

# Portland Area RV Builder's Group Newsletter

Issue 93.4

May 1993

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## April Meeting

The April meeting was at Frank Justice's house. He is well into his first wing, and he built the spars himself. He also builds jigs for most parts as he goes, so be sure to borrow them as they come back from other builders. Frank is also doing a "manual supplement" with photos and all. Maybe we can get him to do a write-up about it and what he intends it for? Eh Frank?

Frank is not letting this 'extra' work slow him down. His project is looking great and moving-along well. Don

Wentz (that's me) showed-off his laser-cut instrument panel. See Builder's Tips.

We also discussed whether or not to have the "2nd Annual Northwest RV Fly-in". The vote was all 'ayes'. See the discussion later in the newsletter.

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## Next Meeting

Place: Hallmark Inn  
Cornell Rd, Hillsboro  
Date: Thursday, May 13

Time: 7:00 PM

The April meeting will be held at the Hallmark Inn Restaurant, across Cornell Road from HIO. Yes, I know I swore we should not meet in restaurants, but I didn't get around to finding another location. I hope the group appreciated the 2 years Steve Harris was our newsletter editor. This is a real effort that I now have a FULL appreciation for!!! Thanks again Steve. We sorely need some fodder from the rest of the group. Earl and I are already tired of making this stuff up! Jot something down and mail it in, we will share it with the rest of the group.

Please be sure and attend. We will be building-up the flyers for the June RV flyin.

## Builder's Tips

I am quite pleased with how my panel turned-out, and many of the builders at the meeting expressed interest in having theirs done that way. I found a vendor within a mile of where I work that has bid doing the cutting for \$100 or less (depending on # of holes). Since my panel has what Van would probably consider to be too many instruments in it, that estimate should hold true. This shop has a better laser than the one I had my panel cut on, so the quality will be even better. He also can work with your original panel-blank that Van supplies, whereas I had to buy a new piece of sheet.

Since I HOPE to complete my RV-6 sometime this year (late this year!) I should have no trouble assisting builders with the CAD work, as they reach that phase of their projects.

## A Builder's Opinion...

### THE CONSTANT SPEED PROP OPTION-IT MAY NOT BE AS EXPENSIVE AS YOU THINK.

Because the RVs were originally designed as sport oriented aircraft, fixed pitch wood props have been the most popular choice among builders. For many years, Van often voiced a prejudice against the heavier, more complex, and more costly constant speed alternative. Now, two of Van's three demonstrators are equipped with C/S props. (The 6A is currently showcasing the Sensenich fixed pitch metal prop.)

Most builders install a fixed prop that is pitched to provide good takeoff and climb performance. These props actually provide pretty good cruise speeds too, but the engine must be spun pretty fast to achieve them - often in excess of 2700 rpm. The penalty for this strategy is reduced fuel economy and maybe additional cabin noise.

Lately I've been advocating a few thoughts that cast a new angle on the argument that fixed pitch wood props are cheaper, lighter, and perform nearly as well as constant speed props. I'm not saying that everyone should get a C/S prop. Just consider whether this argument is valid for your particular type of aircraft operation and aircraft budget.

First off, I don't have my O-360 handbook with me so the numbers quoted here are not exact, but they're close enough to make my point. I'm sure the O-320 handbook would also support similar conclusions for that engine.

The Lycoming published fuel burn figures indicate that there is a significant fuel penalty for cruising in the 2600 to 2800 rpm range. As I recall, a 75% cruise at 2600 rpm costs you about one gal / hour compared to a 75% cruise at 2400 rpm. To go from 2600 rpm to 2700 rpm (redline) costs you nearly another gallon! It just gets worse after redline but for obvious reasons, Lycoming does not provide data above redline.

Basically, according to the factory handbook, the engine specific fuel consumption really starts to increase rapidly at high rpm. I don't know if it's primarily due to decreasing volumetric efficiency or frictional losses but it's significant.

This is my biggest complaint against fixed pitch props. In my RV-6, I figure a maximum long range flight might be about 4 hours in duration. According to the Lycoming data, I could complete most 4-hour flights at the same speed with either a fixed pitch prop or a constant speed prop, but I'd typically burn about 4 gallons less with the constant speed prop if I used it to reduce engine speed while maintaining the same power setting and airspeed. Yes, I know there may be prop efficiency differences but everything I've seen indicates they are small compared to the engine efficiency differences at different engine speeds. Besides, I'm giving the fixed pitch prop the benefit by assuming it's as efficient as the C/S prop (i.e., flies the same speed on the same power).

In terms of weight that's 4 gal \* 6 lbs/gal == 24 lbs.! Hey, that just about covers the weight penalty of the constant speed prop. Besides, prop weight is good weight; it allows me to carry more baggage and still remain within CG limits! In reality, I probably won't realize the weight advantage very often because in most cases, I'd rather carry the extra four gallons of fuel and benefit from the greater range rather than greater payload.

In term of \$\$\$, the fuel savings is about \$2 x 1 gal/hr which equals \$2 / hr! Hey, \$1 /hr will more than cover my constant speed prop maintenance and another \$1 / hr can go into my bank account to pay for the additional cost of the prop over the life of my investment.

Sure, you could select a fixed pitch prop that would fly as fast and economically at a given cruise altitude and power setting as a C/S prop but in general, it would be a dog in climb and also give up fuel/performance at other cruise altitudes or power settings.

I've heard stories about RVs flown side-by-side at the same speed on the same flight where both aircraft used the same amount of fuel, but one had a fixed prop and one had a C/S prop. It's not hard to imagine this as possible because they were two different airplanes flown by two different pilots on one flight or flight profile. I'd suggest repeating several flights at different altitudes and different power settings. Then do it again after switching the props. Then do it again after switching pilots. There are just too many parameters to control! On the other hand, the Lycoming data indicates to me that something is sacrificed in operational economy and versatility when a fixed pitch prop is installed on an RV.

Prop selection is a complicated issue. The bottom line is that fixed pitch props don't necessarily result in significantly greater payload capability (after fuel weight is considered), but they cost less initially, and offer fuel/performance numbers that sometimes match C/S props over a fairly narrow operating range that is spanned by the variables of power setting, altitude, and airspeed,

C/S props are initially more expensive, but offer infinite flexibility in selecting the best pitch for the flight profile. Depending upon operation, they may not be more expensive over the life of the prop.

If you fly over a wide range of altitudes, or different power settings, or wish to maximize range or aft CG baggage capacity, you might want to consider a C/S prop.

Earl Brabandt

Thanks for the input Earl. Readers remember, we all have our own ways that we want to do this. Heck, that is the reason we build our own! So keep that in mind when someone is generous enough with an opinion. My 2 cents worth: You also don't have to re-torque a C/S prop every 25 hours. DW

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## 2nd Annual Northwest RV Fly-in Plans:

We finally had a discussion about the fly-in. First order of business being whether or not the group wanted to take it on. It was fairly unanimous that we did.

Based-upon the discussion, this is what we have so far:

Where: Scappoose

When: June 26, Saturday (same weekend as last year)

Don and Randall to do flyers and send-out. Will be prepping at next meeting.  
Request RSVP to help estimate food requirements.

Randall volunteered to handle judging of RVs; ballots, prizes (Duckworkds LL as top prize). Scheduling results announcement during lunch seemed important. Categories: People's Choice RV-3, 4, 6, &6A. Top prize is for favorite overall.

Monty did considerable research into buying BBQ chicken from a catering outfit after last year's event. Monty, want to head that effort this year?

We thought we would have everyone pay to eat this year.

Brent O. looking into possible flying activities; 1) spot landing? 2) short takeoff? 3) quality landing? 4) any ideas?

Port-o-lets (2) last year cost \$90 (less than I thought Rion). Should we offer Antiquers \$50 to use their facilities and forego Port-o-lets? They didn't get a lot of use last year. Blackie, interested in looking into this?

The Soda is probably our best chance to come-out ahead on this thing. Unless someone has an 'in' somewhere, we will handle-it similarly to last year. I may look for some local scouts or something to 'man' it, if necessary. A % donation to their cause may be worth it to them.

We have appx. \$120 left from last year. That will go into the flyers and mailings. Is Van's interested in helping with mailing costs? Bill or Ken?

Let's all pitch-in and make this thing as much fun and success as last year! Don  
Wentz



### Classifieds

Notice that we forgot about them last month. Well, we didn't get around to them THIS month, either. Let us know what you got but don't want. Ads are FREE. What a deal.