

Putting the Experiment in Experimental

Over 30 modifications resulted in a speed increase of 44 mph.

BY DAVE ANDERS

Like most builders, I like to tinker with our plane. We built my RV-4 over a period of five years seven months, and it first flew in 1991. It now has over 2500 hours and has taken my wife, who is also a pilot, and me over 500,000 miles. It's difficult to express what a joy it has been to be able to fly a machine of our own fabrication, to go anywhere you want to go, and to meet so many different and incredibly amazing people that, over the years, become your friends.

Many builders continue to build other planes and others modify their existing ones. Well, I've continued to modify mine over the years. I'm a dentist by education but an aviation enthusiast by passion. I loved listening to and discussing aviation and aeronautical ideas with my friends that were truly knowledgeable about these things. Over the years I've been blessed by the generosity of those people sharing their ideas with me. I enjoyed taking those ideas, reading about how to do them, and then trying to apply them to my plane.

The early history of our plane is documented in the CAFE Foundation Aircraft Performance Report, "RV-4 New CAFE Triaviathon Champion," by Brien Seeley and the CAFE Board, which appeared in the January 1998 issue of *Sport Aviation*.

When our plane was first completed, its max speed was about 217 mph. We heard about the Sun 100 race at the Sun 'n Fun fly-in in Lakeland, Florida, so in 1993 we headed there to race with the simplest modifications and racing techniques I could adapt to our plane. Our plane went 230 mph that year, and I was hooked. The speeds I claim our plane has gone over the years are from race results when someone else was holding the stopwatch. I know all of us pilots would never overestimate our planes' performance. However, it really is hard to get good data. At the last Sun 100 race I competed in, in 2000, our plane went 261 mph, and for those that don't know, those were standing-start races. That is a documented 44 mph increase.

Formulas for Success

There are a few simple formulas that when applied to the same plane year after year can reveal what change produced the increase in mph performance.

thrust hp = flat plate area (square feet) x speed cubed (mph) / 146225

thrust hp = hp output / prop efficiency

hp = fuel flow x 5.9 lbs/gal / bsfc

Brake specific fuel consumption (bsfc) for a stock O-360 is about .50 and for an O-360 with 10.5:1 compression, flowed with everything, is about .44. These may be rule-of-thumb figures, but when used

Photos: Dave Anders