WINDS ALOFT…LESSON LEARNED

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It is not too often that you will see this, but sometimes the winds aloft at even relatively low altitudes can be substantially different in both direction and magnitude from the surface winds. I experienced this a few times in my flying career while flying an aircraft with a real-time, very accurate wind readout. It was an interesting phenomenon, one that would perhaps require some adjustments in a visual landing pattern even for a fast moving aircraft. (Once in the overhead pattern at Fort Wayne I saw a 50 knot crosswind at 1700' AGL become a 10 knot headwind on final). Gliders and most other general aviation aircraft are not typically equipped with systems that compute and display real-time wind data (although several CCSC members do fly with flight computers that have wind displays). So, unexpected wind-effects are something that you may only notice by an increased/decreased ground speed or significant sideways drift. In a slow flying glider, winds can really, really matter…as I think you'll agree after reading my little story below.

This past Saturday I took a couple of 5000' AGL tows in the Grob 102. Up front let me say I did not check the winds aloft before my first flight. Bad, wrong, not smart...yep. As a result, even though I released within 2 NM of CCSC at 5000' AGL, in less than 5 minutes I was faced with the real possbility of landing in a farmer's field. How did this happen?

We were operating on runway 09 with winds out of the southeast at 6 kts or so. Takeoff and tow was normal and I released about 1 NM northwest of of the rock causeway on the west end of the Caesar Creek Reservoir. (About 2 NM from CCSC.) I then decided to head northeast for a while in the direction of a friend's farm a few miles south of Xenia. Based on the day's conditions I knew there was no thermal activity, so I fully expected to be in a continuous descent from release. I would naturally pad my return point accordingly. I did not, however, give enough attention to the winds. Since we were taking off to the east, I subconsciously was expecting a headwind or crosswind at worst as I headed northeast. In reality, the winds aloft at 3000' were from the southwest and quite strong. I learned after the fact that the winds aloft were forecasted to be 210/34 at 3000' and 210/42 at 6000'. So, I was actually cooking along at about 85 kts Ground Speed (GS) thanks to a direct tailwind as I headed northeast while flying ~ 50 kts, i.e., the no wind best L/D in the Grob 102. (GS verified afterwards by the SeeYou playback software.) At about 4400' AGL and nearly 8 NM from CCSC some air sense finally kicked in and I decided to turn back to the field. I then became fully aware that I had a very strong headwind from about 210 as I turned to pretty much that heading to go back to the gliderport. At 50 kts airspeed and with a ~35 kt headwind, my progress to the field was a wee bit slow as you can understand. Ugh. I had a bit of a problem! (The same wind that had just

pushed me along at 1.5 NM's per minute when a tailwind would now require me to fly 4 minutes to go just 1 NM.)

Now what? Remember learning how to compute a speed-to-fly due to a headwind ? Often what we learn to pass a test or checkride seems theoretical, and perhaps for some the rule-of-thumb about adding 1/2 of the headwind component to best L/D falls into that category. Well, it shouldn't. My particular experience really underscores why. First an illustration. In simple terms, if you are flying at 50 kts and you have a 50 kt headwind, you are going nowhere. So, it is clear that adjusting your speed to fly due to a headwind can become essential. In my case, if I had just flown the no wind best L/D I would have tracked along at 15 kts GS. (50 kts - 35 kts headwind = 15 kts GS). I had about 8 miles to go, and at 15 kts GS, it would have taken ~ 32 mins to get back to CCSC. With a constant rate descent of ~200 FPM, this wasn't going to work out real well: .4300 - (32 x 200 FPM) is not a positive number! I figured out that the wind was from 210 as I noticed no side track of the aircraft as I proceeded back to CCSC. I estimated the winds to be at least 30 knots and so I added 15 kts to L/D and flew between 65-70 kts on the return.

Well, was this going to work...and how could I know? How can you know in your future flying adventures? There is actually a simple way. Once established at your best speed to fly (adjusted for winds as required), take a look at your desired destination. Look away at something else and after 30 seconds or so take another look at your desired destination...and repeat from time to time. (If you stare at the destination you won't pick up a trend as easily.) Is the desired destination rising in the canopy? Not good...based on current winds and speed flown, you are not likely to make it. Is the destination disappearing under the nose? Great...you will probably make it based on the current conditions. Is the destination remaining stationary in the canopy? Good...you will probably just make it based on the current conditions. I saw the latter...a stationary picture. Good.

Longer story short, I landed via a normal pattern to runway 09 at CCSC. If I had gone another mile or two northeast, however, it would have gotten much more interesting. (Note that at 85 kts GS going northeast, this would have only taken about 1 minute.)

By the way, even gliders equipped with flight computers with displays of current winds may need to make a few 360 degree turns to accurately determine wind direction and speed. In my case,a flight computer may not have been that much help since I knew I was staying local for what would be a short flight due to the thermal conditions. I most likely would not have done some 360 degree turns to determine the wind direction and speed. No need to figure out the winds for a local area flight, right?

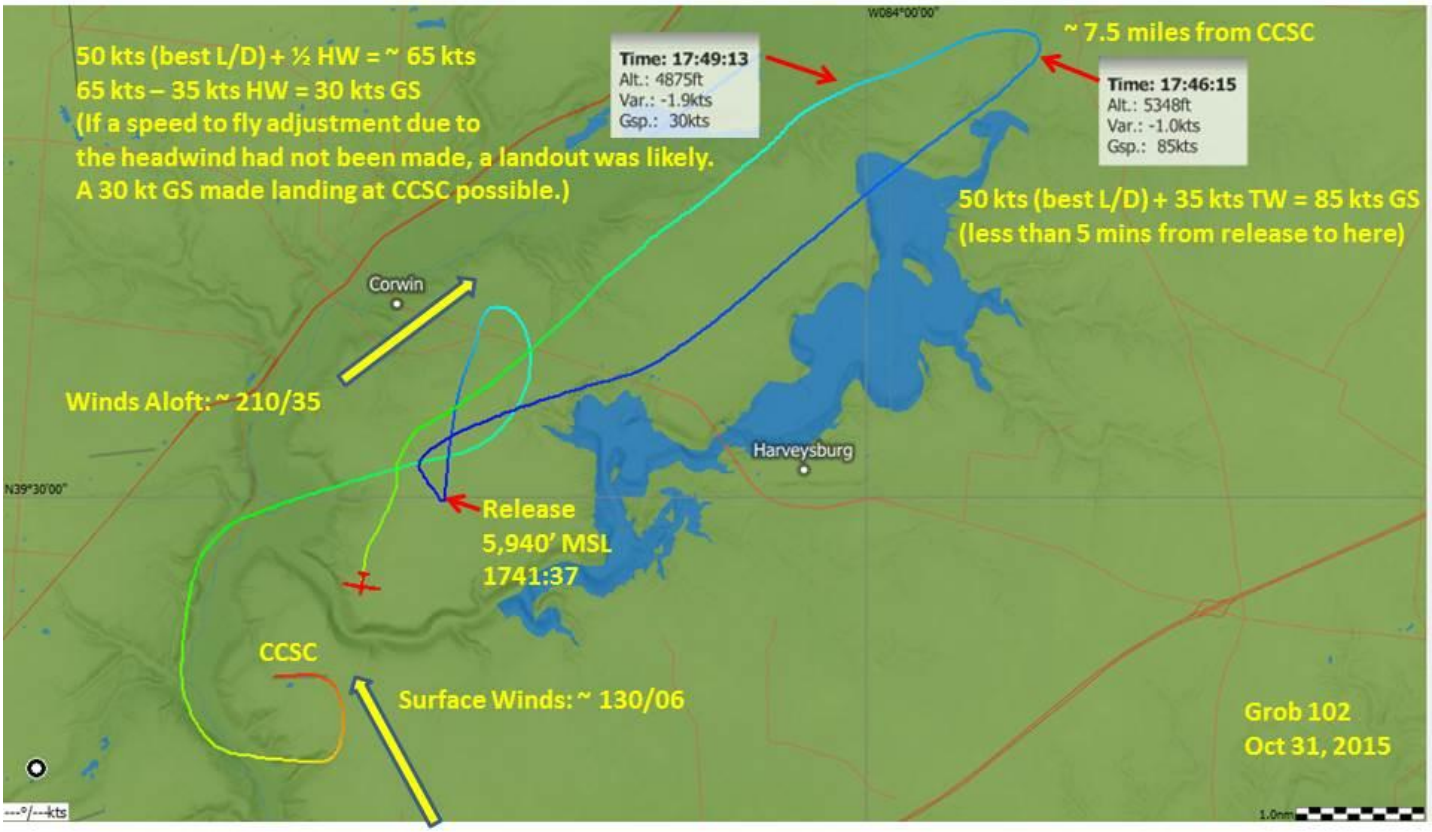
In the end, I re-learned and learned a lot from this flight. Here are some points that I hope you will consider:

- Check the winds aloft for **every day you fly** ...you may note something surprising!
- Takeoff direction does not define where the upwind direction is…the winds aloft do.

- Before takeoff, if possible note the direction the clouds are moving and how quickly. That would not have worked on Saturday as there was a high overcast of uniform clouds and so there was no easily discernible movement.
- Do some wind analysis when airborne. (The winds aloft report... if you checked it and it is current...may not be accurate.) Looking out the window, how do you perceive your GS? Faster than normal? Slower? Are you drifting sideways with respect to your nose position? If time permits, you can turn to the cardinal headings (N, E,S, W) to best assess these affects and determine the wind direction. Once you figure out the wind direction, if you turn into the wind and slow to just above minimum controllable airspeed, you can estimate the wind speed by how quickly...or not...you are tracking across the ground. Are you going forward, are you stationary, or are you tracking backwards? If you are flying at 45 kts and tracking backwards, the wind is greater than 45 kts. As we enter the winter months, winds aloft that strong are possible.
- Always assess whether the wind will be a factor as you head to your destination or away from the field. (In retrospect, I was moving along the ground faster than normal...I should have picked up that I had a strong tailwind sooner than I did.)
- Computing and using a speed to fly to offset headwind effects works…and can be absolutely necessary. It was in my case.
- You can visually determine if you are going to reach a given destination by noting whether it is rising, falling, or remaining stationary in the canopy.
- With the slow speeds that gliders fly, flying in the wrong direction with strong winds can rather quickly get you into a situation where you may not be able to get to your desired destination. Again, in my case it took less than 5 mins of flying in the wrong direction to be confronted with the possibility of a landout...and that right after a 5000' AGL release close to the field in a relatively high performance fiberglass aircraft.

I will reiterate what I said above... I should have checked the winds aloft before I flew on Saturday. Responsibility taken! I think though that it is not uncommon for pilots to skip checking the weather and NOTAMS for local flights as it takes time and it is a diversion from heading straight to the flight line to fly. In light of that, I would like to make a renewed push for each crew to post the weather…to include winds aloft... and NOTAMS for each and every day we fly. This has been hit or miss at best since the idea was proposed earlier this year. Obtaining and posting this data takes just a few minutes and will benefit everyone. Please utilize the board that Brian Stoops made for the trailer for that purpose.

Below is a graphical depition of my flight from the See You program with key annotations added:



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