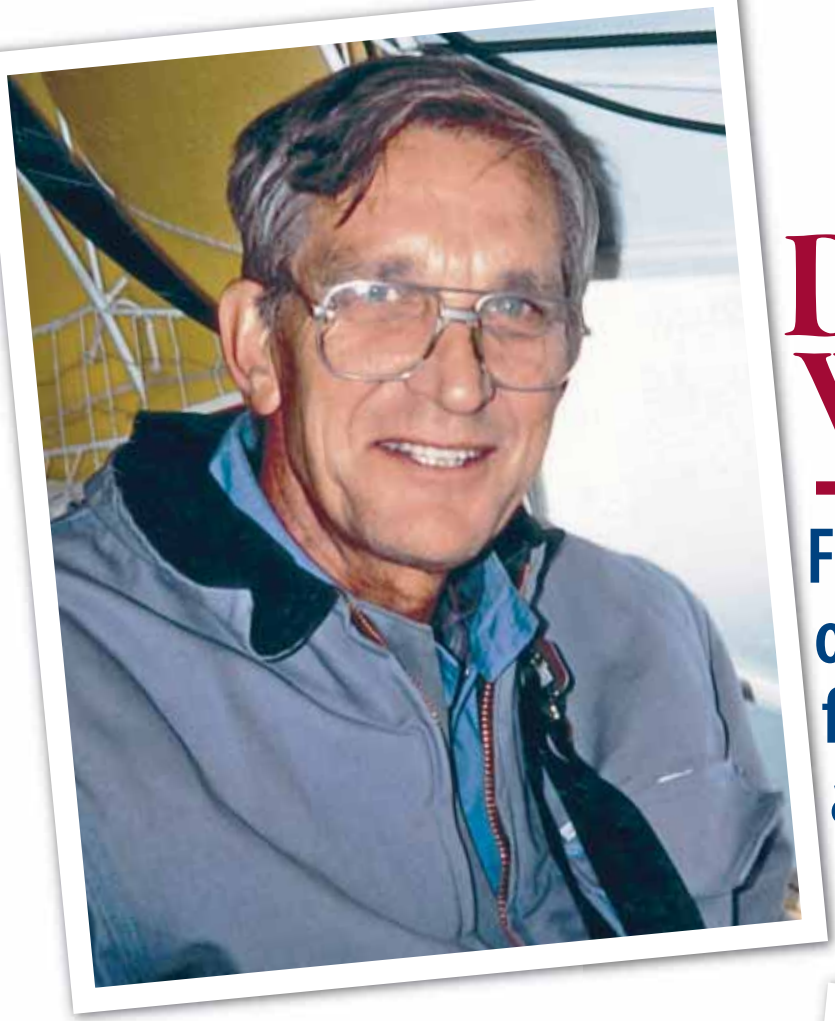

Designer Spotlight

Dean Wilson

For the patriarch of the two-place, folding-wing light aircraft concept, design is a way of life.

BY TIM KERN

There is a small group of men at the top of the pyramid of influence on the growth of homebuilding. Some are well known; others have huge followings, but not household names. The former group includes names like VanGrunsven, Poberezny, Rutan, Schlitter, Slusarczyk and Heintz, to name just a few; the latter is exemplified by Dean Wilson.

Best known as the designer of the Avid Flyer, Wilson's airplane revolutionized the kit business in the 1980s and early 1990s—he not only offered a sweet-flying airplane, but he sold it in largely prefabricated kits. Previously, an "airplane kit" was often a set of plans, a bag of tubing, a box of wood and some cloth. The Avid Flyer wasn't the first to provide a modern kit, but you could argue that it was among the most influential.

Beginnings

For Wilson, the aviation seed took hold early; he first flew at age three and a half. "I remember my first airplane ride like it was yesterday," Wilson said. "It was a 40-horse Cub. We bought a $5 ticket, [local pilot] Bert Zimmerly was flying. My mother was the official passenger. I stood in front of her and held onto the front seat. People on the ground looked like ants."

He started flying lessons in his teenage years, soloing in 1951 and earning his Private ticket the next year. He wanted to learn all he could about airplanes and completed an A&E (Airframe and Engine) course in Spokane, Washington, at age 17, only to find out the CAA wouldn't grant him a license until he turned 18.

Wilson spent much of the early 1950s building flight time, logging an impressive number of types: Ford Tri-Motor, Cub, C3 Aeronca, Waco, Stearman, Pitcairn, Fairchild, Staggerwing Beech, Aerocar, Rose Parakeet, Schweitzer gliders, a 1928 Cessna AW, a Buhl Bull Pup. At the same time, he started building his first aircraft. "When I was 17, I saw a 1913 *Popular Mechanics* book that showed how to build a glider for $10." In his 20s in the 1950s, he referred back to it. "With

For his first design, Dean Wilson combined his interests in gliders and ag planes, creating the 55-foot-span, 15:1 aspect-ratio Eagle sprayer. Eagle Aircraft produced nearly 100 before going bankrupt.

Photos: Courtesy Dean Wilson

inflation, it cost me $50." He completed and flew that hang glider in 1954.

By 1956, Wilson was flying Ford Tri-Motors for a living, hauling feed, lumber and groceries into the back country in the Pacific Northwest. There was a lot of flying work available—but there were also a lot of pilots. "Every used-car lot then had ATPs on the GI bill," Wilson said. "About all you could do then was charter or spray. I flew a lot of spray jobs, too."

Wilson's major claim to fame, the Avid Flyer captured a unique market segment among homebuilders. It filled the space between ultralight designs and bigger, more powerful Experimentals.

About that time, Boeing was recruiting, a result of the 707's success, and Wilson hopped on. "I became an inspector and went to work on the 707. I took Boeing blueprint reading while I was there. I had taken shop in school, and learned drafting." But working on airplanes wasn't enough—Wilson wanted to fly more. He earned his Commercial license in 1957 and returned to spraying. That's when he got the design bug, the result of "spending a lot of time thinking about what it would take to make money in aviation," he said.

By this time, Wilson had worked on a number of ag plane engine swaps, teaming up with Johnny Johnson and Jim Criner, who wrote the CAM 8 specs, the FAA's bible for ag aircraft. Agricultural aircraft are not about passengers; they're all about strength, maneuverability and payload. Wilson had worked alongside the best in the business, from a practical design point of view.

"I learned some of the rules of thumb, like how to static-test things," he said. "I bought a UMF Waco and needed to make a sprayer out of it. I went to the library and learned about aerodynamics." After some study, Wilson said he "knew enough to increase the camber on the wing." But no matter what he did, that Waco couldn't be made to do what he wanted.

Time to Make His Own

In the mid '60s, Wilson gained an interest in sailplanes, and he'd earned a glider rating by 1966 and a glider instructor rating by 1968, flying Schweitzer 222s and 126s. In the meantime, he'd be flying a ton of spray aircraft—from Cubs to Wacos—and that question kept coming back to him: how to make money. So much of an ag pilot's time is wasted, he figured, just turning around for the next pass. Wilson liked the way the Schweitzers handled, and "I thought a sprayer ought to have longer wings—if you have longer wings spraying, you get done a lot quicker. I thought 'sailplane wings' would be good on a sprayer. You go fast, and you still have to turn. The slower you go, the faster you turn; the lower the wing loading, the faster you turn."

By the mid 1970s, Wilson had his ideas on paper. He thought there was a market for an efficient spray plane, so he designed one and started a company to produce it. "The Eagle," he said, "has a 15:1 aspect ratio, 386 square feet of wing area and a 55-foot wingspan. It had an IO-540 (300 hp with an 84-inch, three-blade prop, 113-mph top speed) or the Continental 220-W670 radial (with a 102-inch, two-blade prop, top speed 101)."

One of the Avid's defining characteristics is its folding wings. Wilson got the idea after watching ultralight pilots assemble and disassemble their machines for every flight.

Design was complete in 1975, and first flight took place in 1977. As so often happens in our industry, one company's misfortune can become another's benefit. Bellanca, famous for fine woodwork and craftsmanship in its planes, was on hard times. Wilson, by then running Eagle Aircraft Company out of Eagle, Idaho (a Boise suburb), moved production to utilize Bellanca's expertise. "We built between 95 and 100 out back of the Bellanca factory in Minnesota. A lot of the Bellanca people were available. We put 140 of them to work, and we built a great airplane."

As a sprayer, the FAA-certificated Eagle was a success—the company, not so much. By the end of the '70s, Eagle Aircraft was broke. "We lost money on the Eagle," Wilson said. "We had a bunch of college graduates that didn't realize you needed to sell them as fast as you could build them. Plus, we came on the market in the Carter administration, when interest rates were 21%. [Of all the ag planes of the era], the Air Tractor was the only one that really survived. Leland Snow was smart enough to build them on demand."

So how does a designer keep things interesting? By finding exciting projects, of course. In 1982, Wilson built this Indy car for local racer Ken Hamilton.

Jim Metzger, who later became Avid Aircraft's general manager when Wilson sold the company, was a long-time ag pilot and was familiar with the Wilson design mantra: "For Dean, it was always 'function over form.' As long as it did what he set out to do, it was beautiful to him. His designs always could do things other airplanes just could not do. The Eagle could carry more and do more than anything else with that horsepower. It had those big wings—it was a 'wider brush to paint with,' if you will."

While not consumed by the Eagle project, Wilson rebuilt, re-engined and restored a number of aircraft in the 1970s, including a 1916 Avro 504K that won Grand Champion honors at several airshows. (It's now in Kermit Weeks's collection at the Fantasy of Flight museum in Florida.) He even built an Indy car in the early 1980s for racer Kenny Hamilton. It didn't quite qualify for the race, but it was fast enough to get to make practice runs on the race track. "We just needed more time and money," Wilson said.

After several years of interesting projects in the wake of the Eagle, Wilson reckoned, "I thought I'd go off and see if I could run an aircraft company on my own," building his own workforce and supervising operations, up close this time.

The Avid Flyer Is Born

In the early 1980s, Wilson got his chance when an acquaintance approached him and asked if he'd design an ultralight. Wilson knew many "cities and counties wouldn't let you fly from their airports without an N-number," and talked his friend into doing a light Experimental design.

Wilson wanted a convenient, foolproof design. "I saw a lot of guys who'd spend an hour or two putting their ultralights together," he said. "They'd invariably leave something off. Then the wind would come up, and they'd immediately disassemble the machine and go home."

Hence, the advent of the folding-wing design, one of the Avid Flyer's hallmark characteristics. "There was nothing to disconnect," Wilson said. "You could just fold it up. Two guys could put it together in 5 minutes. Just pull the wing pins, fold 'em back, and you could tow it down the road at 70 mph."

The Avid Flyer weighed around 500 pounds and was designed around a two-stroke, two-cylinder Rotax of about 50 hp. With two side-by-side seats, it was made of tube and fabric with wood ribs. Everything was light, from the tubular aluminum spars to the

Seven Questions for Dean Wilson...

At what point in your life did you know you'd make a career in aviation?
When I was 15 years old.

Which of your designs are you most proud of?
Both the Private Explorer and the Avid Flyer.

What homebuilt aircraft designer do you most respect?
Dick VanGrunsven and Paul McCready (Gossamer Condor and Gossamer Albatross)

Other than the aircraft you've designed, which currently available homebuilt would you most like to own? None of them!

What's the most significant change you've seen in the homebuilt industry since you first began designing aircraft?
There are a lot more people buying and selling kits.

What question do you hear most often from customers building your aircraft? Can I put a different engine on it?

What's the key for a company to stick around in the homebuilt industry?
Simple. Continuing sales.

full-span flaperons. An early Avid could take off from a short strip and climb with the best, on little gas. Its popularity grew as people fell in love with its handling and capability.

"What made the Avid so popular," Metzger said, "was that it was kind of a 'transition airplane.' Originally, it was visualized as an ultralight, but Dean, after he engineered all the features he thought an airplane needed to be safe, saw it was too heavy to be an ultralight. There was a whole new kind of airplane—heavier than an ultralight, but not as big as a Cub. He hit a vein of enthusiasm that hadn't been tapped before: a light, easy-to-fly airplane that could use the new two-stroke engines, but that was safe to fly."

The under-construction Twin Explorer awaits its covering job. The massive machine weighed in at 5000 pounds empty.

Versatile, to say the least. "You could retract the gear, land on water, then you could drop and gear and land on ground, snow or grass," Wilson said of the Twin Explorer. "It was a flying motor home."

Plus, the Avid Flyer was easy to build. All the welding was done; there were no tubes to cut and fit. The ribs were prefabricated, and the folding wing system was convenient—though it was used less for dragging the airplane to the airport than for fitting it into a narrow hangar space. Wilson was also a stickler on getting the right parts to the builder at the right time. Quality control—something as simple as having the right quantities of the right bolts was a big deal then—was well above the industry norm. (Back then it was not at all uncommon to spend the first month after your kit arrived just sorting out what came in the box and determining what was duplicated or, more often, missing.) Kit building got a lot simpler—builders could be flying in less than a year.

Metzger said, "Dean was a stickler for making everything fit. Tab A would always fit into Slot A. Dean was the first one to have that happen—to supply a kit that everybody could finish. He wasn't *afraid* that somebody would finish his airplane—he *wanted* everybody to finish. It became routine to be flying in 500 hours of build time."

It Must Be Flattery, Then

Before Metzger was involved with Avid, however, Wilson ran the company alone. Wilson's aforementioned "acquaintance" wanted to partner with him in a company to produce kits for the Flyer, but the arrangement didn't work out. "A guy came and bought two airplanes, but the money vanished, so I bought him out," Wilson said. "He said he wouldn't compete with me after he left, and we shook hands on it."

That "acquaintance" was Kitfox founder Dan Denney. "At that time, Dan didn't know how to do weight and balance on an airplane—that's the truth," Wilson said, recalling the rough years of the Idaho rivalry. Avid Aircraft (it was called Light Aero, Inc. when Wilson owned it) was in Caldwell, Idaho; Kitfox was in nearby Nampa.

As the Avid movement gained momentum, the rivalry with Denney began to blossom. "I had a few kids that worked for me, and they'd take information over to Dan," Wilson said. "And the Kitfox was born. It had nearly 100% interchangeable parts with the Avid Flyer."

Avid sued, of course. "The judge said, 'It's a copy, there's no question about it; but it's not illegal to copy.' There soon got to be about six copies of the Avid Flyer, all named after predators." Today, there are as many as 20 iterations, each using aspects (some more than others) of Wilson's original design.

Wilson, smarting from the judge's ruling and now having to deal with unexpected competition spawned by his

own design, says he was further hurt by Denney's maneuvers. "The EAA and KITPLANES®, they just gave Dan all the credit for doing everything." Looking back years later, Wilson has developed a theory about how things worked back then: "Dan spent a lot more on advertising, while I spent more on research and testing, which benefited him also. I just wanted to build a real safe, easy-to-fly airplane that was inexpensive; they just went out of their way to promote all the copies. I could see the writing on the wall."

Well, that's one theory. But perhaps it's the case of the engineer vs. the marketer. Homebuilt history offers a number of examples of business-savvy companies winning the longevity battle against companies backed by great engineering. How many excellent one-off designs are produced? Lots. But how many actually turn into successful companies? Few.

Wilson readily agrees that he likes designing and troubleshooting a lot more than he likes the day-to-day of running a business. "Once I've done the tooling and the testing, I don't care about sales and all that. I always lose interest in a design after it's built. You build the fixtures, you get the landing gear to fit four or five fuselages; then the fun is gone."

The Avid/Kitfox rivalry did produce some fun times. When Kitfox produced its promotional video, one scene demonstrated the ease of folding the wings. It was filmed at the Caldwell airport with the Avid factory visible in the background. Shortly thereafter, Avid felt the need to upgrade its own video. In a scene that showed how easy it was to trailer the Flyer to the airport, the truck and trailer are shown pulling away from a suburban house. It was Dan Denney's house. "Nobody but Dan and a few other people recognized that was his house," Metzger remembered, "but it sure was fun to pull that one off."

After Avid, The Wingabago

Always after new challenges, Wilson earned a seaplane rating and designed the Avid Amphibian, a three-place machine that still relied on the two-stroke Rotax. The engine would do the job, but Wilson was starting to see the need for a bit more power. The Amphibian became a

lot more popular with the advent of the 80-hp Rotax 912 a few years later.

Wilson says he loves the exploration that flight affords, and he's also a water-flying buff. He had an interesting commission from France in the late '80s, and he capitalized on those interests. "I built that special Avid Flyer for Hubert DeChevigny to fly to the North Pole in 1987," Wilson said, "and I had designed the twin-engine [Global Explorer] about that time. Hubert really wanted me to build the twin-engine machine. Some of my dealers wanted to buy me out; then one day Hubert sent me a check to start work on the twin-engine, so I just dropped out of sport aviation, just like that, though I had a helluva lot of fun doing it."

Wilson sold the company in 1988 after having delivered more than 400 kits, but he remained close to it and didn't stop inventing. "I had built and developed the Avid Flyer, the Speed Wing; put them on floats and skis; I designed the Avid Amphibian and Avid Magnum," that latest after he sold the company.

The DeChevigny machine filled more of his time after he sold Avid. While designing and building it, Wilson always had inspiration nearby. "I had a picture of the *Spruce Goose* on my wall while I built the twin-engine Explorer. I kept saying: 'If Hughes could build that thing, I can build this.' When the fuselage bulkheads were made, I saw it was so huge that I didn't think it would ever fly. It was just so big, it kinda staggered me for a while. A lot of people thought I'd just gone absolutely nuts. I kept telling people that those O-540s would be plenty."

The Explorer's fuselage opens for cargo loading. Here, an Avid Flyer with wings folded makes its way inside. A Robinson R-22 helicopter, minus the rotor blades, can fit, too.

The result? The twin-engine, officially named the Explorer, was a huge, flying motor home. (Avid GM Jim Metzger unofficially christened it the *Wingabago* years later.) It featured a 67-foot wingspan, a 10-foot-high, 9-foot-deep fuselage with 75 inches of stand-up room. It grossed at 8000 pounds and weighed 5000 empty. "You could put a Robinson R-22 helicopter in it, if you took the rotor off," Wilson said.

The scaled down single-engine Private Explorer was no less of a beast: It featured a bed, sink and dinette. And, easy handling. "Anybody could fly it!" Wilson said.

Unfortunately, the twin Explorer didn't survive. "Hubert took off with the spoilers on, and he wrecked the machine. He couldn't clear the trees and hit a snag with the wing." At least Wilson didn't see it happen. "I was no longer with the plane when that happened."

Scaling Down

Having built the impossible, the merely difficult was going to be easier. Wilson started work on his next project, the single-engine Private Explorer. "That was the nicest plane I've ever built," Wilson said. "I nearly built two [the second one was ready for covering] and started making parts for five."

"With the airplanes that Dean made later, each one flew better than the last," Metzger said. "The best was the Private Explorer. It flew beautifully—great control harmony, light control, and it was huge! It was like riding in the gondola of a blimp, and it did it on 235 hp with a fixed-pitch prop."

The French franc was inflating fast, though, making DeChevigny's payments ever more expensive for him. "The franc went from two to the dollar... to five... to seven! So Hubert just stopped paying me and left. He took everything to Canada." Wilson sold all the machinery and paid every single bill. "I thought I'd just retire," he said. Again. Almost.

The year was 1996, and Wilson had one more prospective kit up his sleeve. That project would yield an incredible flyer, but again economics caught up and

Wilson's most recent design is this Ellipse. Behind 150 hp, Wilson tried for a true four-place that could climb at 1000 fpm, carry 1000 pounds and cruise at 150 mph. Climb performance came up short, and Wilson never produced kits.

it never went into production. The Ellipse was a good-size, four-place aircraft with lots of headroom. Its 36-foot span gave it a 10:1 aspect ratio and what Wilson called "a real good glide." It sported elliptical-shaped wings, tips, rudder and elevator.

"I got a lot of calls for it," Wilson said, "but we never mass-produced it. We'd need to skin the wings in a jig—it wasn't something a homebuilder could do. Also, the market was a little flat for a $40,000 kit airplane. I got it done a month before Oshkosh [1998], but the FAA couldn't get out to sign it off for flight until the month after." That, as they say, was that. He never developed a company around the design.

A Designer Never Rests

That didn't keep Wilson out of his shop, though. In 2000, he returned to his hometown of Clarkston, Washington. He likes being close to his roots, both geographical and avian, and recently added a hangar and an 1100-foot crosswind runway to the family farm's 2000-foot landing strip.

Since his latest retirement, he's been working projects for friends and on his own airplane, a modified 1949 Piper Clipper. "I bought a Clipper in the 1950s. I thought it was the most amazing airplane for the horsepower. I wanted to beef up the wings and extend them to 32 feet, put on a little longer rudder and bigger elevators, add some spoilers, so you could save a go-around."

And has he kept up with the homebuilt world? "Well, I've re-engined several Avid Flyers," Wilson said, "built a cowling plug and mold, and also designed and built fiberglass instrument panel molds for RVs since my retirement."

Wilson says he's amazed at how far kits have come. "Have you seen that [Van's Aircraft] RV-10? It's all drilled—all you have to do is Cleco it together. I just think Van builds a heck of a good kit. It looks plenty strong. It's a little eccentric in the engine mount, but it'll probably hold forever."

He keeps in touch with the faithful, though not at public venues. "I have a phone in the shop. I get calls from Avid Flyer and Eagle owners all the time." He doesn't like the big airshows, though. "I went to Oshkosh maybe eight or 10 times. I got enough of that." Sun 'n Fun? "Once was enough. Maybe I'll go back on my 500th birthday!"

So when he looks back at his career, what does Wilson think? "I'm just totally fascinated by flying, the designing, the building—anything to do with airplanes. I just liked every single phase of it. I'm not bitter about anything. I've gotten to do everything I've wanted to do, though I'm not sure I should have done some of those things. I've been having fun for 70 years, and I wouldn't change a thing." ±