



RVator's Log

Newsletter of the Twin Cities RV Builder's Group

December 2016

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Upcoming Events

December 17- Winter meeting at SteinAir, Lakeville, MN

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**Minnesota Wing
Van's Air Force**

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Shop Notes

Certain airplanes in past aviation history have earned the title of "classic." I'm sure you can rattle off a few: DC-3, Twin Beech, Piper Cub and so on. Arguably one of the "classic" machines of the jet age was the iconic Boeing 727. The "three-holer" came into being as a more efficient version of the old Boeing 707. They were built from 1962 to 1984 and Boeing built a total of 1832 units. When I got hired at NWA in the early 90's, most of us new-hires started out as flight engineers. I rode "side-saddle" as they called for about 800 hours before moving up to first officer.



Being copilot on a three-crew 727 was kind of a cushy job. The "wrench" (as the engineer was called) did all the grunt-work: reading checklists, doing weight and balance, performance calculations, balancing fuel loads, jockeying the cabin temperature to keep the flight attendants happy. Sure co-pilots at least got to fly the jet every other leg but had little reasonability other than to laugh at the captain's jokes and be sure he had first choice of the crew meals. F/O's were also regarded as bird protection for the flight engineer. One of my buddies told me all I had to know was the unofficial co-pilots preflight checklist, which went something like this:

1. Pitot heat
2. Window heat
3. Adjust my seat
4. Prop my feet
5. "What's to eat?"

After graduating from four weeks of ground school and simulator training, we started IOE (Initial Operating Experience). It was twenty hours of actual line flying with passengers and a training captain who had the task of teaching us how to actually fly the machine. Even though I had logged about 800 hours as a flight engineer, I had never actually touched the controls. And I really had no idea what it was like to fly a 190,000-pound airplane.

My instructor was Captain Ron. He was kind of a little fire-plug type of guy who on his off time was a renowned rodeo rider. He told me he had broken about every bone in his body and he looked like it. To listen to him, he real-



ly would have preferred to be a cowboy but somehow ended up an airline pilot. But he was a pretty good instructor. My IOE training schedule was a five-day trip. Our first leg is from Minneapolis to Seattle. Captain Ron will fly first and show me the ropes. Everything goes well on the way out although most of his tips and tricks shoot right past my feeble brain. We arrive in SEA on time and with no big screw-ups on my part. Of course, wouldn't you know it; an FAA inspector shows up to bum a ride on the jump seat. Ron tells him this is my leg back to Minnie and my first time as "sole manipulator of the controls." For a Fed, he seems like an OK guy and smiles and says sometime to the effect that we all have to start sometime. Regardless my anxiety level approaches redline.

I managed to find my way back to MSP with out too much distress. Fortunately the weather was clear and little wind and Captain Ron had me hand flying the beast as we flew downwind for runway 30R. The 727 handles quite well and one would never know that there is 150 feet of tube behind you. Captain Ron had warned me the three-holer is a little tricky to land, especially the stretched version (which we were flying). The main gear is set well behind the center of gravity so if you pull back too much or too quickly during the flare, you ram the main gear into the ground with embarrassing results (if you hit hard enough, the oxygen masks can deploy and that is REALLY embarrassing). So the technique is the opposite of landing an RV... Ron says start the flare where it looks about right and arrest the rate of descent and then start to push forward a little to raise the main gear up to “kiss” it on. Oh, that sounds so easy!!!



The largest airplane I had flown up to this time was a Sabreliner. Its final approach speed is about the same speed as the 727 but is only about 40 feet long and super easy to land. As we turned final, I realize we are pointed right into the setting sun. I can't see a thing! Do those 140 folks in the back have any idea what's about to happen to them? I can feel the Fed breathing down the back of my neck and detect faint snickering from the engineer who just knows I am going to prang it on. I'm trying to squint into the glare but it's hopeless. Ron talks me down final as my eyeballs are about to combust. I can barely see to stay lined up with the runway but we somehow cross the threshold roughly in the right spot and at close to the right speed. At that point my brain shuts down and I forget all about Ron's instruction on making a gentle flare by squeezing back the

wheel then easing it forward to “kiss” it one. In fact I forgot to flare at all and we slam into the ground tallying about 4.2 on the Richter scale. Miraculously the wings are still on and the passenger masks stay put. “Nice job,” says the Fed. He's too kind. The engineer stifles another snicker.

Somehow, five days later Captain Ron signs me off and for the next 4 years I try and figure out how to land the 727. 3000 hours in the right seat and I never really did. Today, I'm still learning how to tweak the RV-7 on to the pavement with consistent success. Sometimes it works... sometimes it's dreadful. But it does keep me humble.

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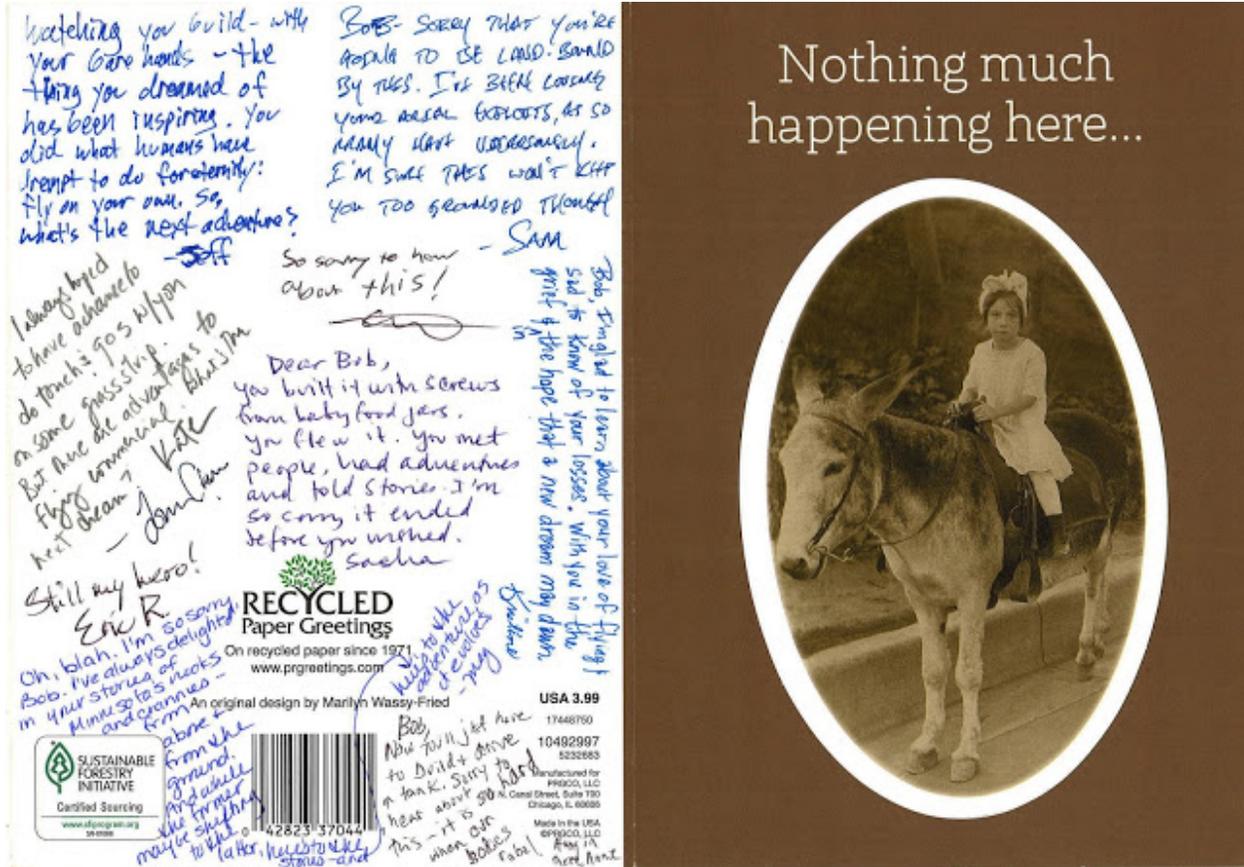
When the time comes to part with what we hold dear

- Bob Collins

Ed note: Bob has been flying his RV-7A for several years. It was a long build with a lot of peaks and valleys. But it was finally finished and he has enjoyed over 300 hours of fun flying including several trips back home to Massachusetts. But during this same time Bob has been plagued with Meniere's disease, a disorder of the inner ear, which can cause vertigo. Now the disease is affecting both ears so maintaining his medical certificate is doubtful. Bob made the decision recently to put the -7A up for sale and a buyer in Michigan snatched it up quickly. He may



build a RV-12 but it's a little early to say. Regardless, parting with an airplane after many hours of building and flying is a bittersweet experience. Bob writes this from his blog reflecting on his thoughts and the thoughts of his co-workers at Minnesota Public Radio...



I can't remember a time when I didn't refer to N614EF as *her*.

From the moment the preview plans arrived in 2001, she was always *her*.

"Touch it once per day," Van's builder support expert advised me early on. Except I didn't touch it. I touched *her*.

And when *she* finally flew, I'd greet *her* every time I walked in the hangar with, "How you doing, by?" And before I turned off the lights and locked the door, she always got a goodbye kiss.

She treated me well and now that I'm in the process of selling *her*, I feel I have failed *her* somehow.

We had a thing, she and I. She took care of me. I took care of *her*.

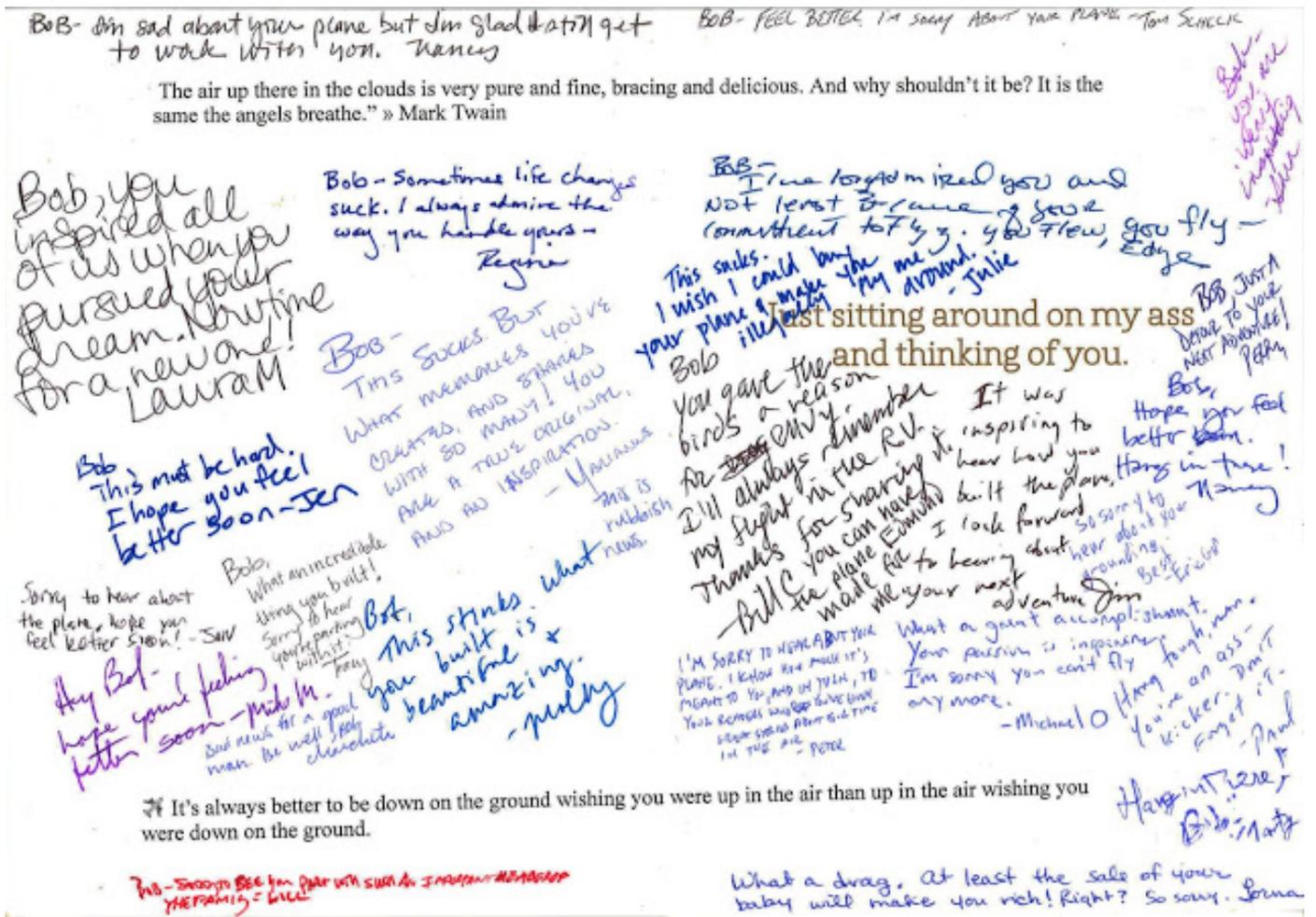
She kept her end of the bargain. Other than those first flights in the test area when she choked on something stuck in her #3 nozzle, she never missed a beat. I'd talk to her on those long trips to New England to see my mom. She'd talk right back.

I don't know -- yet -- who's going to buy her. Someone is coming to look this weekend. We'll go over the

usual things people go over when they sell airplanes, I suppose. And if things work out, maybe I'll ask the only question I really want to ask: Will you love her? Cherish her? Take care of her from this day forward?

It's an important question, because right now it feels like the last guy who said he would is forsaking her.

An aside: My colleagues at work left a card on my desk on Monday. I guess they knew that the coming moment is a painful one, a sympathetic one. Because they signed it.



In the innards of my plane, there are signatures of the people who worked on her. Some have messages. All have autographs. They meant an awful lot to me.

And now these autographs do too.

The Best Pilot Ever?

- Doug

Recently the aviation community mourned the passing of Bob Hoover. I think all of us considered him just about the best pilot ever to climb into a flying machine. His adventures were legendary and I saw him fly his air show routine at Oshkosh many times. I met him once... way back when at an airshow in Michigan. I had flown there in our flying club's ancient 1959 Cessna 150 and won an award as the youngest pilot. The prize was twofold: first was to meet Miss Teen USA who was dressed in a killer tight dress with a banner over her shoulder and looking everything that a 17-year-old nerd/boy could dream of. Second was to shake the hand of Bob Hoover who had just parked his Shrike Commander after one of his usual stunning performances. To this day I still remember the thrill of meeting this aviation legend (and Miss Teen USA was pretty awesome too!). Here's a great video on Bob Hoover's life that you will find entertaining"



<https://vimeo.com/152663476>

Fly the Airplane

- Doug

Excerpts from a recent NTSB primary accident report:

On November 5, 2016, about 0756 mountain daylight time, an experimental amateur-built Stamper model RV-10 single-engine airplane, N924WY, was destroyed during a post impact fire following a loss of control shortly after takeoff from Dubois Municipal Airport (DUB), Dubois, Wyoming. The private pilot, the sole occupant, was fatally injured. The airplane was registered to and operated by the pilot under the provisions of 14 Code of Federal Regulations Part 91 as a test flight. Day visual meteorological conditions prevailed for the presumed local flight.

A witness, who was also a pilot, reported that he saw the accident airplane takeoff from runway 28 (6,100 feet by 60 feet,

asphalt). He stated that he saw the right-side gull-wing door open immediately after liftoff. After the door opened, he saw the pilot reach for the fully open door with his right hand and heard a momentary reduction of engine power. He saw the airplane descend momentarily before he heard an increase in engine power and saw the airplane level off over the runway. He reported that the pilot continued to reach for the open cabin door as the airplane overflew the remaining runway about 35 feet above ground level (agl). The witness then observed the airplane's left wing and nose drop suddenly. He surmised that the airplane had entered an aerodynamic stall/spin. The airplane descended below his line-of-sight before he observed a large explosion.



This is not the first time an RV-10 door has opened on takeoff. In 2007, local builders Paul Irkbeck and Elden Lampretch built one of the early RV-10s. Paul's brother Tom did most of the test flying and he also lost a door on takeoff. An unlatched door is easy to overlook on the -10 and Van later supplied a warning light system to help prevent such a thing. Tom had the door open right at liftoff and it ripped away and landed on the grass at the airport. He flew the airplane around the pattern and landed without incident. The airplane will fly fine without a door. An RV-8 will fly fine if the front baggage door opens in flight. In fact all of the RVs will fly OK with a canopy open. But it can be VERY distracting and sadly this accident shows how distracting it can be.

Some of you may remember the 1985 accident of a Galaxy Airlines Lockheed Electra in Reno. It was a charter flight returning to Minneapolis with 72 people on board. From Wikipedia:

The United States National Transportation Safety Board investigated the accident, and issued the following probable cause:

The National Transportation Safety Board determines that the probable cause of this accident was the captain's failure to control and the copilot's failure to monitor the flight path and airspeed of the aircraft. This breakdown in crew coordination followed the onset of unexpected vibration shortly after takeoff.

The NTSB added the following Contributing Factor:
Contributing to the accident was the failure of ground handlers to properly close an air start access door, which led to the vibration.



The NTSB report indicates that the ground handlers did not properly close the [air start](#) access door due to a sudden change in their procedure when the ground handler supervisor realized that the headset being used to communicate with the flight crew was nonfunctional, and had to revert mid-routine to using hand signals. This break in routine led the supervisor to signal the flight to taxi before the air start hose was disconnected. Although he then realized that the hose was still connected and signaled the flight crew for an emergency stop, and the hose was successfully disconnected, the closing of the air start access door was not completed either prior to the supervisor's initial go-ahead or after the emergency stop. The report concluded that the air start access door is what led to the vibrations. The investigation indicated that these vibrations were not a threat to the aircraft's safe operation, and would likely not have prevented the aircraft from reaching cruise speed and altitude. Similar reports surfaced from other Electra pilots, which indicated that the vibrations ceased at higher air speeds.

While the flight crew was trying to determine the source of the vibrations, they reduced power to all four engines simultaneously, presumably to test the engines to see if they were the source. Power was then not increased before the wings stalled.

Fly the airplane...

N66AP Instrument Panel Upgrade Project Started!

-Alex Peterson, RV6-A, November 2016



In case any of you are wondering where the recent fantastic flying weather came from, you can thank me. About a month ago I started tearing apart my old panel, grounding the aircraft for several months. You're welcome, and I'm glad to deliver on the best November flying weather in at least 15 years!

I finished my original panel in early 2001, just before the first wave of experimental avionics came on the market. The panel was IFR capable (I'm not), and had the then fairly new Garmin 430 with a little moving map display. Keep in mind this was really a jump forward! It sure was for me, as I'd never even flown with a gps, let alone a moving map. The autopilot was a fully coupled system with an HSI. All amazing stuff for something built in the garage!



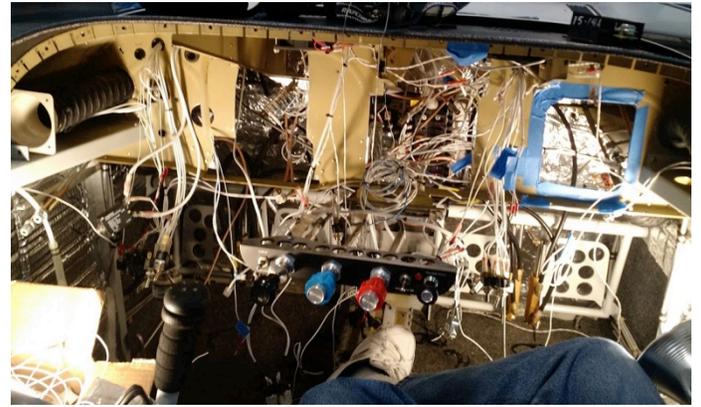
Panel as it was in 2001, and essentially was up until October 2016.

I first started thinking about upgrading the panel a couple years ago, but simply didn't want to spend the money and time only to have the same aircraft with fancy new avionics. I decided that I'd wait until something expensive in the panel wore out and needed dollars to fix. There were also the ever-evolving ADSB solutions coming out monthly, it seemed.

This past spring, I ordered a Garmin GTX 345, which would have given me ADSB out and in capability, something I'd gotten a taste of with the GDL 39 ADSB receiver. This would have been a bit of panel surgery, but nothing too major, and it would have satisfied the 2020 requirement.

However, at about the same time I ordered the new transponder, the autopilot started oscillating in pitch from time to time, gradually getting worse until it was no longer usable this summer. After studying the problem on-line, I concluded that it would be easy to spend several thousand dollars on repairs and still not necessarily fix the problem with the capable, but certified (meaning \$\$\$), Century 2000 autopilot. It seemed to be slip rings in the pitch gyro, but who knows? Add to that the need to do something about the ADSB out requirement looming in a couple years, and I decided to pull the trigger on re-doing the whole panel.

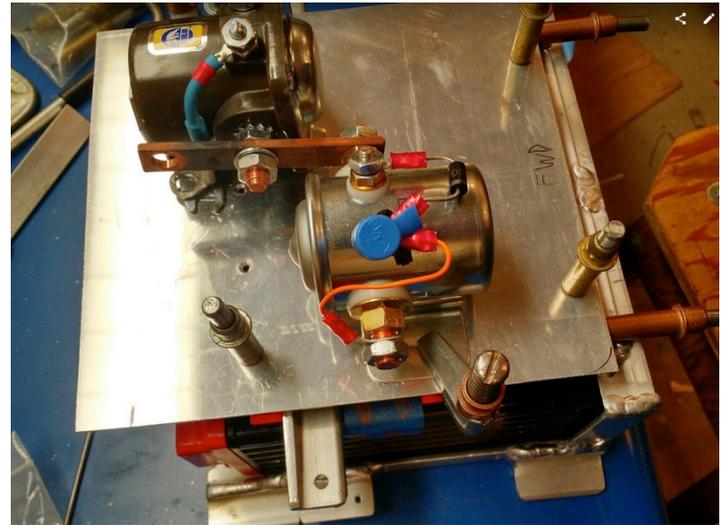
I suppose one could liken it to euthanizing your trusty pet, but after 1540 hours of delightful flying hours, I started tearing apart the old panel:



Whew, I guess I'm committed now!

Being an engineer by trade, I'm acutely aware of the dangers of scope creep on projects. However, I decided to add maintainability to my "must do" list. I changed the master solenoid during my last annual, and it was the most trying task I've ever done on the plane. It was an absolutely miserable experience in gymnastics. So, in addition to the panel upgrade, I added moving the batteries and solenoids to the front side of the firewall as well as moving the fuse blocks to the space between the panel and sub-panel. When I'm done, there will be essentially nothing between the firewall and sub-panel, except for the two Lightspeed Plasma III ignition control boxes. They are reasonably accessible in any case.

Besides the planning and teardown work, most of the effort until now has been mechanical work such as the battery box fab:



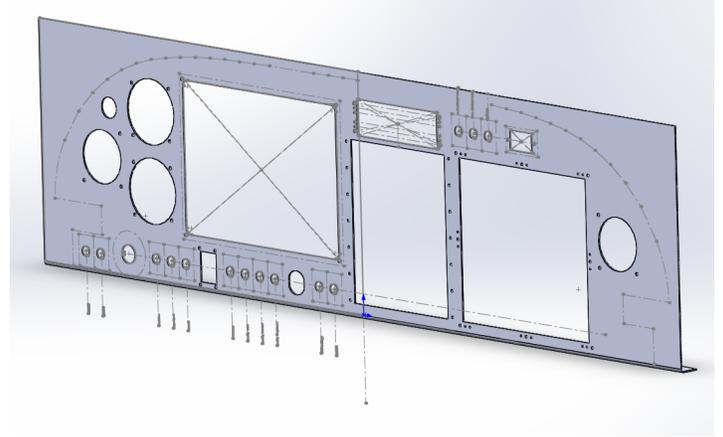


Note the masking tape “helping hand” to hold the wrench!

Or, climbing into the tail cone to begin designing the new pitch servo mount:



Or, designing the panel itself:



So far, so good! I’ve found that I’m enjoying this process more than I expected. In talking with our resident panel upgrade expert Tom Berge, we guessed that this might take around 150 hours’ time to complete. So far, not including my time researching the options, etc., I’ve got about 57 hours into the project. I have an electrical interconnect drawing from SteinAir, which greatly reduces the time needed to research how everything is wired. I recall spending many, many hours during the first panel design to understand this.

For those wondering just what toys I’m putting in – you’ll have to wait for my next report!

Twin Cities RV Builders Group
12 Island View Lane
North Oaks, MN 55127

First Class

Twin Cities RV Builders Winter Meeting

Saturday, December 17, 2016, 10:00 am

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



It's been a few years since we gathered at Stein Bruch's shop to drool over the electronic baubles that we dream of. For those of you who have not visited SteinAir, this is a Saturday morning you won't want to miss. Stein will give us a quick tour and then discuss the latest in EFIS panels and avionics available from all of the major manufacturers such as Garmin, Dynon, and Advanced Flight Systems. The ADS-B mandate looms ever closer so here is a chance to learn about the latest options available.

Coffee, goodies, and fellowship. What more could you want?

More details and directions on the website at www.mnwing.org

If you have any questions or you get lost en route, please call Doug at 651-398-1184