



RVator's Log

Newsletter of the Twin Cities RV Builder's Group

Shop Notes

- Doug

March 2026

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Upcoming Events

**TC RV Builders Wing
Spring**

**Saturday, April 11, 2026,
10 am
Details page 8**

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**Minnesota Wing
Van's Air Force**

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It must've been a particularly dreary non-flying day last spring. I must confess I was doing what a lot of old folks do when they're bored: scrolling aimlessly through Facebook. (don't judge me!) One of the groups that I follow is the "Short-Wing Piper Club." RV folks may not know what a "short-wing Piper." Even is. Piper was well known for the classic J-3 Cub which trained thousands of pilots before and during World War II. But the anticipated post-war flying boom didn't materialize as predicted. By 1948 Piper sales were struggling so they decided to introduce the Vagabond. It would be a cheap (\$1990) stripped down, side-by-side aircraft with 3 feet lopped off each "Cub" wing. With no electrical system, single controls and no landing gear shock struts, the Vagabond weighed in around 635 pounds empty. Over the next couple years, Piper began to recover and introduced more "short-wingers:" the Clipper, the Pacer, and finally in 1953, the very successful Tri-Pacer.



I still have a soft spot for Vagabonds. In 1968, I scrapped up enough to buy my first airplane: a red and white PA-15 Vagabond with an anemic Lycoming engine. The advertised horsepower was 65 but I think many of those horses were still asleep in the barn. With a rather inefficient wood prop, the PA-15 was hardly a rocket ship on a hot day. Nevertheless, Jean and I bopped around in N4320H for a couple years after high school. It was cheap fun flying but like a cork in a hurricane on a bumpy day!

In 1973, we bought a yellow PA-17 Vagabond with a much heftier Continental 65 hp engine. It would motor along at a solid 90 mph and with nearly full span ailerons on the shortened Cub wing, it really handled great. Jean had her license by then and flew the Vagabond as much as



I did. I think we owned it for a couple years and sold to some guy in Kentucky.

Back to Facebook.... some of the Short-Wing Piper folks were talking about Vagabonds one day and I posted a picture of our yellow example taken in 1973. A couple days later I get this email:

Hey Doug, hope you get this message. I almost flew out of my seat when I saw your comment with the PA-17. N4846H has been a long-time family heirloom for



me, with my great grandfather and grandfather both learning to fly in it. They sold it for a Clipper eventually. My grandfather passed away some years ago now and I bought it around 3 years ago now, slowly bringing it back to life. It now has a metal prop and wheel pants, and flies regularly. I'd love to talk more and exchange any photos you may have of the plane during your time with it.

The author of the email was Cody Scott who is a United Airlines pilot living in the Chicago area. A couple days later we managed to link up via phone, and he told me the whole story of 4846 Hotel and how it played such a big part of his family back in the 1960s. He had tracked the airplane down to an owner then based in central Michigan and convinced him to sell it. He sent me a couple more photos:

Here's some photos I have on hand of my grandfather and great grandfather in the late 60s with it, the day my grandfather soloed. This was at New Hanover airport in PA



46H at some time way back in it's youth



After 60 years, 46H is back in the family,... Cody and his wife

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RV-12 Adventures: From Minnesota Gold to 50 States

- Balaji Thiagarajan

As members of the EAA, we're always looking for ways to turn flying into meaningful adventure. Over the past few years, my Van's RV-12 powered by the Rotax 912iS has done exactly that.

The Airplane: Efficient and Capable

Built by Van's Aircraft, the RV-12 has proven to be a fantastic cross-country platform. The fuel-injected 912iS consistently burns about **4 gallons per hour**, making serious travel both practical and affordable.



One memorable flight was from **Crystal, MN (MIC)** to **Cherokee County Regional, GA (CNI)** in the Atlanta area. Cruising at **9,500 feet MSL** with a **48-knot tailwind**, I completed the trip on just **23 gallons of fuel**. Watching the ground speed climb while the fuel flow stays low is one of the great joys of flying this airplane.

Minnesota Gold – 130 Airports

I recently earned the **Gold Level Award** in the Fly Minnesota Airports Passport Program by landing at **130 public airports across Minnesota**.

What started as a challenge became an incredible way to explore our state. From quiet rural strips to busy regional fields, each stop sharpened my cross-country planning skills and reminded me that adventure often begins close to home.

The Next Goal: 50 States

With Minnesota completed, I've set a new objective: **fly in all 50 states**. A recent trip — **MIC – CNI – EKY – NEW – CXO – TKI – STJ – MIC** — added several more states to the logbook. So far, I've completed **11 of 50 states**. Each state brings new terrain, new weather decisions, and new friendships on the ramp. Hawaii will require a different approach — rather than ferrying the RV-12 across the Pacific, I plan to rent from a local flight school when the time comes.

Owning and flying the RV-12 has transformed aviation from a hobby into an ongoing mission. With 4 gallons per hour fuel burn and endless runways ahead, the adventure continues.



Gizmos, Gizmos, Gizmos

- Pete Howell

Avionics have come a long way since I built my RV-9A 20 years ago (yikes!). Garmin now makes systems that rival the F-35 in capability, and cost nearly as much. My modest panel setup has a (PINK!!) Dynon D-10A and an EMS D-10 that have served me very well, but recently, my panel started showing some age...

The Autopilot Crisis

Last year, my TruTrak ADI Pilot 2 autopilot finally gave up the ghost. Alas, no parts were available to fix it. I thought about hunting for a used replacement but surmised it would fail eventually too. I figured there must be another solution that would let me



More Gizmos!

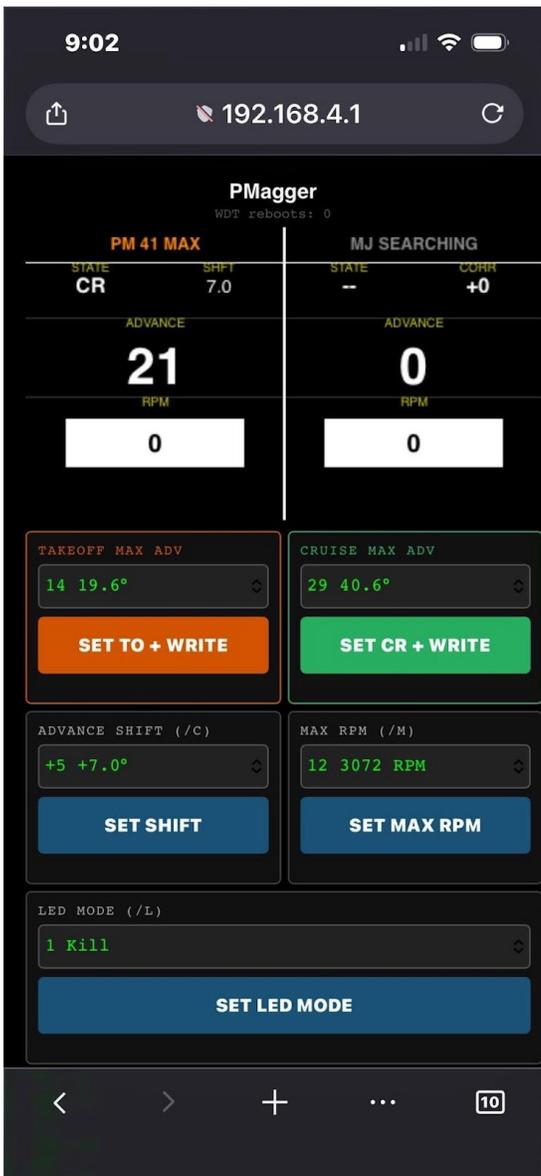
So you want a glareshield-mounted micro EFIS?

Want it to have AOA, airspeed, safe flap speeds, G's, and skid ball? Easy-peasy! That's an ESP32, an RS232-to-TTL, and a TFT color display—call it 15 bucks and some code! The Dynon D-10A spits out all the data in a serial stream—we just catch it and use it to drive the little display on the dash. You can make the display look however you want! I prioritized a large custom AOA display modeled on the flyonspeed.org parameters for use during landing. It's great for keeping your eyes outside the plane at critical times.



How about a display for my dual electronic ignition?

That's a bit trickier because my MegaJolt (ignition controller) has a USB interface and the PMAG has a serial interface, but the ESP32-S3 has the ability to act as a USB host and has multiple inputs, so why not?



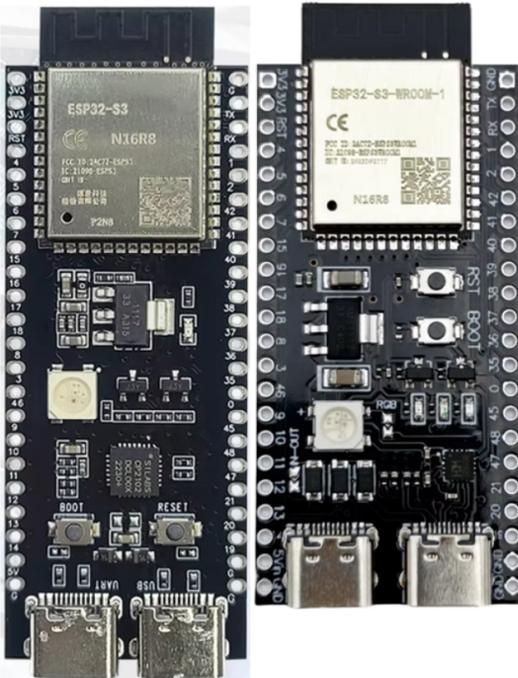
My current ignition gizmo displays parameters from the MegaJolt and actually displays *and controls* the PMAG on the other side. It's got two switches—they can set either ignition for fixed timing at 23° BTDC for a cool ROP climb, then when you get to 9,500 ft, flip the switches to advance the timing for smooth, efficient LOP cruising. The ignition controller even wirelessly sends ignition data to the GRT(as EGT5 and EGT6 - see data above) for recording and after-flight analysis! There is also a wifi iphone web interface to change parameters of the PMag *on the fly*. All this requires only an ESP32-S3, an RS232-to-TTL, and a little TFT display. Extensive PMag bench testing was accomplished on a very Rube Goldberg test rig shown below.



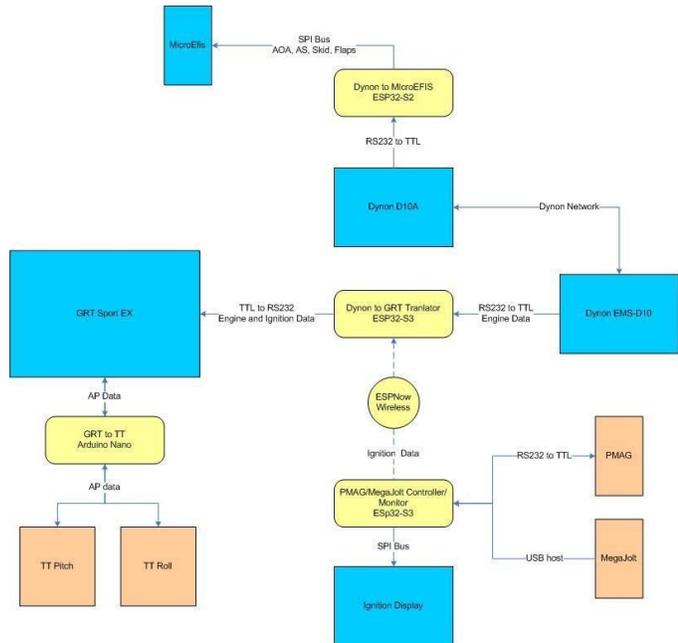


The Hardware

Here is what an esp32 looks like - they come in an array of form factors. They have wifi and Bluetooth built in, making them quite versatile.



Here's a block diagram of all the gizmos in my plane—about \$100 in hardware from AliExpress or Amazon and some (questionably designed by me) 3D-printed cases.



The Secret Weapon

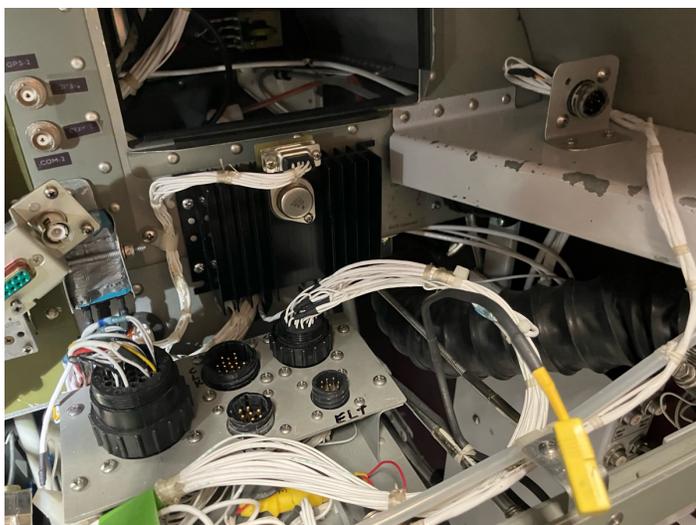
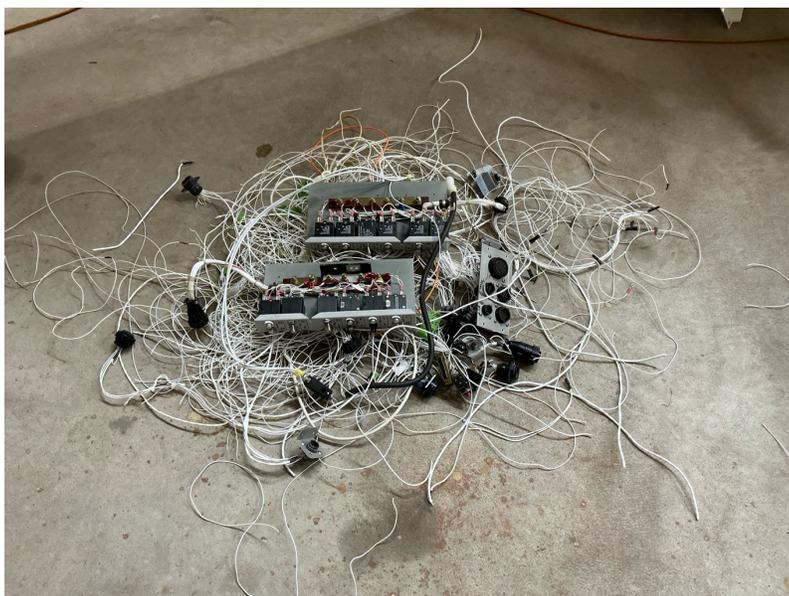
This was all new to me. My coding skills are suspect at best, but a \$20 Claude AI plan gives me a super smart coding buddy and allows me to create code that actually works. I've learned a lot and had fun along the way.

The initial plan was to re-panel with a Garmin G3X system. Super plan. Of course, cost entered the equation and perhaps a simpler plan would be more prudent. Perhaps a Garmin G5 system and upgrade the old TruTrak autopilot to a new King Aerocruise unit. Both those changes required very little in the way of re-wiring. Most panel retrofits eventually get tangled up with mission creep. This was no exception. Perhaps the autopilot could be upgraded to a Garmin system since the G5 would be present to drive it. Well, the engine monitor was a very old MicroVisions VM1000 with no support or parts in case something went wrong. I'm sure by now you can see where this was going. We went full circle and ended up going the full G3X route. This required gutting quite a bit of the electrical system and this is where the fun began.

It normally takes a day to remove all the equipment on a panel and study the electrical architecture. Before I'm comfortable doing an upgrade, I needed to understand the original architecture since I was going to be breaking into it. This one took a week or so. The panel had been reworked a couple of times before the current work. The wiring, which was very neat, was also very overdone. There were lots of "extra" wires in the bundles, and there were lots of old system wires left in place from previous upgrades making understanding the architecture difficult. In the end, it was simply gutted. All switches were left alone except for the mags and starter switches. Those were toggle switches and a push button starter switch, and the owner wanted a keyed switch. I too like a key switch, and I know half of you will disagree. I also like tip-up canopies, but that's another story. The circuit protection was in the form of two circuit breaker panels mounted on each sidewall. Those are going to be replaced with fuse blocks. Lots of electrical stuff was extracted and while new wire will be installed, not nearly what was removed.

What made the wire removal difficult were the many cannon plugs used. Cannon plugs are round pass-through connectors. In some places these are great such as the wing-fuselage juncture, and the wing tips but I found 23 cannon plugs. Yes, 23 plugs. 19 of them between the instrument panel and the firewall with none of them going through the firewall! There were 2 plugs between the Dynon D10A and the magnetometer. And when I say plugs, I mean a male/female set. The builder ran the magnetometer wire along the passenger side longeron to a plug mounted just forward of the panel, then across the panel to another plug onward to the D10A. The complexity was astounding. Tracing wires was all but impossible. Thank goodness for wire cutters.

For any of you planning the electrical system in your build, please consider the "keep it simple" route. Simple is just more robust and much less prone to failure, and if something does happen, it is much easier to trace the fault. While I'm still a long way from completing the retrofit, I think I'm done removing stuff and have started to install the new equipment. We're also planning on moving the battery



from the firewall to behind the baggage wall for weight and balance reasons. This plane has always had a very forward CG that showed up while flying, though the calculated numbers said it was in the middle. While confirming the battery move would work as intended, we discovered the original builder had made a mistake with the datum points. His documented empty W&B was further aft than my RV7A which confused me. You see, I have a parallel valve 360 engine with a two-blade constant speed prop, and he has an angle valve engine with a three-blade constant speed prop. An angle valve engine is somewhere between 35 and 40 pounds heavier than a parallel valve engine. There is no way his empty CG is further aft than mine. We also noticed the documented right main wheel weight was 45# heavier than the left main wheel. I've never seen such a spread on an RV without an obvious reason. I see a new W&B being done at the end of the process. Perhaps we can remove the 10# of lead the tail!

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Twin Cities RV Builders Spring Meeting

Saturday, April 11, 2026 – 10 am to noon

Doug and Jeff's Hangar, 41C Mooney Lane
Lake Elmo, MN Airport (21D)

Pilots always seem to have a great story about how they first got into flying—and RV builders and aviators are no exception!



Our guest speaker for April will be Peter Fruehling, RV-9A pilot and long-time aviation enthusiast. Peter has been flying for over 20 years, ever since he caught the “RV bug” back in 2005. Working alongside Tom Berge, he built a beautiful RV-7 in 2009, and his journey since then has logged its share of twists and turns — selling the RV-7, moving on to an RV-4, joining a partnership in an RV-10, stepping away from flying for a few years, and eventually returning to the skies with a pristine RV-9A. Today, he flies as often as possible and is proudly mentoring his daughter Teagan as she works toward her private pilot certificate.

Also on the agenda, our resident Tech Counselor, Tom Berge, will dive into ***“The Good, Bad, and Ugly of Electrical Systems.”*** Tom’s extensive experience means he’s seen it all — and some of it, as he’ll tell you, isn’t pretty!

And of course, there will be coffee and tasty goodies to enjoy while you catch up with fellow RV enthusiasts. Questions, directions, or comments.... Contact Doug at dcw@mnwing.org or text 651-398-1184