

# The Flying Wire



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**Chapter 124**  
**Experimental Aircraft Association**

**Volume 62 Number 3**  
**March 1, 2023**

**Board Meeting - 5:30 pm**

**Dinner - 6:30 pm \$10**

**General Meeting - 7:00 pm**

[www.EAA124.org](http://www.EAA124.org)

[www.CafeFoundation.org](http://www.CafeFoundation.org)

[www.EAA.org](http://www.EAA.org)

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Santa Rosa, CA 95406

## March 1, 2023 Program

**Andy Werback:** Andy Werback will present his research project on WW2 Advanced Sectional Docks and the role they played in supporting role in allowing the US Navy in the South Pacific. With special added attractions to be presented at the meeting!

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### Dinner Menu:

The March Menu is Traditional Corned Beef and Cabbage (lots of mustard!), Veggie Variety (potatoes, cabbage, carrot, parsnips, rutabaga), Rye bread and butter, and Home Made carrot cake for dessert. \$10. Mmmmm!

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## The Second Time Around

(By Budd Davisson reprint from Experimenter Vol 2, No. 1)

The Lancair Legacy is made for guys like Andy Werback of Sebastopol, California. It's fast, it's slick, and it's just begging to have a detail freak with a thirst for speed jump into its innards and create the ultimate go-fast machine. However, Andy's Legacy RG is not just a machine; it's a delightfully insane combination of art, science, and hypercraftsmanship with just a pinch of black magic and sex appeal tossed in for flavor. Andy's Legacy is an unreal airplane, but Andy himself is an interesting study. For one thing, you don't expect to atched what he did in his job, and from the beginning, I knew I liked tech stuff and airplanes." After earning a degree in electrical engineering, Andy wound up as a biomedical engineer at the University of California (UC), Davis.

"I retired recently, but for many years I worked as a firmware (software) developer and integration/test engineer on radar warning systems for Navy and Air Force tactical aircraft," Andy explained. "We did a lot of flight testing on the F/A-18, for example. The great part was doing software that tied together all the hardware—radar receivers, computers, displays, interfaces, and so on—on some really fantastic jet aircraft."

That certainly sounds like a logical transition into home- building airplanes, doesn't it? Not! Part of the time, when talking to Andy, it's hard to keep from feeling as if you're talking to someone whose level of technical understanding extends far over the horizon from the rest of us. Then he'll say something that brings him back to Earth in a very low tech sort of way.

He continued, "I started flying while I was at UC Davis, but I had started sky diving several years before that. For a long, long time I had a lot more takeoffs than I did landings: My jumps outnumbered my flying hours by quite a bit. "I found learning to fly to be exciting even though we were flying C-150s and 172s. In fact, with only 85 hours, I took a 172 on a cross-country from California to Chicago and back. Then I bought a 182, which was a lot faster, and it got me places quicker. But something was missing. By the time I began to understand what was missing, I got too busy with life and quit flying for 18 years." Sounds familiar, doesn't it?



"I love building stuff. Almost anything: houses, furniture, you name it," he said. "So, during the period that I wasn't flying, I gave some thought to building an air- plane. The first step in that direction came in 2002, when I went to Oshkosh for the first time, not knowing exactly what I'd find. One thing I found was that the event re- kindled the urge to get back into flying. But there wasn't much challenge to it, and the thoughts of building an airplane kept

nagging at me. So I started reading dad's engineering books and looking at composite construction, à la Burt Rutan.

"I found a lot of the information in the books to be fascinating. I especially liked understanding the way things were fabricated and found the technology of the 1950s and '60s to be incredible. The upshot of all of this was that the building bug bit me hard, and in 2004 I bought a Lancair Legacy kit, the fixed-gear version. At the time it seemed like a huge but doable challenge. Of course, it helped that Reid-Hillview airport, where I was building, had lots of Lancairs based on it, so there was a lot of applicable knowledge floating around."



It would be easy to say that this is the beginning of the end of his story—that he got his airplane, worked on his airplane, and finished it. Then he took it to Oshkosh and other fly-ins. But that's not the story because this was only his first Legacy kit. And this is where it gets interesting.

Andy explained, "When I started on the fixed-gear airplane, I went to the Lancair factory for their Builder Assist program, which was incredible. You are presented with boxes and piles of parts and one or two weeks to do a lot of basic assembly. But everything went well and I now have more than 300 hours on that airplane. Oh, and

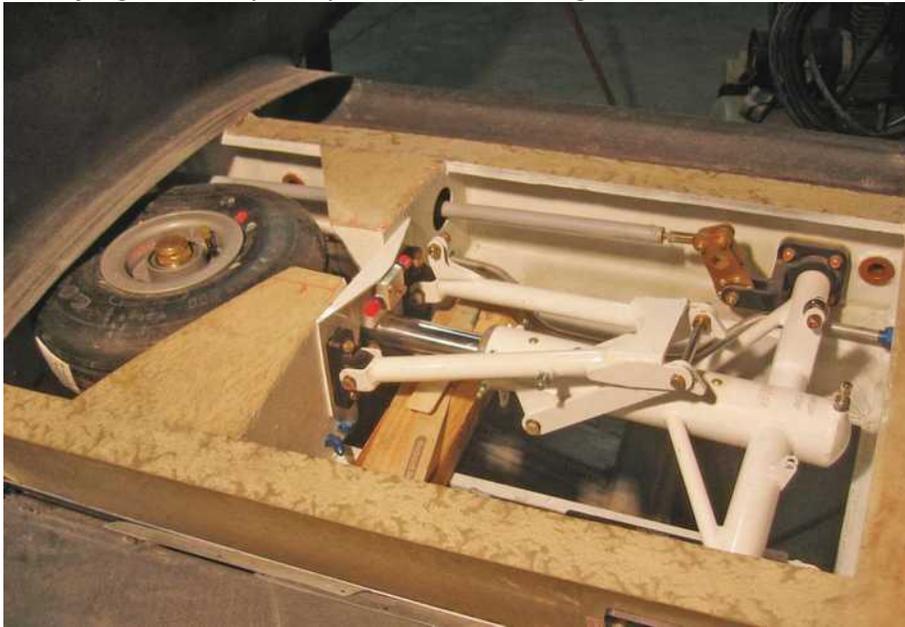
it took me two years to build." Let's back up and read that last line again. That's right: His first airplane project was a 200-mph, fairly sophisticated airplane, and it took him only two years to build it! It should be mentioned that he had a regular day job and wasn't an "airplane hermit" coming out of his workshop only when he discovered his groceries were running low. He actually had a life outside of his airplane building. Still...two years? Seems incredible, doesn't it?

"I really like to build. In fact, I like to build more than I like flying. However, once I started flying the airplane I felt it wasn't nearly fast enough. Yes, it was much, much faster than my old 182, but I was certain that, if I were to do it again, it would be faster."

So, here he is: His airplane is a beautiful piece of work and cruises right at 200 mph. But he's not satisfied. So, what's the logical decision at that point? Build another Legacy. Only make this one better. And faster! To him, that meant learning more about what he was doing. This, even though he had just built an airplane in two years, a feat most mere mortals consider impossible. So, he then did something slightly incredible. He said, "Before I finished the fixed-gear airplane I took early retirement. And although I didn't need the money, I felt as if I needed more education, so I got a job with an A&P/IA as an apprentice mechanic. I figured the only way I was going to learn about airplanes was to immerse myself in them.



"I worked with him for 3 years and got my A&P. As they say, a license to learn. Now I could time a magneto, work on an engine, and do just about everything to every part of the airplane. I wanted to fill in the gaps in my knowledge and this did just that. Plus, now I knew a lot of people who could answer my questions!" Now he was in the process of becoming a well-rounded builder/mechanic (the two skills are often not found in the same individual), and he was still flying a 200-mph airplane that he thought should be faster. So,



he bought another Legacy kit and built another Legacy.

"I found a Legacy kit that hadn't even been unpacked, even though it was 8 years old. But I could only work on it after work hours. So I'd finish working on other airplanes all day and start working on my airplane every night. I knew that if I wanted to fly it, I had to finish it first. And because I'm no 30-year-old, that meant bearing down on it. "The first week after the kit arrived was like Christmas. But this time I had to run a careful inventory and check every part against the current inventory list; because being an older kit, some stuff hadn't been updated, and I didn't want to build out-of-date parts into my airplane."

Because this was going to be his ultimate traveling machine, Andy wanted to get the project jump-started and once again relied on the factory for that initial push. Landing gear retract system in the lower side of the wing. "I took the kit to the Lancair build shop and spent another intense week there. It was 10 hours a day working on the kit with the build center guys looking over my shoulder. We closed out the wing, built the tail, and fit the center section to the fuselage. At the end of the week, I had something that looked like an airplane rather than piles of miscellaneous pieces. What I trailed home was like the empty husk of a cicada: It had the form but absolutely nothing was inside of it, which was fine with me because I wanted to do all the systems and detail work."

If you were to ask Andy if he considers himself to be a perfectionist, he'll argue that he's not. He will, however, freely admit that he has a very clear picture in his mind as to how parts are supposed to fit together and what kinds of tolerances he likes to work to. Sam, Andy's wife, brushes some shavings out of the wing interior. She was hands on throughout the project. Engine mount on the firewall.



He said, “The first thing I did, as I started assembling the basic airframe, was to fit all the components together and start working on how well they transitioned from one to the other. It just seemed natural that there should be absolutely zero discontinuity where one component attached to another, like where the wings hit the center section or how the center section flows into the fuselage. This airplane is just one big beautiful curve and invites a builder to try to make it appear to be made of one piece by eliminating gaps, joints, and mismatches. That’s not being a perfectionist; that’s just recognizing how something is supposed to go together and doing it. To do anything else, when something is shaped the way the Legacy is, is sacrilege. “When you’re building something like this, you develop all sorts of tricks on how to sand straight and keep gaps even and at a minimum. Fortunately, there were a lot of other guys on the airport doing similar things, so I picked up many ideas from them and developed others on my own. I learned, for instance, that one way to make a perfect 1/16- inch gap was to fold sandpaper around a wide putty knife and use that as the sanding block in the gap.” Right from the beginning Andy practiced the “weight is the enemy” mindset that, when trying to build a flawless composite

form, isn’t easy because the temptation to use fillers to get perfection goes the opposite direction.



“You do your level best to make sure the primary surfaces are as straight and as matched as possible so very little filler is needed. Then you try hard to sand as much of it off as possible,” he said. “One of the keys to building light is to build the airplane from the inside to the outside. It’s easy to add weight by treating the inside the same as the outside, with the same attention to detail, and part of that detail is to not add what isn’t needed. For instance, I was tempted to fancy up the baggage compartment with a floorboard kit (5 pounds), but instead I made it as plain, but as well done, as I could. No matter what you do to the airplane that adds anything, it adds weight and reduces performance. Another option I had was to use the Legacy RG adjustable pedal kit; but the Legacy FG rudder bars were much lighter, so I used them. Every single ounce counts. Making these choices is one of the most difficult parts of homebuilding an airplane.” The underlying purpose of building airplanes, as defined by EAA’s mission statement, is education and recreation, and no one can build an airplane without learning how to solve problems. Andy said, “For an engine I was having a 310-hp Continental IO-550N built. At least that’s what I thought I was doing. But the engine wasn’t showing up. I’d call and there was always a new excuse. Finally, I went down to the engine builder and

invited myself to be part of the process. They'd already done the machining, but if I hadn't gone down there and done the assembly myself, I still wouldn't have it. I'm not an engine guy by nature, but with them looking over my shoulder, I spent a week finishing up the engine and getting it on the test stand. They didn't give me a 'do it yourself' discount. But at least I got my motor and that's all that's important. "When it came time for the prop, I went with an MT composite three-blade. It was a little more expensive, but it saved 25 to 30 pounds in one chunk, and that's a lot." Even though this was his second Legacy, Andy will readily admit that some things were harder than others, and he was still learning his way around the airplane. He said, "Although the hydraulics were the toughest thing for me, fitting the canopy was by far the most tedious. You're fitting a carbon fiber frame to a carbon frame, and it's...well...it's tedious. A little sanding here, a little more filling and sanding there.

"The retractable landing gear was nerve-racking because it had to be so precise. You can shim it on installation, but it's better to have the alignment right from the beginning. I had to make a drill jig to guarantee drilling 90 degrees. It's the kind of thing where you measure a half dozen times, take a deep breath, and drill. That's one of those areas where there's just no substitute for going slowly and carefully." For the interior Andy decided to use real leather, which can be heavy if applied via traditional methods, so he compensated by lightening up the way it was mounted.

"The seats are Oregon Aero cushions that I had upholstered, but I stitched the other panels myself to make them match. I had a friend help me make cardboard backing for the side and back panels that are just velcroed in place. They are quite light, partially because I left them open in the back. There are lots more details I could have added, but unnecessary details are unnecessary weight. So..."

Avionics is an area that some homebuilders shy away from, but not Andy Werback. "When I got ready to fly it, I cut right to the bottom line and went up to the Lancair factory. When I picked up the first Legacy at the factory, I took six hours of transition training in their RG. Then when I got ready to go in the RG, I went back up and took another 4 hours of dual, and I'm really glad I did. Even with 300 hours of Legacy FG time, my first flight in the (factory) RG airplane

felt incredibly fast, and the landing was close to being sensory overload. Between monitoring the engine gauges and flying the airplane, I really needed to speed up my brain. Even though I expected it, it was still a surprise.



When it came to paint, Andy knew that a good paint job is composed of three critical processes: the pre-painting surface preparation, the actual spraying of the paint, and the post-painting surface work. He was comfortable with the first portion of the process, but not doing the actual painting and finishing because he knew a good painter is part technician, part magician, and all experience.

"I did all the surface prep, starting with 120 to 150 grit and gradually working my way up to 400 grit. I treated the white WLS epoxy high-build primer as if it were a finish coat, getting it as perfect as it could possibly be. That way, when Juan Solario at T&P Aero Refinishing in Salinas shot the color, it would also be perfect. "We put on the scheme designed by Don Barnes ([www.CellarIdeas.com](http://www.CellarIdeas.com) is his business; [www.LancairLegacy.com](http://www.LancairLegacy.com) is his builder's log—highly recommended) using Sherwin-Williams Acry Glo high-gloss urethane with a clear coat." With safety important to Andy and Sam, they installed a four-point shoulder harness.

Time to Go Flying!

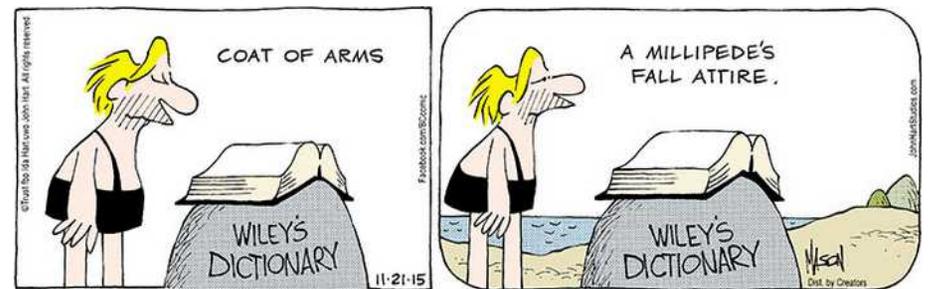
And then the day came where there were no more parts to install;

nothing to be aligned; no tiny nitpicking detail to be finished. The Legacy was ready to fly, and Andy wisely decided he needed a professional to do the initial hops: Even though he had the Legacy FG time, he was still basically a 182, fixed-gear pilot. "Pete Zaccagnino, a longtime test pilot, came in to do the test hops and some of the flight tests to verify the POH numbers. I'm positive I would have been over my head in that environment, and indeed, he did have a slight problem on the second flight, when the gear wouldn't come up.

"It's really exciting to be the owner of any airplane. However, when it's something like this, it's doubly so. It's amazing to think of going somewhere 500 miles away and know you can make it in two hours. And, of course, to win grand champion kit-built award just makes it all that much better." There are some things Andy doesn't mention about building the EAA AirVenture Oshkosh 2012 award winner. First, he had the airplane at Oshkosh 2011 (and won a Bronze Lindy) and listened carefully to what the judges had to say about his airplane. From the minute he started building the airplane, he placed great credence on the advice of others on how to build a safe, good-looking airplane. So, he took the judges' comments to heart, took his airplane home, and reworked it. And he won the Gold next time around.

Andy's story is one of determined self-education and the pursuit of doing things right. It is also one from which others can learn. "Even though I had a lot of friends over to help with the big pieces and to cast their eyes on what I was doing, looking for errors, building an airplane is basically a lonely pursuit. You spend hours and hours by yourself attending to details that you know for a fact no one will ever see or appreciate because they're buried far down inside the airplane. But you do those with the same care that you do items that are right there in the public's eye. That's simply the right way to do things. And before anything else, it's got to be safe and reliable. "Also, there are times when the immensity of what you're doing threatens to overwhelm you, and doubt sets in. Those periods can kill a project, but as long as you keep moving and keep doing little bits at a time and never stop, the doubt is erased by the progress being made. Progress is addictive. Once you taste a little, you want more. And before long, you're racing down the runway in your very own creation, and it absolutely never gets better than

that." P.S. Did we mention that he took two years to build this Legacy, too? Oh, yeah, forgot...and while building the Legacys, he also bought a barely started Skybolt and finished it. Something about wanting to learn welding is his explanation. That's almost depressing!



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## Interesting Aviation Links

(Thanks Harley Milne )

Sonoma to Oshkosh [Click Here part 1](#) [part 2](#)

Lancair Legacy [Click Here](#)

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## EAA Chapter 124 Board Meeting Minutes February 1, 2023

Meeting Convened 5:30

Board Members In Attendance- Dan Steinhoff (President) Dominic Cerneglio (Vice President) John Whitehouse (Treasurer) David Franco (Secretary) John Fritsch, Kevin Quirk, George Marshall, Tim Petersen

January Minutes Approved

Hot Dog Thursday- PCAM is encouraging EAA members to display their planes. Kevin Quirk will coordinator the exhibition of planes.

2023 Meeting Presentation Schedule Assignments

March- Dan Steinhoff

April- John Whitehouse

May- George Marshall

June- David Franco

July- Dominic C

August- Oshkosh Recap

September- John Fritsch

October- Larry Rengstorf / C.J. Stephans

November- Kevin Quirk

December- John Fluno

Board Member Handbooks-

Board Member Bylaws Handbooks have been distributed to all new board members. Approval of the handbooks is scheduled for March Meeting.

Treasurer's Report- Chapter dues are due by the Feb. 1, 2023 meeting.

The chapter posted a slight positive for the month. Hangar spaces are

largely paid up. Propjet has paid in advance for 3 spaces.

Meeting Adjourned- 6:00 PM

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## EAA Chapter 124 General Meeting Minutes February 1, 2023

Meeting Convened 7:00 pm

Meeting Convened- 7:00 pm

President Dan Steinhoff called the meeting to order and thanked Sam Werback and the kitchen crew for their much appreciated efforts. He then handed out member appreciation certificates and EAA pins. He then went on to welcome any new visitors. One new aspiring RV builder announced his interest in building a plane. Two other attendees shared their interest in Paramotoring and getting familiar with the local flying community.

Treasurer's Report- Chapter coffers stayed slightly ahead of expenses this last month. Members were reminded that dues are owed at this time.

Builder's Report- Mike Tovani recounted the progress on his Rans S21. He is working on sourcing an engine and making progress on wiring the plane. He thanked members Bob Gutteridge, and David Heal for their technical suggestions. Paul Hollingsworth gryocopter enthusiast, shared his experience in repowering his gyro.

Presentation Topic- Paramotors Motorcycles Of The Skies

Paramotoring enthusiast Harley Milne shared his passion for the sport, which included a record setting cross country accomplishment. He shared how very dependent he was on accurate weather forecast to aid his record setting effort. He has expanded his interest in paramotoring by creating a 50X challenge. The challenge is part charity fundraiser, part personal ambition to be the first person to fly a powermotor to all 50 states. His breezy storytelling style and enthusiasm for the sport prompted many technical questions.

Meeting Adjourned 8:00 pm



## Chapter 124 Contact Information

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**EAA Chapter 124  
5550 Windsor Road  
Windsor, CA 95492**

Chapter meetings are held on the first Wednesday of each month at 7:00 pm. FOOD (\$7 sometimes \$10) AND SOCIALIZING (free) from 6:15 to 7:00 pm. EVERYONE IS WELCOME!

Directions: The site is located on the west side of Sonoma County Airport. Take the Shiloh Road exit from Highway 101 in northern Santa Rosa. Turn left at the stop light (west) and continue to a "T" intersection. Turn left again and follow the road to the EAA sign on the left.

Members are invited to submit articles of interest. You will be notified whether or not an article will appear in the current issue.

Please email articles to: eaa124newsletter@sonic.net  
or mail to: Stuart Deal  
430 Secretariat Ct  
Santa Rosa, CA 95401

Deadline for newsletter submissions is the 20th of each month. Articles submitted after that date will be included in the newsletter at the discretion of the editor. All articles are copyrighted. To reproduce any article, please contact the editor.

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