Nico's Hangar Meeting

Tuesday, July 21st, 2026 —11:00 AM

Safety Talk: Jim Payne

Speaker: David Hart

Subject: Times I've Scared Myself

Speaker: Dagfinn Gangsass

Subject: Fly By Wire Flight Control

Jim Payne:

Jim is going to be discussing an incident at Truckee on Friday the 17th, during a contest. In case some don't know Truckee has a control tower to help operations; gliders use runway 20 and Jets use runway 29. The gliders operate on the east side. Jim Payne was already in the air when the incident happened. The tow plane was a 185 and was towing an ASW-27 that was full of water, the winds were light. It was a normal takeoff, he is not sure of the altitude, but the towplane surged upwards. The ASW-27 pilot released thinking he was near an imminent stall so he released pretty much at the end of the runway, and turned back to land downwind. Apparently, there were gliders near the end of the pavement, and they were worried about a landing collision. There is also a 300-foot cliff at the end of the runway. He was pretty high-speed, and near the end fearing going off the cliff the pilot intentionally ground looped the aircraft. The plane hit some runway lights and damaged them and his plane. The after-action it was thought the pilot should have landed on 29. The takeaway being that slow tows are problem, and if need be, you have to get off tow. One suggestion if they are available is to add flaps. Slow tows are essentially dangerous for heavyweight gliders. The tow pilot was discussed, who had thousands of tows mostly in training gliders. He said he crosschecked airspeed and that if the towplanes speed was affected it was only a couple of knots. It was noted during landings at Truckee many pilots keep 80 knots due to approaching the cliff. It was also noted that the pilot did make a call on the radio to alert pilots of his release. Jim said Jackie was on top of the situation on the ground when the call was made, making sure no other planes were pushed out for launch.

David Hart:

David has been teaching at MSC since July. A call was made for an instructor and David answered the call; all he needed was a place to stay and a car to get back and forth. MSC bought a Volvo station wagon with 200,000 miles to accommodate David. Mark Barnett answered the call for a place to stay. David is an editor of Soaring Magazine, and is the Vice Chairman of the

SSA. He said this discussion is and extension of the safety talk, and is appropriate for all pilots and is geared for contest pilots.

This first flight is about a low final glide at Newcastle VA, on September 17th 2017.

It is region 4 contest, it is his first contest season. This is a highly technical location. He was trying to finish the task with a relight. His glider is a DG-800 with a motor which was not operable at the time. There are very few land-out locations and the terrain is rough. If things go bad you are landing in a stream bed. The lift for the day was petering out. He managed to touch the third and last turn point and turned back. He then realized his gear was down for a portion of the flight. He had never landed out and figured he could make it back to the airport. Luckily, he made it with 20 feet to spare. He made a note of showing his path of the fields he passed up that were landable. He was low and at one point near the end of the flight he was abeam of a church steeple. He made a note of saying that everyone remembers a crash, but nobody remembers who won the contest. After the meeting I asked him about this specifically and he said he didn't need his spoilers until he was 50 feet near the runway.

Lessons learned:
Use a flight computer with terrain model.

Commit to a land-out if in doubt of final glide.

Contest finishes aren't that important in the scheme of things, and learn from experience.

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Second flight; low save over unlandable terrain Cumberland, MD. October 7th 2024.

It was a pleasure flight on a marginal ridge day; he is very familiar with the area and terrain. There was nobody there on this day, he had already done an engine save over Wills mountains where he climbed to 3000 ft. The Nobley mountains have nobs on them and it has landable terrain but not on the Cumberland side. The winds were off angle. Things weren't working out so he decided to call it a day. His computer said he had the field made even with the terrain. He started over and encountered crazy sink. He was essentially going 100 knots with 1000 fpm down, he got too low to make it back, and decided to head towards the Nobley's, I believe they called it the "dogpit" and when he was close enough, he could land he relit his engine, as he knew if there was a problem he had the field there.

Lessons learned:

Don't trust flight computer in ridge conditions (more sink in lee).

If you're using iron thermal take a high climb.

Don’t count on motor over unlandable terrain

Use the terrain if you can

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Third flight; marginal takeoff at Shiflet, NC March 5th 2026

It was the Carolina Wave Project, there was grass fields and it was a rushed takeoff, as a tow plane was waiting. His engine was not making full RPM, but he knew this. He started taking off and was slow to climb; he had full RPM by the end of the runway, and was about 141 feet off the ground. The fields to his south are higher than him. He is not sure what is happening. He is then 250 feet high and a ¼ mile off the end of the runway. Shiflet is surrounded by hills and unlandable terrain. He then notices his air brakes were not closed and locked and were up a small amount. He diagnosed his error as he was taxiing, he was using the airbrakes and during the rushed takeoff failed to check them.

Lesson learned:

Before takeoff check

If in doubt abort

Understand cumulative probability

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The discussion went into more detail about cumulative probability. The math of which is if you have a 1% probability of running into a mountain after 100 flights the probability is now approximately 66%. To reduce your risk, you must change your behavior.

It was also discussed about your gliders polar. If it’s 50 to 1 it will never attain that. It’s been advertised for 5 years so they won’t reduce it by 2 points when the aircraft is released and achieves less. Just using your glide ratio leaves no reserve. MacCready can affect your glide ratio calculation. During a final glide if there is no sign of lift Jim Lee told the group he sets his MacCready to 2 as he prefers a little bit of conservatism. Another member said that if there is no lift there is “likely” key word….no sink.

There was a question of which is more dangerous, out West or back East. The consensus was back East because of their low ridge flying and that it works and all of sudden its not working and you are really low, and hopefully within range of a field. I can attest to that after looking at David’s WeGlide trace after getting home trying to put together my notes regarding the flights.

David’s flights are available on WeGlide, so you can look them up yourself, they were very interesting to say the least.

Dagfinn Gangsaas

Dagfinn began by showing the military aircraft that use FBW (fly-by-wire) control systems. F-16 was the first then others followed leading up to F-22. Some European fighters have it also. One Russian the Su-57. The planes are built highly maneuverable and are unstable without FBW. Some post stall maneuvering with thrust vectoring, he called “Super Maneuvers”. Some of the civil aircraft that use FBW are 787, 777, A-320, and Embraer. The purpose of FBW is fuel efficiency and easy handling, with no departure of controlled flight. Motivations for FBW is to stabilize unstable otherwise unflyable airframes. Reduce trim drag, and allows smaller tail surfaces for less drag. Safety aspect is to prevent stall, over-speed and under-speed. Automatic upset recovery. Automatic thrust asymmetry and pilot and gust induced load protection, and lower pilot workload. Weight and Maintenance aspect is to remove complex cables and pushrods, springs, bobweights and pulleys. He had a graph of oscillations, and if I understand it correctly, he was showing the difference in a stable aircraft and an unstable one. the Military spec is >=12 seconds and a test pilot >=6 seconds as to when they can stabilize the aircraft.

FBW systems have a lot of elements starting with Sensor for pilot controls, air data, and motion. Computers, actuators, and analog or digital data busses. It took 50 years to get fly by wire to work. The military was the first to use it. The software is the most difficult part. FBW systems set the schedule for certification. The designer of FBW has the ability to create the personality of the airplane. He said dealing with pilots is the difficult part as everyone had differing opinions. Thrust vectoring is highly involved. The first plane to do the Cobra was the Su-27; he had a story where some Russian pilots were allowed to fly to Boeing and allowed them to look the planes over, and to talk to the pilots. He said these pilots were not just regular pilots — they understood everything. Today they have high fidelity simulations, and they have predictions of the plane before it is flown. There is a complicated loop of design, did it fly like the simulator. He said typically the test pilots would be asked how it flew and they would say… “it flew just like the simulator”. In the formal requirements flow he had a list of “shall” statements. All the specs finished with a shall be, example CG envelope shall be… control system shall limit… Etc. I did find the next part interesting and slightly changed my perception of things. Longitudinal stick commands load factor, I expected angle of attack or something like that. Pedals command sideslip, when I expected rudder or coordination. He laid out the three control laws; pilots request for maneuvering, compare to aircraft motion, command controls to meet request. The control theory which is pretty much mathematics is normally first taught at the “Master’s” engineering level and above so, some pretty smart guys! He said there are many judgment calls by the engineers. Typically, out of 25 engineers on a team, 4 are involved in the technical side of FBW. The most important part of FBW systems is the “Alpha limit” better known as angle of attack.

Dagfinn started working on FBW in 1975 and worked on many aircraft 20 that I can see, and a Japanese company. Two of the planes he worked on are the SST and the 747 with the shuttle mounted on top. He made a comment that he felt the Boom Supersonic project won't make it, he felt they don't realize what it will take to get supersonic approval. He worked on the RQ-3A Darkstar which is a joint project with Boeing & Lockheed. The unit crashed on takeoff and there was a war between the government, Lockheed and Boeing. It was 200 million dollars so there was a lot of stress involved. He said he was very lucky everything in the end worked out and that he didn't get fired. It took 2 years to fix, mostly because of so much oversight. It was eventually cancelled in lieu of the Global Hawk the rationale being it didn't need to be low observable for chasing pickup truck wielding AK-47 holders. He noted some unique control aspects those being strong pitch-up at stall, active damping of wing bending for flutter suppression, and using the nosewheel strut to assist in takeoff. He had an image of the award from NASA for the flight of Darkstar. Did Darkstar die? He said there are rumors that Lockheed is building one. They were originally going to cut up the plane and bury it because it is so top secret. They eventually gave it to the Museum of flight, Seattle. That was the end of the presentation but from some questions the answers were interesting. Different compilers for the software you couldn't trust 100% They used multiple computers with different chips and compilers. Boeing had graphical algorithms that how I understand it could create "autocode". The teams did line by line code checking, today they have stuff that is automated for checking. Honeywell did some of the software work. He had three computers in a lab that worked flawlessly, but in the plane all three failed. It was very subtle and very complex and they had to be very careful. It turns out there was no branch in the code for when two values equaled, they thought that would never happen. Civil planes that had FBW were 45 million dollars; Embraer came out with one and charged 16 million. It was the CEO's decision because he saw the future.

Very interesting meeting, thank you, Jim Payne for the safety talk, David Hart for the safety lessons, and Dagfinn Gangsaas for the FBW presentation, and always Nico for the meeting and Pizza.

Jeffrey Bilyeu reporting.