

Vol.4 No.1 | January 2015



EXPERIMENTER

The Spirit of Homebuilt Aviation | www.eaa.org

» **It's Not Paint;**

A vinyl-wrapped RV-9A

» **A California Hummel Bird**

My dream airplane

Pat Hoyt's
Corvair-Powered
Zenith

601 XL-B

EAA Checklist for 2015

BY JACK J. PELTON



LIKE ANY GOOD PILOT we use checklists at EAA to prioritize our activity and be certain we don't neglect critical issues. Here's what is on the checklist for the new year:

AN EVEN BETTER OSHKOSH

Our annual fly-in and convention at Oshkosh is the biggest and most important thing EAA does every year. And what we in EAA leadership have realized is that Oshkosh is the most critical annual event in all of personal aviation.

That fact was driven home two years ago when dramatic and unexpected FAA budget cuts threatened Oshkosh due to unavailability of controllers. Suddenly the entire industry was jerked up short. A year without Oshkosh? It would be a disaster for all, not just EAA.

The good news is that we were able to come to a long-term budgeting agreement with the FAA to provide air traffic control at Oshkosh. In fact, last year's Oshkosh was the best in many years and clearly shows new life and interest in private flying, the first solid uptick since the global recession began seven years ago.

This year we are making still more improvements in the Oshkosh facilities to make everyone's stay more comfortable and enjoyable. New programs are being added to cover our members expanding aviation interests. And as always, you, the volunteers who make Oshkosh possible, are being consulted and included in planning and preparation to make this year the best Oshkosh ever.

THIRD-CLASS MEDICAL REFORM

EAA's number one advocacy effort is to demand that the FAA implement third-class medical reform. There was progress in 2014 with a notice of proposed rulemaking (NPRM) coming out of the FAA, but that proposal has been locked up in review by other government authorities. We don't know at this writing what is in the NPRM, but EAA and other aviation groups continue to insist that the document be released for comment.

Though we are pleased the FAA is following the normal rulemaking path, we also continue to work with personal aviation supporters in Congress to pressure the regulators to act. There are a large number of members of both the House and Senate who support third-class medical reform, and bills have been introduced. There is no more important regulatory reform, and EAA leadership promises to keep the pressure on for logical and meaningful change.

E-AB SAFETY ADVANCES

EAA and the FAA have made improving the safety record of experimental amateur-built (E-AB) airplanes the number one safety checklist item. And I'm pleased to report solid progress with release of FAA Advisory Circular AC 90-116 last fall.

Flights early in the Phase 1 testing of an E-AB airplane have been overly risky compared to the entire safety picture. At EAA we believe that allowing a second pilot with demonstrated expertise and experience in the airplane being test flown can make a big improvement. And with release of AC 90-116 the FAA agrees. Now a builder can, under many circumstances, fly with a second highly experienced pilot during those critical early flights.

YOUNG EAGLES SUPPORT

There has never been a more successful program to introduce youngsters to the thrill of flying than Young Eagles. In the 20-year history of the program EAA member volunteers have taken nearly 2 million young people for an airplane ride, and many of those kids have gone on to learn to fly and begin a lifetime in aviation.

Young Eagles is supported by the entire industry from Boeing to Van's Aircraft. Industry leaders have recognized the critical importance of creating a new generation of pilots and people involved at all levels of aviation.

You, the EAA members, are the essential component in the program when you volunteer your airplane and your time to fly a Young Eagle. And here at EAA headquarters we and the many generous sponsors are redoubling our efforts to support you and your chapters who host the Young Eagles rallies.

KEEP 'EM FLYING

That is the motto of the EAA Warbirds, but that dedication applies to all who love historic aircraft, and that is to say all of us at EAA. Preserving our aviation heritage is a fundamental mission of EAA.

We keep our hands on by flying hundreds of people each year in the EAA B-17 and Ford Tri-Motors. Those programs make aviation history real for so many, and also are a real-world continuing education that uncovers the challenges and solutions to keeping our history alive. And that's the key to EAA historic efforts. We can't predict exactly what challenges lay ahead for warbird and historic airplanes flying this year, but we are ready to meet them.

Your directors and EAA staff wish you a safe and happy new year in the air, and vow to do our utmost, with your support, to preserve our rights to fly and welcome all to the exciting world of personal aviation. **EAA**

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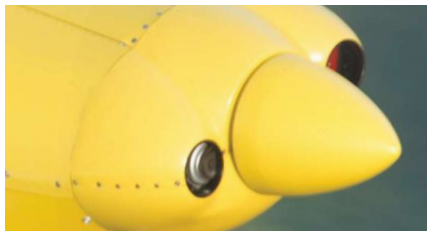
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Features



10 One Hole at a Time

Pat Hoyt's Zodiac CH 601 XL-B

BY BUDD DAVISSON



18 It's Not Paint; It's a Wrap!

Pete McCoy's alternative to paint

BY SPARKY BARNES SARGENT

Departments

02 Tower Frequency

BY JACK J. PELTON

08 Flightline

INDUSTRY NEWS

04 Homebuilder's Corner

BY CHARLIE BECKER

26 Hints for Homebuilders

Smoke those Tubes!

BY KEVIN CONNER

06 News from HQ

NEWS FROM EAA

Columns



28 What Our Members Are Building

A California Hummel Bird

BY DAVID V. DICKEY



32 Ultralight World

Lowell Farrand Joins Ultralight Hall of Fame

BY DAN GRUNLOH

*On the cover: Pat Hoyt flies his Zenith 601 XL-B.
(Photography by Tyson Rininger)*



Share Our Success

Invite others to visit your project or share a ride

BY CHARLIE BECKER

ON JANUARY 26, 1953, less than 30 people came together at Curtiss-Wright Airport (now Timmerman Field) in Milwaukee, Wisconsin, to form the “Experimental Aircraft Owners and Pilot Association.” (That name lasted only one meeting before we became the Experimental Aircraft Association...EAA). After years of individual states one by one banning homebuilt aircraft, the then Civil Aeronautics Administration (CAA), now FAA, had created an amateur-built airworthiness certificate that made it legal to build and fly a homebuilt. Although a rule was in place to allow the homebuilder an outlet for his talents and dreams, it was extremely limited. You were not even allowed to carry a passenger!

Most of the homebuilts built in this pioneering era were original designs because there were no plans available, let alone a kit. Just finding a source for quality parts was a challenge. You couldn't just call Aircraft Spruce or hop on the Internet. No insurance company would insure the plane when it was done. The entire process of getting an aircraft certificated was difficult. You would have to be regularly visited during the building phase by the CAA to make sure you were doing an acceptable job of building.

Contrast that with today. We can choose to build from kits offered by a number of established, mature kit companies with high-quality, well-refined designs. Everything you need comes in the kit, along with detailed instructions. Every design has a least one Internet-based support group to help the builder along. If you have the desire but no skills, you can attend an [EAA SportAir Workshop](#) to learn core skills and build up your confidence. EAA has more than 1,000 volunteer technical counselors who are willing to share their knowledge and expertise to make you successful. Once you are finished with flight testing, you can use the aircraft whenever and wherever you desire as long as you don't

carry persons or property for compensation or hire. You can fly at night, in instrument (IFR) conditions, and do aerobatics. And with the recent release of the new additional pilot advisory circular (AC 90-116), you can even request to have two pilots in the cockpit during flight testing.

Building an aircraft has never been easier. The availability of CNC machining has allowed kit manufacturers to dramatically improve their kits. You need a lot fewer tools to build a kit. The Internet has allowed homebuilders to communicate globally, whereas in the past your only outlet was a newsletter or monthly chapter meeting.

All of these advances are great and result in a much higher likelihood of success. But sometimes this success takes away some of our revolutionary zeal. I always refer to this opportunity to build as the “homebuilt movement.” I like the way those words impart that we are working toward a larger goal. I worry we are losing some of our revolutionary zeal. In the early days, every EAA member was an evangelist for the organization and homebuilding, preaching the advantages of homebuilt aircraft. I think we could use a shot of that zeal again. After all, homebuilding is a wonderful opportunity that teaches us to use our hands and mind to create; a talent that is becoming a rare commodity in today's virtual world.

How about setting a goal for the year 2015 of inviting 10 people over to your workshop to show off your project? If your homebuilt is already flying, set a goal of giving an introductory flight to 10 people you think might catch the homebuilding bug. At worst, you will dispel some of their pre-conceived notions about a homebuilt aircraft. At best, maybe this will get some new folks started on the path of someday becoming a homebuilder.

Let's share our success and motivate others. *EAA*



Grand Prize: Piper J-3 Cub

BACK BY POPULAR DEMAND for the

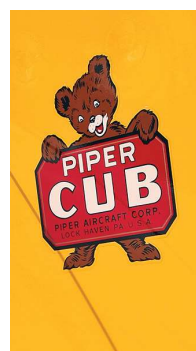
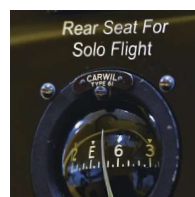
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*Valid only for EAA AirVenture Oshkosh™ 2016



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Honoring the Apollo 13 Mission

ONE OF THE MOST harrowing and triumphant adventures in space exploration history will be commemorated at EAA AirVenture Oshkosh 2015, as members of the Apollo 13 crew and team will participate in activities marking the 45th anniversary of what was called the “successful failure” of the aborted moon mission.

Apollo 13 mission commander Jim Lovell and flight director Gene Kranz will lead the members of the mission team participating in activities at Oshkosh. They will recount the preparations for what was planned as the third manned mission to the moon, the circumstances surrounding the malfunction that threatened the crew, and the ingenuity and determination that allowed the astronauts’ safe return to Earth.

EAA AirVenture 2015, the 63rd annual EAA fly-in convention, will be held July 20-26 at Wittman Regional Airport in Oshkosh. The final schedule and list of additional Apollo 13 team members are still being established. Exact schedules and activities will be announced as they are confirmed.

Lovell is one of America’s most experienced astronauts, with flights on four missions. After flying aboard Gemini 7 and Gemini 12, he was command module pilot for the famed Apollo 8 mission that in December 1968 became the first manned mission to orbit the moon. His flight in Apollo 13 was portrayed by Academy Award-winning actor Tom Hanks in the 1995 movie *Apollo 13*.

Kranz was one of Apollo’s most experienced flight officers during the 1960s, and was a top official in NASA mission operations until his retirement in 1994 with experience stretching from the early Mercury flights through the space shuttle



Flight director Eugene F. Kranz is pictured during a simulation at the flight director console in Houston’s Mission Control Center.

program. Most recognized with his trademark vest that he wore in NASA Mission Control, he was portrayed by actor Ed Harris in *Apollo 13*, whose performance earned an Academy Award nomination.

Both Lovell and Kranz have visited the EAA fly-in convention on several occasions, most notably in 1994 when the memorable Salute to Apollo program recognized the 25th anniversary of the first successful manned moon landing. Both men are also avid aviation enthusiasts with military aviation backgrounds.

Get Ready for Oshkosh 2015

A NEW YEAR BRINGS a fast-approaching EAA AirVenture Oshkosh 2015! You can now purchase your admission tickets in advance and camping for

the 63rd annual convention and fly-in scheduled for July 20-26 at Wittman Regional Airport in Oshkosh, Wisconsin.

EAA members and nonmembers can purchase daily and weekly admissions tickets in advance via a secure website—www.EAA.org/tickets—and purchases made before June 14, 2015, include a \$2 discount on daily adult admissions and \$5 on weekly adult admissions.

“With its variety of attractions and entertainment options, EAA AirVenture Oshkosh remains one of the great family-friendly destinations at an affordable price,” said Rick Larsen, vice president, communities and member programs. “This advance purchase system is the best way to be fully ready for this summer and an unforgettable experience at Oshkosh, while saving money at the same time.”



Skiplanes to Descend on Pioneer Airport February 7

IN THE DEAD OF winter with the holidays firmly in the rear-view mirror, life can get pretty gloomy in East-Central Wisconsin. Thank goodness for EAA's annual Skiplane Fly-In, which brings together aviation enthusiasts for a day of hangar flying, camaraderie, and of course, potentially dozens of skiplanes.

This year's event is scheduled for Saturday, February 7, at EAA's Pioneer Airport. Most of the airplanes arrive (weather and runway conditions permitting) mid-morning and stay until mid-afternoon. In case weather or snow conditions do not permit aircraft arrivals at Pioneer Airport, other activities will continue as planned, including complimentary chili lunch and cake to celebrate the 62nd anniversary of the first meeting of the Experimental Aircraft Association, January 26, 1953, at Curtiss-Wright Field, Milwaukee.

Pilots who wish to participate still have time to register, but must receive approval and flight briefings from EAA prior to landing at Pioneer Airport. Contact EAA's Olivia Rasmus at 920-426-6599 or at orasmus@eaa.org for more information.

The Skiplane Fly-In runs from 10 a.m. to 1:30 p.m. and is free of charge to the general public. Signs will direct visitors to the skiplane area upon arrival to the museum. Shuttle services

will also operate from Basler Flight Service for those landing at Wittman Regional Airport. Regular admission rates apply for guests visiting the museum itself. **EAA**



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Micro AeroDynamics Marks Two Milestones



MICRO AERODYNAMICS celebrated its 25th anniversary in fall 2014—a milestone in itself—but the company also marked another by shipping its 19,000th STC-approved Micro VG kit. If you included spare and replacement parts for aircraft previously equipped with the modification, the number soars past two million vortex generators shipped throughout the world in a quarter century.

The Anacortes, Washington, company has 75 supplemental type certificates that allow Micro VG retrofits on a total of 750 aircraft types.

Vortex generators are tiny aluminum pieces with a quarter-inch high vertical fin arrayed across the upper leading edge of the wing and sometimes along both sides of the vertical tail and beneath the trailing edge of the horizontal stabilizer. In flight, the generators cause the airflow to develop tiny tornadoes that keep the boundary layer attached to the wing, rudder, or elevator at higher angles of attack, reducing stall speed in the process. This allows aileron control even when the wing is stalled.

GAMA/Build A Plane Challenge

THE GENERAL AVIATION Manufacturers Association and Build A Plane have partnered for a third year to sponsor the GAMA/Build A Plane Aviation Design Challenge. The challenge seeks to promote science, technology, engineering, and mathematics (STEM) education through aviation in high schools across the United States.

GAMA will provide the first 100 teachers who enter the competition with

Fly to Learn curriculum for their classrooms, as well as five complimentary copies of airplane design and simulation software powered by X-Plane. The lesson plans can be used to teach the basics of aerospace engineering and design. Students will learn to apply their knowledge to modify and fly their own virtual airplane in a fly-off.

The competition is free to enter. Registration is open until February 13, 2015,

or until the first 100 schools register. Each school's team must have four students to be eligible for the competition. Each team must include at least one male student and at least one female student.

Teachers interested in participating in the contest will find complete rules and an application form online at <http://www.gama.aero/advocacy/aviation-education/stem>. Only one teacher per school will be accepted.

Sonex Reports 500th Completion

SONEX AIRCRAFT SURPASSED 500 flying airplanes after Christopher Madsen of Huntsville, Alabama, made the first flight in his AeroVee-powered Sonex taildragger on September 23, 2014. The first customer-built Sonex flew on June 2, 2000.

"I'm extremely pleased with the performance and the economy and am enjoying the adventures I've had in the 22 hours I've flown so far," said Madsen, who also participated in the company's T-Flight Transition Training program in Oshkosh, Wisconsin, which at last count served 115 builders.

T-Flight increases availability of type-specific transition training in experimental aircraft in response to safety initiatives from the FAA and NTSB, as well as EAA and the Aircraft Kit Industry Association (AKIA). Sonex CEO Jeremy Monnett was elected AKIA president at EAA AirVenture Oshkosh 2014.



Jabiru Disputes Australian Govt's Proposed Operational Limitations

THE AUSTRALIAN CIVIL Aviation Safety Authority (CASA) may have released its proposed operational limitations for airplanes powered by Jabiru engines before gathering all the facts, according to Recreational Aviation Australia (RA-Aus) and the company. CASA issued the "instrument" proposing restrictions earlier this month citing "a high, and increasing, rate of (Jabiru) engine failures" and solicited public comments through November 20. After a strong backlash from the company and operators from around the world, CASA softened its stance and extended the comment period by one week, to Thursday, November 27.

The proposed limitations, if enacted, would allow Jabiru-powered aircraft in Australia to fly only day VFR unless CASA approval is obtained; there are no flights over populated areas at altitude from which it cannot glide to a suitable landing; no passengers; no solo flight by student pilots; and the aircraft must be conspicuously placarded that no passengers are allowed and that occupants fly at their own risk.

After CASA released its original proposal, RA-Aus issued a strongly worded response on November 21, in which it stated, "CASA has provided no specific failure data related to Jabiru engines to industry other than to suggest an increasing rate of engine failures. At no point has CASA published evidence or otherwise to substantiate its claims. RA-Aus and the aviation community have no evidence to suggest that the statements by CASA are made with any substance."

RA-Aus, which is charged with administering the safe training and operation of approximately 10,000 pilots and 3,500 aircraft in that country, called on CASA to withdraw the proposal and consult with all parties to develop an acceptable solution.

CASA met with Jabiru and RA-Aus officials and issued a revised document in which it emphasizes the precautionary nature of the proposed restrictions. "No conclusive determination has been made by CASA about the integrity of Jabiru engines, and no determinative findings have been made by CASA about Jabiru's ability and willingness to produce safe, sound and reliable aircraft engines," it states.

CASA also acknowledged Jabiru's good reputation for manufacturing safe and reliable engines, and that most Jabiru-manufactured engines continue to operate safely and reliably in Australia and abroad.

Jabiru said it has produced 3,665 engines since 2005, with 35 through-bolt incidences occurring since then—some in flight and some detected during routine maintenance inspections. The vast majority of in-flight incidents occurred in hard-working flight school planes equipped with four-cylinder Jabiru 2200 engines. RA-Aus has virtually no through-bolt failures involving private, non-training applications on record. Engineering efforts over the last three years have addressed predominately through-bolt along with some stuck valve issues, including several service bulletins.

RA-Aus states that two-thirds of its flight-training facilities rely on Jabiru-powered airplanes for their operations.

Jabiru has been proactive regarding engine issues. Since October 2013 Jabiru uses standard valve relief pistons that do not allow a stuck valve to impact the piston and cause engine failure. They have been used on all overhauls and repairs since August 2013. The company also upgrades engines to the current spec at owner request during major service intervals such as top end overhaul.

The introduction of roller cams has to date eliminated valve train failures, and the introduction of 7/16-inch through-bolts replace the original 3/8-inch bolts in production engines. A retrofit program for through-bolt replacement is being devised as well.

Pete Krotje, EAA 306085, who operates the sole Jabiru engine and aircraft distributorship in the United States (Jabiru USA Sport Aircraft LLC, Shelbyville, Tennessee), estimates about half of all Jabiru engines currently in operation worldwide are in the United States. Over the past 12 months there have been two valve-related issues that caused an in-flight engine stoppage in the United States. The other issue mentioned by CASA is broken through-bolts. Both issues have already been addressed by Jabiru, Krotje said. "We have torn down and rebuilt about 40 engines, two with valve issues and the remainder for prop strikes," he said.

Still, the damage of the original notice has been done, and although the uproar over CASA's initial proposal has diminished significantly, Krotje acknowledges it will take some time to recover.

Belite Offers Digital LCD Altimeter/VSI

BELITE'S NEW DIGITAL LCD altimeter/vertical speed indicator (VSI) is now shipping! It features a digital altimeter and VSI combined for easy viewing on one screen. And, it has a slew of additional features including one button access to density altitude, system voltage, and VFR cruising

alarm, and it's less than an inch thick, and weighs less than 2 ounces.

For complete specifications and to buy online, visit www.beliteaircraft.com/avionics/altimeter.php, call 316-253-6746, or e-mail info@beliteaircraft.com. **EAA**





One Hole at a Time

Pat Hoyt's Zodiac CH 601 XL-B
BY BUDD DAVISSON

THERE HAS BEEN A LOT of conjecture regarding what it is about aviation that is addicting to some people but has zero effect on others. Why do so many kids seem to come out of the womb with the sure knowledge that someday they are going to fly? Although many are born into aviation families where things that fly are just part of the environment, there are just as many who are brought up in a non-aviation environment but are still drawn to aviation. Pat Hoyt of Eagan, Minnesota, is one of those. He's involved in aviation simply because he couldn't *not* be. For unknown reasons, it's a part of his DNA.

"I have no idea where it [my aviation addiction] came from," Pat said. "I was always fascinated by the *Aviation Century* series, the X-planes, and space exploration as a child. I spent countless hours in libraries in the 500 and 600 sections. (Remember the Dewey decimal system?) Space exploration was much more of a point of national pride in those days, and that was where I wanted to be.

"I wanted to be a test pilot for as long as I can remember, and I have always wanted to build my own airplane. I've made it to most of the Oshkosh air shows since the mid-1970s and was fascinated by homebuilts. I remember the excitement when Burt Rutan first showed up at Oshkosh with his canard designs, and that always stuck with me. Whenever I see photos from those times, I'm always looking for little kids and wondering if I'll see

myself. But even as a young adult, I was never able to start building an airplane due to excessive job travel, no money, no place to build, etc. However, the thought of building my own airplane was always there in the back of my mind.

"It wasn't until I was 42 years old that I finally got to take my first flying lesson. Things moved quickly after that, because exactly 6 years, 11 months, and 16 days from that initial flight lesson, I took my own airplane, N63PZ, into the air on its first flight. I'm proud to say that I built my airplane with my own two hands, including building the engine, and that I did all of my own flight testing."

Pat was a member of a flying club for a short time, but it quickly became evident that he wanted more out of aviation than simply fueling and flying. He wanted his own airplane, and to Pat that didn't mean *buying* an airplane. That meant *building* one.

Pat clearly remembers going through the fascinating process of picking a design. He said, "I studied a lot and narrowed my choices down to several of the more popular low-wing, all-metal designs. I studied examples of each at Oshkosh. I immediately ruled one of them out because I simply didn't fit in it. I'm 6 feet, 3 inches tall. I flew in the remaining two and the Zodiac came out on top. I liked how it fit. I looked how it felt. Better yet, I liked how it flew."

Often when builders start a project, they are facing a big educational obstacle in terms of learning the skills required. They are



Pat loves the look of the bare metal, so he only painted the fiberglass parts.

also often unsure of where, or how, to start building. Pat and his wife, Mary, who was an integral part of the project, didn't have that much of a problem with either area.

"Going into this, I had zero sheet metal experience, so we started at one of the Rudder Workshops that the Zenith people put on back in November of 2006," said Pat. "I took my wife and our dog, Piper, on a 'vacation' to Zenith's facility in Mexico, Missouri. We had a blast and met some wonderful people, and Mary got a ride in the factory's Zodiac demo. We came home from that event with a rudder, and more importantly, with the knowledge and confidence that we indeed were capable of taking the next step, which was building the rest of the tail kit. We went through the same decision process several times during the build period: evaluate, decide, build, re-evaluate.

"I bought parts pretty much section by section. First, we did the tail section, then the wing components, and then the fuselage. I bought what parts I could to make things easy but fabricated some things, too. When it was all said and done, the airplane was probably half kit and half scratchbuilt, especially when it comes to all the stuff that's above and beyond just the raw airframe. There is a lot more to completing an actual flyable aircraft than just finishing an airframe. So much of the stuff in the new kits is prepunched and match holed, so it would be easier today.

"I had to drill most of the holes for the rivets, which were mostly Avex pulled rivets. The actual rivets are the countersunk type; however, the heads are re-formed into a slight dome shape during the installation process via a concave nose on the rivet tool. They have steel shanks. I used a hand riveter because it gave me better quality control than I got from the pneumatic riveters that I tried.

"Riveting was very satisfying, because by the time I got to that point, there was a fair amount of prep work that had been accomplished for each hole—drilling, deburring, application of a metal protectant, and finally, the riveting. Each time I pulled a rivet, it brought a feeling of completion, because that was the final step in the process for that particular hole. There were also some large solid rivets in the wing spars that I used a traditional rivet gun and bucking bar on.

"I was about 90-percent done with the aircraft when some required modifications to the spars and aileron balances had to be made. So, I had to backtrack and redo some things. But I was happy to do them and they resulted in an even better airplane.

"Once I got started, I found the aircraft was actually fairly easy to build. At that point, I came to realize that the odds of success were increasingly in my favor as long as I could keep working on it. One of the hardest things was asking neighbors for help whenever I needed to turn one of the wings over. I think most people around here thought I was crazy for building my own airplane. For a lot of the general public, the thought of someone building an airplane in their garage is way outside the norm. Now that it's finished and flying, however, things are a bit different. There is a lot to be said for demonstrated success."

The wings each house a 15-gallon tank, which the Zodiac community refers to as "long-range" tanks, and considering the



Pat and Mary Hoyt.

low fuel burn of his Corvair engine, it's easy to see why 30 gallons is considered a lot. Pat reports he is using dual in-line electric pumps and fabricated his own 100-percent braided steel hoses using AN fittings.

"I ran 100LL for most of my Phase 1 testing," he said, "and gradually tested 91 octane non-oxy. Now, I burn almost exclusively 91 octane, except when I'm on a cross-country and can only get 100LL. Right now, there is a \$3 per gallon difference in the cost of 91 octane at the local Fleet Farm pumps versus the 100LL they charged at an airport I recently visited."

Pat's height dictated that he use a different canopy on the airplane, which he said was the biggest challenge of the entire build, a familiar homebuilder comment. "The one I used didn't fit very well and I wound up having to fabricate a couple of fiberglass fairings. But they turned out really nice. I also fabricated a metal fairing that wraps around the back of the canopy that turned out



Pat's 601 weighs in at 840 pounds, 40 pounds more than factory's Lycoming O-235-powered model. Pat's custom BRS parachute system and custom canopy account for the majority of those pounds.

great. The new kits from Zenith include this same style of canopy and they've gotten the bugs worked out. Builders today will find it much easier to fit this kind of canopy now."

Other minor fuselage modifications were done, including the mounting of a ballistic parachute. "I did that in consideration of my wife and future nonpilot passengers," Pat said. "We noticed that more of the new factory-built airplanes had whole-airframe parachutes, and my wife liked that idea."

Another modification he made, which is beginning to gain some traction in the homebuilt community, was to install a "Gurney flap" on the elevator. That is a narrow, spanwise tab on the trailing edge that is permanently set at 90 degrees and increases the effectiveness of the airfoil to which it is attached. He said, "I started out small and did some iterative testing with that and have it pretty much dialed in now."

A HOMEBUILT ENGINE

Pat had decided on the Corvair engine very early in the process. Although he had never built an engine of any kind before, the thought of building his own aircraft engine was appealing. "Building your own engine brings with it the distinct advantage of really understanding it," he said. "Plus, guys who have built their own engines are obviously capable of 'rebuilding' their own engines, whereas most pilots with

traditional engines are at the mercy of a mechanic when overhaul time is reached.

"I got the engine out of a 1967 Chevrolet Corvair that was sitting in an auto salvage yard in central Minnesota. It was the middle of winter when I found the car and the temperature was 2 degrees below zero on that day. But I wanted that engine.

"I rebuilt the engine myself, following the proven methods that William Wynne publishes in his manuals and the information that he shares on FlyCorvair.com. I did my best to build a top-of-the-line engine using the best of everything that was available, along with a lot of brand-new parts. The crankshaft was magnafluxed, reground, and nitrided, and I installed a set of forged and balanced pistons and rods along with new cylinders. I also installed a fifth bearing, which provides additional support for the front of the crankshaft. The cylinder heads were machined by a shop that specializes in Corvair aviation head work: Falcon Machine. I'm using a dual ignition consisting of points on one side, and electronic on the other. I used a lot of parts from www.FlyCorvair.com, which along with an MA3-SPA aircraft carburetor, have provided flawless reliability. I get lots of comments about the sound of the engine. People say it sounds really good."

Pat said he has been so impressed with the Corvair engine that he's rebuilding another for a Tailwind he has under

construction, and he has two more Corvair engines under his bench for future projects. His Zodiac Corvair spins a 66-inch Warp Drive propeller made of carbon fiber, and it's set at about 9 degrees of pitch.

One of the most striking aspects of Hoyt's Zodiac is the statement that it makes with its highly polished aluminum fuselage and wings accented with New Holland Yellow tractor enamel. Pat said, "When I was building it, someone would ask what color I was going to paint it. Truthfully, I didn't want to paint it at all, but there were some fiberglass pieces that I just couldn't leave bare."

Not only is there minimum paint on the airplane, but it took minimum equipment to apply it. He explained, "I thinned the paint with mineral spirits so it would flow out better and applied several coats with a roller, followed by very light sanding between coats and then some buffing. I polished the aluminum with Nuvite; and I touch it up in the spring before Oshkosh and that's it. Other than cleaning dead bugs off the leading edges, it's almost trouble free. I get a lot of comments from people on the ground who say the airplane really shows up well when I'm in the pattern."

He has what may be one of the least expensive paint jobs in sport aviation. His philosophy is: "I can understand guys going all out on painting a mega-dollar composite airplane or even a tube and fabric classic. Metal airplanes, however, have their own beauty that should not be covered with paint."

When he was finished building and put the airplane on the scales, it came in empty at 840 pounds. The factory calls for 800 pounds with a Lycoming O-235. Pat said that the BRS parachute system and the custom canopy account for most of his airplane's higher weight, but it is still in line with what similar Zodiacs weigh.

Pat uses 1,320 pounds as the gross weight, and has no problem staying under that with himself, his wife, and full fuel, which is a lot of fuel, given the engine.

So, 5 years, 11 months, and 16 days from setting the first rivet, N63PZ took to the air with Pat at the controls on October 27, 2012, at 8:02 a.m. After receiving some fairly intensive transition training, he got to live out his longtime goal of being a test pilot, and he was doing it in something he built himself. Very few people in the world can lay claim to the same achievement.

"I never did think of it as a big project," he said. "Rather, I saw it as a series of smaller projects. Whenever I finished a small piece, I had a sense of accomplishment for that. Finish enough small projects and eventually you have an airplane."

AND HOW DOES IT FLY?

The obvious question at this point is: How does it fly?

Pat said, "It'll get off the ground at 50 mph, but I usually wait a few more seconds and take off at around 60. I've not had any problems getting into or out of the same fields as my friends with Piper Cubs and Pietenpols. On the shortest grass strip that I can think of, on a humid July day, uphill and with wet grass, I was off

the ground at full weight (with a passenger) by midfield, which would have been around 900 feet, which is by far the longest it's ever taken anywhere.

"I come down final at about 80 mph and touch down in the 50s. It loves grass runways, which is good because I fly into a lot of grass airports, like Brodhead. Plus, the fly-ins I like to go to are often on grass."

The obvious question a lot of people ask about airplanes is: How fast is it?"

"Cruise is a pretty steady 111 mph," said Pat. "I have not done anything to improve the aerodynamics, but I probably should. Wheelpants and some cleanup around the landing gear would get me a bit more. Va is 103 mph, and I slow it down if the air gets too bumpy. At that power setting, which is 2,800 to 3,000 rpm, it's burning about 5.8 gph."



Pat also built the Corvair engine that powers his Zenith. He used William Wynne's conversion plans. He's building another Corvair engine for the Tailwind he is building now.



A combination of digital and traditional round instruments grace Pat's panel.

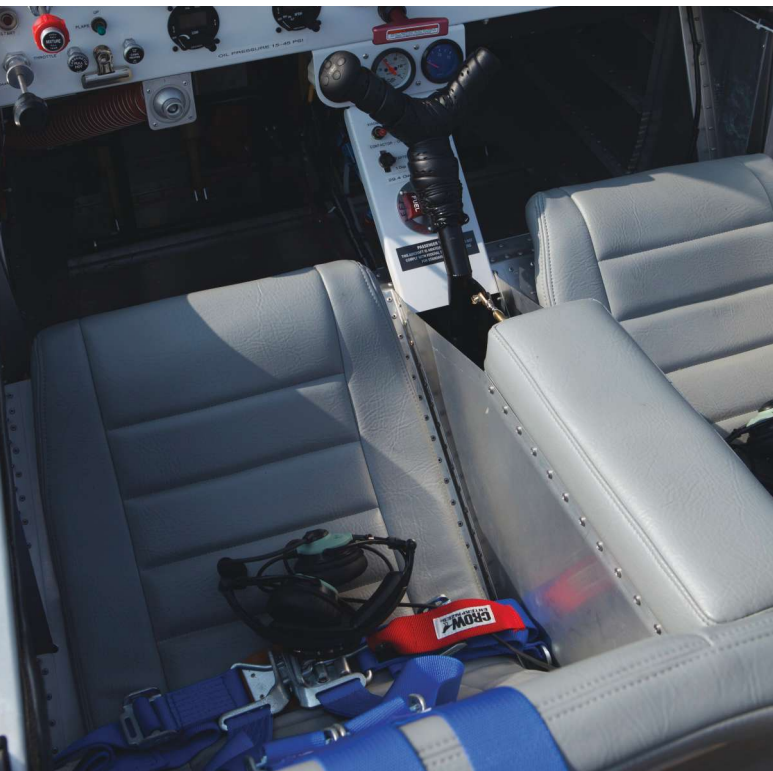
As he transitioned from builder to flier, Pat noticed a couple of things that he would have done differently while building.

“As a first-time builder, I focused too much on the instrument panel and didn’t focus enough on the ‘creature comfort’ stuff like cabin heat,” he said. “After flying it for a while, I went back and totally redid my cabin heater, which is pretty important in Minnesota. I would also have done things differently around the canopy hinge area. I still might revisit that, but honestly I’ve been having so much fun flying and going places that it hasn’t been a priority.

“No one truly builds an airplane all alone. I got lots of advice, ideas, inspiration, and examples from other builders. In fact, a couple people I want to mention are William Wynne, for being so generous by sharing proven methods on Corvair conversions and really saying it like it is, and my local friend John Schmidt, who provided tons of advice and inspiration and who was never hesitant to point out things that could be done better.

CORVAIR COLLEGE VIDEO

The May “issue” of EAA’s Chapter Video magazine includes a 23-minute segment highlighting one of William Wynne’s Corvair College classes that he conducts throughout country to assist engine builders. Here’s that Video magazine.



The Yoke is common in most Zenith models.

When the day came for my first flight, I had John Schmidt there as that one fellow pilot and builder whose unbiased advice I could most trust.”

A project as big as building an airplane literally takes over a person’s life, and it’s easy for it to cause strife in other parts of his existence. However, often it becomes a partnership project that makes the relationships stronger.

Pat said, “My wife, Mary, was really surprised when she heard I was building an airplane! All kidding aside, she’s been very supportive every step of the way. And it goes beyond that: Mary has encouraged the wives of other pilots in our social circle to support their husbands’ aviation interests. When I first started hanging around the EAA chapter, it seemed like it was mostly a tight group of guys; the wives were rarely part of it. But since then, we’ve helped turn a lot of it into a social experience, and the wives are having as much fun as the husbands. Mary and I have hosted a lot of parties where there’s been good people, good food, good drinks, and an airplane project in the garage. That also had the added benefit of putting a lot of EAA-quality eyeballs on my project during its construction. It’s good for the spouses to see that it’s not just their husbands all alone who are building an airplane...that there are also some pretty serious other guys, and wives, doing it, too.

“The entire experience of building my own airplane has been overwhelmingly positive. The people we have met along the way have been top-notch. Paul Poberezny really got it right when he said that the best thing in aviation is the people.

“I built the airplane in my garage. During the summers, I would work with the garage door open, and often people would drive by, stop, back up, and look. Sometimes they’d come in and talk. One time a local skeptic explained, ‘I just don’t understand why you would want to build an airplane.’ I replied, ‘Actually, my wife wanted me to build a spaceship, but I thought it would be better to start with something a little simpler,’ as I pointed to my airplane.

“A lot of people would say that they would never trust something that they built themselves. Other times people would come, look, and sometimes ask, ‘Are you allowed to do that?’ I always felt that was a sad question to ask in this country where liberty is cherished by so many of us. Although it’s unusual for most people to see a guy who’s building an airplane in his garage, I always told people that lots of guys have built airplanes, and that I wasn’t doing anything that a lot of other guys haven’t already done.

“Every day, I think about how we are so incredibly fortunate to live in this country and during this point in history where we can do something like this. In many parts of the world, building an airplane would not be allowed. And for most of human history, the act of flight was simply not possible. We are indeed fortunate.”

You’re right, Pat; we are indeed fortunate. **EAA**

Budd Davisson is an aeronautical engineer, has flown more than 300 different types, and has 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 on www.AirBurn.com.



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IT'S NOT PAINT; IT'S A WRAP!



It's Not Paint; It's a Wrap!

Pete McCoy's alternative to paint
BY SPARKY BARRETT SARGENT



It's a wrap! 3M Scotchprint vinyl wrap, that is.



Pete McCoy and his vinyl-wrapped RV-9A.



One hundred and seventy hours of flying time so far, and the vinyl wrap seems to be just fine.



Even the spinner is vinyl wrapped.

"HEY, NICE PAINT JOB on your airplane!" commented numerous admirers when they saw Pete McCoy's sunny yellow-and-white airplane on the flightline at EAA AirVenture Oshkosh 2014. Pete, who hails from Laguna Niguel, California, and completed his Van's RV-9A in February 2013, would smile jubilantly and reply, "It's not paint; it's a wrap!" His response provoked some incredulous expressions and intrigue, and those passersby paused to learn more.

"It's a 3M Scotchprint vinyl wrap," Pete explained. "There's been a lot of talk on the Internet about people thinking about doing this, and there are at least a couple of companies that specialize in it. So I contacted them and asked a bunch of questions, and they were really helpful. The main company that I know of is in Florida, but I live in southern California. They wanted to get a few people together at one time and then fly somebody out to do the job. That got me thinking I should look in my local area, and I found dozens of companies that do vinyl wrap. You see a truck driving down the street with all the colorful advertising images; well, that's vinyl wrap. So I went to the 3M website and they had a list of installers in southern California. I contacted six of them and sent them a photo of a paint scheme similar to this plane and asked if they could do that in vinyl. They got back to me and I made a selection. Gatorwraps had never done an airplane, but they had done guitars, motorcycles, scooters, cars, vans, and trucks. They had even done a submarine with the conning tower and wings on it, but they hadn't done the really complex corners and contours of an airplane. They were very confident that the installer wouldn't have a problem with it."

Pete was pleasantly surprised to hear the low price quote for the project; it was less than half the price of a paint shop's quote. Not only that, it would require very little time to complete. Another aspect Pete liked about the vinyl wrap installation was that he didn't have to remove any control surfaces from the airplane. Nor was there any tedious masking process. "I was flying for a year with no paint," he said. "And I know several guys who took their airplanes to the paint shop and it took about three months. My first flight was more than a year ago, and I fly every weekend; I couldn't bring myself to go into the paint shop, take it apart, and not see it again for three months!"

THE PROCESS

As preparation for the vinyl wrap installation, Pete made diligent efforts to comply with Gatorwraps' simple instructions to ensure that all the surfaces of the airplane were very clean and very smooth.

"I cleaned all the bare aluminum really well with microfiber cloths and rubbing alcohol to make sure there was no grit, grime, or grease anywhere on them," said Pete. "I also went over the fiberglass wingtip fairings with 400

grit sandpaper just to make sure they were really nice and smooth. I spent a weekend doing that. Then the installers came to my hangar after I got off work, and we'd work for two or three hours in the early evenings. We did that over five sessions. If I could have gotten off work, it would have taken maybe two-and-a-half to three days to do the whole project. So the fact that the whole vinyl wrap installation was basically done in less than a week was really cool; I liked that a lot."

Pete specifically selected Satin White (I080-S10) for the wings to eliminate the problem of glare, which he experienced while flying with the RV-9A's shiny aluminum wings in sunny southern California. He chose Gloss Bright Yellow (I080-G215) for the fuselage and completed the overall scheme with a combination of the two and an accent stripe of Gloss Black Metallic (I080-G212).

The 3M Scotchprint vinyl came in a 60-inch-wide roll, and Pete described the material as having "some micro-channels in the glue that's on the backside, which facilitates placing and repositioning it as necessary when first starting the process. A large sheet of vinyl is 'tacked' down in places overlapping a metal seam (which was trimmed later), and the installer positioned and pulled it up four or five times to get it in good position. Then it's

rubbed onto the metal with a plastic applicator and just fingertip pressure to get the air bubbles out through the micro-channels. That kind of sets the glue and makes it nice and sticky. The vinyl is trimmed at the metal seams of the airplane."

The method is a little different when it comes to compound curves. For example, Pete said the area around the windshield was done with one piece of vinyl. First, a piece of wire tape was applied to the entire edge of the windshield, which was later used to neatly cut away the overlay of vinyl. (This same wire-tape method was used to make the sweeping curve of yellow on the side of the fuselage.)

VINYL WRAP ALTERNATIVES

An Internet search revealed hundreds of imaginative applications for vinyl, and two of the major manufacturers of vinyl wrap are 3M (www.3M.com) and Avery Dennison (www.AveryDennison.com). Several companies advertise vinyl wrap installation for airplanes, including Gatorwraps of Ontario, California (www.Gatorwraps.com), AircraftWraps of North Palm Beach, Florida (www.AircraftWraps.com), and Plane Vinyl of Woodstock, Georgia (www.PlaneVinyl.com).



Looks like paint, doesn't it?

IT'S NOT PAINT; IT'S A WRAP!

Then a large sheet of vinyl was tacked in several places on top of the windshield and covered the area all the way around the lower windshield fairing.

For the fairing's compound corners, "one guy is holding and stretching the vinyl and another guy is applying heat to it with an instant-on blowtorch," Pete explained, adding, "but something like a hair dryer works fine. So when they're stretching and heat-forming the vinyl, all these little rivulets in the material just smooth right out as the sheet is rubbed onto the metal. The whole area around the windshield was done with one piece of vinyl. They actually put a little bit of glue under the leading edge of it, but that's one of the few places they glued; the rest of it is just the glue on the back of the vinyl."

Each control surface and every small piece of aluminum on the plane is covered with one layer of wrap, so if an issue develops, that portion of vinyl can be peeled off and rewrapped. After three months and 30 hours of flying with the vinyl wrap, Pete said the only issue he's had is with the intersection fairings on the gear legs. "Those are places that I didn't get clean and smooth. I had bought prefab intersection fairings and they were still just the raw, uncut fiberglass; so I'm having issues with the wrap sticking right there. I'm just going to take that vinyl off, prep it like

I was supposed to, and then put a little piece of white vinyl back on that, and it'll be done."

BIT OF BACKGROUND

Like many pilots today, Pete first soloed a Cessna 150 in which he obtained his private pilot certificate. That was back in the 1970s when he was in high school and the rental fee was only \$15 an hour wet. By the early 1980s, Pete recalled that the fee was up to \$60. So he stopped flying in order to pay for and complete his college education. Twenty-some years passed by, and in 2006, he bought a Van's Aircraft kit and started building his RV-9A in his garage.

He worked virtually every day for two years on the project until he had to move it to an airport away from his house. "That slowed me down to a crawl," he said, "because I was only working on it for long Saturdays, as opposed to working every night at home in the garage. So it took me seven years to finish it. Throughout the project, when I had certain questions, I'd talk with my wife and she'd help me out; she's an engineer. It took me 2,500 hours to complete the airplane, but I was pretty slow and methodical about it. I had a helper for a lot of the riveting, which was fun."

Three years into the building process, Pete decided it was time to go for his first ride in an RV-9A and then get

Gatorwraps of Ontario, California, did the vinyl installation on this RV-9A.



current with his flying skills. While at Oshkosh, he managed to get a 30-minute ride in Van's -9A, which produced a spontaneous and indelible "RV grin" that he still wears today. After returning home to California, he started flying again and logged 80 hours in a Gobosh and Remos light-sport aircraft. That brought his total pilot time up to 155 hours.

"I also had four hours of transition training in an RV-7A, including turns, stalls, and the technique of slowing down from cruising speed to pattern and landing speed. I felt very comfortable, and my own first flight was a piece of cake," he said. "Phase 1 [testing] is to go out and develop the flight envelope of the aircraft, not just bore holes in the sky, and I took it seriously. I did stalls, turns, climbs, descents, and kept track of fuel burn and other performance data with detailed notes. I did the gross weight testing by using 50-pound sacks of gravel. Each time I loaded and secured one in the airplane, I went out and did stalls and watched the airspeed climb as the plane got heavier with the increased weight. It stalled at solo weight and full flaps at 43 knots; when I had 200 pounds of gravel strapped in the plane, it was stalling at 55 knots. My RV-9A has the 160-hp Aero Sport Power IO-320 with a Precision Eagle EMS electronic ignition, and the airplane flew straight and level from day one."

VIRTUAL WORKSHOP

Throughout his project, Pete posted on his online blog (www.MyRV9.com), documenting his progress with words and images. He chronicled building the empennage, wings, and fuselage and final assembly. He included hands-on photos of himself as well, to show that he was the one doing the work. Pete said that when he applied for his repairman certificate, "the FAA inspector looked through every single page of my blog. He didn't ask a question; he just had me sign the paperwork. That blog worked well for me!"

When Pete decided to have the airplane wrapped in vinyl, he naturally posted that process online as well, as a video on YouTube (www.YouTube.com/watch?v=xH4uJeI9YhI). His online postings received so much attention that he had at least a dozen people, many of whom he hadn't previously met, greet him by name during AirVenture 2014.

"I've been standing here for days at Oshkosh and have talked to lots of people," he said. "Some of them know it's vinyl wrap because they've seen my website. But some of them ask, 'When'd you get it painted?' I'm talking to everybody who walks by, and I'm meeting people from England and Australia who've seen my video and say, 'I know that plane!' This is the best show I've ever had! There's a company here at AirVenture that specializes in airplane wraps, but I've been so busy talking with people, I haven't had time to leave the airplane and go find them!"



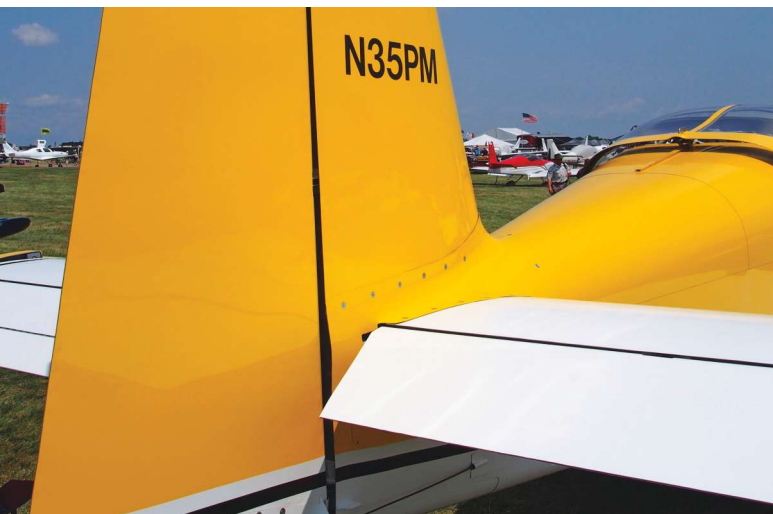
Close-up view of the wheelpants.



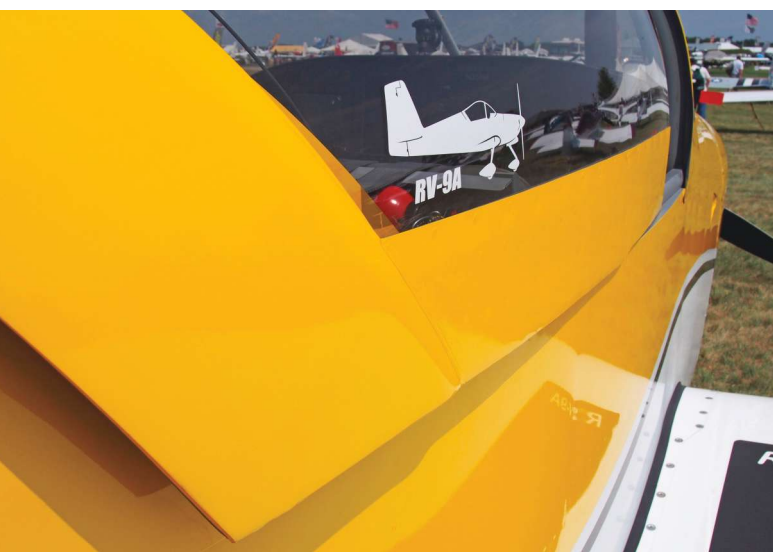
Applying the vinyl wrap.



Close-up view of an air inlet on the fuselage.



Vinyl wrap yields crisp, clean lines.



Installing vinyl wrap on compound curves and corners requires skill and experience.



3M Scotchprint vinyl is thin and flexible.

IT'S A WRAP

Pete shared that some folks are trying the vinyl wrap installation on their own, without hiring a professional installer. "There's definitely a learning curve as to how you do the heating, stretching, and smoothing of the vinyl," he said, "but this is something that can be done by a homebuilder. It's difficult, and there's a learning curve; but if you built an airplane, you can do this. I'd recommend buying some extra vinyl wrap and figuring out the process by practicing on some of the curves and corners. After all, if you don't like it, you can pull it right off!"

Pete reflected that another attractive aspect of the vinyl wrap is that in five years or so, if he decides he doesn't like yellow and white, he can simply peel it off and apply a new scheme to the plane within a week. In the meantime, he's making sure that N35PM is a clean flying machine. The waterless Wash Wax All is his choice for cleaning bugs from the vinyl wrap. He just sprays it on and wipes it off with a soft cloth. For tougher dirt such as oil and grime, he uses propyl alcohol to clean the vinyl wrap.

FLYING INTO THE FUTURE

Of course, there are some questions about the pros and cons of using vinyl wrap, and Pete doesn't know all the answers yet. How durable is it? Will the bare aluminum corrode underneath the vinyl wrap, or will the vinyl wrap help prevent corrosion? Does the wrap have equally good adhesion on bare aluminum, primer, or paint? When the vinyl is peeled off after a period of time, is there any hard-to-remove adhesive residue on the metal? How do frost and in-flight icing behave on the vinyl wrap? Does the installation of vinyl wrap affect airspeed?

Pete is beginning to find answers to some of these questions, and he looks forward to learning more as he continues flying his RV-9A. He said, "There are a couple of guys out there who have had it for a year or two, so I'm not really a pioneer with this vinyl wrap; I'm an 'early adopter.' I cruise at 140 knots and I've had no problems around the leading edges of the vinyl. And I haven't detected any difference in airspeed. As for weight, some of the companies that are installing vinyl wrap say it adds about 12 pounds to an airplane like mine, which is a lot less than paint! I have not reweighed the plane after the wrap, so I have not verified that yet. I love both the building and the flying. I would absolutely love to build another airplane; building this one was a blast. My first flight was April 27, 2013, and I have 170 hours in the aircraft already. So it's not *if* I'm going to fly this weekend—it's *where* I'm going to fly!" **EAA**

Sparky Barnes Sargent, EAA 499838, holds a commercial glider certificate with private single engine land and sea ratings, and she personally restored her 1948 Piper Vagabond.



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Smoke those Tubes!

An alternative to oil

BY KEVIN CONNER, REPRINTED FROM THE HATZ NEWSLETTER

MY NEXT DOOR NEIGHBOR and I were talking one day about our J-3 Cubs and their construction. My Cub was built in Lock Haven, Pennsylvania, and his was built in Ponca City, Oklahoma. He has owned several Cubs and is knowledgeable about them and other Short-Wing Pipers. He mentioned that some steel-tube fuselage structures were treated internally with smoke rather than oil for corrosion control. So I scratched my head and asked more questions. He explained that you could drill a small hole in a section of tubing and add a small amount of boiled linseed oil. Then heat it with your torch and that would fill the entire tube up with smoke. When the smoke

cools down, it will leave a film of oil on the inside walls of the tubing.

That sounded a whole lot better to me than spending hours sloshing oil around in the tubing and trying to recover it. So I went home and drilled a 1/8-inch hole at each end of a section of tubing. I then heated the tubing underneath one of the holes and added a few drops of oil. I angled my torch so it would push the smoke down the tube and a few seconds later and ... voila! Smoke started puffing out the hole on the other end like a toy train. I quickly closed the holes with a rosette weld and moved to another section. This might be old school to some, but I hadn't heard of it before. Seemed to work on. Build on! **EAA**

HINTS FOR HOMEBUILDERS VIDEOS

HERE'S SOME OF THE MORE RECENT VIDEOS ADDED TO EAA'S CADRE OF MORE THAN 400 HOMEBUILDER HINTS VIDEOS:



Knife Trimming Composites

EAA Technical Counselor Mike Busch demonstrates how to trim a layup while in the green state not fully cured.



Removal of Stainless Steel Pulled Rivet

Brian Carpenter from Rainbow Aviation Services demonstrates a technique to remove a stainless steel pulled rivet.



Drilling Holes in Composites

EAA Technical Counselor Mike Busch demonstrates the use of a hole saw to cut accurate holes in cured composite materials.



Locating Blind Holes

EAA Technical Counselor Mike Busch provides a tip to help locate holes without the use of a hole-finder tool.



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A California Hummel Bird

N144HV—my retirement project

BY DAVID V. DICKEY, EAA 399543

IN 2010 WHILE LOOKING for a retirement project for myself—a senior aerospace avionics engineer—I came across a shiny Hummel Bird built by Blackie, a serial craftsman, for sale in Texas. However, the newly introduced Hummel H-5 was already on the market and seemed to better meet my anticipated needs. So I jumped into my car and drove to the badlands of Texas from coastal California to check out the Hummel design philosophy, kit fabrication, and factory support. I also got checked out for flight in a light-sport aircraft after 55 years and even fewer hours in general aviation aircraft.

Following conversations with Terry at Hummel Aviation, I settled on a tri-gear H-5 kit with the big 2.4-liter, 85-hp Hummel engine and a pair of 5-gallon wing tanks.

This would give me the range to visit sons in Nevada and Washington and the incentive to add lots of avionics like a real cross-country airplane. My wife agreed that she would contentedly continue to use commercial flights until I add another seat and more engines to my (next) little plane.

In a year and a half, after working about four hours per day in an ample garage, we rolled out the H-5 and loaded it onto a borrowed trailer for a 10-mile trip to the regional airport and a borrowed hangar. During the next few months, the wings were attached, avionics checked out, and a few hours of taxi testing done to assure myself that the steerable nose gear really would steer. Shortly after a designated airworthiness representative determined it was airworthy,

I turned the H-5 over to a very experienced and enthusiastic commercial test pilot friend who logged a rigorous 10 hours to declare us both ready for each other. As advertised, the plane looks beautiful and performs excellently.

The H-5 features polished 6061-T6 aluminum with some red trim (to minimize weight). The plane has basic instrumentation plus a vertical speed indicator, Trans+C, and iFLY GPS. I didn't attend a SportAir Workshop, but I have encouraged several others to do so. However, I did work with all of the available EAA support services—technical counselors and flight advisors—in three local EAA chapters, and they provided good help.

My favorite homemade tool was a 4-by-8-foot hardwood plywood table with pipe legs. My favorite tools were three worn-out rivet pullers freely exchanged by Home Depot.



Being a longtime EAA member of Chapter 170 in San Luis Obispo, California, and having helped to build for others and giving them consultation on their projects, I had abundant helpful friends with lots of skills and tools. Thanks to everyone who helped or just followed the progress. **EAA**



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Construction, & What's Involved in Kit Building

February 21-22.....Composite Construction, Fabric Covering, Lakeland, FL
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Lowell Farrand Joins Ultralight Hall of Fame

And new from the Ultralight & Light-Sport Aircraft Council

BY DAN GRUNLOH

THE EAA SPORT AVIATION Hall of Fame recognizes individuals who have made significant contributions in the areas of homebuilts, vintage, aerobatics, warbirds, and ultralights. They are selected through a process administered by the EAA councils established to represent each group. All the councils meet every year in November at EAA headquarters to provide advice and analysis to EAA staff and the EAA Board of Directors regarding the needs of our individual communities. I'm privileged to serve a three-year term on the Ultralight & Light-Sport Aircraft Council. Our annual meetings coincide with the Hall of Fame Banquet and award ceremony.

For 2014, we welcomed Lowell Farrand of Ligonier, Indiana, to the [EAA Ultralight Hall of Fame](#) for his significant contributions to ultralight aviation. At the ceremony, Lowell said EAA has been a large part of his life since the days when EAA's offices were in Hales Corners, Wisconsin. (He has a five-digit EAA number, with new EAA numbers now having seven digits. Just an FYI, an EAA number is never used twice.)

Lowell said he enjoyed flying all kinds of airplanes at Oshkosh from warbirds to homebuilts, but he always has had a special attraction to small airplanes because of their lower cost. He thanked the two EAA chapters, 138 and 932, that were central to his life for so many years. His family and a large contingent of chapter members attended the event.

Lowell began flying as a young ferry pilot for World War II trainer aircraft, eventually flying everything up to the AT-6 Texan. He flew a range of British aircraft from Tiger Moths to the Jodel series and then moved on to Aeroncas, Pipers, Stinsons, and Cessnas. He built or restored 25 aircraft and ultralights, and he has accumulated more than 5,000 hours of flying time.

He built a Bensen gyrocopter from plans in the late 1950s and collaborated with a Notre Dame University Air and Space researcher on the design for a powered parachute. He became the first person to fly a powered parachute on June 6, 1968.



Lowell Farrand accepts his Hall of Fame award.

Lowell worked with Wayne Ison on the first PDQ-1 in the late 1960s, long before ultralights existed. He said when he flew the first PDQ-1, he weighed more than the aircraft. Thousands of kits were sold worldwide, but more importantly, the PDQ was the precursor of the [Team Mini-Max](#) line of ultralights and amateur-built aircraft. Lowell continued working with Wayne on powerplants and electrical systems. He was a dealer, builder, and test pilot, and he continues to work with the current company owners as a technical advisor. Lowell probably has the most complete knowledge of anyone living today on the Team Mini-Max aircraft. [Wayne Ison passed away](#) in 2014 and had been inducted into the EAA Ultralight Hall of Fame in the year 2000.

If building and flying pioneering ultralights wasn't enough, Lowell also played a huge role in helping hundreds of others achieve their dream of flight. He worked as a Young Eagles coordinator, served as an EAA technical counselor and flight advisor, and became a designated airworthiness representative. He has test-flown more than 400 homebuilts, has certificated nearly 500 aircraft for flight, and is still active at age 82.

We want to recognize individuals like Lowell and we need your help to identify prospective recipients. Please scan the [list of inductees](#) currently in the EAA Ultralight Hall of Fame and consider who in the ultralight community we should recognize in 2015 and beyond. Download the [nomination form](#) and write a few paragraphs about your nominee's contribution to ultralights. Let's recognize them when they are still around to appreciate the honor.

ULTRALIGHT COUNCIL MEETINGS

During two full days of meetings, our council met with EAA staff as we reviewed many issues of importance to ultralights. We also looked into the current state of the sport pilot and light-sport aircraft (LSA) industry. There is a persistent lack

of flight instructors that has not been alleviated by the current letter of deviation authority (LODA) program. It is intended to enable flight instruction in some experimental amateur-built aircraft, but geographical and temporal limitations and the restriction to legacy aircraft has rendered the LODA ineffective. EAA staff members recognize the problem and they are working on ways to improve the LODA.

AIRVENTURE 2014 DATA

We also reviewed the results from EAA AirVenture Oshkosh 2014 and made suggestions for AirVenture 2015. In 2014, 122 ultralight and LSA pilots registered to fly from the ultralight runway (down from 142 in 2013). But we sold a lot more fuel and total attendance was up 13 percent. The total count of operations in the Fun Fly Zone was similar to last year at 2,000-plus. Our exhibitors gave 222 waived adult rides, 51 rides to minors, and 19 Make-A-Wish rides. There were 40 rotorcraft pilots who gave 238 adult rides and 119 youth rides. There were 23 forums with 829 attendees and 10 workshop sessions with 350 attendees. We also added evening programs, including a slide show, movie night, music jam session, and an ultralight party. The Friday evening Valdez STOL demonstration was very popular, drawing an extra 2,000 spectators to the Fun Fly Zone. That group has stated it wishes to return in 2015. The Saturday 5K run brings in thousands of people who might not otherwise visit our area at the south end of the field. Once they see what we're doing, they will understand why we call it the Fun Fly Zone.

ELECTRIC AVIATION REPORT

The council looked at many issues during our meetings; but I learned much from our look into electric aviation, and I want to share my impressions in more depth. Many people believe electric aviation will become practical in ultralights before the rest of general aviation because of lower weights and speeds of ultralights, and thanks to their simpler regulations. Electric flying could bring a new surge of activity in ultralights just as it did for remote-controlled models. Unfortunately, slow-moving regulations are holding us back.

Electric ultralights need a battery weight allowance to become marketable and popular. An opinion from FAA's legal department has asserted that for the purposes of ultralight regulation, batteries are not fuel. Presumably that makes batteries part of the airframe or engine. It is unfair that gasoline-powered ultralights can have 30 pounds extra on board for fuel but electric ultralights cannot. An advisory circular or exemption request for that amount would kick-start electric aviation.

A 30-pound allowance doesn't sound like much; but it's based on a solid rationale, and every little bit of weight helps. Most legal-weight electric ultralights today can barely fly 30 minutes, making them desirable only for ultralight soaring. The council viewed an informal list of about 15 currently known electric projects.

In 2014, Chip Erwin became the first person to fly an electric ultralight into a major fly-in when he flew his [Zigolo electric motorglider](#) the short hop from South Lakeland Airport to the Sun 'n Fun International Fly-In & Expo at Lakeland Linder Airport.

Unfortunately, experts on aviation regulations feel pretty strongly that this is not a good time to either ask the FAA for changes to FAR 103 or request an exemption unless we're pretty sure it has a good chance of being accepted. Prior refusals tend to raise the bar for the next request. An exemption request needs a well-thought-out rationale and must show concern for public safety along with details about how the exemption would be administered. There is a potential threat of losing some privileges (such as when and where we can fly ultralights) if we push the admittedly beleaguered agency. The Ultralight Council will continue to consider ways to promote electric ultralights.

Sport pilots can't fly electric aircraft (except for ultralights) because they are restricted to reciprocating engines. The wording in the sport pilot rule was intended to prevent sport pilots from flying turbines and jets, but it unintentionally prohibits electric power as well. Only a few words need to be changed, but it could still take two to three years to accomplish. It might come with pressure from manufacturers once they are allowed to sell electric special light-sport aircraft in the United States.

Even though ASTM standards have been accepted for electric aircraft overseas, electric LSA cannot be sold in the United States because of FAA concerns about containment or prevention of lithium-battery fires. For now, FAA wants to see a prohibitively heavy, steel fireproof box. It's not exclusively an aviation problem. The entire world uses rechargeable lithium batteries in everything from smartphones to transportation, and there is tremendous impetus to solve the fire problem.

HOMEBUILT AVIATION TO THE RESCUE

Fortunately, the future of electric aviation depends on the proven creative abilities of the homebuilt aircraft movement. Private pilots (or those with higher ratings) building experimental amateur-built electric aircraft are where we can expect to see the most progress in electric flight. They are almost the only ones who can do it right now, with ultralights somewhat sandbagged by the lack of a fuel allowance. Private pilots, such as ultralight pilots, do not need any special training to fly electric aircraft and shouldn't need to take off with the fuel contained in the equivalent of a fireproof steel safe.

Please send your comments to dangrunloh2@gmail.com. Power up! **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.