the pilot continued the takeoff, finally getting airborne with not much runway left. This time the plane clawed a meager climb rate out of a hot, humid sky and cleared the trees at the end. Barely. I relaxed as the plane appeared to initiate a right turn to follow the course rules, but the right wing kept dropping. When it disappeared behind the trees, the plane was pointed nearly straight down.

My entire conversation circle watched this tragic event. Our reactions ranged from instant analysis of what went wrong to the slow, sad shake of a deferentially lowered head. That was my first reaction, but that sadness slowly morphed into anger. Why didn't the pilot abort the takeoff? There were plenty of opportunities. I assumed (always a dangerous thing but illustrative here) he was experienced in that airplane. If so, did he not notice the plane was not accelerating as briskly as it should have been? Absent that, he surely knew the takeoff roll was taking much more runway than it should have. Even if these two telltale signs were missed, the airplane refusing to climb out of ground effect and settling back to the grass must have been impossible to miss. Three lifesaving opportunities passed by.

I don't know whether the pilot initiated that right turn or whether the airplane just rolled that way as it stalled. I would think the pilot would not attempt to maneuver the plane if it was barely making enough lift in level-winged flight. So, assuming again, if he tried to turn under those conditions rather than proceed straight ahead, well, "shoulda, coulda, woulda."

Mea culpa time: I have no right to judge this pilot. I wasn't in that cockpit. I wonder if some of my anger was really projected fear that I might have done the same thing. I do have an obligation, however, to myself, family, friends, and others to learn from this tragedy. Replaying it in my head and discussing it with others turned my anger into a lesson learned 20 years ago. I haven't forgotten it yet.

Coincidentally, a few days later, I forced a takeoff abort at that same air show. I was in the right seat while another pilot was performing the takeoff from the left seat. The scenario was freshly similar. The engine didn't achieve its maximum rpm when the throttle was advanced. I called that out to the flying pilot, but he was already aware of it and justified it with some appeasement like "It'll come up with more speed."

Well, it didn't, and I suggested we not continue the flight. His response, while continuing to watch the engine instruments, was "No, that doesn't seem right." But he continued the takeoff roll. We had plenty of runway ahead, but the airplane was clearly not performing as it should. Although it appeared the plane would achieve takeoff speed well before we ran out of runway, taking it airborne to resolve a power shortage issue was not in my playbook. I shouted at the other pilot to abort the takeoff, and he did. The airplane didn't fly for several days while repairs were performed on its faulty carburetors.

FLIGHT TESTING TECHNIQUES

To this day I wonder if I'd have forced that abort had I not witnessed the crash a couple of days earlier. I'd like to think I would have whether that other incident was frontal lobe for me or not. I'll never know, but these two incidents have influenced my thinking ever since.

Recently, I called off a flight test. Not because it was too risky or because weather was a problem or because I wasn't feeling well. On second thought, I wasn't feeling well. Physically, I was fine, well rested, and prepared for the flight, but I didn't feel good about making that flight. So I didn't.

I like to talk about the little hairs on the back of your neck, the kind that start standing tall when something isn't right. You've been there. Something you just can't put your finger on is bugging you. It could happen at the grocery store checkout. You have this feeling that you forgot something. My guess is you remember it as soon as you get home. In an airplane, it might turn out to be a missed checklist item or an aging weather report or something you almost noticed during your walk-around. It used to take a full shock of bristling neck hair to get my attention. These days, I stop at the first bristle and proceed only when I'm satisfied that the issue is either resolved or deemed insignificant. And I keep a mental tally of the insignificant items because too many of them can add up to significant. That's what happened the other

I was in the right seat while another pilot was performing the takeoff from the left seat. The scenario was freshly similar.

day. Each individual issue was no big deal, but the fact that there were more than a few meant that airplane was not ready for that flight test. And that pointed to the bigger systemic problem—why were there so many overlooked details?

There's more to the story, but you get the idea. Did I do the right thing? No doubt in my mind. Was I influenced by my experience at that air show 20 years ago? Don't know, but this time I made the no-go decision before climbing aboard. The airplane might have flown just fine, but I'd still rather be on the ground resolving the issues than in the air fighting to survive them. Sure, that kind of thinking means a few missed flying opportunities, but I can live with that. Literally. **EAA**

Ed Kolano, EAA 336809, is a former Marine who's been flying since 1975 and testing airplanes since 1985. He considers himself extremely fortunate to have performed flight tests in a variety of airplanes ranging from ultralights to 787s.



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- > Redeem points for your EAA membership, cash back, merchandise, and more

Plus, each purchase helps support EAA programs. Cardmembers have already helped contribute over **\$500,000** to projects like the museum and youth programs.

Apply Now! Visit usbank.com/EAA_Aviation to learn more.



¹ Only new accounts that booked between 4/1/14-9/30/14 are eligible to receive double points. Promotion period ends 9/30/14. Please wait 6-8 weeks after promotion ends to receive bonus points. Double points are dependent upon merchant classifying themselves with the proper code. Only valid for Signature and Select Rewards cardholders. Account must be open and in good standing to receive bonus points. ² Some restrictions may apply. Visit www.aircraftspruce.com/eaadiscoutGuide.html for a list of discounts. ³ Rewards are earned on net purchases. Net purchases are purchases minus credits and returns.

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