

2013 Contest Safety Report
John Cochrane
Final 1/5/2014

Disclaimers

This is a summary of information available to the rules committee as of the November meeting, collected for the purpose of examining rules and procedures in the interests of improving future contest safety. This is not the NTSB, and we have not done any independent accident investigation. Errors are likely. This is a report from the safety subcommittee (me) to the rules committee. Recommendations are mine only, and not endorsed by the RC.

Summary

We are aware of the following accidents and incidents at 2013 contests.

1. Towplane flip over, Seniors
2. Towplane Chilhowee
3. Tailboom broken, Mifflin
4. Tailboom broken, Hobbs
5. Crash in Mountains, Moriarty
6. Near Midair Moriarty
7. Tail boom broken, minor injury, Elmira

In addition, I received more information about last year's fatality at the Canadian Nationals, with useful lessons about stress and the temptations for low altitude maneuvering.

Fortunately, there were no serious injuries this year

Summary of recommendations.

Damage. Flying in weak weather causes landouts. Roughly 1 in 10 to 1 in 20 landouts results in serious damage. Damage can happen even when safety-conscious pilots "do everything right." This is a fact that CDs and RC should keep in mind, especially when considering pilot enthusiasm for long tasks in weak weather resulting in more landouts.

Back injuries. One of the most common injuries in glider accidents is to the lower back. Brian Milner reports that several months after his accident he was found to have a broken vertebra, and was one false move away from paralysis. He is fortunately on the mend. The hard landing in Elimira reported back pain, but the pilot got out and moved around. *Pilots: no matter how embarrassed you are to have crashed, if there is any indication of back injury stay where you are!*

Reporting. We only have 3 CD reports from 7 known incidents. The RC had to pester pilots to get flight logs. In two cases pilots did not turn them in. In the other case, the trace was scored, but contest management omitted it from the traces sent to SSA.

When crashes are reported to the NTSB, the NTSB's analysis generally yields little useful information. And given the reputation of FAA and NTSB to pull pilot certificates, such reporting is scanty in the first place.

These facts mean that the glider community, and the racing community in particular, has no reliable mechanism for collecting any information about crashes and incidents. The BGA and regular reports in *Sailplane* and *Gliding* are a good example of what we are missing.

We should take reporting and flight log collection much more seriously. After discussion at the RC meeting, we decided this is really a SSA/SSF priority not a rules committee job.

Low thermaling and off-field landing technique. Two of our crashes were preceded by absurdly low thermaling, tiny and absurdly low "patterns" and very slow airspeeds throughout. We need to get out the word that despite all the wonderful stories pilots have heard around the campfire, this is not the way to live a long life.

Discussion at RC meeting suggested a project to systematically examine traces and see just how much low thermaling is really going on and just what off field landing technique looks like more generally. This is a good project.

Leaving contests. Once again, a pilot involved in a crash left the contest in the middle of the night without informing the CD. This has to stop. *Pilots: you must inform the CD before leaving a contest.* There has been a case that an injured pilot refused treatment and died overnight. Yes, you're embarrassed. That is not an excuse for not checking out with the CD. Starting a long drive in the middle of the night after a long day of flying, a crash, a hike, and no sleep represents exceptionally poor judgment.

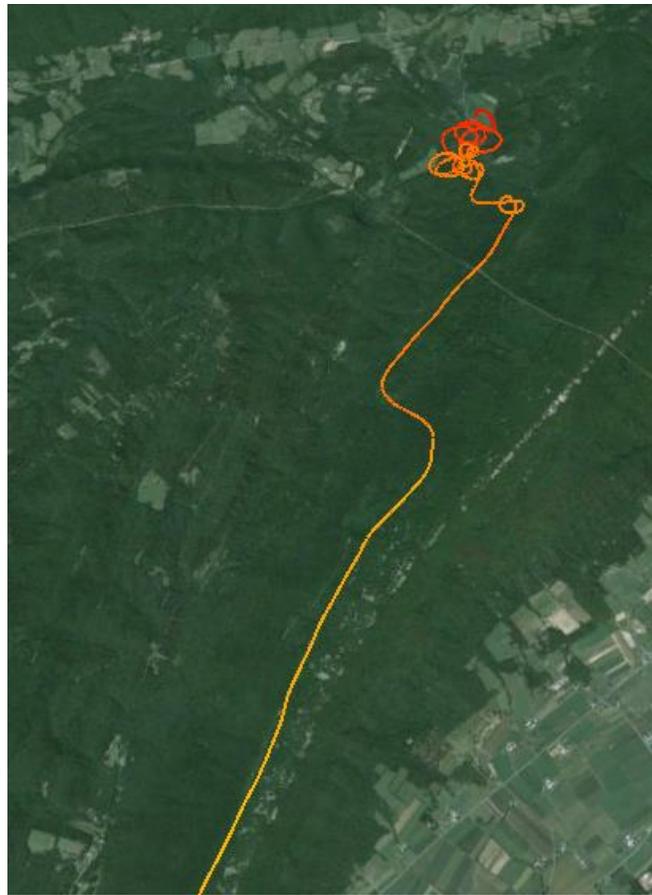
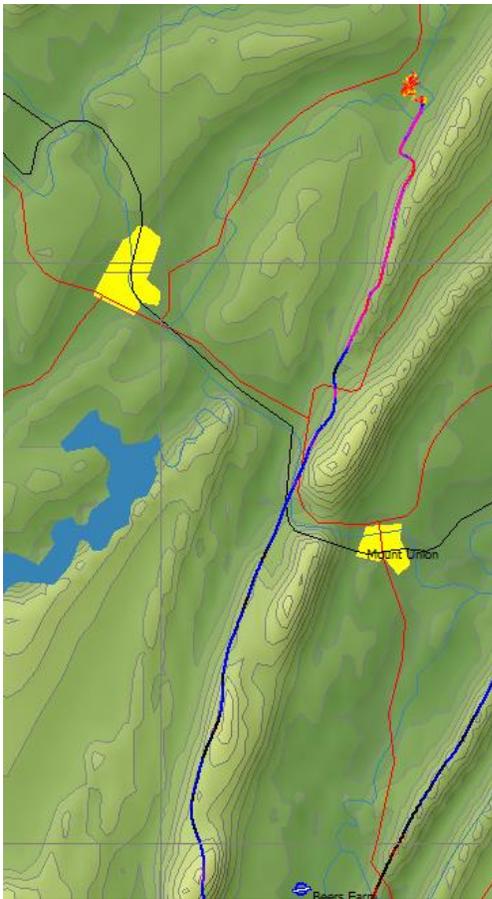
Additional recommendations. The SRA meetings and poll are quite clear on pilot attitudes about safety. We continue to have about one fatality every two years, a serious injury every two years, and a glider seriously damaged about every third contest. This year's safety report documents pilots trying to thermal below 200 feet. Nonetheless, pilots at SRA meetings and on the poll are strongly against any additional measures to reduce the accident rate. Pilots accept these crash rates, each believing himself to be immune to the temptations that have led so many others to unfortunate outcomes.

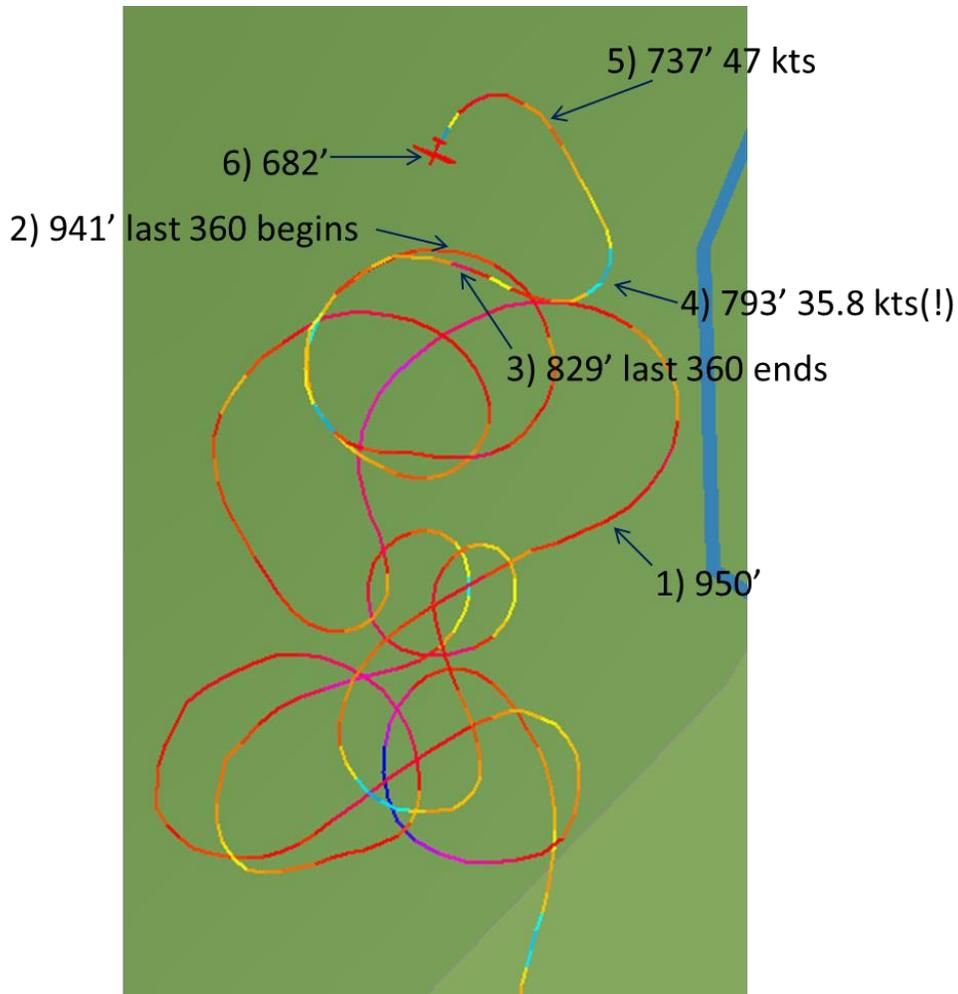
The temptations to push low final glides, absurdly low thermaling, and flying into storms can be reduced by a hard deck, higher finishes, ending the line finish, and procedures for calling off tasks in mid stream. Such measures would help on the margin, though will not eliminate crashes. They represent removing existing temptations, not an attempt to tell pilots what to do. They are also fair as they are applied to all pilots. However, they are deeply unpopular among the vast majority of contest pilots, as helmets in hockey, bicycling and baseball were equally unpopular among participants.

Incidents:

1. Tail boom, Mifflin. After a successful upwind transition, the pilot was not able to stay on the ridge, and flew while steadily losing altitude down the ridge to Mt. Union. Just why the ridge was not working for him is a bit of a mystery, as it was a strong consistent ridge day.

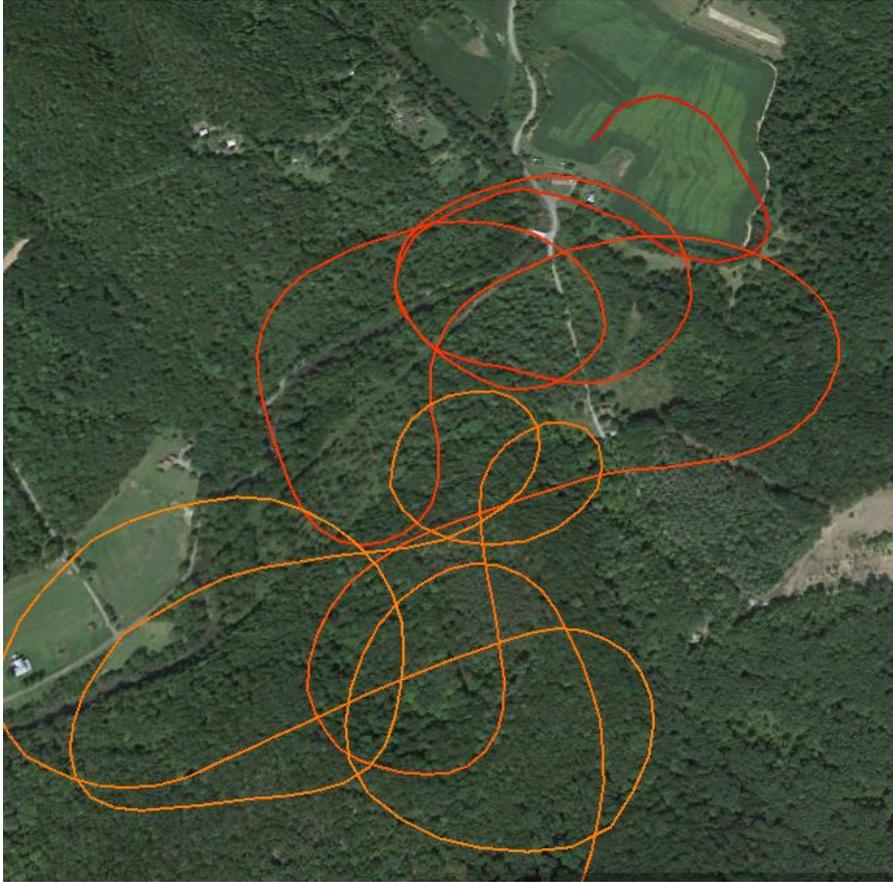
Leaving the last good fields by the road and river upwind of Mt Union, and with either not enough altitude to cross the saddle to Jack's mountain and the friendly Mifflin valley, or situationally confused about which ridge to follow to get there, he continued on, halfway up a low ridge over completely unlandable terrain. When he fell to the bottom of small ridge he was on, he pressed forward to try to ridge soar in a tiny ridgelet in the middle of the valley. When that, predictably, failed to work, he tried to thermal just shy of the first available field since Mt. Union.





See you measures a long period of desperate low altitude thermaling starting at 1350' (600' AGL) and slowly spiraling down. The pilot does not gain a foot in any of these turns, and there is plenty of time to reevaluate and think about changing plan to land now. Point 1 at 950' – less than 300' AGL – marks an exit from one thermaling attempt – and the beginning of yet another thermal attempt, with two direction reversals yet to come.

The last thermaling 360 begins at 941' (259' AGL) and ends at 829' (147' AGL.) The pilot then made a 180 degree turn as a “pattern,” with See You indicated speeds as low as 36 knots. The landing resulted in a ground loop. The pilot is lucky to be alive.

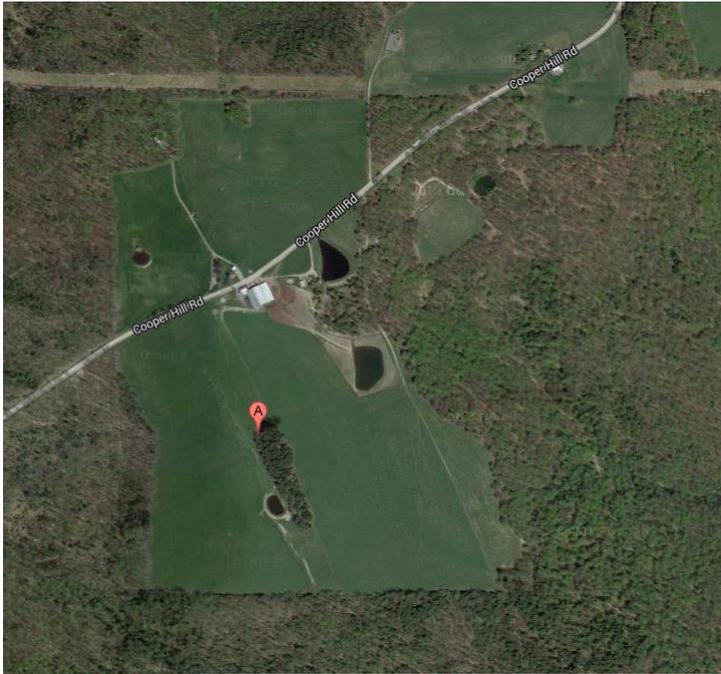


2. Pegasus, Elmira. Off field landing crash.

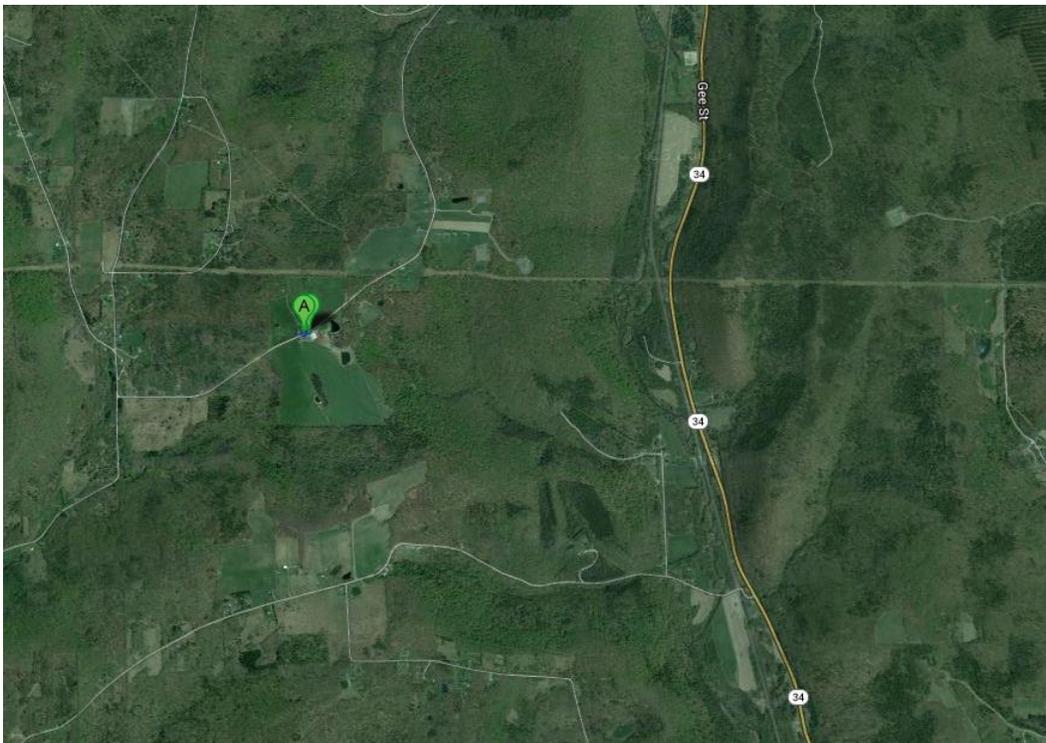
Contest report: “Deteriorating, Strong SW Winds. Pilot has 342 hours, 142 hrs in glider, 92 in Make/model, 6 contest flights. Major damage, no injury. Wind shear on final.”

The contest scoresheet shows a log was turned in and scored, but the log was omitted from the logs posted to the SSA website, precluding any analysis by RC or SSF. The RC chair was able to obtain the log subsequently, and we thank the pilot for providing it for our analysis.

Here is the field – nice and big.



It's the best field in the area. Though this field is on a plateau, with a valley running NS to the E of the field, the fields in the valley are substantially worse.



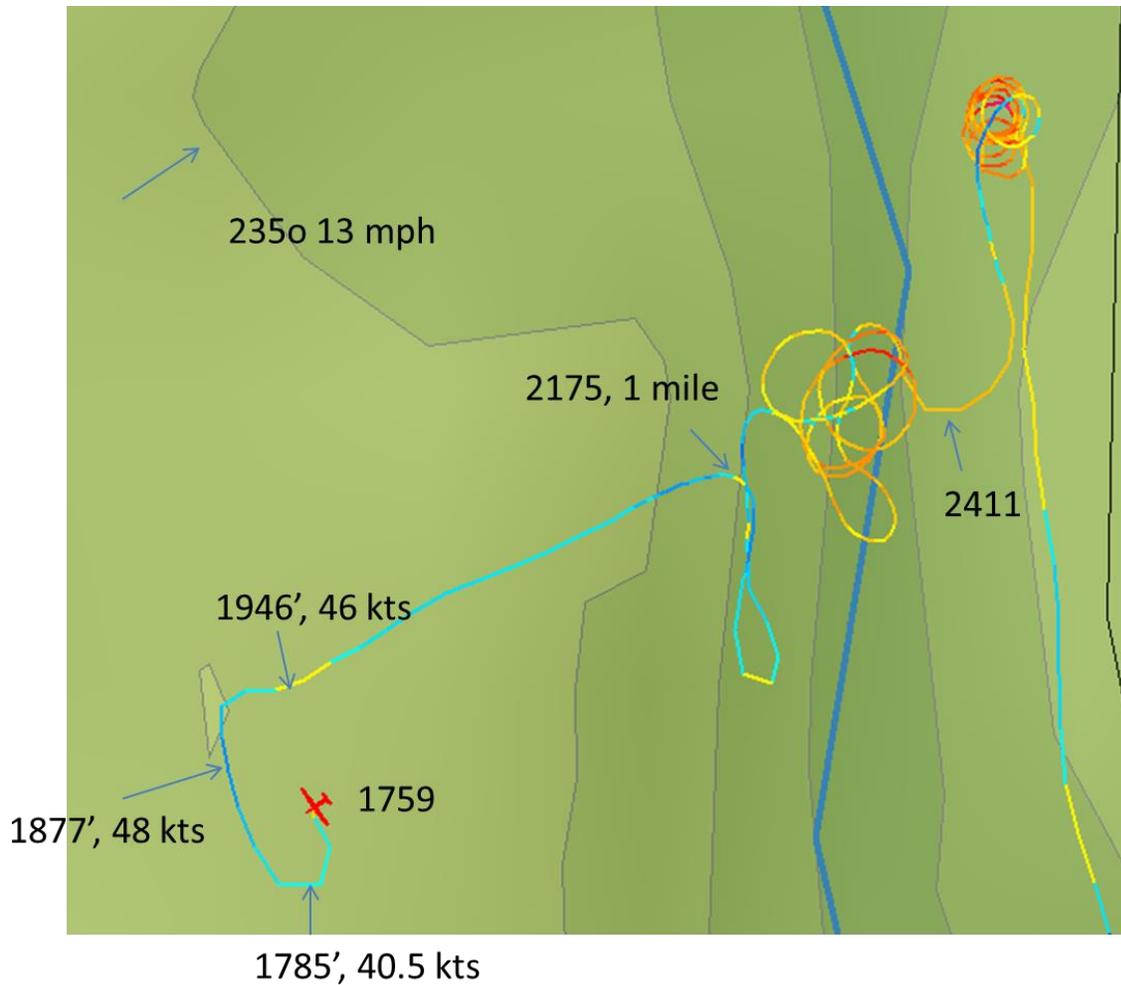
The crash was only 16 miles from Elmira in very weak weather.

The crash site, showing a very nice field and the broken tailboom:



The pilot report (below) mentioned concern about landing “uphill” and into the wind. This concern led directly to running out of energy, as he could have easily done a base to final into the wind rather than go all the way around the field in order to do left hand pattern and land downwind. In this case the slope is so gentle and the field so big that a “downhill” landing might have been a better option.

We should encourage that “the rules” are not absolute – into the wind and downhill can work if the wind is strong, the hill shallow, the field long, and the altitude to go around absent.



Here are the last few minutes of the flight

At about 1000' AGL (above eventual landing site) the pilot is heading N, and stops to thermal once, gaining little. Proceeding E toward the landing field he stops again, now at 2411' MSL = 652' AGL and more than a mile away from the field to try to thermal. He abandons thermaling finally at 2175' MSL = 416' AGL one mile from the field. He passes N of the field at 1946' = 187' AGL, 46 kts IAS. This was a good moment to simply turn left into the field, but he was concerned about slope and chose a downwind approach. (In later discussion with UH, the pilot said that in the stress of events, a right hand pattern or simple left turn to final into the wind didn't occur to him.) The "downwind" leg begins at 1877' MSL = 118' AGL, 48 kts IAS. The buttonhook base and final occurs at 1785' = 26 feet AGL, 40.5 kts IAS.

UH damage report: "Impact was pretty much a straight ahead stall. Break was not consistent with torsional failure. Quite a number of small broken areas in bottom of the nose that imply nose first hit in stalled condition. No damage to wings or horizontal tail."

Given the low speed, the pilot report below ("I felt the bottom drop out"), the UH damage report, it seems most likely that the glider stalled at 30 feet or so.

The pilot admirably wrote up the story for the Valley Soaring Club newsletter, from which I quote. The day was obviously weak, and deteriorating. After many low saves the pilot wisely abandoned the task and tried to return to Elmira. Picking up there,

... I was following the rules and looking for field options early and moving forward looking for the next set of options. I was beginning to get low and there was a valley ahead. The wind was pretty strong and a head wind as I was moving west toward the valley. In my looking I saw a very nice field on top of the other side on the valley – big flat and had rows of hay (a good sign). Down in the valley there were much smaller fields and several of them had Bales of hay, which I saw up close and personal on my first land out. They are huge and if you hit one, Ouch!

... I connected with the thermal again and climbed to what seemed to me to be the top at about 2500 AGL [*See You says 2400 MSL, < 1000' AGL*] – all the climbs and looking took up the better part of an hour or so. [*See You says 15 minutes*] I pointed the nose of my Pegasus to the field resolved to make my 3rd straight farm visit. It took much longer to get to the field than I thought it should have. I was going 55 knots, [*See you says 40-45, and into a 13 mph wind*] gear down and looking hard for wires, fences and things I did not want to bump into. When I got to the house at the north side of the field I was much lower than I wanted to be. [*Why not just turn left and land? Plan A fixation?*] Honestly I was not looking at the panel at all other than an occasional look at the ASI. I could tell from the sound and angles I was going at OK speed for what I believed the wind to be (which I now think I under estimated by 10 to 15 knots) and was lower than I wanted to be (probably 500 ft. on downwind from my trace). [*See You says 115 ft*] But the hill was uphill going north and the book says always land up hill – beside there was a dense forest on the south edge – I did not want to float downhill and hit the forest.

The very large field had a row of 50+ Foot Trees in the center, but enough room not to affect my pattern. So I went down wind [*Note really upwind*] and when I got to the gap between the center trees and the forest I turned base. Lower than I wanted but still in control and everything moving at light speed. [*See you says 26 feet and 40 knots*] The base leg was more of a button hook as I was only able to flatten out for a millisecond. As soon as I got to the position that I thought should point me to final the bottom fell out of the glider. [*This sounds a lot like the glider stalled.*] I pushed the stick forward immediately as I felt the bottom drop out to get speed and then with the green of the grass filling my view pulled up out of the dive at what I thought was the last second to avoid hitting the ground nose first. The front hit at about where my feet are and the impact went through the seat pan into my spine. A few bumps, not many and it was over. *I had a serious pain in my back and got out of the plane as fast as I could move. [My emphasis. When you have pain in your back do not move!]* It was similar to getting punched and I needed to get out and lay on the ground for a few minute to compose myself. Honestly I didn't think anything happened to my Pegasus until I looked back and saw the tail broken off. I knew the wings didn't hit, I knew my back was hurt and I said many bad words to myself in disbelief of the last 10 seconds.

The editorial comments in italic are not intended as a slight on the pilot. The difference between the pilot's recollection and the facts on the trace are illuminating. *It is very easy to think you're at 2500' AGL when you're at 1000' AGL, or to think you're at 500' AGL when you're at 100' AGL; to think you're doing 55 knots when you're barely doing 40.*

It is tempting to (once again) just dismiss this accident and "pilot error," and for pilots to assure themselves that they would never do this. That would be a mistake. A very interesting part of this report is the pilot's extensive efforts to learn "the rules" of contest flying and obtain mentoring and instruction:

I pretty much inhale any book with a glider on the cover. I have read all the hand outs and gone to several camps, talks and 3 conventions. I have also had the great opportunity to fly with exceptional pilots both within and outside our club. The past 4 years have been exciting and life changing.

...almost every book I read and every convention/seminar I have gone to there are things that are repeated and repeated and repeated. Most have to do with safety and the basics that were in the "Gliding Book" I purchased after my first lesson. Also the same focus and weight was shown whenever I have flown with anyone who is an excellent contest pilot. Contest pilot stories are pretty wild, but they are the exceptions and the reality is that the best people follow hard fast rules and are conservative beyond what one would think upon hearing some of the unimaginable flight these people do.

... We have all read the rules, past the test – some with 100%. The Bronze test is very clear about the rules of XC – I could give you the page and paragraph of a dozen books, many from authorities with 50 years' experience, world championships.....all saying the same thing

... Immediately I knew I had violated the rules I had read so many times. The rules that every instructor had told me until they were blue in the face. Up until then I thought I had done an OK job at obeying the basic principles. But in that instant I knew I had not. I knew that there was no other explanation other than "Pilot Error" and that I was extremely lucky and was let off with a warning this time. The whole point of all the redundancy of repeating the basic principles of flying a sailplane is to avoid needing to be "Lucky"

It is a lesson for us all how despite understanding "the rules," a pilot could lose track of his situation so thoroughly. *This can happen to you!*

Hank Nixon commentary:

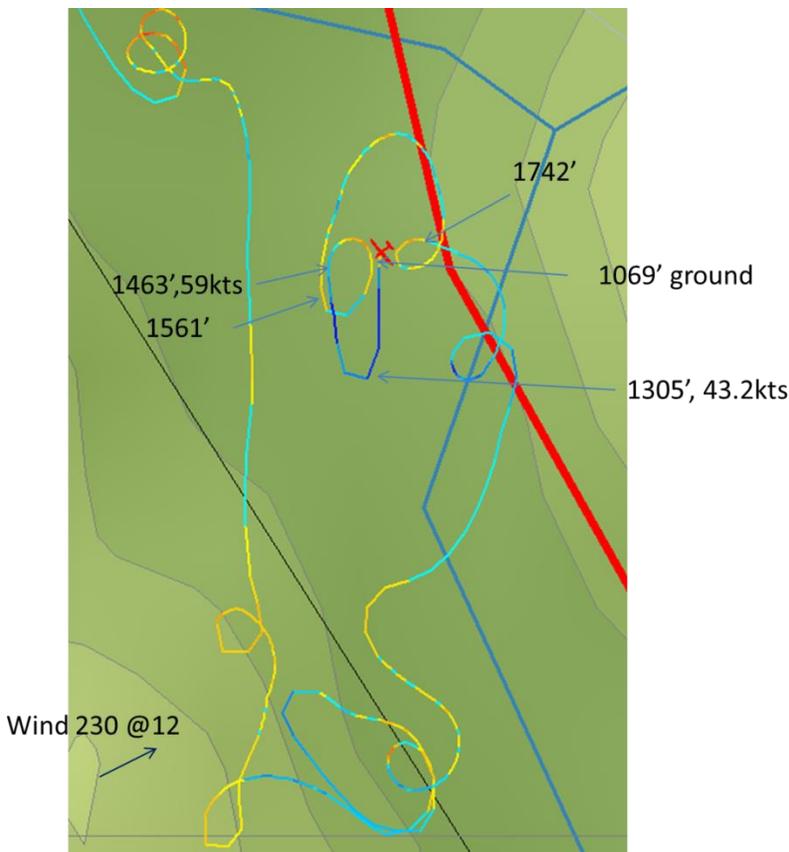
Late arrival at the field and he was low. It was windy and he did not have safety margin in height or airspeed. He seems to have made a good assessment of the field and the plan was reasonable, IF he had the energy portion of the equation right.

The field looks fine in the photos and Calvin reported no issues with it. A low pattern (second one in a row- too confident maybe?), with a low turn onto final near distracting obstacles, led to poor airspeed control, and very much rushed final without time and room to stabilize the approach. Crunch!

This scenario has been repeated many times. The lessons repeated:

- Select a field early and high enough to evaluate and to fly a normal pattern.
- Keep the enthusiasm and confidence under control.
- Note that stress leads to errors so reduce stress by flying the pattern you fly at home and pay extra attention to glider attitude and airspeed.

UH and the pilot mentioned the previous landouts, and the pilot graciously sent the 7/31 trace. Here are the final few minutes of that flight



You see the pilot deviated towards good fields, and stopped to try to thermal within range of the field. But once again he is tempted to keep trying far too low, especially for a pilot in his second contest who has landed out only once before in his entire career.

The second to last thermal turn starts at 1742' MSL, less than 700' AGL. The final thermaling attempt starts at 1561' MSL, less than 500' AGL, and is much too close to the field, passing directly over the landing point.

The pattern starts, too close (especially for being on the upwind side of the field, with a planned downwind landing) at 1463' MSL = 400 feet AGL, though blessedly at 59 kts. Base leg buttonhook is at 1305', 230' AGL, but speed has bled to 43 kts. Altogether too close, too slow, too low – and UH point that getting away with it once might breed bad habits is a good one.

3. Tail boom Broken, Hobbs.

(CD Report) Very experienced pilot, 1400 hours in gliders, 1000 in make/model, 400+ XC flights 200+ contest flights. No injury. Major damage.

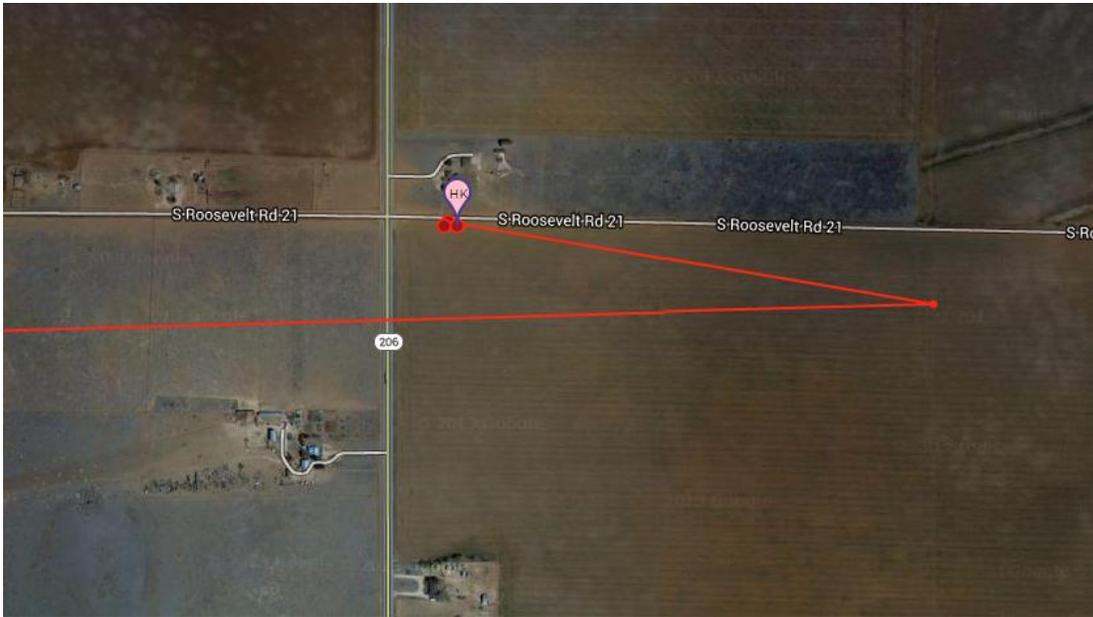
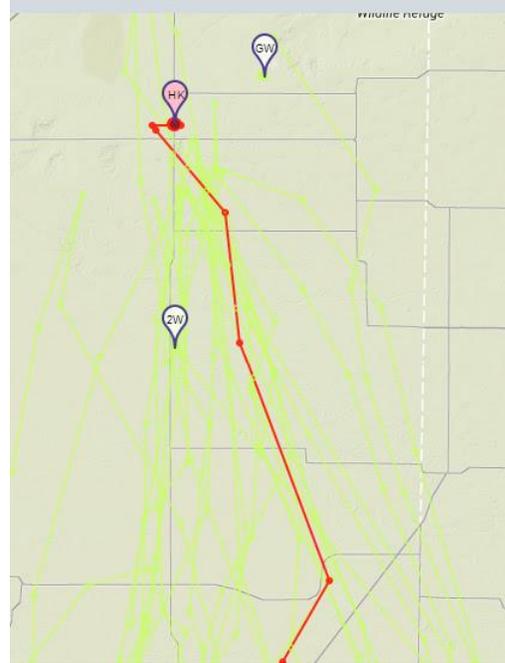
“.. flight entered into an area partially obscured by high cirrus. ... after several failed attempts to find lift to egress the area or reach a suitable airfield, pilot had to plan an off field landing. After close evaluation pilot flew ... over a hard packed agricultural field with small (less than 6" high) furrows. ... landing was planned between the furrows. As the main touched down, the left wing also contacted the ground due to a slight slope which could not be observed at altitude. A full 180 degree groundloop resulted, breaking the tail boom and horizontal stabilizer. There was no damage to person or property.”

JC comment. We were headed to a 25 mi turn area around Portales, then home. Cirrus came in and shut down the lift. It was down to survival conditions over poor terrain. At the 25 mile mark to Portales, pilots faced an interesting decision: keep going to Portales, where there are fields and an airport, or turn around, covering very poor terrain until the airport at Tatum. Many pilots turned around, and had low scrapes over hostile terrain. Many pilots landed out. The first picture on the left shows the spot display and you can see the large number of landouts.

The accident happened right near the edge of the Portales turn area over an area of good fields. The pilot found a weak thermal at about 3,000', went in to nick the turn area, returned to his weak thermal at 2,000', was not able to make it work, and landed in the fields.

There is an irreducible amount of bad luck that can happen when we land off field – a good point to keep in mind when tasking or flying. A pilot may simply fail to see or anticipate the possibility of a slope in otherwise flat terrain, or crop can grab a wingtip.

The flight log was not turned in, showing as a 100 point penalty on the scoresheet. The pilot subsequently provided the RC with the flight log, but asked us to keep analysis of it private. I have edited the above report, produced with other sources, so that it is not inconsistent with the flight log.



4. Crash in mountains, Moriarty

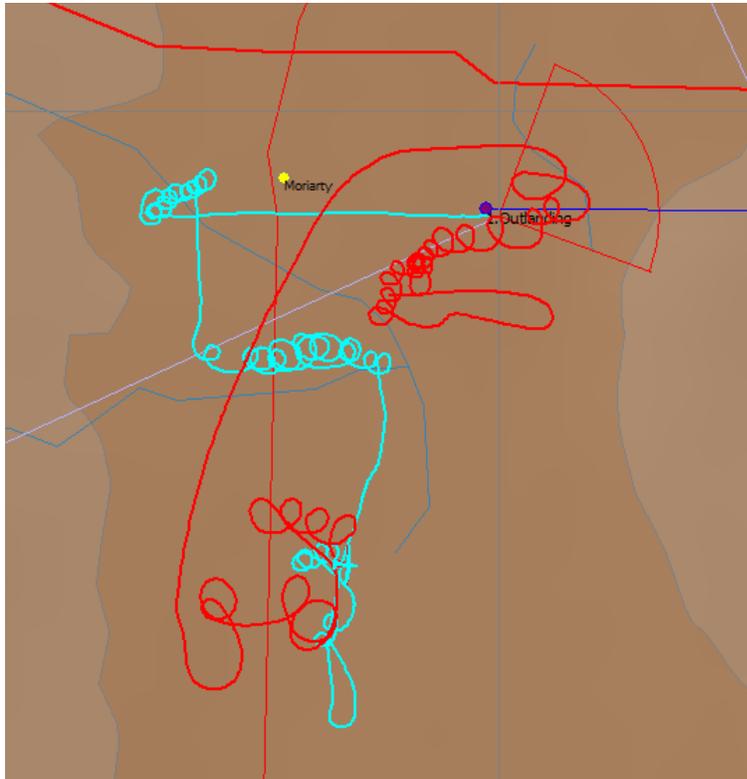
Frank published a detailed report on soaring café, here <http://soaringcafe.com/2013/06/the-end-of-the-road-for-ta-part-ii-the-crash-report/>
I don't have much to add.

There is no CD report, and no flight log on SSA website. Frank reportedly left the contest in the middle of the night, without informing the CD.

5. Near mid-air Moriarty

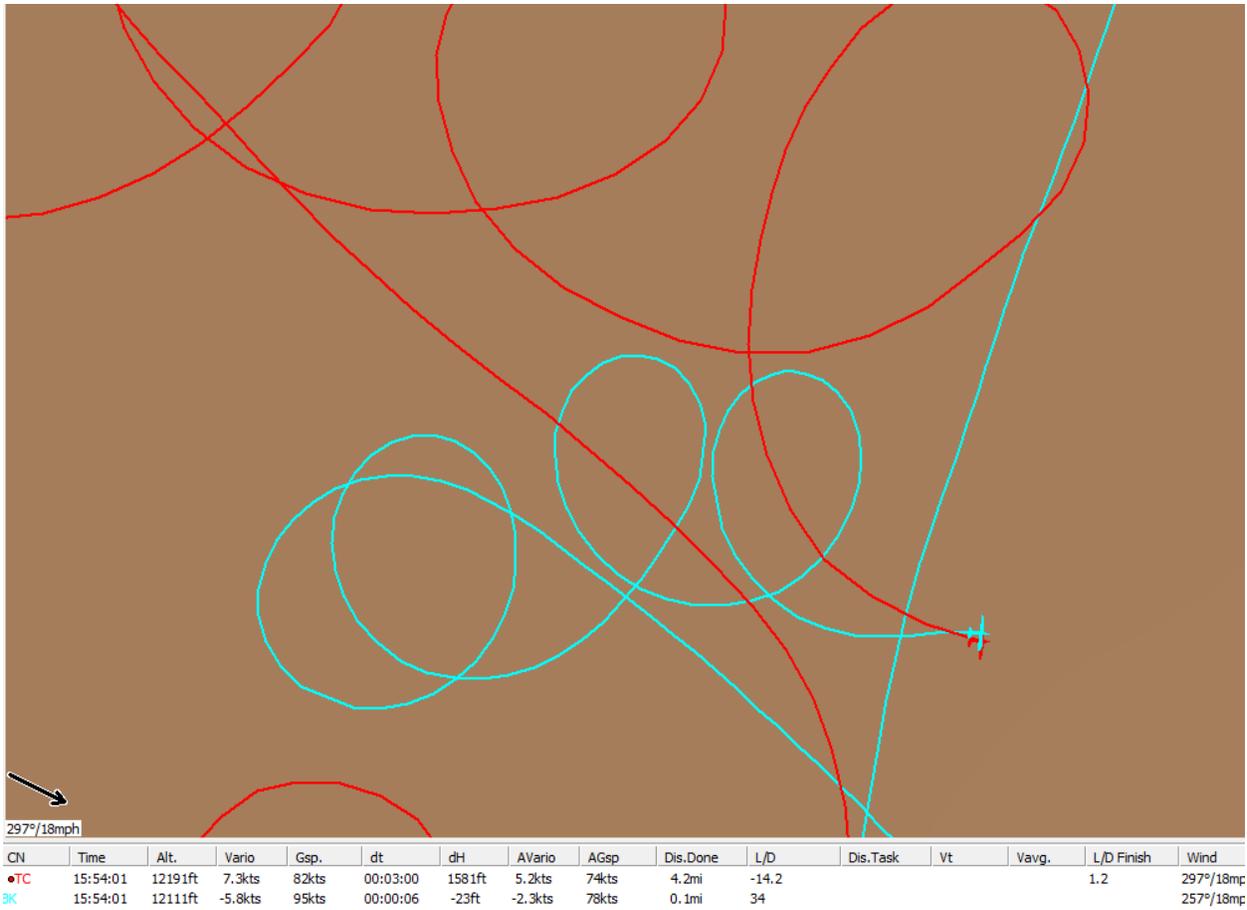
Tom Kelly forwarded the traces. Neither pilot had Flarm.

The situation: the pilots were in the first few thermals off tow.

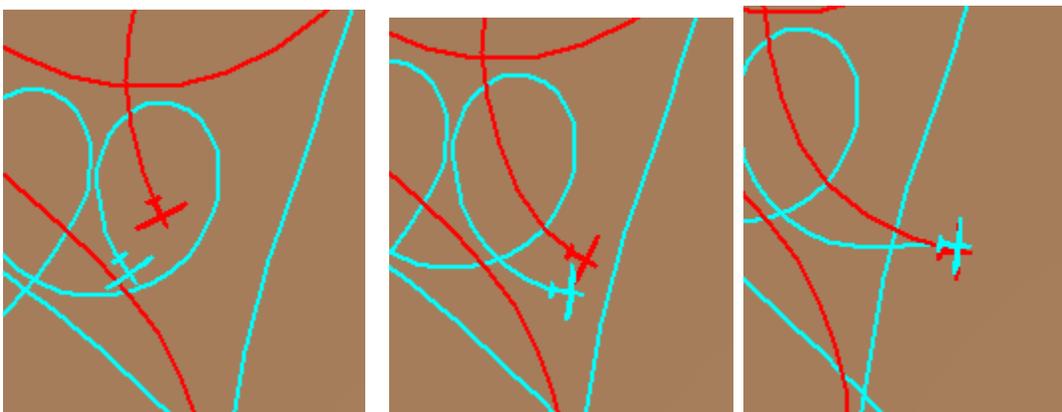


The next picture shows the moment of closest approach. As far as See You can tell, this is a crash. The gliders are in almost exactly the same position and less than 10 feet apart vertically.

Both gliders have plenty of opportunity to see the other one. They did 3-4 thermals in parallel cores before converging. Red had started circling, blue flew directly towards red, then stopped in an earlier core. From the traces it looks like blue may have seen red as he flew straight towards him to join his thermal. They were at exactly the same altitude and climbing at the same rate the whole time.

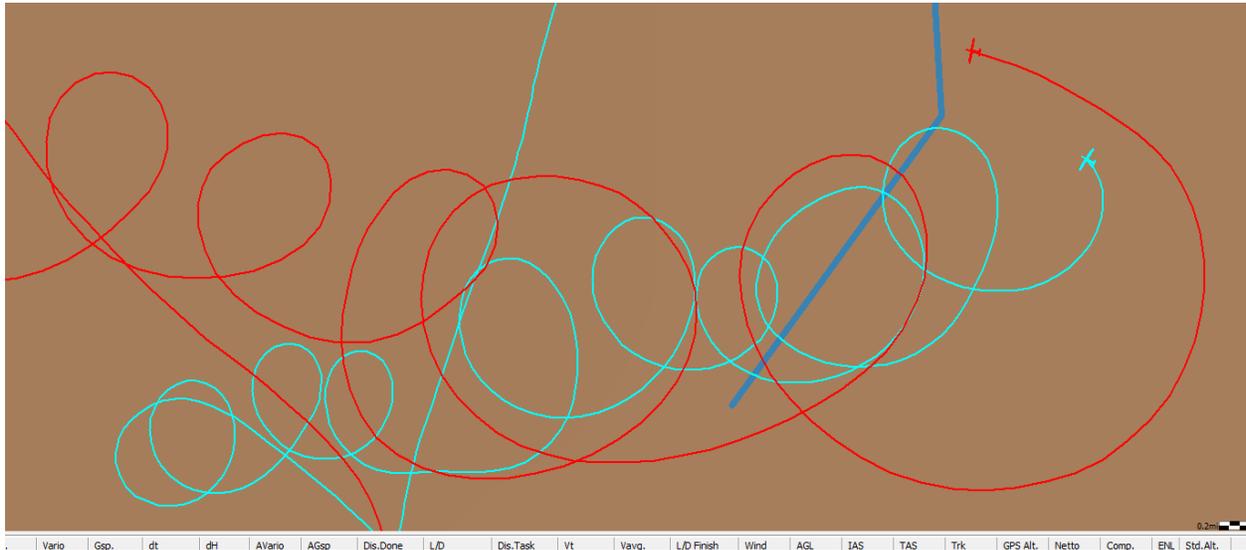


Here is a little movie of the miss. Just before the miss, blue is ahead and red behind, so blue must have filled his canopy, except blue is on the outside so red may have been looking in to the turn. At the next fix they are side by side, where commonly pilots do not look.



The last picture shows one contributing factor: red is doing big boat circles and blue is tightened up in the core.

This incident reinforces the need for good lookout – don't miss a glider circling in a parallel core – look to the side and up, not just straight where you're going. It also suggests the value of Flarm.



6. Towplane flip over, Seniors,

(CD report) Clear, wind 290-360 10-14 kts; pilot 9000 hrs + with 500 in make/model. Major damage, minor injury. Report excerpt:

Aircraft was on the second landing of a contest launch. Winds were shifting in direction and velocity. 8-10 kts tailwind. Aircraft touched down past midpoint of 3,500' runway and slightly fast, Within 200 feet of the contest grid, pilot came on brakes hard and nosed the aircraft over. ... Pilot had only flown 5 hours in the past 90 days. Weather conditions did require careful attention to touchdown point and speed during rollout. Conditions at the time of the incident were within operating limits of the aircraft and airfield Standard Operating Procedures.

Airport procedures are being reviewed and a closer look at the currency of non Seminole-Lake Gliderport employed tow pilots will be done before the first tow.

(John Good report) Wind was such that towplanes were landing back toward the grid, a normal practice for which there's plenty of room. But a towpilot touched down long and "hot", and in trying to stop quickly put the plane over on its back.

7. Towplane incident, Chilhowee

(No CD report)

(John Good report) Towpilot doing a "warm-up" flight veered left toward a glider still parked next to its trailer. Prop and left gear hit the glider's right wing as pilot yanked the plane off the ground. Towpilot reported that towplane didn't properly respond to her inputs - but after becoming airborne she was able to narrowly miss two buildings and fly to a more or less normal landing (despite damaged landing gear). It's worth noting that space restrictions at Chilhowee cause parked trailers to be closer to runway ops than is ideal.

8. Canadian Update

I corresponded with several Canadian pilots who had received the official Canadian Transport Safety Report on the fatal crash at their 2012 nationals. Alas, they still do not have the trace which would answer many questions.

This crash was very close to a finish cylinder which allowed for "finish" points even if pilots did not land back at the airport. .."glider was discovered approximately 2.5 km southwest of the club, near Arthur East Field" That report places the glider 1 mile from the finish cylinder.

"We finally received an accident report which indicated that it was likely a stall /spin at slow speed and low altitude in gusty conditions of 25kts. A branch of a tree had entered the cockpit at the accident site. The pilot had personal minimum ceiling of 300' for his off field circuits."

"We also found out that the pilot was likely under a lot of stress, as there were multiple stressors and likely fatigue was a significant factor leading towards acceptance of higher risk and a factor for less than stellar decision making for a highly skilled, experienced, excellent contest pilot. He had been struggling in his last two contests flying 15 M instead of 18M configuration of his Lak and was not at the top of the leader board where he usually performed. He had also been the sniffer for 2 hrs preceding the gate opening for his class. Conditions were difficult on course and they became more difficult at the time of the accident with high surface winds 15Kts gusting to 25 Kts."

"It was suggested by our SO [safety officer] that we should have pilots sign a release that it is their wish to have the national soaring safety organization have a copy of their flight recording in the event of an accident? Does not mean the person who has it will turn it over!"

"I'm told by another competitor that he overflew a runway oriented into wind not long before the accident; Canada doesn't use airfield bonus, since a lot of our airports have narrow runways with very high runway lights (both due to snow - narrow to minimize cost of cleaning, the height to have them stick up through (our airfield has 2' coverage right now), which are certain to cause damage - therefore, the AB makes less sense here. It is causing a lot of discussion."