



RVator's Log

Newsletter of the Twin Cities RV Builder's Group

Shop Notes

- Doug

December 2025

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Upcoming Events

TC RV Builders Winter Meeting

Saturday, Jan 10, 2026,
10 am
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Minnesota Wing Van's Air Force

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“in.sur.ance” - noun. “a practice or arrangement by which a company or government agency provides a guarantee of compensation for specified loss, damage, illness, or death in return for payment of a premium.”

One of those necessities of life that we love to hate: State Farm (the ‘mayhem guy’), Progressive (everybody knows “Flo”), GEICO (little green lizard), and so on... we know ‘em all. We’ve got policies for shiny cars, big houses, cool hangars, aging bodies and of course, our RVs (the flying kind that is). In the aviation world, sometimes I think the insurance companies hold more power than the FAA when it comes to experience requirements, coverage restrictions, and so on. If you dive into the fine print of your aircraft policy it might scare you to find out all the things you can’t do with your airplane. I know that I can’t land on a frozen lake, take a vacation in Mexico, and they won’t even let me engage in warfare or terrorist acts!

In our September issue, we talked about Nancy Burkholder’s miraculous accident that resulted in the insurance loss of her RV-6. No matter what type of insurance we have, whether it be for our car or house or our airplane, we really never know how good it is until there’s a claim. First comes the paperwork. Nancy’s carrier wanted the following:

- ☐ Completed Aircraft Incident Report form (attached)
- ☐ Completed Aircraft Inspection Report form (attached)
- ☐ Contact info for anyone from the NTSB or FAA that is involved
- ☐ Photos of the damage to the aircraft; both close up and from several an-

gles (include an overall photo containing the tail number) (please see attached)

- ☐ Photos of damage to any property outside of the aircraft
- ☐ Photo of the aircraft’s instrument panel, or a listing of the installed avionics
- ☐ Copy of pilot’s license, medical, flight review or recurrent training
- ☐ Copy of last 3 pages of pilot’s logbook entries
- ☐ Copy of pilot’s logbook excerpts to comply with any specific requirements (make and model time, complex time, retractable gear time, conventional gear time, etc.)
- ☐ Copy of logbook entry for last annual inspection of airframe, engine and propeller



After Nancy spent hours filling out all this paperwork the next step was to wait. A couple weeks went by, and it was determined that the insurance company was going to total out the airplane. The insurance company now officially owns it so Nancy relinquished all the logbooks and all other documentation. A settlement check finally arrived in the mail which is what insurance is all about. Seemingly case closed.

But the story doesn't quite end there. In fact, it gets rather interesting from this point on. In late October, I get a phone call from a gentleman in Houston, Texas, who has bought the remains of Nancy's airplane from Underwriter's Salvage Company who the insurance company contracted with to sell the salvage. His name is Sid and he got my name somewhere out there in RV land. He is currently on the road with his buddy Syad driving nonstop from Houston to retrieve the remains of Nancy's airplane. Sid is building an RV-7 and wants Nancy's engine and prop as cores to overhaul. Sid has a gentleman by the name of Trent from Indianapolis who is interested in the rest of the air frame.



Sid and his buddy Syad starting the "disassembly."

Sid tells me that Jeff Turner, who is the president of the New Richmond EAA chapter now has the airplane in his hangar. The master plan is to meet Saturday morning to start taking it apart. My role is just to introduce Jeff and Sid and stand back and watch this drama play out.

We all get together for breakfast Saturday morning and shortly thereafter head to Jeff's Hangar. Sid and Jeff start working on the cowling and I stand back to provide moral support. First off, we discover that the engine won't turn over at all because it's completely full of water. Removing the plugs drains the water out of the cylinders which at last now frees up the engine. Jeff gets a 5-gallon bucket, opens up the oil drain and out pours over 3 gallons of pure Wisconsin Lake water.

By midafternoon, Sid, Jeff and Syad had removed the engine, the prop and the

instrument panel. They manage to squeeze all of this into the back of Sid's SUV and the and Syad shortly are back on the road for Texas. Jeff gets the wings off a few days later (not an easy task on an older RV-6 with many, many bolts holding things them together. A couple weeks later, Trent, the buyer from Indianapolis shows up with a trailer and loads up the rest of the air frame and the way it went to Indiana.

Nancy is back at work on her RV and in the interim she bought Barb Mack's RV-4 to scratch the RV itch for the foreseeable future.



Trent and the remains of N69NB

When an RV Builder Slumps

- Bob Collins

Any fan of baseball knows that even the best players can get into a bad slump.

It happens to airplane builders, too. Although I don't consider myself a great builder, I'm generally pretty good at it what with over 4,000 hours of building experience and (almost) two airplanes to point to.



But late 2025 has put me into a deep losing streak and the solution is the same as the one those great players use: come back tomorrow, put your work in, and grind it out. I was so close this summer. After a few years of spending arguably too much time being a baseball usher, a Woodbury Forestry Department tree waterer, the janitor (and web editor) of EAA Chapter 54 in Lake Elmo, and professional grandfather, I turned attention to getting my RV-12iS project done, which had already consumed an estimated 1,100 hours over 8 years.

I had not yet started the 912iS, which I'd uncrated in June 2020, so in June 2025, I methodically worked through each item in the Van's excellent Production Acceptance Procedures and the plane (now registered as N612EF) was acing everything until I got to the part where I needed to confirm the wing spar override, which prevents starting the engine if the giant pins holding the wings on aren't in and secured. The slump begins.

The engine wouldn't crank. Much research and advice followed whereupon I saw the note I'd written in the KAI years ago where I'd broken, then re-crimped the #12 pin on the HIC-B. I took the canopy off, pulled the connector and pulled the #12 wire, and out it came. After fixing it, the engine cranked when it should have and didn't when it shouldn't have.

A day or so later I tried the first engine start. It turned but it did not fire. Since I smelled fuel, I assumed it was coming from the cylinders. I'd also put anti-seize on the spark plugs which I later learned you shouldn't on Rotax plugs. I cleaned each up, ordered the heat transfer compound and put them back in for a quick test. It fired but I could not get above 800 RPM and as soon as I brought fuel pump #2 online, it died. Because of the heavy smell of fuel, I decided to discontinue.

I stood outside the plane scratching my head, when I realized my sneakers were getting wet. It wasn't raining. Fuel was pouring from the steps and upon much investigation and removal of upholstery, floors, and inspection panels, I determined it was probably coming from the fuel line/fittings in the forward tunnel, a view of which was blocked by the rudder pedals.

This is the worst possible place for a fuel leak because this is the worst possible design for an airplane. A narrow, mostly inaccessible tunnel with wires, fuel lines, heater and throttle cables, in which a view of the fitting is entirely blocked by rudder pedals and brake lines.

Blood was shed trying to get at things. Lots of blood. Murder scene blood.



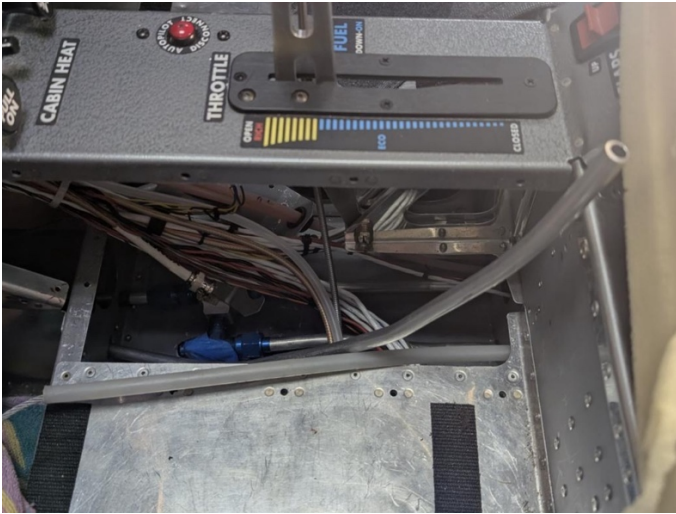
The next day I removed the rudder pedals and Pete Howell and his friend, Bill, came over to Fleming Field (KSGS) for a look. Using a scope, I got a good video of the bulkhead fitting believed to be the offender and it seemed like it was leaking but not enough to account for so much fuel pooling in the tunnel. Could the line itself be split? Unfortunately, it's impossible to remove this fuel line in an RV-12iS once it's in and we removed everything we could to get it disconnected at both ends with much blood shed and many expletives hurled at Rian Johson at Van's, who thought this was a good design. We never reached a conclusion although I did cup one end of the line and blew in the other and did not get the impression any air was escaping. More research followed.

I cancelled the remaining transition training flights I was undergoing (I was at least signed off by Matt Both after 9 years as an inactive pilot) and ordered a few tools that might make it easier (though not easy at all) to work at getting things reconnected, and also ordered the Del Seals from Aircraft Spruce which builders told me should help eliminate the leaks.

They didn't. In fact, a new leak showed up at a bypass fitting where I'd disconnected the fuel line. There was a bad flare. I can't fly this thing. I won't fly this thing!

I talked to my friend, Tony Kirk, former Van's support guru and likely to be the DAR should the plane get finished someday and decided I wanted to replace the fuel line; I didn't trust the integrity of what was there now. It had to be done right no matter how much blood would continue to be shed, nor how much work needed to be undone.

To my knowledge, only one other builder had ever accomplished this task: Tony Kirk. Tony actually volunteered to fly from the Toledo area to do it for me. But with his guidance, I made a new fuel line and snaked it into the tunnel and flared the ends, then reconnected the lines. I removed the fuel tank, capped the lines and pressure tested the entire fuel system.



This is something that should have been done on initial installation and if I'd done it, there's a good chance the plane would be flying by now, but there is no step in Van's instructions to do so. It should have been obvious to me; why wasn't it?

Here's why: Van's once sent you a set of plans and a book with a narrative of what steps you were supposed to perform. As you made progress from subkit to subkit, that narrative got shorter, to the point where you were forced to study only the plans and see the big picture to determine what needed to be done next.

Now, Van's puts each step on the plans so builders are merely following a stated step, then another, and another. Builders don't have to understand what they're doing or what the big picture is. Van's doesn't even tell you the name of the part that would give you a hint what it's for; everything is just a part number. So what should have been obvious literally was lost in "tunnel vision."

At least the removal of the fuel tank gave me the opportunity to follow a service letter from Van's to install an inspection port. Then I put everything back together, added fuel, and tried the engine again.

Again, it started but it was obviously ill, and I discovered later that cylinders two and four were not firing. I now suspected the four injectors involved were clogged after sitting for five years, but I needed to prove that before taking apart an engine I still didn't understand fully.

John Melchert, Rotax-trained investigator, was called in to try to see what secrets are inside the engine's computer - the ECU. But he couldn't get his "dongle" to connect to the maintenance connector to download the data.

It had taken almost three months to reassemble the plane, and I was back where I started. So I sent a message to Steve Wentworth asking him if he wanted an RV-12iS. More RV'ers came forward.



SteinAir's Josh Swenson contacted me and said he wanted to come evaluate the entire electrical system to rule that out. He'd built the harness. He swapped two wires on the maintenance connector. Apparently, Van's knows that after upgrading another component (which I'd done), these wires need to be swapped. But they never issued a service letter. Lacking the cabling to tap into the ECU myself, more help arrived from people sensing I was ready to quit the team. Bob Mowry on the VAF Facebook Wing sent the ridiculously expensive (more than \$2,000) "dongle" that builder Rob Carsey owns but circulates among builders (as he also does with a prop balancer). He also contacted Dr. John Russell of Missouri who knows the process of getting at the injectors, a valuable guide as Lockwood Aviation wasn't returning my messages after an initial consultation. I no longer do business with Lockwood Aviation.

John also enlisted the help of Nate Holderbein, a regular on Doug Reeves' Van's Air Force. Nate is a savant at interpreting ECU data.

By now Nate had the ECU data. He consulted with a friend at Motive Aero. "He's noticing the same thing as me, that there are a number of different error types and it doesn't seem to point at any single issue," he told me. "He seems to suspect that it's a wiring issue, with an emphasis on grounds and connections at the fuse box. Along with the

injector service you are working your way through, it would be worth taking a close look at the ground wires for both lanes at the fuse box and all grounds in general." There was only one way to solve this. One item at a time, check to see its impact, and then move to the next item. Wash. Rinse. Repeat.

Mark Shanahan of EAA Chapter 54, who'd taken one of the light-sport courses recently, stopped in to help me identify parts and we carefully removed the entire fuel rail and all the injectors. Dr. Russell volunteered to drive up from Missouri to help. Instead, I took his suggestion and bought an injector pigtail from the auto parts store, wired it up to bench power, filled each injector with brake parts cleaner, then blew 35 psi of air into it as the pigtail was powered to spray out a fine mist. Then I put each injector – each with two, new \$11 O-rings - back and carefully reassembled the fuel system.



A few days later I rolled it out for a quick start. The engine started! The two cylinders were alive!

Did we solve the problem? Or did we just solve one of many problems?

The next day I did an engine run per the Van's Production Acceptance Procedures and shipped the log file to Nate. While the data was more encouraging, he found that one of the two #4 injectors might still be a problem.

"Notice that the injector identified is showing zero mass for a short period of time then the graph jumps up and looks more like the others," he wrote. "That jump with the injector 4 lane B is probably when you cycled the lane and it came back."

But Dr. Russell noticed something. The B injector on number 4 came alive when I increased the throttle to 5000 RPM. It's possible whatever was making it cranky, was blown out. Or maybe it was magic. Whatever was happening, the injector was online and staying up with its seven siblings.

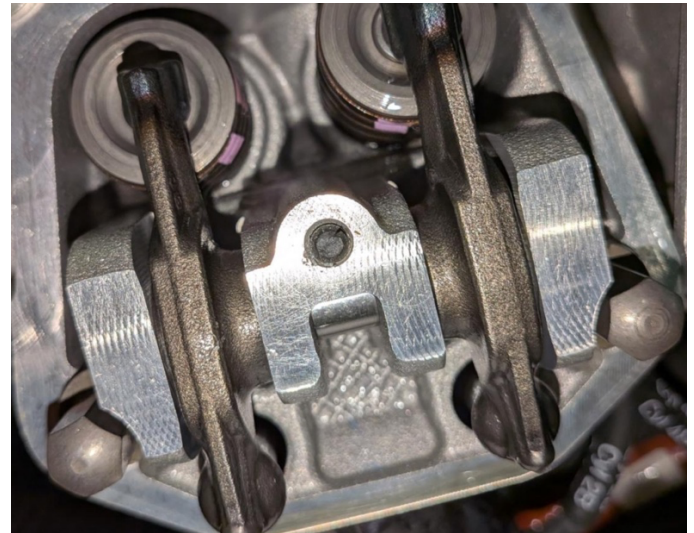
But we still don't know the answer to our question. Did we solve the problem?

As this was the first full engine start after the Rotax oil purge procedure, the lifters needed to be checked to be sure there was no air in the oil system. I asked Melchert to come back and do that. At the same time, he and Nate were in a third-party dispute over whether the fault indicating a faulty injector was from the earlier engine start or the latest one (I'd started the engine with Melchert before checking the lifters).

Only clearing the ECU data, and another engine start would answer the question.

The lifters were fine but in the process of tightening the valve cover screw, Melchert broke it, and he didn't have a tool with him to remove it.

Then he went to Florida on business.



I was later able to get the screw out, thanks to the advice of Dan Theis, Mike Graczyk, Al Kupferschidt, and Marlon Gunderson at EAA Chapter 54 who all suggested the screw wasn't under any tension. They were right.

The engine is still offline. I'm waiting for an order of screws and O-rings from Advanced Powerplant Solutions (no more Lockwood for me!). I don't trust that any of those other screws aren't over torqued so I'm replacing them all. Count the number of people mentioned in this column and you'll have a good idea of the best part about building an RV.

Maybe in the coming week, I'll have an answer to the question: Am I still in a slump, or have I broken out of it? There's only one way to end a slump: Come back tomorrow, put your work in, grind it out.

And have a lot of friends you make along the way.

Epilog... November 8, 2025.....

It's over! The nightmare is over. There was still some confusion in my mind about which ECU fault indicators went with which engine test, so I cleared out all the logs. I replaced two of the valve cover bolts and O-rings from the overtorquing episode because I didn't trust them, buttoned everything up, put the bottom cowl back on, attached all hoses and wheeled it out for a test.

It started smoothly with the ECU showing no warnings.

I have to figure out why Alt Amps is 0. Still a lot I need to learn about what's happening under the hood

I had only chocked the wheels so when I gave it takeoff power per the PAP, she jumped the chocks. So we taxied down to the end of the lane and back. It also squished the chocks. Whoops. Those were pricey!

Let's review the number of people who made this happen and marvel anew at the kindness of the RV community.

The cast in the order of appearance in this drama:

Tony Kirk - Who called almost immediately back when the initial issue was the fuel leak at the bulkhead fitting, the only OTHER RV-12 builder I know who has actually replaced the line. You know, if those injectors hadn't been clogged, if that engine hadn't been obviously sick, it would've taken me a lot longer to find that fuel leak, perhaps with disastrous results. There were multiple conversations which no doubt delayed Tony in completing his aircraft. Tony will be my DAR next spring, I hope. Tony, by the way, offered to fly from Toledo to South St. Paul to do the work for me.

Pete Howell and his friend, Bill Swanson - Again, typically, Pete was proactive in reaching out with an offer to fly over and help remove everything you need to remove to get at that fuel line. By then, I'd lost too much blood to continue. He later made another appearance to help reinstall the fuel tank.

Tony Scaglione - A major player in this. Came to my rescue early with ideas and contact information. Tony has been a hand holder for me over the years. First ballot HOFer

Lockwood Aviation - Gave me some quick assurance that it wasn't unusual that all for injectors would be clogged on only one side of the engine (then ghosted me for the rest of the endeavor, unfortunately)

My wife, who kept my spirits up. During this debacle, we celebrated our 43rd anniversary.

John Melchert - Though he was knee deep in condition inspections, he took time to come try to talk to the ECU (which wouldn't talk because wires were reversed in the connector). He assisted in the lifter check and ECU log interpretation.

Multiple VAF/FB regulars - Helped identify why the ECU wasn't talking to BUDS.

Nate Holderbein, Bob Mowry, John Russell, and Rob Carsey - These were the big heroes of this. I'm not sure who started the conversation among them but I got multiple messages about the need for a dongle and Bob's was located. He sent it to me and helped with understanding the BUDS software. John Russell called me to talk me in off the ledge. One of these guys pulled Nate into the mix who agreed to analyze the data. Between the four of them I had everything I'd need to see likely culprits and they all just got together on their own to organize the relief effort. Nate and John spent countless amounts of time patiently exploring what the data was saying and although I didn't always understand what they were saying to each other, they were getting me where I needed to go without judgement. Dr. Russell, by the way, offered to drive up from Missouri to help me out. (I should add that I had a number of DMs on VAF offering to let me borrow a dongle.)

Josh Swenson - As indicated earlier, Josh saw the thread and on his own contacted me and practically insisted on letting him come to the hangar and check out the harness, which he did on a day his kid was sick, his wife couldn't take time off, and his dad was in a dentist's chair. Dad fled the dentist to stay with Josh's kid so Josh could come help.

Mark Shanahan - EAA Chapter 54 (Lake Elmo, MN) - a recent light sport training graduate helped me identify engine components and remove as necessary. The gang at Chapter 54 steadied me as I faced the broken bolt situation. Join your local EAA chapter.

All the VAFers on this thread.

Brantel, who solved, upstream on this thread, a nuisance headphone short warning on the G3X that cropped up in the middle of trying to solve a larger problem.

I know I am leaving someone out and I will edit as necessary to keep this updated for all of these folks' RV Hall of Fame induction ceremonies.

I feel truly blessed to be in the RV community still.

Now to the question, am I keeping or selling? I don't know. Functionally, I'm confident in the plane's ability and performance. The only problem I have is difficulty hearing someone on the radio. My deafness (Meniere's) remains a concern with regard to pilot performance. I have to evaluate whether I've aged out. I'll have a few months to do that now with knee replacement coming up.

"Thank you" is remarkably insufficient to all of you, but "thank you."

Now, on to knee surgery!

Safety is a process

- Bernie Weiss

As my remaining years to fly are now a lot fewer than the years I have flown, I want to make the most of them. This realization has caused me to be more deliberate about my flying and training. Don't get me wrong; I have always taken training seriously and have been disciplined to get a bit of training every year.



When I transitioned into my Bonanza and then again into my RV, I paid special attention to training. Knowing the systems, performance, and appropriate flying speeds is not all I need to know to fly safely.

Last year I decided to take a comprehensive Bonanza training course that covered 2 ½ days of ground school, simulator and actual flight training. Many of the pilots were ex-military or commercial airline pilots, and they had a special attitude about training and their approach to flying. Note that those two groups of pilots are some of the most experienced pilots around and yet they continually seek out additional training, even in a "simple" plane like a Bonanza. I also had a bi-annual flight review in my RV last year by Doug Weiler.

As I thought about both of these experiences I realized that all of these outstanding pilots continue to improve their skills regardless of their past experiences. In summary, they approach their flying skills, their flying judgment and their all-encompassing approach to safe flying as a process to be improved, not a box to be checked.

I now augment my on-going training by watching shows like "Fly Wire" with Scott Perdue on YouTube who analyzes flight accidents and by listening to the podcast "Aviation News Talk" with Max Trescott among others. The

hosts of these shows are very experienced pilots and instructors and do a thorough job analyzing accidents and providing insights and tips. Again, one of the lessons I take away from each show is that a pilot's approach to flying by focusing on skills and continually analyzing his/her flight is an important component to increase the probability of the safe completion of the flight.

We are fortunate in our club to have great instructors such as Doug Weiler and Tom Berge among others. Their approach to flying that they bring to each flight, regardless of whether it is a short hop for breakfast or a 1000-mile cross-country trek is designed to minimize risks and improve the odds of a successful flight. As we are about to start a new year, it is a good time for each of us to commit to enhance our continuous improvement process that will result in safer flying.

Surprise!!!!

- Tom Briden

Finding this 7/16-inch wrench in my right wing bay last week is one reason to do a thorough condition inspection. I was kind of playing around with a new long-stemmed fully articulating borescope when I decided to look beyond the Vans Service Bulletin inspections on my RV8A. I decided to look in some adjacent wing bays to test out the features of the \$200 borescope. Holy crap, look what I found. A Craftsman original!!



Apparently it was last used during my Garmin right wing autopilot servo install from 5 years ago. It somehow migrated to the next open bay! Well, we all know that loose metal objects in a busy, motorized wing section is not a healthy thing! I can only imagine what would have happened if that got lodged in the bell crank area!?!? Like many of us, I have many extra wrenches, just in case I need a certain fit. Maybe next time I should count them both before and after I do projects.

Funny thing, the same thing happened to me during elbow tendon surgery about the same time. After the arm close-up the doctor went home. The diligent staff still needed to perform a post-op X-ray. Sure enough, half of a long-broken drill bit was left deep inside of me. "Quick, call the doctor back before Tom wakes up". That's not exactly how it went but you get the idea. They woke me up and asked if we could do deja-vu all over again. It was a long sleepy day.

I guess this borescope was a lot like my Xray, finding unwanted loose objects to keep me alive and well.

Yep, dodged another bullet.

Be careful out there and report back your findings.

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Twin Cities RV Builders Winter Meeting

Saturday, January 10, 2026 – 10 am to noon

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

On just about any VFR day that's flyable at Lake Elmo you might find **Donaven Chase** firing up his RV-9A and getting some air under his wings. Donaven has to be one of our more prolific pilots flying dozens of hours every year. It might be a cross-country trip with a friend or a fly-in breakfast but often just buzzing around enjoying the beauty of flying his RV. But perhaps we should say RV(s) plural because he also owns a single seat RV-3 which he says is his very favorite flying machine.

With the cost of aircraft ownership going nowhere but up, Donaven will talk on "**RV's on a Budget**"; how he has updated his RV-9A over the years and how he has less than \$10,000 into his RV-3 (how is that possible??) He'll also discuss lessons learned from an emergency in the RV-3 where all the right pieces fell onto place for a successful forced landing.

Also on the agenda will be a discussion from **Pete Howell** on "**MOSIAC for Dummies**" and what does it mean for RV builders and pilots.

PLUS.... As always, coffee and necessary goodies for your dining pleasure!!!! Note.... Restrooms are at Lake Elmo Aero.



Donaven and his wife Trisha