



RVator's Log

Newsletter of the Twin Cities RV Builder's Group

Shop Notes

- Doug

December 2021

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Upcoming Events

Thursday, January 6th, 7:00 pm – Virtual webinar with RV-9A world traveler Guil Barros. Details on page 9.

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Van's Air Force**

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Here we are again... it's December and the glory days of this past summer are fading into the reality of puffy winter jackets, ugly hats with ear flaps, warm woolen mittens and all those favorite things we love about winter in the north country. Thankfully my neighbor Tony, who has a barn full of power toys, has agreed to keep my driveway clear again as my enthusiasm for wrassling with my snow blower has long since died.

I was talking with a non-flying friend the other day who asked if I could fly my RV in the winter. I tried to explain in layman's terms how we stave off the chill with dual heat mufflers, the famous Tom Berge cabin heat valve and trying to fly on clear days which capture some meager radiant energy under that big bubble canopy. Lot's of guys just hang it up for the winter, but I find it hard to resist the rush of a 2000 fpm rate of climb on a cold winter takeoff.

But what about ice? And I don't mean that one-inch ridge just outside the hangar door which makes dragging the -7 out to fly a total pain in the rear. We're talking about airframe ice. I'm sure I don't have to harp on this in detail as we all read the aviation magazine articles warning of the dangers of airframe icing. We know that our RVs are NOT approved for flight in any kind of icing conditions and most of us are VFR pilots anyway. But we do build our airplanes with several features that directly address aircraft icing. We install heated pitot tubes, alternate air sources or carburetor heat valves and fuel vents located near warm engine exit air.

In 50 years plus of flying, I've poked the icing bear a few times. There were a couple scary encounters in single engine Cessnas back when I was young and immortal. The corporate turboprops I flew in the 70's and 80's had boots and hot props and all that stuff, but I do recall a few times when conditions were such that even those measures weren't enough, and we had to

come up with a Plan B asap. Transport jets have heated everything and fly fast enough that icing is generally a not a big factor. More importantly of course was deicing prior to takeoff which was mandatory. Sadly each winter we see a number of GA takeoff accidents where the pilot violated the rule that you CANNOT takeoff with a snow or frost covered wing.

Three years ago I had my one, and hopefully only, RV icing encounter which reinforced the fact that I am flying a little airplane. It was January 2, 2019 and Frank Huber's RV-7A had been in the Hibbing paint shop for the past few weeks. It was now complete and ready to go. He and Tom Berge were going to fly Tom's RV-7A that morning for the pickup and at the last moment, I decided to tag along in my RV-7. The weather was really cold and overcast around 3000 feet. They initially departed VFR from the Cities but further north they ran into snow showers, landed,



checked the weather, and filed IFR. I too filed IFR and had a rather uneventful flight north with scattered snow showers here and there. I was in and out of the clouds, but no icing was encountered. I broke out about 10 miles from Hibbing, landed and Tom and Frank arrived about 20 minutes later.

We spent a while checking out Frank's beautiful new paint job and I decided to head back shortly after noon. Tom and Frank would follow in a couple hours after wrapping up the paperwork. I hadn't paid a lot of attention to the weather forecast as conditions back home were good VFR with ceilings around 3000 feet and good visibility. I filed a IFR flight plan as the Hibbing weather was now around a 2000-foot ceiling with light snow. Visibility was not too bad... around 4 or 5 miles. I filed for 4000 feet which would put me in the clouds. I didn't think too much about icing as it was a cold and dry 10 degrees which usually is too cold for significant icing (at least so I thought).

I got my clearance and took off, contacted Duluth departure, and climbed into the clouds up to 4000 feet. I really had not gotten more than 20 miles and started getting a fair amount of ice. It began to dawn on my dumb pilot brain, that this is really not a good idea in a little airplane. Even non-pilots know that the Duluth area seems to generate its own, sometimes ugly weather that defies forecasts. Years of experience flying big turbine jets with sophisticated deicing equipment (not to mention five flight attendants) does not translate well to my little RV with its fearless heated pitot tube.

Thinking I could turn into a big ice cube any minute, I quickly chickened out and thought I should really just land, fall back and regroup. I asked approach for a diversion over to Duluth International only 20 miles away. The ice didn't get much worse, but I really wanted to get out of the clouds. The weather in DLH was 2000 overcast and 3 miles in light snow and in short order I was vectored for the RNAV to runway 21. I landed, taxied over to Monarch Aviation, shut down and headed into the warm lobby (the temp was still around 10 degrees).

Now what? I checked the weather, and it is 3000 overcast and 10 miles visibility about 20 miles south of Duluth and like that all the way back home. But now the airport is IFR, 2 miles in light snow and I have no desire to file IFR and get back in the clouds. Jean and I were leaving for a Hawaii vacation in the morning so now the old "get-home-itis" begins to cloud my thinking. A wiser choice might be to leave the airplane in their hangar for the next two weeks (\$\$\$\$\$), rent a car and drive home. But I had about another hour to decide, so I sat there staring at my iPad. Ever so slowly the snow crept its way off to the east and finally DLH calls 3 miles. I rush out to the RV, shiver my way through a cold start, taxi out and takeoff on runway 27 knowing the visibility should get better just southwest of the airport. Sure enough, by the time I get to Cloquet the snow ends and I motor back to Lake Elmo at 2500 feet. Frank and Tom eventually get back to Anoka VFR just before sunset.

The moral of the story for me is three-fold: never trust icing forecasts (especially anywhere near Duluth!), don't even think about poking the icing bear and don't forget I am flying a little toy airplane. Plan accordingly!!!!!!

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Welcome Aboard!!!

-Doug

Join me in welcoming these new members!!

JD Haas, Roseville, MN: JD says he is a low timer with retirement on the near horizon and thinking about building an RV-14.

Steve McCluskey, Plymouth, MN: RV-10 tail kit is on order. Based out of Crystal.

Jeffrey Ellis, Austin, MN: RV-7A tail kit under construction.

Tim Glover, Lino Lakes, MN: A&P mechanic, aircraft broker and building an RV-10.

Jonathan Ingalls, Burnsville, MN: RV-8 tail kit on order

Tom Tegeder, Plymouth, MN: Ted reports: "I had the opportunity to meet a couple of good guys the other day at Maple Lake MN Airport - they had just landed their Van's RV maybe a 7a - took them 12 years to build it - great paint scheme - 180hp Lycoming - new glass panel Garmin - what a cool plane - took a video of their take off - it climbed easy & fast - they mentioned that they fly out of Crystal Airport & told me about the Minnesota group"

Edward Gwiazdon, Lake Elmo, MN: recently purchased a very nice RV-9A

By the way, we now have "officially" 285 members with 90 flying RVs!!

What MNVAF Members Are Building and Flying

by Frank Huber

Mark Owen, RV-12

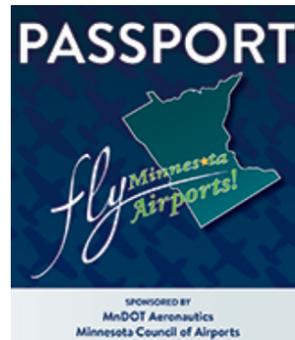
Mark did not have a single hour of flight instruction or experience when he was getting the itch to build his own airplane. He took a class on sheet metal building at Oshkosh and found the process enjoyable. He was interested in the Light Sport category and RV12 was his choice for the following reasons: reasonable cost, 800-900 hours estimated time to build, kit quality and fitment. Mark was able to get a demo ride in the Van's RV12 which really set the hook!



Being an electrical engineer, the wiring and electronics was not a problem for Mark, but the fiberglass layups and canopy trimming/drilling proved to be challenging. Mark has equipped his aircraft with a single Dynon Skyview HDX, ADS-B In/Out, Garmin GTR200 Com, Dynon AutoPilot including the dedicated control panels. He plans to have his plane painted in mid-February by a fellow RV driver located at Poplar Grove IL. His paint scheme is still evolving but will be a base of white with several shades of blue stripping.



He started building his project in January 2013, and completed his project in April 2020. Not having a pilot's license, Mark had Tom Berge do the test flying. After completing Vans test program, Tom taught Mark to fly his RV-12, successfully earning his Sport Pilot certificate. Not surprisingly, Mark says Tom was an amazing instructor with much patience and encouraging teaching techniques.



Mark has flown over 250 hours since May of 2020 when flight testing was completed. All of his logged pilot time has been in his RV12. Since he received his pilot's license in November of 2020, he has visited 133 of the 134 airports in Minnesota (guess which one he left out :)) getting stamps in his passport book. Mark says he has met so many interesting people at the

FBOs and is amazed this network of airports is just waiting for visitors! He is planning to pursue Wisconsin's airports next. Mark also has family in Austin TX so that will be his next big cross-country adventure.



His brave wife, Naomi is his regular co-pilot!

Mark took his father, who just turned 98 on November 11th (Veteran's Day) for a ride this past summer. His dad is a WWII Navy pilot, who piloted PBY and PBM rescue planes based out of Hawaii. Mark says It was great to get him up in his plane this summer and let him have the controls for a bit!



Mark's son Ross has also gone flying with him.

Trouble Shooting 101

- Tom Berge

This past summer while flying to Flagstaff for my rafting trip, I experience an interesting occurrence. Level flight, minding my own business, an alarm yells out, "High Voltage". Swell, just swell.



I glanced at my Advanced Flight Systems engine monitor just in time to see my voltage return to normal. I thought an anomaly. A few minutes later

the darn thing did it again along with a rising fuel flow rate and my #2 EGT rising. Tach also jumped a little then settled down. Not the kind of thing I needed to start my "must-arrive-on-time" trip. The engine was perfectly happy, smooth, no complaints. The engine monitor on the other hand was having a moment. This went on for a while but eventually returned to normal. As I recall, we had the same thing occur a number of times throughout the trip, but every time, no indication that the engine was unhappy. Then normal.....

I've seen some strange stuff through the years and the most likely cause of this odd anomaly was probably a bad ground. It was an easy fix. Fast forward to an October trip going to Nebraska. Once again, minding my own business, along comes that dreaded voice yelling "High Voltage". Fuel flow was jumping all over the place, going as high as 22 gallons per hour. The #2 EGT bar went yellow announcing a high indication. As before, the engine ran perfectly. Understand that while my fuel flow was reading very high, the actual fuel flow was not as confirmed by my fuel level gauges. Increasing the mixture which should have cooled down the EGT, actually raised it. And what's the deal with my voltage spiking high enough to set off an alarm? On top of that, none of these anomalies were present without the others. With the troubleshooting wheels turning in my head, I'd "fixed" the ground wire so that can't be it; perhaps I had an intermittent fault with my monitor. Yup, that's it.

Since my monitor is old, I've been collecting a few spare parts just in case an event such as I was experiencing occurred. By now the faults were constant. Let's start throwing parts at it to find the culprit.

First I replaced the cable between the control box and the screen. No joy. Then the screen was replaced. No change. That left the control box, the one with all the wires. Back when this box was designed, the wires were simply attached directly to the box. No plugs were used. Of course, I installed the box in a very accessible location where I could easily swap all the wires while sitting upright. Wrong, I did not do that. I did mount it so I could access the box and wires, but easily it was not.

Three hours later, the replacement box was in. Throughout this process, there was a nagging thought bouncing around the back of my mind saying maybe I do have a high EGT and the fuel flow issue was just a coincidental case of bad luck. Perhaps it was a burned valve? Well, let's go do a test flight.

Same old problems, nothing changed. Next step in the troubleshooting process was to Google it. I found a Mooney driver who had the same thing happen to him. Reading through all the associated threads, none of which I wanted to hear, there was one little nugget that stuck. While his issue turned out to be something else, that nugget got me going in the right direction. Could I have a bad spark plug or wire? My engine ran smooth, and my run-ups were normal, but maybe.....Another test flight would answer my burning question. For those of you who have never done an inflight mag check, it's a valuable tool. (One time a few years ago I did an inflight mag check on another RV and the engine just quit. That was bad.) So I took off, leveled the airplane and waited for the bad engine monitor indications to present themselves. It didn't take long. Left mag, fine, right mag, oops.

There was my number two EGT dropping like a brick. The engine wasn't too happy about that either. I have found the culprit,



I think. Tracing the bad wire/plug was pretty simple. The plugs were about 120 hours old, but hey, maybe I got a bad batch and so all were replaced. Not wanting to put all my eggs in one basket, I also replaced the associated plug wire with an old wire saved from my last plug wire replacement. Off on another test flight and all was good. Everything fell back into place. Success!

So, how could one bad spark plug/wire cause all these odd indications, seemingly unrelated to one another? Here is my prognosis. I have a dual Lightspeed electronic system firing a

wasted spark through coils. If a plug doesn't fire, the energy is still produced by the coil and has to go somewhere. That somewhere was my engine monitor. Somehow the energy got into my engine monitor and added 2400 impulses per minute. The only instruments that operate on pulses are my tach and my fuel flow. Since the fuel flow operates by counting pulses to determine how many gallons have passed the counter, adding more pulses to the system increased the indicated fuel flow. The more sparkplug misfires, the higher the fuel flow error. Since I was intermittently missing spark on one plug of my #2 cylinder, the fuel charge was not burning correctly and when the exhaust valve opened, the EGT probe picked up the higher temps causing my indication to correctly increase. Increasing mixture just added more gas to the problem.

What did I learn from all this? First of all, don't brush aside a change in engine indications. Many times, there are little warnings that something is going bad. My spark plug/wire didn't completely fail. It failed in stages. Don't change your alarm settings to make a nuisance alarm go away. I didn't but was tempted because my EGT rise was only around 50-60 degrees. The fuel flow issue could have been explained away with a bad transducer but would have been exposed after I spent \$200 for another. The high voltage alarms have not reoccurred. Most problems you'll run into are generally the simple problems. For the last two annuals, I'd measured my spark plug cables intending to replace them, but always put it off. I now have a new set of cables and I do think these were the original cause of my problems. And lastly, when troubleshooting, be relentless.

Airplane Camping at Glacier National Park

By Pete and Andi Howell

The Idea

The Pandemic hit and the world had kind of shut down but flying in our small plane was still pretty safe in the summer of 2021, so Andi and I decided to try once again to get to Glacier National Park to camp, hike, and sightsee. We always laugh about this trip because it had been planned and attempted for several years, but either work or weather always seemed to get in our way. My buddy Steve at work actually called it our "white whale" trip!



The Plan

We mapped out the trip and planned to land and camp at Ryan Field, a small grass strip just outside of West Glacier, Montana. A fuel stop was planned for Beach, ND near Teddy Roosevelt NP. We had been to Beach before and knew they had a nice car and food close by. A car was rented at KGPI, and the FBO knew we were coming. Now we just needed some good weather...

The Trip Out

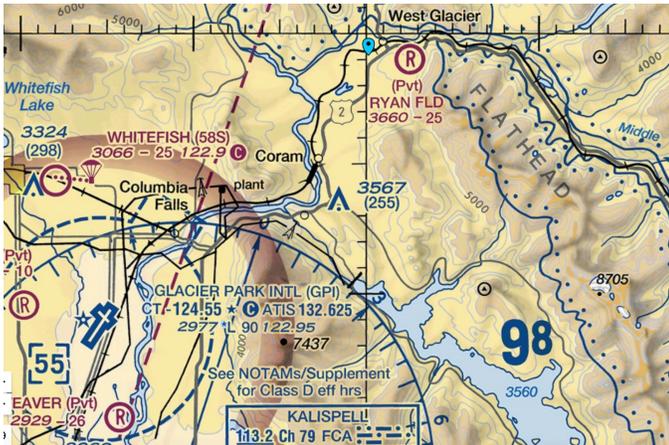
The weather on the day we planned to depart ended up being as good as we could have hoped for. We had loaded the plane with our camping gear the night before and got an early start on our westward journey. We saw light winds and some fog in the valleys until we reached the South Dakota border, from then on there were just a few clouds in the sky!

We landed among the sunflowers in Beach in the late morning and took the courtesy car into town and got a quick bite to eat. After fueling up and dodging all the grasshoppers (swarms!) on the ramp, we headed west again. The terrain of eastern Montana is not very exciting until you hit the Missouri River, then you start to see the vast reservoirs that supply water and power to the western states. I was excited see an interesting part of the Missouri River known as the Missouri Breaks. It's a desolate area it has a stark beauty all its own. It did not disappoint from the air!



Once past the Breaks, you start to get into the mountains. The RV-9A dutifully ascended to about 12,500 feet, and before we knew it we were over some of the higher peaks and barreling into a 50-knot headwind. Just to be on the safe side we followed US route 2 through the mountains and into the wide Flathead valley just West of Glacier National Park. As we came over the last peaks, we called the tower at KGPI and were cleared to land. After shutting down, we were met by a great young man in a golf cart who hustled Andi off to the bathroom and asked me where we were headed. I told him we

were going to Ryan Field to camp and his eyes lit up. He told us it was one of his favorite places and he spent several nights in the summertime camping up there.



We quickly gathered our rental car and grabbed a bite to eat. Back at the airport, we loaded the camping gear into the rental car, and Andi started to drive to Ryan field while I climbed back in the airplane took off and headed to Ryan by air via the pass. This allowed us to have a vehicle and for me to land light at a new to me grass strip. Even though I had studied the briefing, looked at the satellite photos, and talked to a few people that had landed there previously, I was still nervous as I looked forward to probably my most challenging landing yet. I brought back the power and set up for a left downwind with mountains just off to my right. I kept my speed as low as possible, turned base before the river, and came in over the trees, very tall trees!! I was a little fast but was stopped by midfield. A big sigh of relief and new goal accomplished!



The Camp

I was pleased to be down safely, but the real thrill was realizing we had the place all to ourselves! I carefully taxied to the tie downs and got the plane secured while I took in the scenery and waited for Andi to drive over. The late afternoon sun was stunning! She soon arrived and we set up camp – there is a camping shelter for cooking with running water and now they even have showers! Our food was locked in the bear box and we relaxed around a campfire and had a few beers. It was magical!



The Park

If you have been to Glacier, you know the place will leave you slack-jawed, with incredible views in every direction. We drove the Going to the Sun road and did several hikes along the way. We marveled in the waterfalls and the incredible scenery – we did not see any bears but did see plenty of deer (we were OK with that!). Days were spent in the park and evenings back at camp with the plane, reading, eating,

stargazing and sleeping – it was cold at night, even in August. That first stroll to the bathroom in the morning was an eye opener!



The Trip Home

After 4 days in Montana, it was time to come home; we broke camp and spent the last night in town so we could clean up, as we were a bit “grimy”. We packed the plane, returned the rental car, gassed up, and left at first light before the tower was open.



Circling above the airport got us high enough to clear the mountains to the East and as we crossed them, the sunrise provided some of the best views ever from the plane! The rest of the trip was pretty boring save for a bit of weather near our fuel stop in Dickinson, ND. After lunch and a short detour, we were direct KANE and a chance to sleep in our own bed!

It really was one of our best airplane adventures yet! Great flying, camping, scenery, it had it all. We’ll be going back at some point to Ryan Field to do it all again. The Recreational Aviation Foundation owns Ryan Field, and you need to get a briefing from them prior to landing. They operate on donations, so consider becoming a member; I think you would like the people. The RAF is active locally at Bowstring, MN, Isle, MN, and Cornucopia, WI (I highly recommend all these strips, too!)

Twin Cities RV Builders Virtual Winter Meeting

Thursday, January 6, 2022, 7:00 pm

On – line Zoom Webinar

Join us next month for a virtual evening with RV-9A builder/pilot and prolific world traveler Guil Barros. RV You-Tubers may be familiar with Guil's channel *Build-Fly-Go* which currently is documenting his RV-10 build. But Guil's claim to fame is he and his wife Mary's amazing trip to Brazil (and back!) in his RV-9A. For those of us who consider a Brainerd pancake run pushing the limits, this will be a fascinating evening on the planning and execution of a BIG trip in a little airplane across lots of water and lots of jungle.



This will be a COVID-free Zoom webinar presentation. About a week prior we will be sending out an email link with directions for everyone to be able to join us from the comfort of home.

Stay tuned for more details.....