

free flight **vol libre**



2014/4



LONG TIME READERS OF THIS MAGAZINE will have noticed the continuous and increasing quality of *Free Flight* over many years. All this quality has been because of the long term commitment of its editor, Tony Burton. However, he now wishes to retire from this job. The SAC Board and all the members shout out a loud "THANK YOU" to Tony for all the *Free Flight* issues that he has done! It has been 195 issues over 33 years. Wow!

Call for editors – for *Free Flight* and for the SAC web site content

SAC wishes to find a person interested in being editor of *Free Flight* and one to be an editor for web content. Depending on motivation and time available, one person may be able to fill both roles, but the initial objective is to find two people. If you have any interest in these roles or if you know someone you would like to recommend, please contact me directly (Al Hoar <al_h@shaw.ca> or 403-650-3418) or any other member of the SAC Board of Directors. Our contact information is always in *Free Flight* and at <www.sac.ca>. An outline of the work the editor actually does is on page 26.

Background & discussion A detailed and thoughtful discussion concerning *Free Flight* was held at the SAC Board of Directors telephone conference meeting on 8 September. The question was – What specifically to do regarding Tony's wish and decision to retire as editor in 2015? Tony has been doing this work for so long and doing it so well that SAC members in general take receiving *Free Flight* as a given thing. It just happens – we look in the mail box one day and there it is! Tony says, "Being the editor is a huge contribution to SAC, but especially it is about the best thing a person can do to become totally plugged into the world of soaring in Canada."

This magazine is many things and probably different aspects are important for each reader. It is entertainment but also an important communication tool, a learning tool, a safety tool, and it is an archival record of the sport of soaring in Canada, something the web cannot provide. Some people will read just the stories that are interesting to them. Others will read the magazine completely, cover to cover. Some people will note the regular data features, such as FAI records and badges, list of SAC clubs, committees, and contact information. Still others, I suspect many, keep it for future reference.

The Board discussed the relative contributions of *Free Flight* and of the SAC web site towards all of the objectives of SAC and SAC clubs. The Board believes that the SAC web site is more likely to be the medium through which new people are introduced to our sport. However, the web site needs to be kept up to date, and be easily and thoroughly useful to potential new members. The Board thought that a web editor is needed for this.

What are the contributions of *Free Flight* and the SAC web site? They are Communication, Promotion, Introduction, Information, Sporting, and Historical Recording. Considering all these needs, which tool is best to deliver them? A printed magazine, a web site, a combination of both, or something else? This much is true and important, the people filling the two editor roles will be able to positively change and improve the SAC organization by using the best medium, the best method, to fulfill each of the needs above. It appears that a close working relationship will be needed between web editor and *Free Flight* editor.

A related discussion at the SAC Board conference call revolved around volunteer services versus paid services. Some members have struggled with this question at the club level. Clubs are essentially voluntary organizations. The question sometimes arises of paying an individual for some part of essential club work that needs to be done. However, this decision has the potential to create a conflict in the minds of those who are volunteering their time. Our conclusion was that it is primarily an individual decision. Some people will be happy to volunteer, even a significant amount of time, while others may value their time differently. There was no decision that the new *Free Flight* editor and the new web editor would be paid; however, it was generally agreed that expenses incurred, especially for travel to certain SAC meetings, would be reimbursed by SAC. In the past, the *Free Flight* editor has been paid for the preparation of the magazine to the printing stage, formerly expensed by the printer at a greater cost. The more recent web editor position has not been paid. ❖

free flight

vol libre



The journal of the Soaring Association of Canada
Le journal de l'Association Canadienne de Vol à Voile

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The pdf copy of this issue is in colour on the SAC free flight web page.



All dressed up but often no place to go at the 2014 Nationals.

photo: Martin Brassard

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Shivering

Dr. Dan Johnson, from SOARING

something to think about on your wave flight

IT HAD BEEN MEANT TO BE A SHORT LOCAL JOYRIDE on a blustery winter day at the mountain gliderport. Ron hadn't set up the oxygen system or put on a snowmobile suit. The tow was pretty challenging, with the tug bucking in turbulence and uncommanded rolls of nearly 45 degrees. After release, Ron struggled up and down in turbulent lift for 45 minutes, gaining altitude slowly. It hadn't helped that the two variometers disagreed – one was obviously wrong, but which? After a while, he decided to believe the pessimistic one, and climbed better.

Suddenly, the turbulence stopped. He was in glassy-smooth lift. The wave was not strong – he was climbing only 200 or 400 ft/min, depending on which vario was correct, but he was climbing. He changed plans and would stay up for a while. As he neared 12,500, the regulations on oxygen use came to mind. Well, not its number; but he did recall that he could ascend to 14,000 ft as long as he didn't stay there more than 30 minutes, and he had to use oxygen above that.

While moving fast at 14,000 to avoid climbing, he realized that the regs didn't say how long he had to be below 12,500 before he could again spend a half-hour at 13,000. He used logic: after about 25 minutes find the descending part of the wave, get below 10,000, and then promptly go back up again. (You know that's wrong, right?) After a couple of hours of this madness, the radio crackled, "We're going to shut down at 5pm, and there are only two of you still up. The wind is gusting to 35 knots, so be careful when you land." Ron checked his watch. It was nearly 4:30. He hated to go back down. Then he started shivering. Just slightly at first, then his whole body began to shake. Being a physician, the three brain cells still functioning joined hands, and he promptly pulled the spoilers and went straight home. He warmed during descent, and stopped shivering by circuit height.

Why was Ron shivering and why was this important? I want to make three points: hypothermia is more likely during hypoxia, there are easy clues you can use to detect your incipient hypothermia, and shivering is an emergency. Get warm *now*. Unless your glider has a heater, you'll need to get low.

Hypoxia hastens hypothermia

You are a "homeotherm". The enzymes that make you a biochemically dynamic organism, and let you have all sorts of fun, function properly only in a narrow temperature range of about 5°C. They are destroyed somewhere above 43C and work badly below 32C.

Your body burns fuel in small fuel cells, the mitochondria, to produce heat and store energy for action. This involves a very precisely choreographed process at the end of which electrons are accepted by oxygen to produce water. No fuel, no energy is produced; no oxygen, no energy is produced. So you see that when oxygen delivery is deficient, such as at altitudes above about 7000 feet, less metabolic heat is produced. Thus we get cold faster, and hypothermia is more likely and

You may already know that Mr. Fahrenheit didn't have any future scientific discoveries to help him create his scale. So he took as zero the temperature at which salt won't melt ice (this is why salting roads doesn't do anything at below-zero Fahrenheit, so Canadians just use sand). He set 100 as the temperature of a warm-blooded animal. These points allowed the manufacturers of thermometers to calibrate them, and be comparable.

Many years later, Mr. Celsius knew that the melting point of pure ice was constant (he set this at zero), and its boiling was as well (although altitude-dependent, the relationship with altitude is easy to calculate). This allows the manufacturer to calibrate the thermometer without sticking it up the butt of a live chicken (caution: the historical details here are only approximately correct).



SOARING ASSOCIATION of CANADA

is a non-profit organization of enthusiasts who seek to foster and promote all phases of gliding and soaring on a national and international basis. The association is a member of the Aero Club of Canada (ACC), the Canadian national aero club representing Canada in the Fédération Aéronautique Internationale (FAI), the world sport aviation governing body composed of the national aero clubs. The ACC delegates to SAC the supervision of FAI-related soaring activities such as competition sanctions, processing FAI badge and record claims, and the selection of Canadian team pilots for world soaring championships.

free flight is the official journal of SAC, published quarterly.

Material published in *free flight* is contributed by individuals or clubs for the enjoyment of Canadian soaring enthusiasts. Individuals and clubs are invited to contribute articles, reports, club activities, and photos of soaring interest.

E-mail contributions as an attachment in Word or a text file. Text is subject to editing to fit the space available and the quality standards of the magazine. Send photos as unmodified hi-resolution .jpg or .tif files.

free flight also serves as a forum for opinion on soaring matters and will publish letters to the editor as space permits. Publication of ideas and opinion in *free flight* does not imply endorsement by SAC. Correspondents who wish formal action on their concerns should communicate with their Zone Director.

Material from *free flight* may be reprinted without prior permission, but SAC requests that both the magazine and the author be given acknowledgement.

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ASSOCIATION CANADIENNE DE VOL À VOILE

est une organisation à but non lucratif formée d'enthousiastes et vouée à l'essor de cette activité sous toutes ses formes, sur le plan national et international. L'association est membre de l'Aéro-Club du Canada (ACC), qui représente le Canada au sein de la Fédération Aéronautique Internationale (FAI), laquelle est responsable des sports aériens à l'échelle mondiale et formée des aéroclubs nationaux. L'ACC a confié à l'ACVV la supervision des activités véliques aux normes de la FAI, telles les tentatives de record, la sanction des compétitions, la délivrance des insignes, et la sélection des membres de l'équipe nationale aux compétitions mondiales.

free flight est le journal officiel de l'ACVV publié trimestriellement.

Les articles publiés dans *free flight* proviennent d'individus ou de groupes de véliques bienveillants. Tous sont invités à participer à la réalisation du magazine, soit par des reportages, des échanges d'idées, des nouvelles des clubs, des photos pertinentes, etc.

L'idéal est de soumettre ces articles par courrier électronique, bien que d'autres moyens soient acceptés. Ils seront publiés selon l'espace disponible, leur intérêt et leur respect des normes de qualité du magazine. Des photos, des fichiers .jpg ou .tif haute définition et niveaux de gris peuvent servir d'illustrations.

free flight sert aussi de forum et on y publiera les lettres des lecteurs selon l'espace disponible. Leur contenu ne saurait engager la responsabilité du magazine, ni celle de l'association. Toute personne qui désire faire des représentations sur un sujet précis auprès de l'ACVV devra s'adresser au directeur régional.

Les articles de *free flight* peuvent être reproduits librement, mais le nom du magazine et celui de l'auteur doivent être mentionnés.

Pour un changement d'adresse, communiquez par sac@sac.ca. La revue est disponible gratuitement, en format "pdf" au www.sac.ca.

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more dangerous at altitude. This is one of the main dangers of climbing Everest without oxygen. It's cold up there, and there just isn't enough air to burn the fuel in each cell's "stove". Ron was going to get cold regardless, but he got cold faster at 14,000 asl than he would have at the same temperature at sea level. To put in another way, you can be ice fishing longer than you can fly wave. The level of tedium is similar; the thrill is different.

But I only fly during the summer! Where were we? We were saying that one of the reasons to use oxygen is to stay warm. It makes a difference. The simple truth is that a thinly clothed person will lose heat at any temperature much below body temperature. Certainly, by the time the air temperature is at or below 20C, body temperature will drop in an hour or two. This varies greatly with the level of physical activity, but we're really not exercising in the seat of the glider, are we? On the good days, it's cool up high. So we're almost always at some risk for getting cold while soaring, especially if we soar from the desert, where it's too hot for warm clothes on the ground.

Our bodies cool off slowly. As they cool, predictable changes occur that can give us a clue to add insulation, turn on the heater, or descend to a warm altitude. This cooling-off causes slow, subtle, responses that you can use to judge safety. Clues you can use are: cold hands (warm heart), a full bladder, feeling cold (but an unreliable clue to *being* cold), and shivering.

Cold hands, warm heart It's true that your hands and feet will chill quickly simply by being exposed to the cold. What is more important, they will get cold, even inside down mittens and boots if your core temperature begins to decrease.

If your hands feel cold, at least you know that your body is cooling down. Partly, this is because warm hands mean that your body is warmer than necessary, and extra blood is being delivered to your fingers to radiate away extra heat. If you have your feet in warm boots, or your hands in insulated gloves, and they get cold, your body is cooling down.

If you're wearing shorts, as you cool you will see the skin of your thighs begin to look marbled or mottled. The body shuts down circulation to the skin to preserve core temperature. Blood flow to the skin is delivered through an *arteriole* that comes straight up from below, and fans out through the skin across about a centimetre where it enters *venules*. This creates little fingernail-size pale spots, where the supplying arteriole has cinched down creating pallor, surrounded by a pale blue line at its periphery, where there's a little back-flow from the dark deoxygenated blood of the venules. This creates a pale blue honeycombed look. If you see this on your own skin you can be confident you are developing hypothermia.

This skin change is part of a general constriction of blood vessels to the extremities. There are two systems of veins – superficial veins just under the skin that dilate when we're too warm and constrict severely when we're cool, and deep veins flanking each artery in pairs. As we cool down, the superficial veins close down. The deep veins are next to the arteries. Heat is given up from outgoing arterial blood to warm incoming venous blood. You who are engineers will recognize this as countercurrent exchange (opposite flow permits the exchange of warmth).

A full bladder The constricted blood vessels reduce the capacity of our vasculature. Suddenly we have too great a blood volume for the space now available. Blood flow through the kidneys increases, causing more urine to be formed to get rid of the extra volume. So long before you feel cold, before any fall in core body temperature after an hour or so in cool surroundings, you will notice that you have to urinate a lot sooner than usual. This effect is called *cold diuresis*, and its important for two reasons.

The first is that when you land in the heat, your vessels again dilate, but you've urinated away the fluid needed to fill them, to support your blood pressure. This means that you need to be drinking while you warm up, such as during descent. The second is that you get rid of both salt and water, so you need to rehydrate with electrolyte solution or eat some salty food while drinking water, just as if you'd been sweating heavily.

Feeling cold is a clue Feeling warm or cold is related to our skin temperature. If we feel cold, it's because our skin is cold. Generally, this is because our environment ⇒ p28

Into the woods!

Karl Boutin, GGC

... quicksand?! ...

KILO BRAVO IS A GREAT GLIDER FOR LANDOUTS. The ASW-20 will take you anywhere you ask it to go and, if you misjudge what is needed to get back home, KB will gracefully obey the pilot commands and put herself down in any decent field. She really is a fine sailplane, and season over season my partner Rémy and I go out of our way to make sure she gets lots of practice at landing out in new fields.

This year has not been different from any other except, perhaps, that Rémy did decide to perform the initial *aux vaches* of the season. I'm usually the one who warms up KB to landouts, but this time my partner chose to do one in June while I was away in St-Auban, France. I heard getting the glider out of the field that day was a muddy affair. Maybe he expected to find another good stash of chanterelle mushrooms in such a wet place.

When I came back from my holiday in Provence, Rémy and I met for our regular bi-weekly meeting. This is when, in front of a beer and Chinese food, we spend half of our time talking about gliding, KB maintenance, and flying in general. Rémy debriefed me on his wet landing and updated me on what had happened at the club while I was away:

- "Kilo Bravo is all cleaned up and ready to go."
- "More gliders at GGC have FLARM installed now. Maybe we should think about getting one."
- "The new floor in the club house looks great."
- "I have not yet found what the issue is with the Borgelt vario."
- "Don't forget to get the fuselage dolly back from Ulo when you're at the club."
- "We have to redo the W&B soon."
- "KB's main wheel brake is adjusted properly now."
- etc...

A triangle So when I found myself on the low side of the altimeter over the Gatineau Hills last Saturday, I knew I could count on our faithful ASW-20 to perform a good landout. Why was I getting so close to the lakes and hills around Notre-Dame-du-Laus? I am not sure exactly why – I had not been bold – in fact, I was on this northerly 219 km triangle because I had scaled down my ambitions of completing my 300 km Diamond Goal triangle during Fly-week at the club.

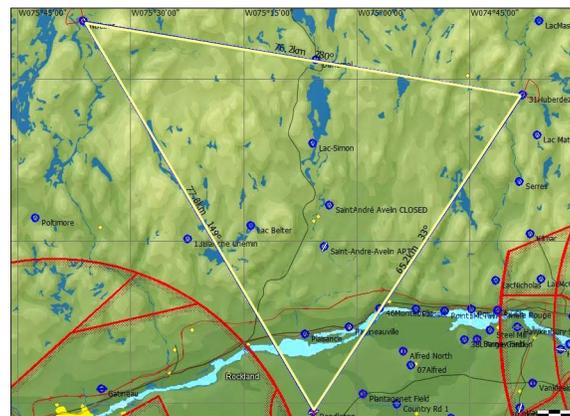
We all had been hoping for the weather to improve during the week, and it had. Tuesday had been a washout but Wednesday saw some flying. By Thursday, I was back

to declaring a triangle in the Colibri. On Friday, I was even able to complete the triangle I had declared that morning. I was all set to go for the big Three Hundred on the next day, and the forecast looked so good... *biblical* was the word used by a member staring at XCSkies on Friday night. Well, *Alleluia!*

But, as we all know, Dr Jack is a jerk. The next morning, the temperature maps were not that epic any more, so I decided to save the 300 km attempt for another day. But it was still going to be nice, and even though it would likely stay blue in the south, over the Gatineaus to the north it was going to be very good. Most of the pilots at Pendleton that morning kept up their hopes. We D'ed and pulled gliders to the end of 26 and then we waited for the cu to pop. I had declared a flight that seemed achievable: Pendleton – Huberdeau – Notre-Dame-du-Laus – Pendleton. It was now almost one o'clock, time to go. I launched at 12:55 and was on my way northeast.

When I fly cross-country, I hear voices in my head. The voices of instructors and fellow pilots giving advice on what to do – or not. When crossing the Ottawa River to the north and flying over the forested Gatineau Hills, the voices always agree: get high and stay high. I sure was going to take their advice and reach for cloudbase early in the flight and stay in the shade of the cumulus for the rest of the day. It took some effort to get started but after a while the thermals began to work for me. With a good average and a good ceiling I progressed, first to Huberdeau, then Notre-Dame-du-Laus.

On the second leg, north of Lac Simon, I renewed my commitment to stay high in the sky. The flight computer displays some alternate landout options but those airfields seem so far on the horizon that you really hope



you will not have to go there. I flew using only the very top of the soaring lift band. Cloudbase, soar a little, climb back to cloudbase, more gliding, rinse and repeat. It all worked fine and that part of my task went without a hitch.

It was 15:15 now and I was the King of the Hills! Now just eleven kilometres from the last turnpoint, I would need one more climb to cloudbase for the victorious final glide to Pendleton. Simple plan. I was getting so good at this cross-country stuff that I had already spotted the cloud, on course of course, that would be my last refuelling stop after Notre-Dame-du-Laus ...

Landout The chosen cloud was fine and gave some lift but I lost patience with its meagre two knots. I had seen my averager buzz at 5 knots for most of the afternoon and I wanted to get a good time on this last lap. Anyway, the cumulus were all lining up on the track toward home so I figured I'd get my lift at the next big black cloud.

There is nothing as disheartening then the sound of a sad variometer. The annoying, sagging, low tone has always made me want to cry.

After I left my last wimpy thermal near Notre-Dame-du-Laus, that was the only sound I heard! I tried all of the tricks in my playbook, nothing worked – I did aim straight for the dark bulge under the next cloud, I did turn 90 degrees, I did sniff around all corners of its huge mass, I even moved over to the neighbouring cumulus, nothing! Sink, sink, and more sink. Soon I was way down below my margin to fly over these hills. All this boreal forest was getting too close

for comfort and I turned back towards Notre-Dame-du-Laus and the Rivière du Lièvre valley.

The region I was over is known for its lakes and hills. It is cottage country, not pasture land. I could spot a few fields cloistered by rivers and forest but the choice was limited. I aimed for a couple of fields that looked acceptable from a distance. My choices were a big brown field east of the village and a small green one by the highway just south of town. When it comes to landing, big and brown is usually better. I drifted toward this one as my first option while keeping tiny green in sight in case I needed a plan B. The glide slope towards them was getting more shallow, and I hardly dared to look at my altimeter at this point. The depressing sound of the vario was still droning in the cockpit and the lakes were getting closer. On a hill just beside the big field, I noticed a tall antenna with its tip already above the horizon! It really was time to concentrate on the landout now:

- *"Big brown field, small green field, big brown field, small green field..."*
- *"Wait a minute... what is that shiny grey stuff on the side, can that be rocks?"*
- *"And what kind of funky surface is that? Nope!"*
- *"Time to switch to plan B – it's small but it looks okay."*
- *"OK, time for the SSSLOW checklist:"*
 - "Slope: Parallel to the road and river."*
 - "Surface: Nice uniform green."*
 - "Stock: Nothing there."*
 - "Length: I see seven power poles – that's long enough."*



"Obstacles: I see the poles and the wires. There are trees at both ends and a kind of island of bush to the side of the field but I will be able to clear all of those."

"Wind: It has been light all day and seems even calmer on the lake by the road."

- *"All right then – time to commit."*
- *"Alpha Tango this is Kilo Bravo. I am about to land out. I'm turning off the radio now and will report once on the ground."*

We are animals of habit. With a left hand circuit, I was about to commit to *Tiny Green*. It was the right choice, providing a good view of the poles, wires, and other obstacles I had to clear. The downwind leg was just over Lac des Pins and the Rivière du Lièvre. A quick glance at the altimeter showed 1800. With this reading in my mind, I was tempted to fly around and try one more time to find the mythical low save. This trick has sometimes worked for me in the past around Pendleton. But my landout training stopped me on this track. I was over a lake and below the hilltops in an unfamiliar environment; I was committed to this landing and I was not going to mess up my circuit. I turned off the Borgelt and kept flying my circuit.

It was a perfect circuit followed by a perfect approach in a perfect field. The touchdown and roll-out were smooth and gentle. If only my friends at Pendleton could have seen this landing, my personal best. I took a deep breath, looked around and enjoyed the moment of peace after such a flurry of thoughts, decisions, and actions. All was now quiet in the cockpit of my 20. But something was odd with the altimeter? It registered 700 feet! I had just landed without taking into account the field elevation in my circuit planning. Flying over the hills all afternoon, I had lost 500 feet as the ground kept on creeping up on me. I did not have height to spare when I read 1800 feet on the altimeter. The circuit that looked right when I was at the entry point over the river looked this way because it was just about right. Lesson learned. From now on I will add Elevation to my landout checklist (SSSLOWE).

Retrieve After all this excitement, I knew I would have plenty of time to cool off under the wing. As the last leg of my triangle was more than 70 km, it meant that via road and the ferry over the Ottawa River, it would take a long time for my crew to show up. I wondered if my good karma would be enough to draw volunteers for such an expedition north. I called the clubhouse standing in my field beside the glider. I may have been in cottage country but my cell was still reading three bars. I gave all the details about my position and requested that the crew call or text me on their way from Pendleton.

I left the field via the main exit and saw that the gate was padlocked. I walked across the road to a fruit stand that was part of the greenhouses I had overflowed on my base leg. Michèle, who was working the cash, was very helpful in trying to find the owner of the field. She made a few phone calls and even offered the keys to her Jeep for me to go to the house next door. *"The family owns this field but on a nice day such as this, they may be boating on the*

river". The house was indeed empty but when I returned, Mr. Bergeron, who had stopped at the stall for corn, knew where to find members of the Thauvette family. He was kind enough to drive me to their house which was just next door to his place. André welcomed me with a wide grin and the standard: *"Did you run out of gas?"* No André. Out of luck, out of wit, out of lift, out of skills, but not out of gas. André drove me back to my field and unlocked the gate.

On the ride out of the village, I noticed the tall antenna which I had spotted earlier that day. *"What is the field behind this antenna"* I inquired? *"That is not a field, mon ami, it is Le Lac à la Vase"*. This big brown patch I was aiming for is in fact an old lake that had filled over time with mud and sand. You can walk briskly on its surface but if you stop moving, you slowly sink to the bottom. People have lost horses and cows in there. Had I stuck to my original field selection, Kilo Bravo may well have ended up in quicksand!

I had my quota of emotions for the day; I was going to grab my book, sit by the road and wait for my crew to arrive. By this time, Tim and Claude had texted me to let me know they were on their way. The ETA from the car's GPS suggested 18:20. With an hour and a half to kill, I had a chance to chill out and move a few chapters forward in my novel. I lay back in the shade of poplars and enjoyed this peaceful summer afternoon. I could hear people having fun with their boats on the water. I watched a float plane taking off from the lake and spotted a Robinson helicopter en route to a cottage. The sun was slowly gliding down in the west and the colours began to slide to amber. Time passed. At 18:45 I began to worry again because my crew was 30 minutes late. I tried reaching Claude via text but I did not get any reply. I had been warned that the signal on the highway between Notre-Dame-de-la-Salette and Val-des-Bois was marginal.

While I was anxiously watching each car coming from the south, Mr. and Mrs. Thauvette and their son pulled over on the road next to me. Rémi Thauvette was André's brother and he was here to have a look at this silly pilot who had run out of gas. I offered an overview of the ASW-20, explained what had happened, how nice their field was, and how I would be out of there in 15 minutes once my crew showed up with the trailer. *"Do you mean a long white trailer with a fin on top?"* Huh?! The whole family had passed such a trailer a few kilometres south on the highway! This meant that my crew should definitively be here by now. Were they lost? Could they have driven by and I missed them because I was so deep in my book?

I was just beginning to figure out how I would run after my renegade crew when, at last, the Cobra trailer appeared at the bend on the road. Tim and Claude had followed the GPS directions which was aiming for the coordinates I had given over the phone. Were the coordinates accurate in the first place or did I read them incorrectly? Were they recorded properly at the other end of the phone or was it just that the GPS device was too dumb to find the right way to the field? My crew ⇒ p28

The “S” curve

Mike Bird, from *Sailplane & Gliding*

a short history of sailplane development, and why has performance gain flattened in the past 30 years?

THE GOLDEN AGE of glider development ran from the early 1950s to the early 1980s. In the middle of that steeply rising curve were the 1965 World Gliding Championships at South Cerney, where I edited the daily newsletter. I saw fixed wheels and wooden wings (some of our British designs sadly looking like starved horses) competing with retracting wheels, flaps and, most importantly, fibreglass with immaculate, wave-free finish.

The Open Class in 1965 was in fact won by a wooden, fixed-wheel 15-metre Foka, and not by the favourite, the 18-metre glass D-36, grandfather of the ASW-22. But that victory was due to brilliant Polish team flying and old style tasks favouring distance over speed.

In the years 1964-74, I owned shares in a Skylark 3, Dart 17, Standard Cirrus and finally a Kestrel 19, each new glider delivering a 10% jump in performance on the previous one. George Moffat said you had to get a new ship every couple of years or so to stay in the running internationally.

My graphs of year against the BGA handicap (the most reliable database of cross-country performance for the most commonly used gliders) show for each class an S-curve levelling out in the early 1980s, or more than 30 years ago. Since then, improvements have been small and confined to superships.

The ascent of 15-metre unflapped gliders shows a classic S-curve from the 1937 Meise to the LS-8 and Discus 2, currently the baseline of 100 for BGA handicaps. The first big leap was from pre-war Göttingen sections to NACA laminar flow sections, for example the Skylark 2. The last two wooden gliders in my chart, the Foka 4 and Ka6E, are rated 81 and the first two glass gliders (the Libelle and Standard Cirrus) average 90. So an improvement of nine points, take away two for retractable wheels, means that a gain of 9% in about five years is due to modern materials. The LS-4 of 1980 is 58% better than the Olympia 2 of 33 years earlier (see the Standard Class graph on the next page.)

Amongst Open Class gliders, the 72% gain in cross-country performance between the Slingsby Sky of 1950 and the ASW-22 of 1981 understates the actual speeds and distances that are now achievable, since the new ships cut

through sink and headwinds, and crossed vast gaps that put the old gliders on the ground before they reached the next thermal.

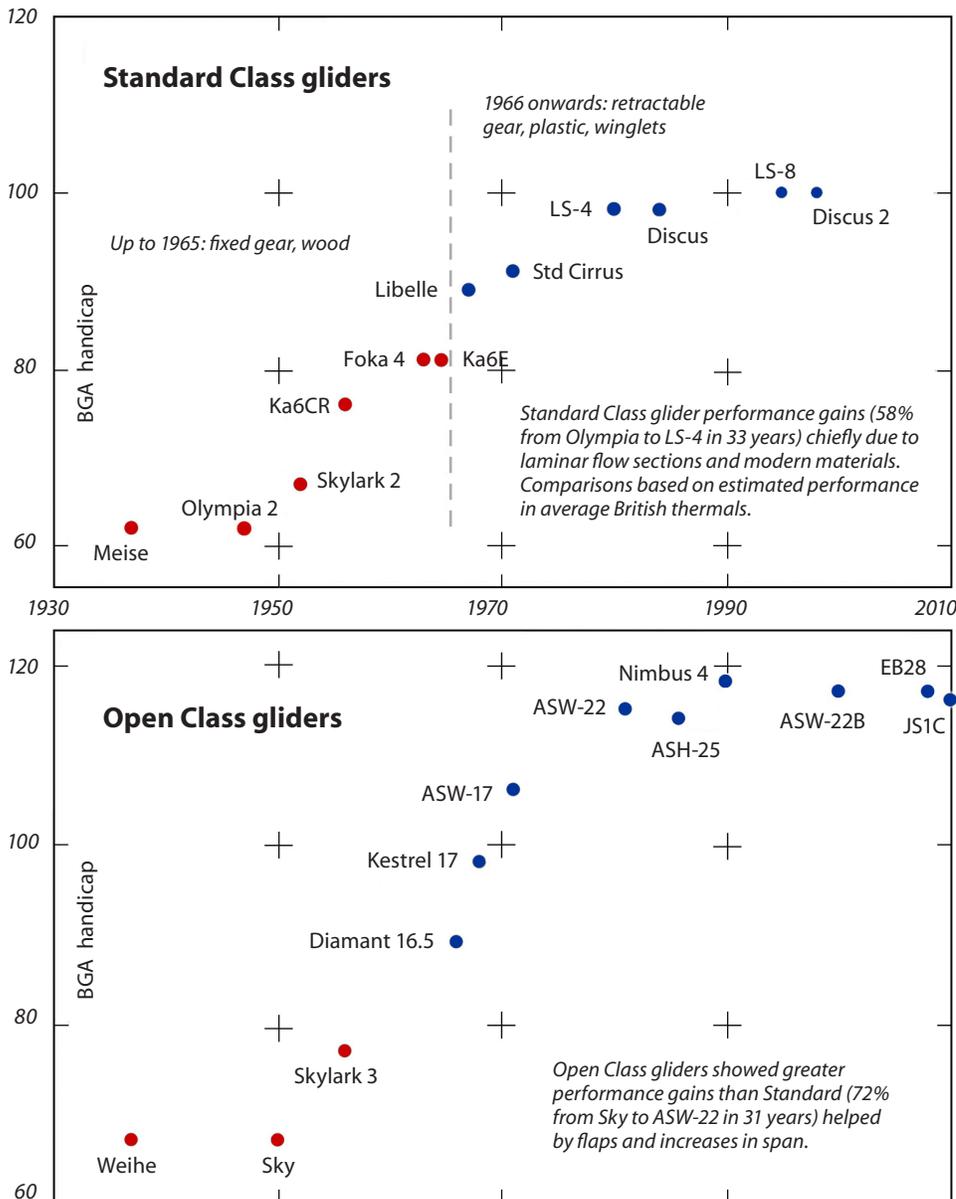
The question of whether Open Class has stagnated is more controversial if you include one-off superships, for which claims are made that are yet to be verified in flight tests, and they have no BGA rating. All my numbers are necessarily based on the BGA rating of generally available gliders. However, our top pilots also tell me that the JS-1 A and C are better than the BGA handicap tables show. These pilots turn in stellar performances in these gliders – perhaps they are too modest to attribute to their own skills, so they give the glider the credit instead. Or are the BGA handicappers underrating the new ships?

Remember that the “British Standard Thermal” gives an average rate of climb of little more than two knots, so the super-flat high speed polars we read about may not be relevant. We spend a lot of time flying 10-20 knots above max glide in this country.

Where did performance gains come from?

I have tried to analyze the respective contributions of new wing sections, span, wheels, flaps, winglets, and materials. I have attempted to compare like with like. Thus where a very similar glider design appears with different spans, I averaged the gain from each additional metre of span. Likewise, one can compare versions of the same glider with and without fixed wheel; ditto flaps. Such comparisons are flawed since important differences may creep in such as from the continuous cleanup of details in later versions of the same glider. Later editions of a type are likely to be better finished because the manufacturer has moved up the learning curve and the workforce have become more expert.

- *Aerofoils* Laminar flow added around 8 BGA points
- *Wheels* Retractable undercarriages add about 2 points
- *Span* Each extra metre adds about 2 points
- *Flaps* Add about 2 points
- *Winglets* Add one or 2 points
- *Materials* Add roughly 7 points, but note Afandi Darlington’s remarks on next page.



The devil is in the details

From the Skylark 3 to the Nimbus 4 is 41 BGA points. But by the formula above, the span difference of 8.5 metres gives us 17 points, retractable wheel another two, flaps another two. Materials seem to make a difference of seven points. So where do the other 13 points come from? Afandi Darlington, former British Team member and aircraft engineer, says: "Once laminar aerofoils became widely used, it was higher strength and stiffer materials which allowed the aerofoils, and so wings, to be progressively made thinner, which continued to drive down drag and increase L/D. One aspect that isn't so obvious when comparing older gliders to new ones is the amount of effort that has been expended in the detailed aerodynamic design of newer gliders – small things like control run sealing, efficiently venting cockpit air, winglets, and the design of tailplane-to-fin and wing-to-fuselage junctions have all helped in the rise of L/D max with time."

Why the diminishing returns?

However, those astonishing gains were mostly made in the 1960s and 1970s. Since then a flattening out has been observed. If glider cross-country performance had already begun to level out – only 50 years or so after cross-country soaring began in Germany – the obvious question is, why? The brutal response must be: Why not? Most technologies exhibit an S-curve in their development. In the case of piston engine aircraft,

after advances in the 1920s and 30s thanks to stressed skin cantilever wings, retractable wheels and variable pitch props, the limiting factor was the speed of sound, which the propeller tips were hitting as the aircraft approached 500 mph. Jet engines were the breakthrough that moved us on to a new S-curve.

The 100:1 sailplane: will it fly?

Obviously one asks what the next breakthrough technology for gliders will be. Boundary layer suction may be the nuclear fusion of glider designers. It seems to have been so for the past 30-odd years. It will apparently need 500 watts or two-thirds of a horsepower, equal to two men's pedal-power. An ASH-25 descending at one knot is using five horsepower. If gains of 30% are envisaged through suction, the power required should be provided by a fan driven by the glider's own forward movement, since the glider should gain roughly twice in wing drag performance what it would lose from the fan. However, that would not propel us to 100:1 L/D. But I suggest that an aircraft using any other method to achieve suction – eg. batteries or solar panels – is not really a sailplane.

Always look on the bright side of life

It's the pilots, instrument makers, and forecasters who are getting better! Are they the new S-curve?

FURTHER READING

Dr. Loek Boermans of Delft University wrote three important articles in S&G 2009 (Jun/Jul, Aug/Sep, Oct/Nov) covering all major aspects of sailplane aerodynamics, including opportunities for sizeable future reductions in drag and increases in lift using boundary layer suction.

Concordia – a joint effort between Dr. Boermans, Gerhard Waibel (designer of all the ASW- gliders at Schleicher), Johannes Dillinger (master thesis student at Delft University and supervised by Boermans and Waibel) and Dick Butler in the USA – reflects much of this thinking, except that suction is not employed: nevertheless a max L/D of 75:1 is currently estimated, some 20-25 per cent higher than achieved by the top gliders of 20 years ago.

The correlation between max L/D and cross-country performance in UK weather is around 0.95 (reflecting the weak conditions very often encountered) so a handicap of over 125 should be expected if Concordia or its derivatives were to feature regularly in UK contests and require a BGA rating. ❖

2014 Nationals

Ray Wood, GGC

Mother Nature 7 - Pilots 4

AT THE PILOT MEETING at the end of the practice days, I was asked several times if had I flown on Sunday – from every report it was a day that should not have been missed to do chores at home. Darn, made my first major judgement error and the contest hadn't even started yet.

Tuesday June 24 was the mandatory pilot evening meeting. All of the local airspace and other mission-critical data was shared with the pilots and crew to ensure a safe and uneventful few days. The Task committee was chosen, and I think the person who nominated me thought I would keep the tasks manageable (*small*) since I was again at the lowest end of the polar curve for this contest.

There were two types of tasks used for this contest, the Turn Area Task (TAT) and the Modified Assigned Task (MAT). In this issue you will see an article by Willem Langelaan that explains these tasks and the best way to fly them. There were elements that were common to both types of task. The start cylinder had a 5 kilometre radius cylinder around SOSA that allowed gliders to spread out while climbing to altitude waiting for the start gate to open. This cylinder had a 5000 foot cap on most days so that a start could be accomplished simply by climbing in a thermal to above the capped altitude or by flying out of the side of the cylinder below 5000 feet. On the windy days I was drifted so far downwind gaining altitude waiting for the start it felt like I had gone to another turnpoint just crossing the 10 kilometre width of the cylinder – a top-up was needed to accomplish a good start.

The finish was a 2 km radius cylinder at SOSA to separate aircraft finishing from different directions. It had a safety altitude of 650 feet agl to ensure there were no dangerous final glides that may have been safer as landouts. Anyone arriving

below that altitude was assessed penalty points on a sliding scale according to how low they actually crossed the cylinder perimeter.

Each day after studying the weather data, we would set a task duration depending on the amount of time we believed there would be useable lift – long enough to be challenging, while at the same time respecting the need to be safe, with late starts some days and weather moving in early in the day on others.

The TAT worked well for Club Class as we had such a wide variety of gliders with the ability to average 50 km/h at the low end to 100 or more at the top end of the performance range. TAT allowed us to fly on days we weren't sure some parts of the task area would be working well, so large cylinders could be used, up to 20 kilometres radius were common to accommodate both weather and glider performance.

The number of turnpoints varied each day; on one of the days where we were uncertain how the day would develop, we called for one turnpoint which would give the minimum scoring distance required by doing a simple out-and-return. Not a call popular with all of the Task committee, in the end we were just trying to find a way to get a day where the minimum number of pilots could fly scoring distance in marginal conditions.

Wednesday June 25, no contest; Mother Nature wins the day. The next day was memorable only for being launched into rain showers, being shot down, sitting on the grid with the rest of Club Class, and relighting only to get rained on again in the air. Upon de-rigging I discovered I had a good load of non jettisonable water ballast stored in the spoiler boxes. Good thing we didn't fly, PW-5s aren't supposed to carry water ballast, I'm sure there would be a penalty in there somewhere. That evening we had a great pulled pork dinner. Traditionally at contests everywhere there is always great food to look forward to at various planned meals, but the flying we all came for was absent, so 2-0 for Mother Nature.

Friday June 27, *Woo-hoo!* we get to fly. The weather looks not only promising but we are certain as we set the tasks we were going to actually head out on course and fly them. We had one major consideration for task setting, the Waterloo Airshow was this weekend. Practice for the air show was today. The airspace for the Waterloo control zone increased in diameter making it impossible to plan tasks to the north through the already narrow



Bill Cole studies his task

Martin Brassard

corridor between the Waterloo and Toronto airspaces. For Club Class, a 3 hour TAT was called: Ohsweken, Straffordville, Waterford, and finish.

Looking at the sky from the grid towards the first turnpoint, I knew we were in for a good day, there was a cloudstreet heading from the start area to the first turnpoint cylinder. I followed the street, deep into the first turn area, I could see a lot of blue on course to Straffordville, I was anxious to make the best of the cloudstreet that persisted well after the gate opened. As I turned towards Straffordville, I planned a curving course line to stay under the clouds and avoid the potential landout by flying in the blue. My strategy worked, getting me to the turnpoint 2 circle even if it was the long way around.

After nicking the cylinder, it was clear my race was not with the other pilots but with the cirrus that was shutting down the thermals just west of my location. I raced towards the Waterford turnpoint, relieved that only a slight detour would allow me to nick this cylinder as well on my way home. Bumping along on anything going up, I was resigned to a landing at Brantford airport and a towplane retrieve. I had enough altitude to explore an area just north of the airport that seems to always generate thermals, and I was rewarded with a boomer that put me well above final glide – I wasn't racing any more, I just wanted to actually finish. To my surprise when the scoring was complete, I was 6th of 14 for the day, once again avoiding the dreaded FDL (Finished Dead Last).

June 28, Day 2. The weather isn't just promising, it looks great! The Task committee meeting planned 4 hour tasks designed for both classes. For Club, the task was St. Marys, Palmerston, New Hamburg, Ingersol, return.

We came to race and be tested and this was going to be a test indeed. When the gate opened I was not high enough to head out on course but elected to start anyway. I knew conditions would improve as I headed west. The first half of the first leg was a real nail-biter (who's got time for that when you're getting on a first name basis with squirrels in tall trees). Things improved just north of Ayr and went well all the way to Stratford, where I spent too long looking down at the fine airport I really did not want to land on. I struggled along on course, eventually digging out of the weeds and had a relatively relaxing flight until I was trying to make the Ingersol turnpoint near Woodstock. I got home on my own, it was a trying flight, I made it to the airport with just enough altitude for a base leg. Getting to SOSA without a towplane or trailer was about as good as it gets. Scoring complete, I was 10th place in Club Class – I wasn't disappointed.

June 29 was cancelled at the morning pilot meeting. June 30 was the most tiring day of the contest to date. A sniffer was sent up three times but was unable to climb above 2400 feet, not enough to launch the grid. July 1, again no contest, but the promise of a cold front had us looking forward to some great soaring to come. The eternal optimism of glider pilots. July 2 – Mother Nature wins again. I've long since given up on counting which contest day it was. It was chicken BBQ day though, which was a hit. Now it was July 3 and becoming boringly repetitive! The last several days' non-participation

by the weather was the result of two frontal systems stalled by a hurricane progressing slowly up the east coast. We are running out of time. There is a discussion on voting to extend the contest into Saturday to get the two more days of the four required to have an official contest.

Friday July 4 The cold front has passed and it will be flyable today. A 3 hour TAT is called for Club. The turnpoints are selected to put us near Lake Erie if the convergence of lake and land air masses produce a "sea breeze" convergence line. Our task is St. Thomas, Hagersville, and return.

I was thrilled with the weather, the task we had set, and the opportunity to run along a sea breeze front. With a strong crosswind to battle on the way to the first turnpoint, it was clear this would be another trying day. On the first leg, the day met expectations, it was a long way into wind to the first turn. It was clear to me that it would be yet another 'nick the cylinder' day. As I reached the turnpoint area, I could see that a classic sea breeze cloud formation was too far out over the lake and way off line, so I had to settle for staying more or less on track. In spite of being well away from what I usually think of as the strong part of the sea breeze, I found strong lift and was able to complete one of my fastest legs at 68 km/h (I am flying a PW-5). All was going well until I left a thermal near Ohsweken. I watched several pilots who had converged on this area move on a more westerly track. I chose to fly a more direct track which was too close to the Hamilton control zone. It was a decision-making error I would soon recognize.

West of Jerseyville and only 13 km from SOSA, I needed a get-home climb badly, I found a thermal generated by a pile of brush being burned, through grim determination I climbed 1500 feet but was being drifted back over the countryside I had just flown over and too close to the Hamilton airspace and XCSoar beeped at me. Heading back on track for SOSA I returned to the same thermal source at a hundred feet higher than the last trip. Trying every source imaginable, nothing was going up and I landed 3 kilometres from my house. At least I was close to home for a quick shower before heading off to Flamborough Hills Golf Club for the "Final Banquet", even though we were going to have that extra day tomorrow to try for an official contest. I was very disappointed to see that my landout cost me two positions on the score sheet. Well, if you don't have a great score, then you better have a good story. My experience is that landouts usually make great stories.

July 5: Day 4 finally. The weather report looked good – with a few caveats – it would be a blue day and winds were forecast to be 12-15 knots out of the northwest. I'm not enthusiastic about flying in the blue, and add strong winds in an aircraft that doesn't penetrate well – this was going to be a test.

The A task called for 3 hours, but with pilots struggling to climb, I radioed down to CD Tom Coulson for a change to the B task of 2.5 hours: St. Marys, Ohsweken, and return. Today was the only day I had put the B task ⇒ p29

2014 CANADIAN NATIONAL SOARING CHAMPIONSHIPS	27 June				28 June				4 July				5 July				total score
	DAY 1				DAY 2				DAY 3				DAY 4				
	pos	kph	km	pts	pos	kph	km	pts	pos	kph	km	pts	pos	kph	km	pts	
CLUB CLASS	3 hour TAT				4 hour TAT				3 hour TAT				2.5 hour TAT				
1 Anthony Kawzowicz LS-4 DW	1	69.6	208.1	a978	4	67.3	312.5	876	1	80.9	256.2	1000	4	64.7	162.5	970	3824
2 Krzysztof Wiercioch SZD-51 XN	2	68.8	207.6	966	2	70.0	311.9	912	6	73.0	241.7	902	6	61.9	160.4	927	3707
3 Roger Hildesheim SZD-55 AT	9	57.0	172.7	800	3	69.5	277.2	a905	7	72.1	247.7	892	5	62.7	156.5	a939	3536
4 Bill Cole Mosquito BC	8	58.8	175.7	a825	5	65.9	262.3	a858	2	80.0	247.1	989	11	53.6	132.4	a803	3475
5 David Cole SZD-55 AF1	4	60.0	179.6	a842	6	61.7	312.5	804	3	79.5	251.9	983	9	55.4	155.7	829	3429
6 Robert Zachemski SZD-55 Z	10	56.7	169.6	a796	7	60.2	240.0	a784	5	73.0	252.1	903	12	53.0	140.1	794	3277
7 Matt McKrell ASW-19 6H	3	61.4	183.1	a863	9	56.6	223.7	a737	9	65.4	240.2	809	8	57.8	164.8	866	3275
8 Ray Wood PW-5 VS	6	59.4	193.1	834	10	56.5	257.3	736	12	–	212.4	523	2	65.4	168.2	980	3070
9 Stan Martin Mini Nimbus Z1	7	59.1	178.6	829	12	–	172.5	c373	4	76.5	246.3	945	7	58.2	201.3	872	3019
10 Tom Butts LS-4 SO	5	59.9	178.9	a841	1	74.1	311.2	965	13	–	60.9	150	1	66.8	205.3	d990	2946
11 Rafael Nunes SZD-55 RN	11	56.2	164.4	a789	13	–	68.7	cl64	11	62.2	221.5	769	3	65.1	170.7	975	2697
12 John Brennan DG-505 Elan 505	12	51.9	152.4	a728	14	0	0.0	0	8	69.2	226.6	855	10	55.1	136.4	a825	2408
13 Selena Boyle SZD-51 NN	14	46.3	170.7	649	11	53.3	253.3	695	10	62.8	219.5	776	13	–	27.8	e85	2205
14 Hans Juergensen ASW-20B J3	13	46.8	138.6	a657	8	57.8	229.5	a752	14	0	0.0	0	14	0	0.0	0	1385
FAI CLASS	3 hour TAT				3 hour TAT				3 hour MAT				3 hour MAT				
1 Jerzy Szemplinski ASG-29 XG	1	85.4	255.9	a984	1	87.3	277.7	1000	5	89.5	285.6	947	1	91.9	280.1	1000	3931
2 Dave Springford ASG-29 F1	3	82.3	246.0	a948	3	86.2	263.3	988	3	93.0	281.3	985	3	84.1	260.6	915	3836
3 Sergei Morozov ASG-29 MS	4	82.1	245.2	a946	4	80.7	258.8	924	2	94.2	299.0	998	2	85.1	269.4	926	3794
4 Jörg Stieber LS-8-18 JS	2	85.1	254.7	a980	2	87.2	288.1	999	6	86.7	287.1	917	5	79.1	246.6	861	3757
5 Chris Gough LS-8 44	5	79.0	239.6	910	7	71.9	278.9	824	1	94.5	284.9	1000	4	81.5	244.6	888	3622
6 Luke Szczepaniak ASW-27 2W	6	77.5	229.6	a893	10	65.7	298.3	753	9	81.9	312.8	867	6	78.6	283.7	856	3369
7 Pierre Gavillet LAK-17A PG	10	66.3	195.8	a764	9	67.4	236.9	772	7	84.0	251.8	a890	7	74.3	227.4	808	3230
8 Willem Langelaan Antares OX	7	76.1	228.0	a877	5	77.9	236.0	893	4	89.9	277.8	952	8	41.8	143.9	455	3177
9 Ray Bourgeois ASG-29 ROY	9	68.8	204.9	a793	6	74.5	256.1	854	10	79.2	240.4	838	9	0	0.0	0	2485
10 Frere / Hansen Duo Discus LI	8	70.0	208.9	a807	8	69.9	248.2	801	8	82.3	256.5	871	9	0	0.0	0	2479
11 Jean-Yves Germain ASG-29 VV	12	0	0.0	0	11	58.4	237.2	669	11	60.9	225.0	644	9	0	0.0	0	1313
12 John Brake Kestrel 42	11	56.3	183.9	649	12	0	0.0	0	12	50.0	158.9	529	9	0	0.0	0	1178
Handicapped values shown. Penalty codes: (a) time less than minimum (b) distance under minimum (c) 25 pt airfield bonus (-) landout (d) finish penalty (e) distance under 50 km																	



Maria Szemplinska

The Nationals winners and runners-up. From the left: Chris Wiercioch (2nd in Club Class), Roger Hildesheim (3rd in Club), Anthony Kawzowicz (winner in Club), Jerzy Szemplinski (winner in FAI Class), Dave Springford (2nd place in FAI), Sergei Morozov (3rd place in FAI).

Flying MAT and TAT tasks

Willem Langelaan, SOSA

managing your time on these competition tasks

IN THE SOARING ASSOCIATION OF CANADA rules for our National Soaring Competition, the traditional racing having a limited set of assigned turnpoints is no longer included. Instead, the task committee is limited to selecting a Turn Area Task (TAT) or a Modified Assigned Task (MAT). Both tasks share a minimum flight time that is set by the Contest Director (CD). This makes time management an important strategic aspect of either task. This article reviews timing decisions for both tasks. But first, have a look at the definitions here that are used in the SAC 2014 Rules & Regulations.

MAT (Modified Assigned Task) *“The objective of this task is to achieve the best speed over a course of one or more turnpoints with a finish at the competition site. A competitor has to finish the task in order to receive a speed score.”*

The CD shall designate a minimum flight time and a sequence of up to 11 turnpoints. Designated turnpoints must be attempted in the designated sequence, but a competitor may elect to finish after any turnpoint in the sequence. Successive turnpoints shall be no closer than the minimum leg length.

A competitor who achieves all designated turnpoints may elect to fly to additional turnpoints. Such pilot-selected turnpoints must comply with any restrictions the CD has imposed and no turnpoint may be repeated unless at least two intervening turnpoints are claimed (Start and Finish are not turnpoints). The CD may:

- restrict the maximum number of turnpoints to a number less than 11;
- restrict the number of times any particular turnpoint may be claimed;
- designate a final turnpoint that all competitors must use immediately prior to a finish. This final turnpoint shall be no further than 10 km from the perimeter of the finish cylinder.

The Contest Manager shall make a task claim form available for this task on which the competitor shall list all turnpoints claimed in sequence. For tasks not completed, the competitor shall specify the next intended turnpoint. If the next intended turnpoint is not specified, the Finish Point shall be used. A competitor does

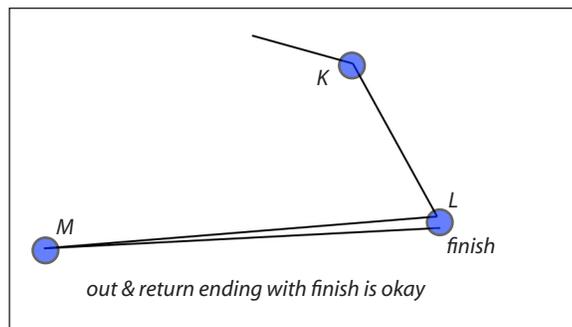
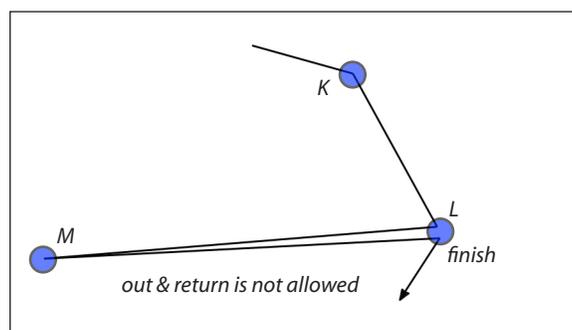
not have to claim all turnpoints achieved. A competitor may submit a subsequent task claim form for the purpose of obtaining a more accurate score before the results are official.

TAT (Turn Area Task) *“The objective of this task is to achieve the best speed over a course consisting of start, one or more Turn Areas, in the specified order, with a finish at the competition site. A competitor has to finish the task in order to receive a speed score.”*

A Turn Area (TA) is a cylinder centred on a turnpoint. The CD shall designate a minimum flight time, a sequence of one or more TAs and a radius for each which shall be an integral number of kilometres with a minimum of 2 km. The perimeters of successive TAs shall be no closer than the minimum leg length, and they cannot overlap.

flying by the MAT rules

MAT turnpoint decisions A MAT consists of designated turnpoints and additional turnpoints. For the designated



turnpoints, the rounding sequence is mandatory, yet the number that are rounded is optional. Even after just rounding the first TP the pilot can return to the finish to receive a speed score.

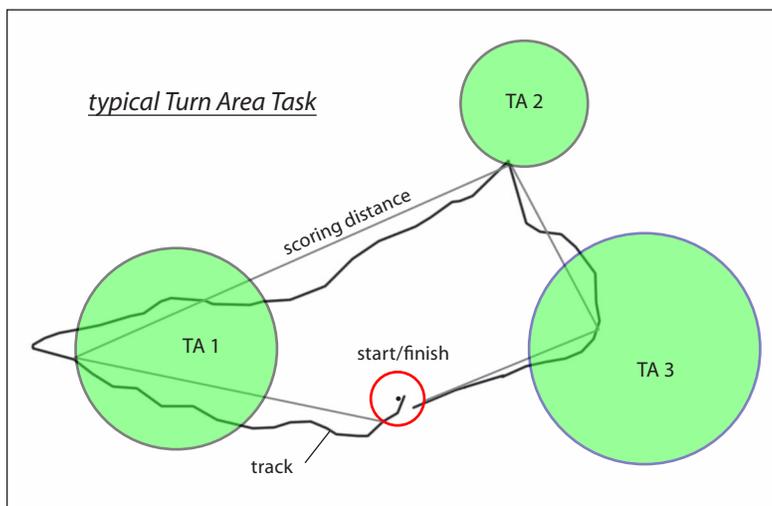
Additional turnpoints After all designated TPs are rounded in the required order, a pilot may elect to fly to additional TPs. An out-and-return is not allowed, ie. from turnpoint L to M and back to L is not allowed. A triangle is allowed, ie. from turnpoint K to L to M to K is allowed. Note that the start and finish are *not* turnpoints. If the finish coincides with a TP then an out-and-return that ends with a finish is allowed.

The sum of designated TPs plus claimed additional TPs shall be not more than eleven. However, a pilot may fly to any number of TPs, but no more than eleven can be claimed. After landing the pilot can choose from the rounded additional TPs to claim the greatest scoring distance. If by mistake an out-and-return sequence was flown, then one of these TPs must be excluded from the claims list.

flying by the TAT rules

TAT turn area decisions To receive a speed score in a TAT, each turn area (TA) must be reached in the specified order. If a TA circle is not reached the pilot will only get a distance score.

The pilot must decide how deep to fly into a turn area circle. The TA can be "nicked" or can be flown to a good looking cloud near the edge of the far side of the circle or anywhere in between. General practice is to fly as deep into the first or second circle as conditions warrant, to be prepared for a change in weather conditions later during the task.



When weather conditions improve the cross-country speed increases. If not enough time was spent to fly some distance into earlier TA circles, then it could happen that even extending the flight to the opposite end of the last TA may result in an under time finish with a less than optimal flown distance.

Conversely, if the weather deteriorates it is advantageous to have more time spent and more distance flown into a TA earlier on with a higher cross-country speed. When arriving at the last TA there will be less time remaining. Thus less time needs to be spent in a slow speed struggle in weak conditions to finish at or over the minimum time.

MAT & TAT time management

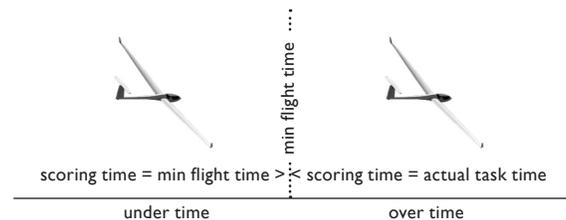
Scoring time

The CD assigns a minimum flight time for each task instance. This is interpreted by the scorer as follows:

- if a pilot finishes the task under time, the minimum flight time governs and will be used to calculate the scoring speed, which will be less than the task speed.
- if a pilot finishes the task in over time, the actual time on task from start to finish will be used to calculate the scoring speed.

Example 1 minimum flight time = 3 h
total task speed = 80 km/h
total time on task = variable

task time (h)	task speed (km/h)	dist. (km)	scoring time (h)	scoring speed (km/h)
2.5	80	200	3	66.7
3.5	80	280	3.5	80.0



Timing decisions

Planning to be right on time is the optimum strategy. In a well-flown race the final glide is the fastest portion of the flight. The pilot can skip at least one and maybe two climbs – it's pure cruising. This will increase the task speed for the flight. The larger the percentage of the time spent in final glide, the larger its effect on the overall task speed.

Example 2 minimum flight time = 3 h
speed up to final glide = 80 km/h
final glide speed = 160 km/h
final glide time = 18 minutes or 0.3 h
final glide distance = 160 x 0.3 = 48 km
total time on task = variable

task time (h)	to final glide (h)	to final glide (km)	final glide (km)	total task (km)	scoring speed (km/h)	dV (km/h)
3.0	2.7	216	48	264	88.0	0.0
3.1	2.8	224	48	272	87.7	-0.3
3.5	3.2	256	48	304	86.9	-1.1
2.95	2.65	212	48	260	86.7	-1.3
2.9	2.6	208	48	256	85.3	-2.7
2.8	2.5	200	48	248	82.7	-5.3

⇒ p27

attempting the ‘holy grail’

Mike Morgulis, Toronto Soaring

IT WAS BILL COLE WHO TOLD ME that Kerry Kirby and Dean Toplis were mulling over selling their Jantar at a beer night that I had to miss last year. Bill hadn't finished the sentence before I pushed the "send" button on my phone, letting Dean and Kerry know that I would like to buy 69. Their beloved glider would soon change hands, only the details of price and bank loan remained as variables. (I extend thanks to my bank's loan officer who suggested that calling it a "vacation loan" was a good way to go, thus avoiding an assessment by the bank staff who admittedly knew nothing about sailplanes.)

My first flight in 69 took me from Great Lakes Gliding to its new home at Toronto Soaring, with Nate (my oldest kid) bringing the trailer. I enjoyed a few more Jantar flights in 2013, logging a few hundred kilometres. However, no electronic gadget I owned would speak with its Cambridge 302 flight recorder, so all of those flights only remain in my memory.

After an inch-by-inch annual from club member and resident AME Vic Guerreiro, I flew 69 on a blue day on its first flight this season, 145 km. I had let the winter slip by without fiddling with the 302, so again, no flight downloads. I loaded *SeeYou* onto my iPhone and tested it on a short XC flight with Nate in the Puchacz, and uploaded it successfully to the OLC. Hurray! I flew 69 a couple more times and made sure that the trailer was shipshape. It was time to go XC in earnest and try my first 300 km flight. I've been flying since 1991, and other than a few contests and XC flights hovering near 200 km, I've been busy instructing. Buying 69 was my chance to really spread my wings.

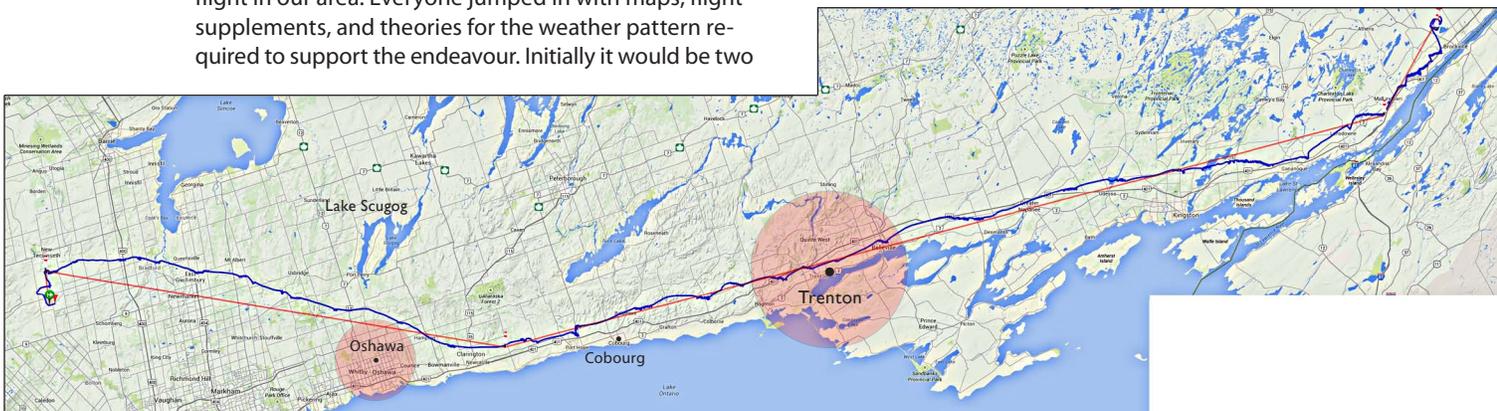
In mid-June, I drove over to Great Lakes to see the gang, grab a burger, and catch up on old times. When I arrived, Kerry and Tom Robertson were vocally musing about a 500 km downwind dash to Montreal, the "holy grail" flight in our area. Everyone jumped in with maps, flight supplements, and theories for the weather pattern required to support the endeavour. Initially it would be two

Ka6s and two Jantars, but then it was down to Kerry in his -6E and Tom and me in the Jantars. We planned more by e-mail. Over dinner and beer we programmed data devices and marked up maps. Dean and Suzanne Lafontaine joined us again and fed us more intel for the Quebec leg of the trip (always nice to have the inside scoop from native Quebecers), and also arranged prior permission from the friendly owner of the airstrip in St. Michel de Napierville where we hoped to finish. This grass strip is just outside of the Montreal control zone, 512 km from Great Lakes.

On the prior Wednesday, Kerry said that a high pressure was moving in favourably for a Saturday attempt, 5 July. We confirmed final plans on the Thursday (I was getting tired of beer by this point so I had ginger ale). On Friday we each packed and prepared, and on Saturday morning Nate and I drove at the crack of dawn to Toronto Soaring to get the Jantar and tow it the 50 km over to Great Lakes to meet up with Kerry and Tom. The cut-off for the day was 11:30, and almost by pure will, a small cu appeared over the club, followed by one over Beeton. Kerry took off first, and before I had even launched, he radioed that he was off on course.

I thought I'd rigged the Jantar wrong somehow as there was a noticeable angle of attack on aerotow and no hope of getting into the high tow position. Once I released, normal attitudes returned and only then did the penny drop – the Pawnee has about 100 more HP than a Citabria. I connected with a thermal that gave me enough height to reach Alliston to the north where I could climb higher outside of the Pearson Zone. Tom called up... he was delayed in launching.

The drift eastwards was immediately apparent in my climb over the Honda plant at Alliston. The lift below



4000 feet was weak and broken, but above 5000 feet it worked really well, and cloudbase was at 6400. This meant a relatively narrow working band for the day. Kerry called over to find out where I was – I was still behind him. He drove 6E hard and was pressing the attack. I pushed the nose down and flew towards the next patch of cu by Bradford, noting my sink rate and speed. I didn't want to top-up every five miles; I certainly never flew that way before, but the sink was strong so I didn't want to spend extra time working a thermal lower down. I decided that if there was lift around 5000, I'd top-up quickly and head out on course again.

As I circled, I noticed that the thermal I had left previous to the current one had evaporated. As soon as I headed out from what I determined was the last thermal in the area, a cloud suddenly appeared exactly where I thought I'd need it next. When I spoke with Kerry, he said the same thing was happening to him. We were at the beginning and end of the local development. Tom called up, said he couldn't connect, and decided to fly locally for the rest of the day. We were covering lots of ground in a short amount of time. I'd been up for almost an hour and had still not seen Kerry in 6E – it turns out that we were flying a parallel course with me running a cloud street immediately south of him.

After Bradford, I altered course towards Clarington, flying between Lake Scugog and the north side of the Oshawa control zone. My 302 still wasn't happy with me, so navigation continued with my finger on the map, my compass, and my watch. Kerry's theory was that no two lakes looked the same, and one couldn't miss Lake Ontario by this point. Yes folks, sometimes it really is just that basic. I seemed to be doing okay, my iPhone was still logging the flight, as was the 302, and I turned down the volume on the ILEC as it had started to become annoying.

Kerry and I finally met up around Coburg; we had a great run in the convergence from Lake Ontario, which gave him an average L/D of almost 60:1 – greater than 200:1 at one point! The Ka6 was nicely positioned to my right, and I thought it a great time for a photo, so I fumbled around the cockpit looking for my digital camera. By the time I found it, we were in lift again.

At Brighton we were at the west end of the Trenton control zone so I volunteered to call up for permission to enter. It had been many years since I'd called a tower, so to say I was nervous was an understatement. I checked the frequency cheat-sheet which had been prepared for us and called:

"Trenton Tower, this is glider Charlie Golf Golf Bravo Whiskey."

Almost instantly came the reply,

"Golf Golf Bravo Whiskey, go ahead."

"Golf Golf Bravo Whiskey is at 4500' agl flying cross-country from Tottenham on an eastward course towards Kingston, with another glider two miles west, Xray Sierra Xray."

"Roger Golf Golf Bravo Whiskey, you're cleared to enter the zone. Tune One Two Zero Three, report back alongside the tower."

I stared blankly at my radio, I had nothing that resembled a 1203. I had my "aha" moment at the same time the controller asked me to repeat my aircraft type.

"Golf Bravo Whiskey is a glider."

"Uh... roger that. You don't have a transponder?"

"Negative, no transponder."

"All right, Golf Bravo Whiskey... hang on a moment."

My radio suddenly made a sound it has never made before, something like a coffee grinder and a milkshake mixer; it lasted for about 5 seconds.

"Uh, okay, Golf Bravo Whiskey, I see you both now. Continue on your heading, there's helicopter traffic inbound but I'll keep them below you."

I'd just been scanned by primary radar! I could have sworn that I could see my bones right through the skin for those five seconds. He asked me to keep north of the 401 which was fine with me; my thermal was tracking nicely on that route. I remembered to tune back to 123.4 and let Kerry know that we had the green light to enter and then returned to the tower frequency. A short cloudstreet appeared so I followed it. The drift to the south was a bit stronger than I wanted, so I radioed down again to let the controller know where I was.

"Trenton Tower, this is Golf Bravo Whiskey reporting by the tower, 5500' and climbing. I've drifted a bit south."

"Roger Golf Bravo Whiskey, I see you. Can you maintain altitude? There's inbound traffic."

"Negative, Tower, I'm still a glider – I'm climbing if that helps."

"No problem, traffic is below you. I've called Kingston to let them know you're heading their way. Will you be flying over 7000?"

"Negative, it's not that good a day, I'm almost at the top now at 6200', heading east."

"Okay Golf Bravo Whiskey. Traffic clear, use the zone at your discretion and report at the east boundary."



Kelly and Mike at Brockville

Nate Morgulis

I knew Kerry was somewhere behind me, but I never heard him on the radio, so I thought he was just monitoring. Turns out he was on the terminal frequency. I never saw him in the zone either, and part of me started to get worried, but I figured that he'd be fine as there was a runway just below us which could definitely handle a glider! Kerry later ribbed me that I wasn't merely abeam the tower when I called in, but directly over top of it. I'm waiting for his final version of the story that has me flying past its windows! Regardless, I got scanned by radar a few more times as I flew eastwards.

Soon enough I was over Belleville, my mum's home town, and I called the tower once more to let them know that I was exiting the zone. I thanked the controller for his help and he wished me well on the rest of my flight. It was a slow day for this guy I figured, and not every day that he had two gliders transit his zone. It was definitely a positive experience.

A few minutes later Kerry called me on the radio and we met up at Napanee. We started to turn a bit northwards to keep the shoreline to our right. Kingston was the next big hurdle, the airport and control zone were far to the south. The terrain looked horrible on the maps, but we could definitely see landable fields below us. Unfortunately, the wind was more northerly now, and more importantly, the convergence was gone. Getting to Gananoque was the toughest leg of the trip – we spent about an hour down low mucking around in weak lift and hoping it would get better.

I had one thermal which seemed strong and was building past 5 knots in one spot. On the next turn the needle pegged the good side of vario but a split-second later the sky fell out from underneath me. My head bounced off the canopy and there was literally nothing on the instruments, accompanied by silence. Two skipped heartbeats later everything returned to normal. I recentred and braced for the 'air pocket' as I went around again, and hit it despite the shift. It was cancelling out my climb on the other 9/10 of the thermal. I recentred one more and managed another circle, while trying to avoid the sink... again with the awful thud. Kerry started to head over to me but I warned him away as I left. Just as well, we were drifting over the St. Lawrence towards the USA, and I didn't want to test their air defence system.

We hit marginal lift just west of Brockville by the shore, trying to climb and connect with the cu to the east. The thermals were weak and broken, and it was now 5 o'clock. Kerry headed north while I struggled to get a bit more altitude – the Ka6 had an advantage in the weak lift. A freight train appeared underneath me and triggered the release of a thermal which took me up a thousand feet. I made a mental note to include train schedules in my preflight.

Kerry and I mulled over our options and decided to land at Brockville airport; Montreal would have to be enjoyed by two other glider pilots. He elected to land first as he had higher wings than me and he'd check for runway lights. I had some excess altitude to burn off so I did

some wingovers and rolling on the point. I radioed my intentions, lowered the wheel and relaxed into a good circuit. I kept a bit of energy on final so that I could fast-taxi to the apron. I was rewarded with a chirp as the main wheel made contact with the tarmac. The crosswind pushed me a bit to the left, so I steered right, then left, enjoying zig-zagging the rest of the way down the runway. Kerry said it looked like I was trying to avoid a torpedo. Eventually I came to a stop and we pushed the Jantar onto the apron alongside the Ka6.

The airport was completely deserted; we walked around a bit, checked out the main terminal building, and poked around the hangars. Nate showed up with 69's trailer an hour later; Dean and Suzanne had issues with Kerry's trailer but after a trip to Canadian Tire, trials with three different voltmeters and finally a workable solution with the trailer lights, they arrived just after sunset, which was when the mosquitoes in the surrounding swamps decided to take flight. We looked like flailing idiots as we derigged the Ka6 and put it into its trailer.

Only one restaurant remained open in town, a *Swiss Chalet*. I'm not sure how a place which serves chicken as a specialty can suddenly run out of chicken, but that was our luck for the day. We slept at Dean's dad's place in Kingston and then headed home on Sunday morning. Kerry, Dean and Suzanne made it as far as the on-ramp to the 401, which was when the Ka6 trailer decided to shed what was left of the right wheel bearing. We let the smoke clear, removed the hub to confirm our suspicions, and mulled over the possibilities of finding an open VW dealership which would have this ancient part in stock. Kerry urged us to head home while he remained behind with Dean and Suzanne to conclude his chapter of the adventure.

Actually, after we'd landed in Brockville and were waiting for our crews to arrive, an elderly fellow drove up and introduced himself to us, gave us his phone number and instructed us to call him if we needed anything. While we were at the side of the road in Kingston, wondering where to get a new VW wheel bearing, Kerry and I looked at each other and half-jokingly said, "Hey, let's give that guy a call!"

We had flown 365 kilometres in five hours. My iPhone flight recorder worked perfectly and I was able to post my flight on the OLC. I'd flown slightly farther than Kerry but his handicap scored him higher than me to give him second place in Canada, with me in third. We placed higher than everyone in the Nationals, albeit we weren't on a closed task like them. Still, it was sweet and we both enjoyed our 15 seconds of fame.

I owe Dean and Kerry a lot of thanks. They've been great friends and totally supportive over the years. Buying the Jantar from them meant that it was staying "in the family"; I'm trying to keep 69's reputation and legacy healthy. This winter I've promised myself to get intimate with the Cambridge and to get it to talk with my Dell Streak 5, and my laptop. In the meantime, Kerry and I have vowed to try the Montreal mission once more. ❖

An extraordinary meeting

Judy Soroka, Cu Nim & Valerie Deschamps, CAGC

ON 29 MAY, THE CANADIAN AVIATION HALL OF FAME held its 41st Induction Gala in Calgary at the WestJet Campus. One of the head organizers, Capt. (Retired) Rosella Bjornson, invited the Alberta Rocky Mountain High chapter of the *Women in Aviation International* (WAI) to attend the function as hostesses.

We are members of this WAI chapter. Being a pilot is not the sole criteria for membership, only an interest in aviation. Our members are people from all walks of life: avionics engineers, air cadets, airline pilots, an aviation physician, a future helicopter pilot who is a hearing impaired chiropractor, and even one elderly lady who just loves to talk "prop talk". We are the only glider pilots. Our chapter has had the opportunity to participate in many events including a private tour of the new Calgary Airport control tower, a behind-the-scene view of aircraft being built at Viking Air, and participation in Vintage Wings of Canada Warbird appearances.

The annual induction gala is held in various cities in Canada. This particular day was unique for our group. Chris Hadfield, famous Canadian astronaut, was guest speaker and presenter of the awards. The four inductees were Clive Beddoe, Robert Engle, Frederick Moore, and Lorna deBlicquy (her daughter accepted post-mortem). Although this was a formal gala, it was held in a WestJet hangar which had a new Encore DH-Q400 in front of the hangar doors behind the stage. The dress code was formal so we dressed accordingly in long gowns and all our finery! We had our group photograph in front of the new Q400 and found it hard to focus on the camera as we wanted to study the shiny new airplane!

After we welcomed and registered the attendees, we met the inductees and their families. For dinner the WAI group was seated at a table at the rear. We were fortunate to have the colour guard and celebrities pass in front of us as they made their way around to their tables. There was the expected pomp and circumstance of singing 'O Canada' as we watched aerial views of different parts of Canada on the jumbo screen. After introductions and brief speeches, the chaplain recited 'A Flyer's Prayer' (by Patrick Phillips).

After the first course was served, Judy noticed one of her WAI colleagues begin to slump in her chair, looking quite pale and was obviously losing consciousness. The woman seated next to her began to support her, asking if she was okay. Because Judy is an RN by profession, she rushed to the ill woman's side to assess the nature of the medical crisis and determined that EMS was needed immediately. Two WestJet flight attendants, who were MCs of the program, came to assist Judy and the patient was



Chris Hadfield, Judy, and Val.

removed from the main area as the proceedings continued. The Calgary Fire Department arrived a few minutes later, and paramedics arrived 15 minutes after the 911 call was initially made. They took control of the situation and got the patient into the ambulance. Fortunately, the medical crisis was resolved without having to transport the patient to a hospital and she was later taken home by her husband. Judy has provided care in many places but this was a first in a hangar and wearing a long gown kneeling on the (very clean) concrete floor!

After the ceremonies, there were opportunities to have photos taken with the inductees and Chris Hadfield. Judy was offered this chance as it was known that there was a medical crisis that was dealt with quickly and quietly with little disruption to the proceedings. The flight attendants wanted to have their own photo with Mr. Hadfield first. He didn't realize that there was another person involved in this situation until Judy stepped around both. As anyone meeting Judy knows, she is "vertically-challenged" so was obscured by the six foot something male and somewhat shorter female flight attendant.

Mr. Hadfield looked puzzled when Judy stepped forward. Judy said: "My name is Judy Soroka and I am a member of Women in Aviation International. I am also a registered nurse and was first on the scene that occurred earlier with my colleague at our table". He took her hand, shook it firmly, then looked her directly in the eye and responded: "Thank you for being the professional you are in assisting your friend. I really appreciate it."

Judy was astounded that her profession was acknowledged by this great man who had endeared ⇒ p27

Racing to Melita

Ulli Werneburg, RVSS

more SAC history: the 1966 Nats

IN 1966, the Canadian Gliding Championships were held at the municipal airport in Regina, Saskatchewan. They were organized by the well-known Canadian soaring pilot, Julien Audette, the first Canadian to get his Gold badge with three Diamonds and also a prominent resident of Regina. It was no doubt Julien's influence in the city that brought this championship to Regina's main airport, allowing sailplanes to mix with regularly scheduled airline traffic.

Largely because of the promise of good Saskatchewan soaring conditions, a large number of Easterners decided to head west, including notables such as Wolf Mix, Dave Webb, John Firth and Charles Yeates. My brother Hal and his gliding partner Peter Trounce decided to join the fun and make the long journey west with their Schleicher K8B. Peter's son Paul and I went along as crew. A total of 39 pilots with about 32 gliders were entered in the competition.

Since the K8B was not a high performance glider even in those days, we had no great hopes of winning anything but just hoped to have a good time and also to experience the prairies for the first time.

The trip to Regina was uneventful except for the fact that Peter's car, a big 8-cylinder Pontiac began to overheat as the weather got warmer and also no doubt due to the huge, barn-like trailer which housed the K8. Peter decided that the only remedy was to open the windows and turn on the heater, which indeed made things better for the car, but quite a lot worse for us inside. It was with great relief that we finally saw Regina's skyline on the horizon.

Heading out to the airport next day we were amazed at the way the big airplane traffic and the glider operation were able to co-exist. Gliders were consigned to a far corner of the airport and tows were held during take-offs and landings of the larger aircraft. Reasonable arrangements were also made for glider landings, which resulted in very few, if any, landing conflicts during the duration of the competition.

In those pre-GPS days, eastern pilots were concerned about navigating in this relatively featureless terrain. Consequently, we decided to spend a couple of pre-contest days working out a system of navigation by precisely noting the direction, number, size, and type of grain elevators in many of the Saskatchewan towns which were turnpoints.

The first competition day arrived. A strong cold front had gone through with strong NW winds. In deference to the many low to medium performance sailplanes, the task committee decided to send the fleet 302 km downwind to Melita, MB.

One of the curious features of the contest (dictated by the need to co-exist with large aircraft) was that competitors had to take their tow release time as their task start time. This prevented sailplanes from hanging around the busy airport for any length of time while waiting for the best time to start. Tow time, and therefore start times, were drawn by lot. This introduced an added element of nervousness among the pilots as well as the crews who had to be ready in case their pilot was not able to connect or even get a decent thermal right after launch.

Peter and Hal had decided that Hal was to have the first flight and he was lucky enough to draw a launch position in the middle of the field, meaning he should be able to see some other competitors not too far away right after release. Conditions were building up nicely, with good cumulus development by the time the launch started, which meant that most pilots connected and were soon on their way, drifting quickly down course by the 15-20 knot tailwind. After a few anxious moments following release, Hal also connected and was last seen heading southeast at about 4000 feet.

The rest of us hooked up "the barn" and quickly headed down Hwy 39 toward Weyburn, Estevan, Oxbow, and ultimately Melita. Soaring conditions continued to improve and we were happily cruising along between Weyburn and Estevan when we suddenly felt a bit of a bump from the back, quickly followed by a trailer wheel whizzing past us down the highway! The barn had shed a wheel! We watched it zooming along, missing oncoming traffic, and it finally spent its energy at least half a mile down the road in the right hand ditch. A quick inspection of the trailer revealed little or no damage and we realized that the lug nuts had simply come off. A quick search behind us revealed none of the missing nuts so the only thing to do was go and retrieve the wheel, jack up the trailer and temporarily fasten the wheel with a couple of nuts from the remaining wheel. We proceeded slowly to Estevan where we were able to obtain some replacements.

An operator assisted "person-to-person" telephone call to Hal at contest headquarters also showed that he was still flying so we confidently kept driving east. (Contest workers simply did not accept any person-to-person call if there was no landing information for the pilot, therefore crews could make long distance calls all day at no charge.) Near Oxbow we saw a glider in a field which turned out to be Gordie Hicks' high performance Sisu 1A. In a field not far away we saw the Ka6BR belonging to Bob Gairns, followed not long afterwards by Paul Krause's L-Spatz III.



RR Gamp

The 1966 Nats competitor line-up. Wolf Mix, overall winner, is standing astride his SH-1 between the centre and back rows. Back row (left to right) are: Dick Mamini, Dave Webb, Mike Stoten, Bill Roach, Vic Shobridge, Lloyd Hunter, Hal Werneburg, John Pomitlarz, Horst Dahlem, Gordon Hicks, Peter Trounce and John Firth. Centre row: Oscar Boesch, Eric Ketonen, Wilbur Eley, Jake Brauer, Paul Tingskou, Paul Krauss, Roy Gray, David Parsey, Julien Audette, Charles Yeates, Kai Gertsen, Klaus Stachow, George Redzich, Bob Gairns, Kurt Kovacs, Harold Eley and Elvie Smith. Front row: Willi Deleurant, Stan Bienada, Bob Cheston, Kerry Bissell, Henri Chabot, Norman Tucker, Peter Timm, James Long, Charlie Bonds and "Shorty" Boudreault.

The first two of these gliders had better performance than the K8 so we began to wonder if Hal had suffered a similar fate. However, another call back to Regina resulted in no further info about Hal. With nothing else to go on we headed confidently down the highway, making one or two more calls as we went, still with no results.

By now it was well after 5 pm and Melita neared. Hoping for the best, we continued on and soon found the airport. From a distance we saw a number of gliders and, getting closer, joyfully discovered that our K8, CF-ROP was one of them. What a great feeling! Hal had made it and had been one of the first arrivals to boot. It was also his first 300 km flight, good for his Gold distance and Diamond goal. Wolf and his Std Austria SH-1 were there (he had been the first to arrive), as was Peter Timm from BC and his kit-built K8B, Kai Gertsen with his Ka6CR, Charles Yeates and his SH-1, as well as Dick Mamini in an L-Spatz (roughly the same performance as the K8) and a couple of others. Some pilots couldn't find the airport and landed a significant distance further on – Vic Shobridge in North Dakota!

After joyful greetings we quickly derigged and were back on the road towards Regina. On the road home the soaring conditions were still good until at least 8 that evening, with high-looking cloudstreets continuing to decorate the sky. It had been an excellent day and would probably have been enough for a 500 km downwind dash. The first competition day was completed successfully with nine competitors reaching Melita, Hal being one of the faster pilots.

Next day's briefing provided some controversy. It turned out that two of the favourites, Dave Webb and John Firth, each flying HP-11s, had been in view of each other during much of the task and were seriously racing in an effort to be the first to reach the goal. Finally, within view of Melita they recognized a landing strip and promptly landed there a couple of minutes apart. They were happy to be the first to reach the goal but after waiting for quite a while for others

to arrive began to wonder why no one was joining them. When they then saw other gliders arriving but not landing on their strip, it dawned on them that something was wrong. It turned out that in their haste to beat one another to the goal, they had mistakenly landed on the wrong airstrip! As a result, both were scored as having landed out. Naturally, Dave and John filed a protest, based on not having been alerted by the organizers to the existence of a second airstrip at Melita. I don't remember the details of the final decision but some kind of accommodation was reached, and they got a small penalty and a finish rather than landout points, fifth place for the day.

For Peter and Hal the remainder of the competition went almost as well as the first day. No doubt due to their consistently good, if unspectacular flying, they finished fifth overall out of 39 pilots (there were seven teams), thereby also winning the team trophy – their best day being third on Day 5. Wolf was first on five of the seven days and won his third national championship by a significant margin, 650 points ahead of Webb, followed by Yeates, Firth, and the Trounce/Werneburg team. The weather wasn't 'Western Classic', but some of the weak, blue days helped the slower gliders such as the K8s, Skylarks, BG-12 and others. On Day 1 to Melita, Wolf set a Canadian 300 km speed-to-goal record of 108.7 km/h, and followed the next day with a new Canadian 200 km triangle record of 78.2 km/h. The best distance, 388.8 km, was flown by Roy Gray on Day 6, the free distance day, which was a contest requirement at the time.

The contest was a considerable success due in no small measure to the outstanding efforts by Julien as well as the decent soaring conditions. Looking back, it seems that there was more competition enthusiasm among Canadian soaring pilots then. Also, to be able to fly a Canadian Nationals out of an airport with regularly scheduled airline traffic would be a figment of someone's overheated imagination these days – but it actually did happen! ❖

Snowbird ... epilogue

Dave Donaldson, GLGC



Mike Campbell

ON 2 AUGUST 2010, *Snowbird* officially claimed the record as world's first human powered ornithopter. She was built and flown by a team of University of Toronto students led by Todd Reichert and Cam Robertson at the home of Great Lakes Gliding (aka Ronan Field). We also trained the pilot, Todd. I wrote about the birth of *Snowbird* in Free Flight 2011/1 – you should read it again.

With the flight recorded in the history books, it was time to find a home for this artifact. The Smithsonian expressed interest but Todd and Cam wanted to keep her in Canada. A year after the historic flight, she was carefully packed into a tractor trailer and shipped her to her final home in the Canadian Aviation & Space Museum in Ottawa. She was stored at the museum until this past March when a small contingent of the original team gathered to repair minor damage from the move (some trailer rash) and prepare her for display.

In early March last year, Cam e-mailed to let us know that they finally had a date to put *Snowbird* on display. The plan was to spend 30 & 31 March preparing and hanging her, 1 June the contingency date, with the official unveiling 2 June. I was able to book off work 30 & 31 March, but had to be back on 1 June, so sadly I was going to miss the festivities.

I arrived mid-day 30 March to lend a hand with repairs and preparation. She arrived in very good shape and it didn't take the crew very long to get her in order. Carston and his dad, Robert, had flown out from Vancouver, very fitting considering the amount of work they both put into her construction. In all we had about eight people volunteering their time. Our workshop was the area under the right wing and behind the DC-3. It was an exceptional experience to be crawling around museum artifacts while helping prepare the next one for display.

One of the challenges was figuring out how and where to display her. With a wing span of 32m, *Snowbird* has the longest wing span of all the aircraft residing indoors. The Lancaster checks in at a mere 31m. It wins in weight, with a maximum take-off weight of 32,727 kg. Empty, *Snowbird* is 42 kg and the addition of Todd almost tripled that. It's safe to say that *Snowbird* is by far the lightest complete aircraft in the collection. The decision was made to use this weight to advantage and hang her from the ceiling. The only other aircraft hanging on display is a different *Snowbird*, #5 from the famed RCAF aerobatic display team. Mounting will be a little easier as our *Snowbird* is staying upright, while #5 is inverted.

Cam and Todd had been working with the museum riggers engineering an "I" beam frame that would be hoisted into the air, hanging from the ceiling of the building, and *Snowbird* would hang from the beam. We had a look at the cable they were planning to use and well, I think it weighed more than the airplane it was about to support. No worries of a cable failure here.

The next big challenge was figuring out the exact location for the attachment points. The original plan did not take into account a nearby display case for aeroengines. This plan would have put the nose of *Snowbird* a couple of feet inside that case. After much discussion and measuring, all parties had settled on a plan.

On the 31st we added attachment points from which we could hang her. Among the jobs completed that day was to make some control locks. They hadn't been needed earlier

as she was only rigged when flown. A couple of carefully shaped aluminium bars connected to the actuating arms on the control surfaces did the trick. As she was controlled using RC airplane servos, it was a beautifully simple solution. These two parts and the cord to hang her were the only things added to the aircraft that were not there when she flew. It was very important that the historical accuracy of the original aircraft remained intact.

In the afternoon, plans were finalized and the riggers mounted two hand crank winches, the type you would use on a boat trailer. They planned to return early the next morning, before the museum opened, to attach the lines to the ceiling and complete the hoist. Sadly I was out of time and headed home.

The rest of the job was completed and *Snowbird* is now higher off the ground than she ever was in flight. Todd and Cam gave a wonderful speech as part of the official unveiling. A couple of the GLGC members made the trip to witness the event.

Next time you go to the museum in Ottawa, when you walk into the main display gallery, take the path to the left, past the WWI and Bush Plane displays. As the path curves right and you see the display case full of engines, look up and you will see *Snowbird* soaring overhead. An interesting side note, the DH Beaver on display, serial #001, was flown extensively by Mike Ronan, owner of Ronan Field. It's a real piece of aviation history. ❖



Dawn on 2 August 2010 at the Great Lakes Gliding field, Todd Reichert is in *Snowbird* and getting ready for the historic flight.

Common glider accidents in training – avoiding PIOs

The following information is primarily aimed at instructors but all pilots can benefit. Based on the major accidents over the last decade in Canada, FT&SC has prepared a list of training points that instructors can use to mitigate having similar accidents with a student or will help students avoid similar accidents when the student is solo/post licence.

These points should be reviewed each spring by instructors. A further good reference for these points is Derek Piggott's *Gliding Safety* and *Understanding Gliding*, available at most glider pilot supply sources.

- Understand why PIOs (Pilot Induced Oscillations) occur including impact of weight & balance. Most PIOs occur on take-off.
- To avoid PIOs on landing, begin with a stabilized approach.
- Teach students to rest their arm on their lap so only the wrist action controls the stick motion (proper seating).
- Student should look to the horizon at the far end of runway before rotation and hold off (Not doing so is a common cause of landing difficulties).
- Use at least ½ air brake in the roundout and hold-off to make the glider less pitch sensitive.
- Teach student not try to plant the main wheel on the runway (wheel barrowing). Hold off until minimum energy before the touchdown; open full air brakes once the main wheel has settled on the ground (as student perfects landings, you can introduce opening the air brakes gradually in the round-out, and hold off with full air brakes).
- In a crosswind, touch down slightly faster than minimum energy landing.
- If PIO starts, have the student hold the stick in the centre for a second or two to let the glider settle (fly level) and rest their arm on their lap again and raise or lower the nose with "pressure" control as appropriate.
- The instructor should be prepared to hold the stick steady for a second or two if the student is having other than minor difficulty with PIO and then transfer back after student rests arm on lap.
- Instructor should take control any time a PIO is moving towards an unsafe situation. Intervene earlier rather than later as little is being learned once student is in anything other than minor PIO. Scaring themselves

is detrimental to further progression. Oscillations to loss of control or ground impact can occur very quickly if instructor lets student try to recover more than minor oscillations.

- Go back to the simulator if problems with PIOs are repeated.
- Watch for PIO sensitivity or overcontrolling in general in your students – watch if they apply rapid control movements in flying maneuvers. Do they let the glider fly and use pressure control to move the stick/rudder. or are they constantly making corrections for every control input ("churning the butter")? If so, sort this out before they fly close to the ground. It is obvious when looking at the control surfaces of a glider during turns if the pilot is doing this.

Causes of fatigue

Stress can cause fatigue and glider pilots tend to ignore the accumulated effects of fatigue. Many of the factors that contribute to fatigue are fairly well understood, but when combining several factors, although each factor may not seem significant by itself, it is the contribution to the whole that may have devastating results. In addition, we may think we are excellent at handling flight stress and fatigue but many an experienced pilot has been caught. The major problem with fatigue is that its insidious nature usually doesn't set off any alarm bells before a flight, but during the flight the conditions may be enough to tip the scales.

We understand how lack of sleep contributes to fatigue, but underestimate how being even slightly tired or jet-lagged can affect our cognitive ability. For argument's sake, let us say this can have a 5-20% effect on our cognitive ability depending on how much and how long we have been having poor sleep. Additional fatigue can be created by multiple retrieves, glider assembly and disassembly, pushing the glider out to the launch point, etc. Other stressors can work against the mind and contribute to fatigue such as an unfamiliar aircraft, equipment, soaring area, or airport, just to name a few.

We know we must remain hydrated – studies show that 1% dehydration can have an effect on our cognitive function. We feel thirsty at 2% and can be seriously dehydrated at 3%. More water is needed when on oxygen and electrolytes can be flushed out causing stress on our bodies and minds. Descending from aloft into warmer air can also dehydrate us

(see "Shivering" on p4). Let us say that this might reduce our cognitive ability 5-20%.

Heat stress can cause us to tire quickly. While waiting on the flight line in the sun to launch we tend not to drink the water we reserved for the flight and further contribute to heat stress. Being on a tarmac surface or in high humidity will make this worse. Studies have shown that heat stress can reduce mental function and at the extreme, unconsciousness or death, but for argument's sake we will assume a 5-20% reduction.

Oxygen or the lack of it contributes to fatigue. We must use oxygen above 13,000 (10,000 after 30 minutes in Canada) but less oxygen can affect the frontal lobe of the brain at much lower altitude (7000 ft) depending on the pilot. If you are hypoxic you are likely not aware. If you're a smoker you have much lower tolerances. Again this could be a 5-20% reduction in thinking power.

Blood sugar levels are critical to clear thinking. Flights of three or more hours without nutrition can start to have a negative effect on us. Another 5-20% reduction in our cognitive ability could be assumed.

As we can see, after a long flight when we return to the field to land, we could be operating with a cumulative effect of 25% to 100% reduction in our cognitive ability. Now we add our age. The older we are the more these factors will affect us and we may be closer to the higher end of the scale. We may *literally* have half a mind to land, which is probably the most challenging part of the flight. I have witnessed many mass landings on a contest day where this fatigue has played a factor and watched less-than-stellar performance from highly skilled pilots, especially if there was an addition stressor such as a strong crosswind. This could be overwhelming in an off-field landing; the accident record reflects this.

Last but not least, there is emotional stress such as argument with a significant other before a flight, or long term stress such as death of a family member as much as a year before a flight that can establish a significant level of fatigue and affect our ability to concentrate. Are you burning the candle at both ends? Do you have a fatigue management plan? What metrics can you apply to this process? Sometimes we are our own worst enemies and apply more stress to ourselves to complete a task, perform better at a contest, or just not be late for supper. We often accept higher risks to achieve some benefit but do not realize the additional stress and

effect on our decision-making or total fatigue. The best way to handle all this is in our pre-flight preparation. Plan to counter factors by carrying/using adequate water, food, oxygen, etc. Apply the "IAMSAFE" checklist daily and use a tool such as the Risk Assessment Matrix (go to *ff 2013/1*, p26). Tracking your score here is not as important as looking at the factors to see the cumulative effect. The last metric I use is "fun". If you are not having it, something is wrong, don't fly.

Motion induced blindness

Here is a serious piece of information that most people are not aware of: In a motor vehicle accident where a car hits a slower moving vehicle coming from the side, the drivers often swear that they just didn't see the vehicle coming from the side. Well, they aren't lying. They really don't see them, even in broad daylight. This phenomenon on the car drivers' part is known as "Motion Induced Blindness".

Once airborne, pilots are taught to alternate their gaze between scanning the horizon and scanning their instrument panel, and never to fix their gaze for more than a couple of seconds on any single object. They are taught to continually keep their heads on a swivel and their eyes always moving. Be-

cause, if you fix your gaze on one object while you yourself are in motion, your peripheral vision goes blind. Until about three decades ago, this "heads on swivel & eyes moving" technique was the only way to spot other aircraft in the sky. Nowadays they have onboard radars and we have FLARM, but the old technique still holds good.

Let me give you a small demonstration of motion induced blindness. Just click on this link <www.msf-usa.org/motion.html>. You will see a revolving array of blue crosses on a black background. There is a flashing green dot in the centre and three fixed yellow dots around it. If you fix your gaze on the green dot for more than a few seconds, the yellow dots will disappear at random, either singly, or in pairs, or all three together. In reality, the yellow dots are always there. Just watch the yellow dots for some time to see that they don't go anywhere!

So, if you are driving on a highway and if you fix your gaze on the road straight ahead, you will not see a car, a scooter, a buggy, a bicycle, a deer or even a human being approaching from the side. Now reverse the situation. If you are crossing a road on foot and you see a speeding car approaching, there's a 90% chance that the driver doesn't see you, because his/her peripheral vision may be blind and you are in that blind zone!

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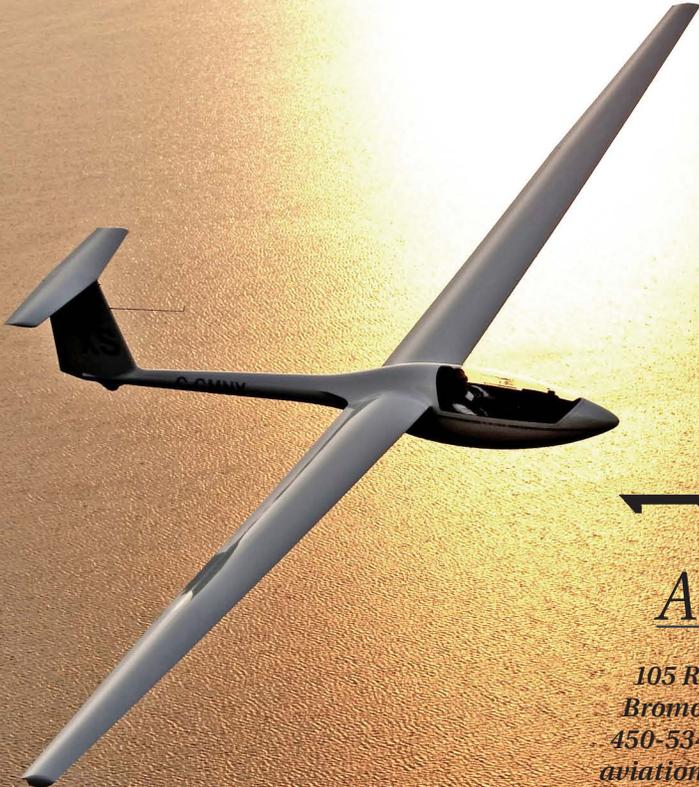
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Reconnecting with an old friend

On July 12, my partner was flying our HPH 304S Shark so I borrowed the 1947 PA-12 of my good friend Mathieu Côté for a flight with my girlfriend, Isabelle. The flight plan was to fly from the base airport Drummondville (CSC3) to Montmagny (CSE5) for lunch with her family. Then, I wanted to make a detour to CVVQ at St-Raymond (CSK5) to meet friends and see my former ASW-20 that I sold in 2012 to Denis Pepin and Pierre Beaulieu. I had seen pictures of the improvements they made to it and wanted to see it with my own eyes. Then I was to fly my way back with the sun setting for a great romantic end of day.

The flight to Montmagny got bumpier with the thermals developing. I didn't want to deal with Quebec Terminal, so I had to fly below 1500 feet over the south shore of Québec City. That proved to be challenging with the PA-12 wanting to climb with every thermal. I overflew Orleans Island then the string of islands until abeam Montmagny for a bumpy circuit in a gusty wind.

After a welcomed lunch at a restaurant in downtown Montmagny with Isabelle's family and the usual, "Wow, that's a nice looking old airplane!" we took off for St-Raymond. Again, I went low around/under the control zone.

Closing in on St-Raymond, I received some "Welcome, Gab" and procedure messages on the radio and got in for an uneventful landing. My former ASW-20 was in flight, flown by Pierre who told me he'd be down pretty soon. I watched a few gliders land including Jean-Guy Hélie and soon after

Pierre. I was talking with Jean-Guy and helping him push his glider in his shelter when Pierre arrived and asked me if I wanted to fly KX. Huh... Yes! I got very excited and a few minutes later I had the parachute on my back, Pierre's soaring hat on my head, and in the familiar cockpit (eight years and about 600 hours) for take-off.

I managed to catch a weak thermal and fly around for about 40 minutes. Coming down was difficult as there were weak thermals everywhere and it felt so good flying the -20 again. It was nice to notice how nice this glider flies and maneuvers, the good feedback on the flap handle, the soft ride with the flex wings, etc. In about five minutes of flying, it all felt instinctual again, like it was two years before.

The thing that I miss the most on my 304S Shark from the -20 are the landing flaps with the interconnected ailerons. The Shark only has 18° landing flaperons that are obviously nowhere close in efficiency to the 55° of the -20. So, I decided to do myself a favour and I let my glide path get high on final. When I got uncomfortably high, which I found is the right technique during my years with the -20, I set full landing flaps and I was just high enough when the glider starts to descend for a perfect glide to my aiming point with very little air brakes. My landing was very good (confirmed by Denis and Pierre who were watching), proving I had not lost my touch with the -20.

After many thanks and some talking with Pierre, Denis and other CVVQ friends, we climbed back in the PA-12 for the flight back

with a detour near Trois-Rivières as Isabelle wanted to see the Laviolette bridge. The leg to Drummondville was super smooth and the bright orange sun was setting.

What a memorable and outstanding day that was! It was only made possible because of fantastic people. Many thanks to Mathieu for letting me fly his great old PA-12 Super Cruiser. Many thanks to Pierre and Denis for the unexpected opportunity to fly in my old beloved C-GRKX. Congratulations again for all the improvements and primping you've done to an already beautiful glider. You definitely have the most beautiful ASW-20 in Canada (if not the US too) and I'm proud the glider remained in Canada and that I could make another flight in it.

Gabriel Duford

What the *Free Flight* editor's job is all about

Gathers and edits content

- Contacting people, usually with some arm-twisting and reminding, is required to get the content submitted at the appropriate time. Many articles are submitted by people who have unique soaring experiences – other articles are requested by the editor. The editor must be proactive – getting sufficient material to fill an issue does not happen without actively chasing after it (ex. contact a pilot who had a noteworthy flight).
- The editor would typically become familiar with events going on across Canada. For example, each contest held usually has a report or blog and scores, but a contest report would not automatically be written and submitted to the editor. In this case a contest report would need to be requested by the editor. The editor should get himself added to group e-mail lists of the larger clubs as this is where club events of national interest are discovered (ex. cadet soaring camps, MayFly, etc.). The editor can get ideas/contacts by watching the SAC Forum and other venues such as *rec.aviation.soaring*. Regular contributors from SAC committees may need to be prodded.
- The editor will get most English language soaring magazines mailed to him on a free exchange basis. They are an especially good source of training and safety articles (ex. Dr. Johnson's aviation medical articles from *SOARING*). Sometimes articles from these soaring magazines are used with attribution, such as "the S curve" from *Sailplane & Gliding* in this issue.
- The editor will get the one and only entire reference set of *Free Flight* back issues, currently held by Tony. Content from previous issues is sometimes used as historical filler to complete the magazine.



Isabelle Richard

• Editing the content includes correcting articles for spelling, grammar, and clarity. Every article needs to be edited to fit the space available and to make text fit well on the page. Editing also includes selecting photographs either submitted or requested. Tony has a large collection of soaring photos available for use.

Magazine preparation

- The magazine is laid out by the editor using *InDesign*, and is made completely ready for printing with a press-quality pdf sent to the printer.
- detailed proof reading by someone other than the editor is essential – best done by a laser printout of the pages being read completely, character by character (a spell-checker will not do!). Correct, then repeat. Presently, Ursula does this. It's an important job and a skill. Typos are unacceptable in a national magazine especially for critical data like names and contact info.
- Familiarity with *PhotoShop/Photo Elements* is needed as every photo used will be tweaked to scale/crop/brighten/modify, etc.
- Contact and coordination with the magazine printer. The printer in Ottawa is doing

a good job using a high end digital output. *Free Flight* is mailed by the printer, with the mailing labels coming from the SAC office.

Tony is willing to advise/support the new editor during a transition period. Some trickery is involved in the preparation, and in the useful features of the software.

Al Hoar, Alberta Zone Director

A book deal for clubs

The excellent soaring training book, *Advanced Soaring Made Easy*, by Bernard Eckey, has sold well at \$65 but I am presently out of stock – it is expensive for me to hold many copies. However, given the now even greater cost of shipping this heavy book to individuals (about \$23 to Ontario), I will continue to offer the “Buy 9, Get 10” deal I made with clubs last year. If a club organizes the sale and distribution of nine books locally, I will have the supplier ship ten directly to the club, thus bypassing the mailing costs. Contact me at <t-burton@telus.net> for more details.

Tony Burton

extraordinary meeting from page 19

himself to Canadians and to other people worldwide when he was the commander of the International Space Station. The evening was all about those who contributed to the advance of aviation, but to have someone like Chris Hadfield recognize the contribution of something not aviation related was special indeed. He invited Valerie to join the group for the photo when Judy told him that she was also a member of WAI.

The members of WAI and the organizer of the gala later expressed their gratitude to Judy for quickly taking care of the crisis. The patient was grateful that she came to her aid.

Judy nearly backed out of attending the gala. Her brother had suddenly passed away three weeks prior and her heart was heavy; aviation was the furthest thing from her mind. Her husband Lyall, who is an airline pilot, talked her into honouring her commitment. This extraordinary day and the extra ordinary meeting with Chris Hadfield put the wind back into Judy's wings so that she could soar once again. ❖

flying MAT and TAT tasks from page 15

Over time

Finishing over time as close as possible to the minimum flight time results in the best scoring speed.

- For the pilot who finishes in 3 hours, the relative time spent in final glide is 10%.
- For the pilot who finishes in 3.5 hours, the relative time spent in final glide is 9%.

As expected, the latter will benefit slightly less from the high speed final glide. Being over time results in slightly slower speed. It appears insignificant, however in a contest a few points can make the difference between winning or losing the day.

Under time Finishing under the minimum time will significantly lower the scoring speed.

- A flight time of 2.95 h (3 minutes under time) has as poor a result in speed as being 30 minutes over time.
- A flight time of 2.9 h (6 minutes under time) results in a scoring speed of 85.3 km/h.
- A flight time of 2.8 h (12 minutes under time) results in a scoring time of 82.7 km/h.

Short task

In a short task the relative percentage of the final glide time increases. As can be expected this results in a higher total task speed. It amplifies the spread of the speeds for finishing over time and under time.

Weather improves

A good strategy is to finish over time. For example, the first two hours of a three hour task are flown in weather that results in a 60 km/h XC speed. Then the conditions improve and the achieved XC speed increases to 80 km/h. If the time of day, weather, and task permit, this may warrant flying past the minimum flight time.

Example 3 minimum flight time = 3 h

part 1, hours 1 and 2,
 speed = 60 km/h
 distance = 120 km
 part 2, hour 3 up to final glide
 speed = 80 km/h
 final glide speed 160 km/h
 final glide time 18 min or 0.3 h
 final glide distance 160 x 0.3 = 48 km
 total time on task variable

total task (h)	part 1 dist (km)	part 1 time (h)	part 2 up to final glide (km)	final glide (km)	total task (km)	scoring speed (km/h)	dV (km/h)
3.0	120	0.7	56	48	224	74.7	0.0
3.5	120	1.2	96	48	264	75.4	0.8
4.0	120	1.7	136	48	304	76.0	1.3

This example shows that if the conditions improve, and as long as a higher cross-country speed can be maintained, it pays to continue to fly longer than the minimum time. This is particularly true if part of the task can be flown with much higher speed along a sea breeze front, on the ridge, in wave, or under a cloud street.

Weather deteriorates

A good strategy is to finish under time if a change in weather is such that the risk of a landout before the task can be completed is highly probable. An under time finish will give you a speed score, however a landout will result in much fewer distance points only.

soaring conditions	over-time finish	under-time finish
<i>no significant change</i>	<i>minor penalty</i>	<i>major penalty</i>
<i>significant improvement</i>	<i>reward</i>	<i>major penalty</i>
<i>hopeless deterioration</i>	<i>landout = major penalty</i>	<i>reward</i>

had ventured up a logging road and had to turn around after getting nowhere. It didn't matter much at this point, we would derig KB on the double, tuck her in the trailer and head home.

I was all prepared for the retrieve: tape removed, L'Hottelier fitting disconnected, equipment out of the cockpit. I was going to time myself and in 15 minutes flat, we would be in the Sonata, on 309 heading south. I had just bragged to the Thauvette's how easy disassembly is. "We just pull those two pins and we're almost done". Back up the trailer, lift up the Cobra's shell, pull down the ramp, wing dollies back, fuselage dolly...?!

"Don't forget to get the fuselage dolly back from Ulo when you're at the club."

Epilogue It all turned out fine in the end. Kilo Bravo slept safely in Mr. Thauvette's barn. The crew and I had pizza and beer in the village. We drove back in the glow of the full moon and by the time we reached Buckingham we decided to head for Gatineau instead

of GGC. Shower and good warm beds were awaiting pilot and crew.

The next morning I picked up the dolly at the club and Dan Daly volunteered to give me a hand for the second retrieve, which this time was smooth and easy. A 500 km retrieve in

total, lots of ups and some downs, one happy landing, and a good weekend adventure. Special thanks to Tim Tuck, Claude Poulin and Dan Daly for volunteering as crew on a very long retrieve. Thanks also to the whole GGC family for making such adventures possible. Happy landings to all. ❖



Karl Boutin

shivering

from page 5

is cool, and we're making our skin cold by shutting down its blood flow as our core temperature drops (imperceptibly at first).

But, if we feel warm, we may be cold, if something is warming our skin without increasing core temperature. A menopausal hot flush makes a woman feel hot, but the result is actually a drop in core temperature, for heat is lost. Standing by a fire, or in the sun, or climbing into a hot tub makes us feel warm long before our core temperature responds.

A danger of alcohol is that it increases blood flow to the skin, making a person feel warm while permitting more heat to radiate away and dropping core temperature. Taking those drinks to warm up has killed people.

Shivering is a danger signal

When our core temperature drops only 1-2°C, we begin to shiver. As we realize when we exercise, our muscles are big fuel cells, making a lot of heat. Shivering is essentially immobile exercise, and it generates a lot of heat.

Why do I say shivering is a danger signal? Because gliders don't have heaters! If we are shivering, our core temperature has already dropped, and we are continuing to lose heat. The brain is already slower, and reactions and judgement will be slower. Shivering is a sign that we really, really need to get warmer. And

continued cooling will lead to uncontrolled shivering. A core temperature drop of about 2-4°C will at some point cause shivering that's so severe that normal muscle control is difficult or impossible. We really do not want this to happen in the cockpit.

Clothing The goal of wearing clothing goes beyond looking great. Even in the prairies, on a soarable day, cloudbase is at least 10°C cooler than the ground (the lapse rate is about 3°C per 1000 feet), and any excellent day has bases 7000 to 15,000 feet asl. It's usually cool, and always shady up there.

You can always know how cold it will be at the top of the climb because the temperature at cloudbase is at the dewpoint, and your aviation met forecast will tell you this.

One goal is to keep hands and feet warm enough not to feel pain whilst our body shuts down their circulation to save itself. This is accomplished with long johns and warm socks and long-sleeved shirt layers with gloves.

The other goal is to keep the core warm by decreasing heat loss, so that the gloves and down boots aren't so necessary. We do this by insulating scalp and breastbone.

We lose heat from our sternum, because under this are the great blood vessels, and from the scalp because it's very rich with blood vessels. Hatless bald guys have 25% of total

heat loss from the scalp, and I can tell you that the hat doesn't have to be extremely thick to make a huge difference, especially as most gliders have a windscreen. Thus, the priorities in keeping warm are:

- Wear a cap. Wool in cold weather, anything in mildly cool weather.
- Cover the upper chest. Some pilots take along a jacket and pull it over their chest after climbing out of the heat. Others wear zip-up shirts or pullovers that are closed up high.
- Wear layers on arms and legs, so that when you get back down, you can quickly shed insulation that's no longer needed.

History bits While reviewing literature for this essay, I noticed a couple of interesting facts about the importance of hypothermia to a couple of famous military campaigns.

- Hannibal lost nearly half his army of 46,000 men crossing the Alps in 218 BC. It was one of those many military campaigns that looked good on paper.
- Baron Larrey, Napoleon's chief surgeon, reported only 350 of the 12,000 men in the 12th Division survived the cold during the Russian campaign.

Recommendation

When planning the day's flight, look at the dewpoint prediction, and dress for that temperature in a way that will allow you to alter your clothing on the ground to avoid being too hot. ❖

into XCSoar, anticipating a change before the gate opened, one of the perks of being on the Task committee. It was an hour after my launch that I actually made it out on task, after retreating to the start cylinder several times before a useable start height was made. The run to the St. Marys area was punctuated by a lot of drifting back while thermaling, keeping an eye open for thermal sources and potential landing fields; it was no time to relax.

After turning at St. Marys, there was a little time to relax even though I was going downwind. Back-tracking to a thermal I used briefly on my way into the turnpoint, I connected in a couple of turns, and from this point on it was a completely different flight, using only a few thermals on the first half of leg 2, climbing and drifting downwind on course, at about 2/3 of the way along the second leg it was not necessary to stop and thermal, I simply bumped my way along watching the required climb height to finish decrease on XCSoar as I did the longest final glide of my time in the PW-5. After going just a couple of clicks into the Ohsweken turn cylinder, I turned for home. I could gradually increase

speed on track to SOSA, and for the first time in the contest I felt like I was racing something other than weather-induced doom. (Yesterday I sure would have liked to have even a tiny bit of the excess energy I was experiencing now.)

After a good final glide above the safe arrival height I could breathe a sigh of relief, we all now had four contest days in the bag.

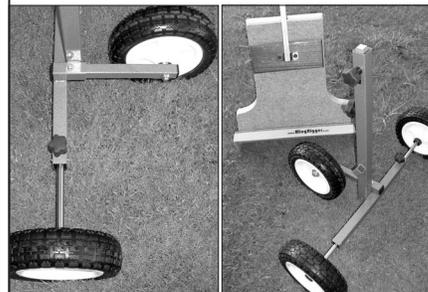
I tended to the business of cleaning and stowing the glider and helping my neighbours do the same. I went to the clubhouse to turn in my flight file and waited for the verdict. After a couple of minutes our scorer Rob Russell announced I was in second place. "Okay, how many pilots still have to turn in their files?" "None." I was only ten points behind Tom Butts! After both Tom and I landing out Friday, we placed 1 and 2 today; now there's a great story. However, I would rather be two places higher in the final score with a little less adventurous a tale to tell.

After four flying days, we only had three landouts for the whole contest, a huge difference from 2011 when ten landed at Tillsonburg one day, and my personal landout record for that contest was five field landings. We had

no accidents or incidents. Congratulations to everyone from the Contest Manager, CD, and all crews and pilots for keeping a difficult contest in perspective, "keep it safe out there." ❖

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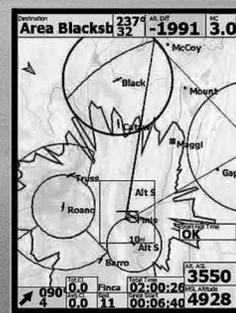


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These badges & badge legs were recorded in the Canadian Soaring Register during the period 10 June to 20 September 2014.

GOLD BADGE

338 Patrick Pelletier Winnipeg

SILVER BADGE

1082 Timothy Fulcher Winnipeg
1083 Jay Allardyce Winnipeg
1084 Bruce Armstrong Winnipeg
1085 William Vollmar London
1086 Karl Boutin Gatineau
1087 Michel Jacques Quebec
1088 Louis Chabot Quebec
1089 Jean-Yves Germain Quebec
1090 Kyle Tiessen Rockies
1091 Eva Dillon York

DIAMOND DISTANCE (500 km flight)

Anthony Firmin York (assigned from BGA)
Jim Fryett York 501.8 LAK-17A Arthur E, ON

DIAMOND GOAL (300 km goal flight)

Patrick Pelletier Winnipeg 306.9 DG-300 Starbuck, MB
Sylvain Larue Rideau Valley 305.7 LS-4 Kars, ON
Jay Allardyce Winnipeg 316.5 ASW-19 Starbuck, MB
Bruce Armstrong Winnipeg 317.1 ASW-15 Starbuck, MB

GOLD DISTANCE (300 km flight)

Patrick Pelletier Winnipeg 306.9 DG-300 Starbuck, MB
Jay Allardyce Winnipeg 316.5 ASW-19 Starbuck, MB
Bruce Armstrong Winnipeg 317.1 ASW-15 Starbuck, MB
Jean-Yves Germain Quebec 305.0 ASG-29 St Raymond, QC

SILVER DISTANCE (50 km flight)

Timothy Fulcher Winnipeg 70.4 PW-5 Starbuck, MB
Georges Boucher Quebec 72.0 Grob 102 St Raymond, QC
Jason Acker Edmonton 54.9 ASW-15 Chipman, AB
Bruce Armstrong Winnipeg 111.8 ASW-15 Starbuck, MB
William Vollmar London 59.0 Grob Astir Embro, ON
Karl Boutin Gatineau 72.8 ASW-20 Pendleton, ON
Michel Jacques Quebec 55.9 LS-4a St Raymond, QC
Jean-Yves Germain Quebec 153.0 ASG-29 St Raymond, QC
Kyle Tiessen Rockies 67.2 PW-5 Invermere, BC
Eva Dillon York 67.0 Libelle 201 Arthur E, ON

SILVER/GOLD DURATION (5 hour flight)

Bruce Armstrong Winnipeg 5:16 ASW-15 Starbuck, MB
William Vollmar London certified from SSA
Michel Jacques Quebec 5:08 Pilatus B4 St Raymond, QC
Louis Chabot Quebec 5:16 Std Cirrus St Raymond, QC
Kyle Tiessen Rockies 5:36 PW-5 Invermere, BC
George Wong Vancouver 5:18 Grob 102 Hope, BC
Yvon L'Allier Quebec 6:18 LAK-12 St Raymond, QC
Eva Dillon York 5:15 Libelle 201 Arthur E, ON

SILVER ALTITUDE (1000 m height gain)

Jason Acker Edmonton 1785 ASW-15 Chipman, AB
Jay Allardyce Winnipeg 1948 ASW-19 Starbuck, MB
Felix Hurtubise Quebec 1080 Pilatus B4 St Raymond, QC
Bruce Armstrong Winnipeg 1796 ASW-15 Starbuck, MB
William Vollmar London 1253 Grob Astir Embro, ON
Karl Boutin Gatineau 1365 ASW-20 Pendleton, ON
Kyle Tiessen Rockies 1510 PW-5 Invermere, BC
Marc-Antoine Nadeau Quebec 1085 Puchacz St Raymond, QC
Yvon L'Allier Quebec 1177 LAK-12 St Raymond, QC
Eva Dillon York 1160 Libelle 201 Moriarty, NM
Pierre Bouchard Quebec 1222 Puchacz Baie St-Paul, QC

49 Maitland Street, Box 1351, Richmond, ON K0A 2Z0
(613) 838-4470, <rogerh@ca.inter.net>

The following record claims have been approved:

Pilot Chris Gough
Date/place 11 May 2014, Chipman, AB
Sailplane ASW-15 (C-GRXQ)
Record type Free triangle dist. – Territorial – Open, 15m, Club
FAI category 3.1.4d
Distance 672.4 km (Open, 15m, Club)
Task start/finish Chipman, TPs – #1 Marsden SK, #2 Gough Lake AB, #3 near Redwater AB
Previous record Nick Bonnière 630.8 km, Open & 15m (2012)
Bruce Friesen 609.5 km Club (2011)

Pilot Tim Wood
Date/place 9 July 2014, Elko, BC
Sailplane DG-400 (C-GETW)
Record type 500 km Speed to Goal – Territorial – 15m
FAI category SAC
Speed 93.3 km/h (15m)
Task start near Elko BC, finish Valemount BC
Previous record Charles Yeates 77.1 km/h (1966)

C BADGE (1 hour flight)

3029	Martin Pula	York	2:34	1-34	Arthur E, ON
3030	Felix Hurtubise	Quebec	2:02	Pilatus B4	St Raymond, QC
3031	Bruce Armstrong	Winnipeg	5:16	ASW-15	Starbuck, MB
3032	William Vollmar	London	3:37	Grob Astir	Embro, ON
3033	Sandrine Gressard	Gatineau	1:46	L-33	Pendleton, ON
3034	Kyle Tiessen	Rockies	5:36	PW-5	Invermere, BC
3035	George Wong	Vancouver	5:18	Grob 102	Hope, BC
3036	Marc-Antoine Nadeau	Quebec	1:30	Puchacz	St Raymond, QC
3037	Yvon L'Allier	Quebec	6:18	LAK-12	St Raymond, QC
3038	Eva Dillon	York	5:15	Libelle 201	Arthur E, ON
3039	Pierre Bouchard	Quebec	2:31	Puchacz	St Raymond, QC

soaring services

Fox One Canadian distribution for instruments and software for LX Navigation, SeeYou, Becker and Dittel radios, and will continue to support Ed's former customers. For more product info, go to <www.foxone corp.com>.

High Performance Sailplanes Dealer for Antares gliders, ClearNav Instruments, soaring computers and varios, SAGE mechanical varios, Strong parachutes and Cobra trailers. For product details visit <www.langelaan.com> or e-mail <willem@langelaan.com>, (647) 236-1286.

MZ Supplies Canadian dealer for Schleicher sailplanes, Borgelt instruments, Kelly covers. Ulli Werneburg, <wernebmz@magma.ca>, (613) 826-6606.

Solaire Canada Dealer for the new PowerFlarm "core" (brick) and portable collision avoidance systems. Now transponder and ADSB capable and approved for use in Canada (and the USA). Also still available some new and used PDA, PNA and Dell Streak devices, various flight computers, instruments etc. For more details, visit <www.solairecanada.com> or e-mail ed@solairecanada.com, (226) 271-5322.

Sportine Aviacija Canadian dealer for LAK sailplanes. LAK-17a – 15/18m flapped; LAK-19 – 15/18m Standard; LAK 20 2-seat 23/26m Open. <www.lak.lt>. <nick.bonniere@withonestone.com>

Windpath North American dealer for SZD-54-2 Perkoz, SZD 51-1 Junior, SZD-59 Acro, and SZD55-1. Also MDM-1 Fox, PW-6, PW-5, and Avionic trailers. Jerzy Szemplinski, <www.windpath.ca>, <info@windpath.ca>, (905) 848-1250.

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Eastern Zone

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robfrancis@tru.eastlink.ca

AÉRO CLUB DES CANTONS DE L'EST
Bromont Airport, QC
Marc Arsenault (514) 862-1216
marcarnault@sympatico.ca

AVV CHAMPLAIN
St. Dominique A/P, QC
www.avvc.qc.ca

CVV QUEBEC
St. Raymond A/P, QC
(418) 337-4905 www.cvvq.net

Eastern Ontario Zone

BONNECHERE SOARING
Dave Beeching (613) 584-9336
beechingd@sympatico.ca

GATINEAU GLIDING CLUB
Pendleton A/P
www.gatineauglidingclub.ca

MONTREAL SOARING COUNCIL
Hawkesbury A/P (613) 632-5438
www.flymsc.org

RIDEAU VALLEY SOARING
35 km S of Ottawa at Kars
club phone (613) 366-8202
www.rvss.ca/

Southern Ontario Zone

SOSA GLIDING CLUB
NW of Rockton
(519) 740-9328
www.sosaglidingclub.com

YORK SOARING ASSOCIATION
7 km east of Arthur
club phone (519) 848-3621
info (416) 250-6871
www.yorksoaring.com

ERIN SOARING SOCIETY
7 km east of Arthur
www.erinsoaring.com
info@erinsoaring.com

GREAT LAKES GLIDING
NW of Tottenham
www.greatlakesgliding.com

LONDON SOARING CLUB
between Kintore & Embro
www.londonsoaringclub.ca

TORONTO SOARING CLUB
24 km W of Shelburne
www.torontosoaring.ca

Prairie Zone

PRINCE ALBERT GLIDING & SOARING
Birch Hills A/P, SK
www soar.sk.ca/pagsc/

REGINA GLIDING & SOARING CLUB
Strawberry Lakes, SK
www soar.regina.sk.ca

SASKATOON SOARING CLUB
Cudworth, SK
www soar.sk.ca/ssc

WINNIPEG GLIDING CLUB
Starbuck, MB
www.wgc.mb.ca

Alberta Zone

ALBERTA SOARING COUNCIL
asc@stade.ca
Clubs/Cowley info: www.soaring.ab.ca

CENTRAL ALBERTA GLIDING CLUB
Innisfail A/P,
www.cagcsoaring.ca

CU NIM GLIDING CLUB
Black Diamond
club phone (403) 938-2796
www.cunim.org

EDMONTON SOARING CLUB
North of Chipman
www.edmontonsoaringclub.com

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Beaverlodge A/P
www.soaring.ab.ca/gpps/

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ALBERNI VALLEY SOARING ASSN
Port Alberni A/P, BC
http://avsa.ca

CANADIAN ROCKIES SOARING CLUB
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