RVator's Log

Newsletter of the Twin Cities RV Builder's Group

December 2011

In this issue…

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Upcoming Events

December 10th: Time to make up that Christmas list. Our next meeting will be at SteinAir with the sole purpose of coming up with the latest techniques to spend LOTS of $$ on your instrument panel. (Details on page 8!!!)

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Minnesota Wing
Van's Air Force

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Shop Notes

Are we there yet??????

It was probably about five years ago that I began to seriously plan for retirement. I thought about getting back into corporate aviation but I had been there and done that and couldn't see myself running around getting coffee and ice again for the big wheels and maybe occasionally flying the airplane. I thought of seeing if Cirrus might need a demo pilot or something like that. But I was always drawn back to the idea of building another RV. I really enjoyed the building process although maybe I was conveniently forgetting about some of the more agonizing parts of the process.

In fall of 2007, I bought Bill Swanson's RV-7 tail kit and decided to get down to business. I still had about 10 months to go before retirement so I didn't work too hard at that stage of the game. Somewhere I seem to recall that Van had published an estimate of about 1500 hours to complete a quick build kit. Once I retired in summer of 2008, I figured I could rack up about 5-6 hours a day and doing the math, I figured I'd be flying in at most 2 years. How naïve could I be? You would think I would know better after spending 12 years building my RV-4!

So here we are exactly 4 years and 2200 hours of building time later. Are we there yet?? Well I think the end is in sight. Here are some thoughts on being a repeat offender:

- Spend the money on a quick built kit. Yep, I know there are some purists out there who must drill, file, and massage every aluminum molecule on their RV, but paying those Filipino craftsman about $5 an hour to save yourself about two years of work is well worth.

- Before you get too far along, latch on to an experienced builder or tech counselor like our own Tom Berge. He can steer you in the right direction REAL early to avoid significant agony later on. It is amazing how many ways you can "paint" yourself into a corner. I'll give you a quick example. Tom was helping me do the final riveting of the forward top skin and was "commenting" on all the wiring running under the canopy rail, which restricted access to the rivets we needed to buck. We did it but then it took me seven hours of labor to install the four bolts that hold the roll bar in place. I could have easily run all the wiring under the floor and left lots of room under the rail for rivets and bolts. No wonder this is taking forever!!!

- Have a nice, warm, well-lit place to work. Invest some time and planning into your RV builder's "man-cave". It will be your second home for thousands of hours!

- Think down the road a bit and define how you are going to use your RV when it is finished. You can go light and cheap…. smaller, used engine, fixed-pitch prop, and VFR instrumentation. Or a screaming cross-country machine… maximum allowable horsepower, constant-speed prop, IFR instrumentation. My humble opinion: no car engines (having Mr. Lycoming churning away up front over the mountains is a good thing!), constant speed prop (climbs REAL fast), autopilot (a TruTrak is one of the best investments you'll ever make), XM satellite weather (or the upcoming ADSB receiver), some type of traffic avoidance box (I have had WAY too many close calls around the MSP area), have a pro paint the thing (I can hardly paint a bathroom), try to stay current during the building process, and be sure the nose wheel is on the tail end (sorry, just couldn't resist!)

I logged all of my building time in Kit Log Pro, which is a great program to keep track of your hours (then again, maybe you don't want to know). Having logged 2200 hours so far (with several hundred more to go), the usual suspects suck up the majority of the time. The canopy is a hog… so far over 200 hours of blood sweat and tears. I am building a slider and I think they are cool. Whether it is more labor intensive than a tip-up, I don't know. The cowling is another time monster (150 hours plus). At first it seems intimidating but slowly things fall into place. Then there was electrical wiring (485 hours)… one wire at a time of course. Engine baffling (150 plus hours)… Van provides a baffling kit but there is a LOT of tweaking necessary. And of course, there is a treaded fiberglass work. First time around I hated it, but this time, it was more manageable. Just get used to itching a lot!

Hopefully I haven't scared you off. The end result will be WELL worth the effort. I am really getting excited about finishing my -7 and I think I'll be airborne by the end of winter (yes, well behind schedule). The canopy should be finished in a month and then the wings go on and it is time to hook everything up. Tom Berge and I just finished up the last of the riveting (the forward top skin between the panel and the firewall). That was an agonizing task but I bribed Tom enough to handle the grunt work telling him too I'm old and crippled to shimmy upside-down under the panel. I even made a dream trip over to Wipaire to talk about a paint job. It should be flying on Tuesday… see you at OSH.

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Flyin' the "Clown Plane"

-Doug

About a month ago, I got a call from our local avionics merchant Stein Bruch. He asked if I might be interested in ferrying their recently completed RV-9 out to South Dakota and deliver it to his brother Zweit. Now if you have been down to Stein Air recently you may have been aware of their RV-9 project. Now that it is finished, to say it has a rather unique paint job is an understatement. Let's just say that when you file a flight plan for this airplane and you are to specify the color, you just say "all of them"!! You can see why…

Stein's master technician Chris Stenstrom calls it the "Clown Plane" which I think sums it up. Actually the inspiration comes from Zweit's two little boys who have a vast collection of Little Tike's toys all in rather striking colors. As long as one doesn't stare too long at it the chance of a seizure is greatly reduced (I'm just kidding!! It's really pretty cool!)

N14ZB is a -9 with a 0-360 Barrett Lycoming. It's got a Cato three-blade prop and an AFS 3500 VFR EFIS panel. Of course a TruTrak autopilot does most of the work. The trip sounded like a fun time. My assignment was to fly out to the Bruch ranch strip about 5 miles north of the Sturgis, SD airport. Stein said the strip is actually a road, which leads from the main highway to the Bruch family ranch. Plenty long at 3800' but about 30 feet wide. Hmm... maybe best to avoid a screaming crosswind for my first landing there.

I waited a couple days until the weather forecast sounded good and on the morning of October 19, I launched around 0800. The weather was overcast around 2500 feet in Minnesota but the forecast was to be clear crossing the SD border.

"Clown Plane" was a nice machine. The Cato prop is very smooth and the Vetterman dual muffler system makes a BIG difference in noise level (I think I'd recommend them). I motored along across the flatlands of central and then western Minnesota around 3000' agl. Finally the skies cleared just south of Watertown and I climbed up to 6500'. I actually had about a 10-knot tailwind westbound, which just never happens so it was only 2:05 to Pierre for a fuel stop. "Wow, did you paint that thing yourself?" asked the FBO receptionist. I pleaded totally innocent. As I started up, a Sanford Health medevac King Air pulled up next to me and the co-pilot had this odd look on his face (he just wanted one, I know!)

It was only another hour to the Bruch airstrip. It is a couple miles northeast of Bear Butte, which can be seen about a hundred miles away.

Actually the strip was easy to find with a bright red hangar roof standing out among the brown grassland of late fall. Thankfully there was no wind so I circled the strip and decided to land to the east. The -9 with a Cato prop glides like a competition sailplane. You REALLY have to plan ahead as it will not go down. With power off and full flaps, I shimmied down between a couple trees at the approach end trying to keep the speed down to about 60 knots and it still floated a little bit. But I stayed on the gravel and Zweit was there to meet me.

Stein and Zweit's dad owns the family ranch. It is 2000 acres plus, which is typical of the size of the ranches out here. Zweit needed at least five hours of dual to meet the insurance requirements so we wasted no time and got started. We went through a pre-flight briefing to familiarize him with the RV-9 and mounted up to do some air work.

Zweit has a couple hundred hours with about 50 in the family Citabria, so he has a good tail wheel background. In fact, a lot of his flying is "off-airport" with any good road or reasonably "flat" field serving as a landing strip. We spent about two hours going through various maneuvers, stalls, and so forth. I could tell he was going to be a quick study. His day job is a fireman and paramedic and spent many summers fighting wildfires all over the country. He has even climbed Devil's Tower. This RV stuff should be no problem!

That evening I stayed at his beautiful home about 10 miles west and enjoyed the company of his wife Scotty and the two boys, Quinn and Beck.

The next morning dawned absolutely perfect… clear and calm. We stopped in Sturgis for coffee and Zweit showed me the array of biker bars that cater to the big motorcycle rally held there each summer. The rest of the year, Sturgis is eerily quiet. At the ranch, we pulled the -9 out of the hangar and launched into the cool morning air. We ran through emergency procedures and then flew around Bear Butte to the Sturgis airport for landing practice. Zweit was progressing quite well and after a dozen or so takeoffs and landings, we decided to take a short cross country to Hot Springs, about 75 miles to the south and home base of uber-exhaust-man Larry Vetterman.

We programmed the Garmin Aera and pushed the appropriate buttons to take us first to Custer, SD and then to Hot Springs. We climbed to 10,500 to clear the highest of the Black Hills and motored south. We landed in Hot Springs and gave Larry a call. It was great to talk to him again and he said he would be out to the airport in an hour. We went out and did a couple more landings until Larry arrived and then taxied over to his hangar. Larry is truly one of the RV world's most enjoyable members.

We chatted for the better part of an hour and Larry brought us up to date on his exhaust business. Over the years he has sold over 10,000 units to RVs all over the world. He still sells about 50-60 a month and sells systems for all RVs except the RV-12. Larry also stays busy as the Chairman of the South Dakota Aeronautics Commission. Soon it was time to head back so we cranked up the -9, took off and set a direct course for the Bruch strip.

When we arrived back at the ranch, the wind had kicked up and our approach was a little more challenging. Just as we flared, a gust picked us back up into the air and Zweit went around for another try. #2 approach and landing was fine so we called it a day and I signed off Zweit as a brand new RV pilot.

That evening Zweit drove me back to Rapid City where I stayed overnight and caught the DAL flight back to MSP in the morning.

All in all it was a fun trip and I gained a new appreciation for the RV-9… a well mannered, easy to handle, tail dragger that will be right at home in South Dakota.

The Call

- Tom Berge

"Ring, ring"

"Hello Peter, how's it going?"

"Just made a great landing at Owatonna in a really stiff cross-wind and I broke my canopy"

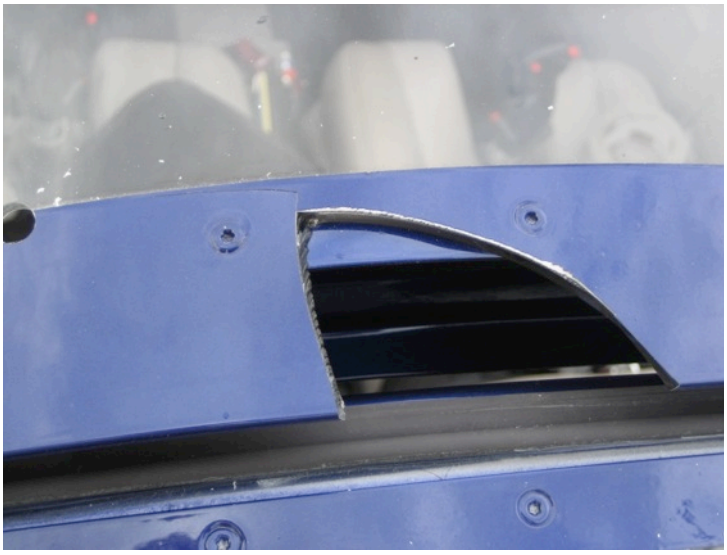
Dead silence on my end of the call. Then, "You did what?"

"I broke my canopy"

Now, be honest, doesn't that just make you cringe? Besides the obvious feeling of sadness, my first thought was thank goodness it wasn't my canopy. Selfish thought I know, but I bet your thoughts would be similar. The wind was indeed gusty that day and Peter had pulled off a great arrival. He then he proceeded to park into the wind as one would with a tip-up canopy. Parking the other way with the wind behind you gives new meaning to the word "sail". By the way, save the tip-up versus slider argument, we all make choices! As Peter was getting out, his hand on the roll over structure, the wind slammed the canopy down on his knuckles. My opinion is the knuckles should have failed, but God made those knuckles to withstand bar fights and such, and sure enough, they turned out to be stronger than the Plexiglas. Out pops a 1 1/2 x 2 1/2 size chunk of canopy. Ouch!

Peter was surprisingly calm during the call, probably in shock, and was interested in my opinion on what to do. His thoughts were to fly the plane back home and then go from there. My thoughts were something on the order of "no way", out of concern there were stresses introduced during the break, potentially causing a crack to rapidly spread. After some convincing on my part, Peter agreed I should fly down with a Dremel tool to at least radius the corner of the break, hopefully relieving the stresses. Upon my arrival at the airport, Peter had already found a crack had spread along the canopy frame outwards about 2 inches. We borrowed a drill with a unibit and stopped drilled the end of the crack with a ¼ inch hole. Comfortable with my work, and bearing in mind I was going back in my RV, Peter successfully flew the cripple back home.

How could this happen??



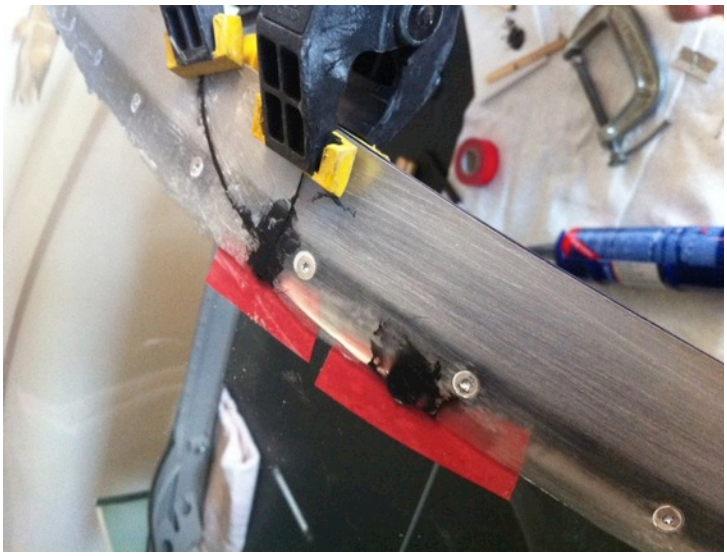
A sight that strikes terror in the heart of an RV builder!

The plan….

Our plan was to attempt a fix of the existing canopy since the worst that would happen is it wouldn't work. In a nutshell, we needed to reattach the wayward piece and add some sort of structure to take the load. Our choices were either aluminum or fiberglass. To conform to the curvature of the canopy, fiberglass would certainly work best. We decided to try some carbon fiber due to the stiffness of the material. If the stuff worked, it would be thinner than regular fiberglass. I know from experience that composites don't stick very well to Plexiglas, sanded or not, so a plan had to be devised to deal with that issue. Our plan was to lay up the composite, remove it from the canopy, finish the edges and glue it back on. We tested 3M 2216 epoxy adhesive, Sikaflex adhesive and a glue that Express Composites in Minneapolis told us to try. The 3M 2216 failed with aggressive pulling, so we passed on its use. Sikaflex, which is the adhesive people are using to glue canopies on instead of rivets/screws worked great with no signs of releasing. The third adhesive is essentially super glue and also worked very well with the added benefit of being thinner. We chose the super glue in an attempt to keep the patch as thin as possible so the repair wouldn't look like a repair. The drawback of using superglue is in not knowing the durability. Once again, we all make choices.

The outcome…

The wayward piece of Plexiglas was glued back in with the Sikaflex and the two stop drilled holes were filled with the Sikaflex as well. Step one was done so onward with the composite portion. This being my first attempt at using carbon fiber, I was impressed with how easy the material was to wet out with West System resin. We put down a layer of 3M box tape to act as a release and sure enough, the composite popped right off after curing. The edges were finished nice and straight, and the carbon fiber strap, which was one layer thick, was glued back on. Now a word of caution, the super glue was applied with a brush and considering the surface area, the odor was pretty intense. A mask would have been useful and probably even smart. With a layer of carbon fiber on both sides of the Plexiglas, the resulting stiffness is really quite remarkable. After giving the glue a few days to cure, I sanded the surface to remove any high spots and sanded the edges to blend with the Plexiglas. One layer of a micro balloon filler to smooth the surface for painting finished my portion of the job. And now a collective holding of our breath in the hope the repair holds.



Lastly, it was off to the paint shop to apply Peter's favorite blue paint and the repair simply disappeared with nary a hint of the dreadful day on the ramp at Owatonna when the Plexiglas broke but the knuckles didn't.

Where the Rubber Meets the Runway

-Pete Howell

First the good news….You built a beautiful RV and have been flying it for several hundred hours…… now for the bad news; somebody has to take care of that beast. That somebody is you….. Let's take a look at one aspect of airplane maintenance that we all have to deal with sooner or later, selecting and changing the main gear tires.

My RV-9A now has over 860 hours on it, and I just changed the main gear tires for the second time. Amazingly, the nose gear tire still looks relatively new. I started out like most everyone, with tires supplied in Van's kit (Aero Classic). These tires were an upper middle end product that served me well for over 450 hours. I'd love to tell you that my brilliant pilot technique allowed me to keep the tires for so long, but I'm smart enough to realize it's probably just Van's computer punched pieces that let me build an airplane with square landing gear. Regardless of the reason, I've been very happy with my tire wear.

Aero Classic
All Weather

My tires wore perfectly evenly and I never even had to rotate them. Once again I think I was lucky in this regard. When those tires finally ran out of tread, I began looking at options for replacement. The simple answer was to go to Van's or Aircraft Spruce and just get new tires. The range of tires available in the size needed for my RV-9A main gear (5:00X5 6 ply) was truly staggering. Tires ranged from an inexpensive Air Trac at $53, all the way to a Flight Custom III that would run me over $140 each!

Before I bought tires, I did a little research and found out that there was another option, retreaded tires. Several local RV pilots were using them and reported fantastic wear and a relatively inexpensive price (ding!). I ordered a set of "MONSTER" retreads ($62) from Desser tire along with a set of "air stop" tubes. These came within a week in a big, heavy box and I began the tire change process. Before we begin, just a note about the "air stop" tubes. The original tubes that come with the kit are notorious for leaking air, requiring you to fill up your tires once a month. The air stop tubes are made of synthetic rubber that really seems to hold air for a much longer amount of time. They were not cheap ($50), but I do think they were worth the investment.

Okay, let's get started. The first thing you'll notice about the retreads is that they're bigger than the original tires. They have a tread depth of 9/32", a difference you can see and feel. Every plane will be different, but I had to carve a little bit off the bottom of my wheel pant openings to make sure I had adequate clearance all round.

Step 1 - Remove your wheel pants, increasing the clearance if necessary.

Step 2 - Jack up your plane in your favorite manner. I use a jacking table under the main spar, middle of the fuselage, to lift up the entire plane at once.

Step 3 - Remove the cotter key that secures the main axle nut. Try not to ruin it because you may have to reuse it if you can't find one the same size (don't ask me how I know)

Step 4 - Remove the main axle nut.

Step 5 - Remove the safety wire and unfasten the bolts that hold the brake caliper together.

Step 6 - Remove the wheel, placing a block of wood under the axle, just in case.

Step 7 - Take the wheel to the bench, clean off all the gunk, and deflate the tire. Remove the bearing and spacers from each wheel half. (The bearings are held in by a spring retaining ring)

Step 8 - Once certain the tires are deflated, remove the bolts that hold the wheel halves together

Step 9 - Unless you're really lucky, that tire will be stuck to the wheel, and you'll need to break the bead loose. I usually put a towel in the ground, and step on the bead to break loose. I've also used a small press when it was available.

Step 10 - Now the wheel is removed and the tube can be removed from the tire. It's sometimes easier to use a tool to remove the valve stem and deflate the tube completely. It is very likely the valve stem will be stuck in the rubber grommet in the wheel half. A squirt of silicone spray will help break it loose and make removal easier.

Step 11 - Use talcum powder to thoroughly coat the inside of the tire and also put an nice coating on the outside of the new tube.

Step 12 - The new tire should have a red dot on it. This is done at the time of wheel balance at the factory, and will show you were the valve stem should be located. Remove all the air from the new tube, and stuff it in your new tire lining up the valve stem as best possible. This may be harder than you expect, but it can be done.

Step 13 - Inflate the new tube just a bit so it will take the shape of the tire. This will help it from being pinched when you insert the wheel halves.

Step 14 - Insert the wheel halves onto the new tire/tube combination, carefully threading the valve stem through the grommet in the wheel half. Check to make sure the wheel halves will not pitch the tube when you put them together and tighten the bolts. Don't forget to install the brake disc on the backside of the wheel halves before the bolts go in (once again, don't ask how I know this)

Step 15 - Once the wheel halves are tightened, slowly inflate the tube to set the tire bead. I like the inflate and deflate tires several times to make sure the bead is set and to get the tube set inside the tire with no kinks.

Step 16 - Reinsert and properly tighten the valve stem, then inflate your tire to the pressure you like. My plane seems like 45 pounds in the main tires.

That's it for installing new tires on the wheels. Now's a great time for inspecting some components that don't get looked at very often. First, take a look at the brake pads. Rapco brake pads have a notch used as a wear indicator. If you can clearly see the notch, the pads are fine - to get really precise, you can measure them with a caliper.

This is also a great time to re-grease the wheel bearings. Finally, take a look at the brake line that leads into the caliper. Check for cracks or anything rubbing on the line that might cause wear. (Note: If Doug finally starts to pay me for my subpar writing skills, I might write an article on how to change the brake pads and how to grease wheel bearings for the next newsletter!!) *(editor's note: the compensation committee has been notified!)*

If everything looks good, reinstall the bearings, and put the wheel back on the axle. With your third and fourth hands helping to hold everything together, position the brake pad and install the bolts that hold it, capturing the rotor. Properly torque the caliper bolts and secure the heads with safety wire. Install the axle nut, and tighten it until the wheel is snug with no play in the bearings. The nut has several indexing holes to allow you to insert the cotter key, securing it.

All that is left is to reinstall the wheel pant and check clearance around the tire, I like to have a thumb width on both the sides and front and rear.

Changing the tires can easily be done in an evening or two, provided you don't run into a tire is really stuck to the rim. There you have it! If you have any questions, drop me a line at fly.rv9A@gmail.com.

NOTAM: RVator's Log Publishing Change for 2012

For the last year or so, the number of hard copy versions of your newsletter has dwindled to less than two dozen. The per issue costs is beginning to get far too expensive so beginning in 2012, we are planning to make every effort to convert to strictly to an on-line version. In January, we'll be sending out the 2012 dues notice with all of the details.

Just about everyone now has computer access in one form or another so hopefully this will change will work out for the vast majority of our members. We should be able to come up with a plan that will meet everyone's needs. Many thanks and please stay tuned….

Minnesota Wing – Van's Air Force
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First Class

Minnesota Wing December Meeting

Saturday, December 10, 2011, 10 am

SteinAir
21170 Eaton Ave., Suite A
Farmington, MN 55024

Yes, you do need to lust over the latest glittering electrons. Come down to SteinAir and take a tour of the latest EFIS doo-dads and touch screen thingies as Stein Bruch does his darndest to separate us from our life savings!! All sorts of new innovations have been developed since our last visit. Join us for another interesting morning. Bring your questions, thoughts, dreams and a maybe even a cocked and ready credit card! Coffee and goodies as usual!!!

Directions:

South on I35 to Exit 81 (Lakeville, MN). East ¼ mile to Kensington Blvd. Turn left and then immediate right on 210th St. West, which becomes Lakeville Blvd and then becomes 212th St. W. Turn left on Eaton. SteinAir is on right. If lost call Doug at 651-398-1184 or SteinAir at 651-460-6955