

## DOGFIGHT | EXPERIMENTAL VERSUS STANDARD

Editor at Large Tom Horne and Senior Editor Dave Hirschman have a lot of things in common: lots of ratings, lots of experience in lots of airplane models—and lots of opinions (as well as similar haircuts). We last turned them loose on the topic of radio communications and standard phraseology (see “Dogfight: Say It Right” July 2011 *AOPA Pilot*) and the response to two different schools of thought on this topic garnered interesting opinions from a large number of readers (see “Letters” page 22). So we launch them into another “Dogfight”—we hope you’ll enjoy these two takes on a topic, and keep those cards and letters coming.

—Ed.

# There's a reason they call it 'Experimental'

Fly a plane I built myself? No way

BY THOMAS A. HORNE >

**P**ilots—most of us, anyway—place a high degree of trust in their aircraft. We all expect aircraft to be built, tested, and certified to safety standards that are worthy of that trust. When you fly an aircraft that's been certified by the Federal Aviation Administration (FAA) you can be sure that its materials and manufacturing processes have been approved by a government-sanctioned body, and that test pilots have flown the airplane in virtually every flight regime. That includes test flights to determine the aircraft's behavior in stalls, dives, and other maneuvers—and to make sure that stability criteria meet FAA standards.

That's not so with airplanes in the Experimental category. While some Experimental-category designs benefit from creators with aeronautical engineering backgrounds, others don't. It's entirely possible for an inspired, yet

untrained, individual to come up with an airplane having flight characteristics that don't meet conventionally accepted safety standards. Does the airplane rapidly roll off on a wing at the stall, or tend to spin with little provocation? Hard to say. But certified airplanes must demonstrate that they don't.

And then there's the issue of building an Experimental aircraft. A buyer purchases a set of drawings and the necessary parts, or a kit, and then it's time to start cutting metal and spinning wrenches. Does the builder know how to work with aluminum, wood, or fabric? Does he or she understand accepted assembly practices and standards, electrical schematics, how to build jigs, or how to properly use a torque wrench? Maybe, maybe not. Does the builder even understand how to read the drawings he or she just purchased? Maybe,

maybe not. In short, does the builder know what he or she is doing?

Often, the answer is “no.” Which is why some companies offer assistance during construction. After all, regulations require that 51 percent of an Experimental aircraft must be built by the owner, and the construction project can take years. It's a daunting task, so sellers of some Experimental kitplanes make quick-build kits designed for minimal time wrenching—and plenty of hands-on help from the kitplane company.

*Continued on page 100*





# What's right with Experimental aviation

Innovation, ingenuity—and progress

< BY DAVE HIRSCHMAN

**A**m I the only one who finds it ironic that so many fellow pilots profess such deep and abiding faith in FAA certification when, time and again, that agency shows itself to be so dysfunctional?

We all bemoan the astronomical cost of new aircraft and the glacial pace of engine and airframe advancements. Then we insist that GA manufacturers subject themselves to an arcane and indifferent FAA certification process that requires spending tens of millions of dollars and years in development to bring even modest new products to market. Might we, then, be part of the problem?

I've always been drawn to Experimental aviation because that's where new ideas are tested and proven. That's where advancements in performance and efficiency are made. That's where some of the smartest, most driven, and most visionary people in the aviation world focus their talents. Burt Rutan, Curtis Pitts, Alan and Dale Klapmeier, Walter Extra, and Lance Neibauer all made their marks in Experimental aviation first.

When I was a young teen, my parents built a VariEze. I don't remember much about the process other than that the fiberglass skills they developed were extremely useful in patching my dinged surfboards—and that a tall, dark-haired guy with lamb-chop sideburns who lived in the desert seemed quite interested in their progress. That guy, of course, was Rutan, a national treasure whose other flying creations (*Voyager*, *SpaceShipOne*) now reside in the Smithsonian's

National Air and Space Museum; today his *SpaceShipTwo* stands poised to revolutionize space flight.

My folks also owned a Beech Bonanza and a Grumman Tiger over the years. But building their airplane gave them a singular sense of purpose and accomplishment, and flying it to Oshkosh for EAA AirVenture in 1978 was a high point of their lives together.

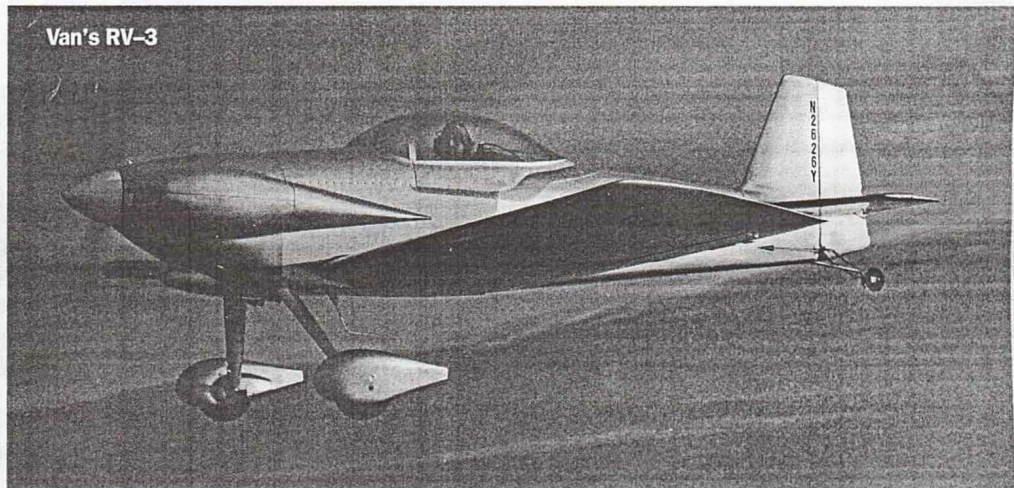
During GA's wilderness years in the 1980s and early 1990s, when most large U.S. manufacturers had stopped making single-engine piston airplanes entirely because of sky-high liability costs, kit manufacturers such as Lancair, Stoddard-Hamilton, Van's, and others continued to advance the art of flying. Composite construction, electronic ignition for aircraft engines, airframe parachutes, and alternative fuels took shape during this period. Today's Cirrus Aircraft, as well as the Cessna Corvallis, are among the many direct descendants and beneficiaries.

Experimental aviation has pioneered avionics innovations including low-cost glass panels, engine monitors, GPS-derived synthetic vision, infrared cameras, and digital autopilots—mainstays of modern GA cockpits. During the past two years, in which a woeful economy took a horrendous toll on GA manufacturers, more Experimental single-engine, piston aircraft were added to

*Continued on page 101*



Van's RV-3



**AOPA Aviation Summit**  
Join editors Dave Hirschman and Tom Horne at AOPA Aviation Summit in Hartford, Connecticut, September 22 through 24, and hear them discuss "Dogfight" and other stories the veteran writers/pilots prepare for *AOPA Pilot*.  
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For safety's sake, companies have been known to perform far more than half the assembly.

When the work is finished, you have what's quaintly called a "homebuilt." The owner's name is part of the model name. That can be a source of pride, but personally I'd never fly an airplane that I built myself. I'll leave that to the experts. Besides, "homebuilt" is a term that seems better associated, say, with building a bird house than with something as complex as an airplane.

The day will dawn when it's time for the homebuilt to have its first flight. Unfortunately, this is the time when many accidents occur. Builders who aren't professional test pilots, or are less than proficient, often discover lousy handling characteristics on those first flights and come to grief.

***"Homebuilt" is a term that seems better associated, say, with building a bird house than with something as complex as an airplane.***

Other issues crop up later in the Experimental aircraft's life. Is the owner capable of maintaining and repairing the aircraft? Maybe yes, maybe no. Oversight of maintenance, accident analyses, and other safety issues are lacking in the Experimental world, and often there's no formal structure or process for disseminating vital safety-of-flight information. That means no airworthiness directives and no service bulletins. So owner-pilots may not be aware of the need for repairs in the first place.

For all these reasons, you should see a placard on every experimental aircraft, in plain view of passengers. The placard says: "This aircraft does not comply with federal safety regulations for Standard aircraft."

Is this a warning to the trusting passengers? Sounds like it. Yes, the Experimental category has developed some clever designs. There are many accomplished designer/builders. But not enough to make that placard go away.

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the U.S. aircraft registry than factory-built models. Sales of new engines, props, and avionics to Experimental aircraft builders play a vital role in keeping small aviation firms healthy to supply FAA-certified manufacturers.

Experimental aviation shows the way to a promising future: Klaus Xavier gets nearly 100 miles a gallon in a VariEze with an electronic ignition and fuel injection of his own design. Racers flying Experimental aircraft built at home are pushing 400 miles an hour. All this says nothing of the major contributions made to aviation (and our national life) by the warbird, aerobatic, and vintage aircraft communities—all of which do some of their most important work through the Experimental category. The Light Sport aircraft category is a critical extension and modification of Experimental aviation, and one that promises to serve as the front door to flying with new training aircraft such as the Cessna 162 Skycatcher, or the kitbuilt Van's RV-12.

Some point to the relatively high accident rate among Experimental aircraft with deep and well-founded concern. There's plenty of room for improvement there, and I'm confident the efforts of AOPA, EAA, and others will help lower it—because pilot training and education can and will make the difference.

Instead of asking what's wrong with Experimental aviation, the FAA and aircraft manufacturers should take note of what's right about it. Aviation, and particularly Experimental aviation, appeals to the best attributes of our national character: independence, curiosity, craftsmanship, personal responsibility, technical know-how, and teamwork.

Part 23 manufacturers should be able to take advantage of the proven technology, materials, and construction methods that Experimental aviation has pioneered to produce airplanes that fly higher, faster, with greater reliability, and at less cost. GA will have a brighter, more dynamic future with more experimentation—not less.

Fred Johnson of Ocala, Florida, built and flew a Christen Eagle that carried a tiny, engraved plaque in the front cockpit. It was the FAA-required passenger warning that told of the Eagle's experimental nature and stated that it does not comply with FAA requirements for Standard aircraft. Scrawled beneath it, however, was a personal note from Fred, the builder, who added: "It far exceeds them!"

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