2011 Winter

free flight / vol libre

Priorities

Sylvain Bourque SAC President

THE 2010 SEASON JUST FINISHED ON A POSITIVE NOTE – there were only a few accidents and claims in 2010, and thankfully no fatalities. Congratulations to all pilots and clubs for the safety initiatives they have taken. This places us in a good position to negotiate the fleet insurance premiums for 2011. More details will be available at the 2011 AGM.

Safety must be the #1 priority for all clubs, instructors, towpilots and glider pilots of Canada. Humility is the best quality that a glider pilot should have. Good pilots have the ability to question themselves. We should do the same with our own club procedures. Why question ourselves? In order to raise our safety level and, at the same time, lower the accident rate and casualties. The winter is the best time to do it. Visit the SAC website <*www.sac.ca*> under Flight Training in order to consult the available safety documents like the CFI Audit, Safety Audit, and the National Safety Program.

We are completing the schedule for the next AGM in Quebec City, to be held on 19 March. It will be organized by the Quebec City gliding club. A safety seminar will take place Saturday and Sunday. For further details, consult the schedule on page 22. This seminar is not only for instructors; glider pilots and student-pilots are welcome. Discussions will be of general interest, glider safety related. In the afternoon, a novice talk on soaring will also be held by a World soaring competitor.

As the East Zone director and SAC President, I invite you to the charming City of Quebec in March. I can't wait to meet you there.

La saison 2010 vient de se terminer sous un signe positif : cette année il n'y a eu aucune fatalité en planeur au Canada! Bravo à tous pour les efforts de sécurité. Seulement un petit nombre d'accident et de réclamations ont eu lieu en 2010, ce qui nous place dans une bonne situation pour négocier de bon prix pour nos primes d'assurances 2011. Plus de détails sont à venir à l'AGM.

Il faut que la sécurité demeure la priorité numéro un de tous les clubs, instructeurs, remorqueurs et pilotes de planeur Canadiens. La qualité la plus importante d'un pilote étant l'humilité, un bon pilote doit avoir la capacité de se remettre en question. Ça devrait être la même chose avec les procédures d'opération de nos clubs respectifs. Pourquoi se remettre en question ? Afin d'améliorer notre sécurité et par le fait même, les risques de blessure et de décès lié à notre activité. L'hiver est le moment idéal pour le faire. Visitez le site web de l'ACVV/SAC au <*www.sac.ca*> sous la section des documents – Flight Training, afin de consulter les documents sur la sécurité : comme le CFI Audit, Safety Audit et du National Safety Program.

Nous sommes à finaliser les menus détails de la prochaine assemblée générale des membres de l'ACVV/SAC 2011 qui sera tenue par le club de Québec le 19 mars 2011 à l'Hôtel Château Laurier. Un séminaire sur la sécurité aura lieu le samedi et le dimanche matin. Pour plus de détails, aller voir plus loin à la page 22. Ce colloque ne s'adresse pas uniquement aux instructeurs, les pilotes de planeur et élèves-pilotes y sont les bienvenus. Les sujets traités seront d'intérêt général, liés à la sécurité en vol à voile. Le samedi après midi, une discussion pour les débutants au vol voyage aura lieu. Cette discussion sera donnée par un compétiteur aux mondiaux de vol à voile. C'est à ne pas manquer.

En tant que directeur de la Zone Est du Canada et Président de l'ACVV, je vous donne rendez-vous dans la magnifique Ville de Québec le 19 mars 2011. Au plaisir de s'y rencontrer !

free flight
vol libre

2011/1 – Winter

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

ISSN 0827 – 2557

The story of this enthusiastic little girl is on page 12. Another fine cover photo by Maria Szemplinska.

DEPARTMENTS

Not your average birthday flight

Tammie Diesel & Tony Burton

ON FRIDAY, October 29, Walter Mueller turned 90, and he chose to mark this special occasion as any glider pilot would, soaring above his home town. The morning started out clear, calm and a rather cool -4C, so the planned 11 am take-off at Grande Prairie Regional Airport was delayed an hour. Finally, shortly before noon, Walter was pulled out to the runway and hooked up to his towplane, an Acro Sport 2 piloted by a long time friend Jordie Carlson. A bit of a hush came over the group of about twenty family and close friends as first the glider then the towplane lifted off on a 4000 foot tow, and soon both aircraft were out of sight.

Waiting, we talked about the many finer points of long friendships with a unique pilot. We finally sighted the glider again and were all able to watch its seemingly lazy return, but within two minutes Walter was nosing down toward the runway. A cheer went up from the spectators as the wheels touched and the glider came to a halt. From lift-off to landing, about 31 minutes passed. Walter's face showed great happiness, and this sense was quickly reflected back to him by everyone there, shaking hands in congratulations. Let me tell you, I felt completely blessed to be a part of this. There is not one other place on Earth I would rather have been that day; watching and photographing this was a "top-10" event of my short life so far!

In a post-flight interview with a local reporter, I heard Walter respond to a question with, "Well, every flight feels wonderful." I am quite sure that his feet really did not hit the ground for two days! That evening at the special aviation get-together he opened his dress shirt to show a T-shirt on which was written, "*it is never too late to have a happy childhood*", and the next day was the big birthday party and open house with 95 signing the guest book.

Tammie

WALTER IS ONE of a very short list of those pilots, of any stripe anywhere in the world, who are still active on passing 90 years of age.

Walter had his first glider flight as a teenager in Germany in 1937 and earned his licence in 1939. He was a Luftwaffe flight instructor during WWII. Walter ⇨ **p30**

Tammie Diesel

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. The accuracy of the material is the responsibility of the contributor. No payment is offered for submitted material. All individuals and clubs are invited to contribute articles, reports, club activities, and photos of soaring interest. An e-mail in any common word processing format is welcome (preferably as a text file). All material is subject to editing to the space requirements and the quality standards of the magazine.

Images may be sent as photo prints or as hi-resolution greyscale/colour .jpg or .tif files. Prints returned on request.

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.

For change of address and subscriptions for non-SAC members ($30 or $55 for 1 or 2 years, US$35/$60 in USA & overseas), contact the SAC office at *sac@sac.ca*. Copies in .pdf format are free from the SAC web site, *www.sac.ca*.

President Sylvain Bourque
Vice President John Mulder
Treasurer David Collard
Secretary John Mulder
Office: **SAC office**
71 Bank Street, 7th floor
Ottawa, ON K1P 5N2
Office Manager Tanya Storing

tel: (613) 236-4901 ext. 109
fax: (613) 236-8646
e-mail: ***sac@sac.ca***
web site: ***www.sac.ca***

Deadline for contributions:
10 **March, June**
September, December

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 vélivoles 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 vélivoles bienveillants. Leur contenu n'engage que leurs auteurs. Aucune rémunération n'est versée pour ces articles. 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. Les photos vous seront retournées sur demande.

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 ou s'abonner à la revue, communiquez par <*sac@sac.ca*>. Le tarif d'abonnement est de 30$ pour 1 an et 55$ pour 2 ans. Pour l'extérieur du Canada, le tarif est de 35$US pour 1 an et 60$US pour 2 ans. La revue est disponible gratuitement, en format "pdf" au <*www.sac.ca*>.

EDITOR
Tony Burton
Box 1916 Claresholm, AB T0L 0T0
phone (403) 625-4563
e-mail ***t-burton@telus.net***

copy proofing – Ursula Wiese
French content – Sylvain Bourque

Courier service to 335 – 50 Ave. W

COMMERCIAL ADVERTISING
SAC office (613) 236-4901 ext. 109
e-mail ***sac@sac.ca***

Date limite:
10 **mars, juin**
septembre, decembre

letters

Mid-life aerobatics

I'm 63 years old with about 20 of them spent in airplanes in my spare time, 750 hours in 172s and tail-draggers (most of that time towing gliders), and almost 500 hours in gliders (about 200 of those as an instructor).

I started my mid-life crisis flying-wise a little later than most and that's why I found myself last January down in sunny Arizona. I spent a week outside of Phoenix at Estrella Sailport learning sailplane aerobatics with the renowned Jason Stevens. It was a great experience (13 flights in all) and the opportunity to fly "The Fox" was really special. Then, this past summer I decided to continue my training at SOSA's field though continue isn't quite the right word.

I began at the beginning again with the acro syllabus that Scott McMaster put together. Scott is a very experienced power and glider aerobatic instructor whose enthusiasm seems to be boundless (it also rubs off on you very easily). He along with his wife Andrea Kuciak, Lorna Novosel, and Joe Stubbs are the acro instuctors and I flew with all except Lorna at various times.

The acro progam begins with extensive ground briefings regarding flight envelopes and aircraft limitations, human medical factors, flight safety, and parachutes (inspections, use after egress, etc.) and then goes on with detailed pre-flight briefings for each maneuver being done as well as post-flight de-briefings. As Joe explained, 5000 foot tows are expensive and the maneuvers eat up a lot of altitude in a short time. You want to get in the most aerobatics possible and not waste time and money talking.

We started with the basics: down-lines and up-lines, pulling the exact amount of g's while adding absolutely no bank or course changes. Then into vertical entries and exits, on to humpty-bumbs and loops. And so on… I managed to get all the way through the basic maneuvers (I have to clean up the slow roll to complete the basic program). I also did the comprehensive spin training unit (a series of four or five flights covering just about every kind of spin, entry, and exit except inverted spins) because I eventually want to instruct aerobatics at my home field – York Soaring.

The final "blessing" flight of the basic acro training is a get-yourself-out-of-this flight where the instructor purposely ruins your entry into or exit from various maneuvers to confirm that you *can* recognize the problem *and* get out of it safely (yes, you do know it's coming). SOSA's acro program is a great one and in my opinion SAC should consider adopting it nationwide for those other clubs (like York Soaring) who are contemplating an acro program.

I should mention that SOSA uses the DG-505 (sans winglets), two ASK-21s, and the Puchacz (for spin training) for acro flying. As a good friend and fellow instructor at York, Charles Petersen (the driving force behind the future acro program at York) said, "When we start doing aerobatics here a whole lot of pilots and instructors will suddenly become students again!" Think back to your first solo flight (big smile), now think ahead to your first solo half-cuban eight (another big smile). Even if you aren't into aerobatics, a few basic lessons can make you a sharper pilot.

Next spring I plan on returning to continue to combination maneuvers and the instructor's program. Guess my mid-life crisis isn't over just yet.

Don Kuehn, York Soaring

⇨ **p26**

17 flaps of the wing ...

a human-powered ornithopter is built and flown at Great Lakes Gliding Club

David Donaldson, GLGC

15...16...17...17 FLAPS of the wing– that's when the "engine" ran out of "fuel". The engine in this story is University of Toronto PhD student of aeronautics, Todd Reichert. The bird he was piloting and flapping is the *Snowbird*, the first successful human-powered ornithopter. This was the culmination of many years of hard work, three of which were at Ronan Field (CTR3). I am not here to tell Todd's story; if you Google "ornithopter" (assuming you have not already) you can see his side, in his words. Go to <*http://hpo.ornithopter.net*> and you can see the specs. We are here to tell our story.

A bird in the nest March 2008, Todd and Cam Robertson, the two leads of the project, visited Great Lakes Gliding Club to inquire about building and flying their now-historic bird off our field. They had been looking for an airstrip close to Toronto and were calling fields in the *Canadian Flight Supplement* when they talked to an Air Canada pilot who directed them to Mike. Although the project was well underway by the time the team set up shop in the barn, let's pick up the story from there.

Professor James DeLaurier (aka Dr. D) glues thin wood strips on the edge of the foam ribs.

Why Ronan Field? In large part it was due to the connections between what they were doing, how they will operate, and how a soaring club operates… besides, they needed a *really* wide grass runway. Mike Ronan met the two students and immediately welcomed them. The club embraced the news and offered their support. As Mike's place is the former Ronan family farm, it has a big barn. This barn serves us very well for winter storage and now it was going to be the summer workshop for the project.

Over the next three summers we watched as the aircraft took shape and finally spread her wings to take flight. As this project was a full time job, the work was done Monday to Friday with much overtime, so there was little to no activity in the barn on the weekends. During the construction of *Snowbird*, we would show up for our regular weekend operations and have a look at the various components and parts as she started to take shape. Show up any evening during the week however, and chances were you would see the team members hard at work.

New students Part of the rationale for basing the project on a glider field is that they would need flight training, after all the plan is to not only build the craft, but fly it too. This meant they needed ground school: did I mention they were PhD students of aeronautics? The thing is, although they have the detailed knowledge on aircraft design, they were missing the operational portion. So we spent some time talking about procedures, safety and airmanship.

I think their choice of a glider club was very wise since they were planning two-axis control and we glider pilots were much more in tune with the secondary effects of

A cool dawn launch, ready to go when the fog clears enough.

rudder having to pick up a wing on take-off than your typical power pilot. It was very gratifying to have a PhD student say, "Finally, I understand spins!" So with enough ground school to get started, Todd and Cam began their flight training. It was not yet 100% confirmed who would be the pilot for the actual flight, there was still time; after all, they hadn't completed the construction yet.

Murphy's law What can go wrong, will. We had only just begun the 2008 season when the Pawnee had a hard landing and we relocated to Toronto Soaring for the summer. The ornithopter continued to grow in the barn but serious flight lessons were all put on hold. With his characteristic generosity, Mike got Todd up in the *Lambada* for several flights.

Power The airplane needed a rowing mechanism, the one selected <*www.rowingbike.com*> became one of the sponsors. This is a very cool bike – I encourage you to take a look at the engineering details from their website.

Initial rigging of the 4-piece wing. The outboard section is short, but the wings would not fit in the barn otherwise. From the left: Todd Reichert, Carson Dueck, Robert Dueck, Dr. D

The original design plan for the ornithopter had both the arms and legs providing power, mimicking the setup for the rowing bike almost exactly. This created an interesting challenge for the controls. The plan was to use servos for radio-controlled aircraft to actuate the control surfaces. The controls were to be mounted on the handlebar and actuated by the pilot's thumbs, much like a Game-Boy controller. However, the handlebar was abandoned before completing the aircraft, and the power for the downstroke of the wings would come only from the legs of the pilot with a two-legged press on a sliding block.

The controls were still RC servos but the controllers were now a pair of mini joysticks mounted under the seat: one for rudder, the other for elevator. The trim was mechanical – an elastic band to centre the stick. To deal with the flight loads, both the vertical and the horizontal all-moving tail surfaces were designed to be aerodynamically neutral. This would not only reduce the control forces but also prove to be of great value when the control system failed once during flight tests.

Part of the motivation behind the project was Todd's love and fascination with human-powered machines. He not only studies this but lives it. His regular mode of transportation is bicycle, including riding his bike from downtown Toronto to the field a couple of times and on to Toronto Soaring. This affinity is also evident in his next project, an enclosed bike he is designing for a university competition that is well on track to break the existing speed record.

A side note: Todd's PhD thesis was actually on aeroelasticity, Cam's was on elasticity of materials, neither on human powered flight. I personally give them full marks for creative application of a thesis as an excuse to build and fly a really cool airplane.

How do you measure weight? We are cognisant of the issues of carrying extra weight in an aircraft. On this project, weight really was measured in grams. A mantra in human-powered flight aircraft design is that if it won't break, it's too heavy. I was asked to loan a GPS flight recorder to the project but it was too heavy. She started with a pair of wheels, specially ordered, but after the first flight tests they realized only one was necessary.

There is a sign in the barn, "Laminar flow or we don't go". This reflected not only the singular focus that the team had on their goal, but also the tolerances that this project demanded. I am still amazed at the weight of this craft. We have all had that back-breaking experience of holding a rather heavy wing as the pilot wrestles with an uncooperative main pin (an ASW-20 in the club comes to mind). With a wing span of 32 metres (103 feet) one would expect there to be considerable weight. Weighing in at only 27.1296 kg (59.7 lbs) for the entire wing, tip to tip, not only was it an easy job for two people to manage, but I was able to lift my end with just one finger.

Every possible opportunity to "add lightness" was taken. A series of holes were drilled in the wooden trailing edges of the tail surfaces; this reduced the weight by 73 grams. I picked up the handful of pieces that were cut out and I

could barely feel their weight. Being out at the end of the moment arm, this allowed a corresponding decrease in pilot weight. This upgrade came very late in the program and if memory serves, this was done for the last day of flights. Perhaps the straw that allowed the camel to fly?

By the way, a signifcant design feature of the wing is that there is no hinge mechanism, the flapping motion was possible by the flexibility of the spar itself. Not only that, the correct twisting of the wing to create thrust was built right into the position of the spar in the airfoil at the wingtips. *(Note this in the photo on the previous page.)*

A glider at heart The similarities between *Snowbird* and a glider are striking. First, she is composite. She is only rigged before a flight and, of course, there is that whole lack-of-a-noisy-engine part. Carbon fibre and Kevlar featured very prominently and, like many experimental aircraft that came before, she was built for a single purpose – literally not an ounce more.

The main structure is carbon fibre tubes. The fuselage is a tube about 6" in diameter. There are two machined aluminum blocks lashed to the fuselage with Kevlar that act as the connection points for the wings. The size and lightness of all the components was astounding. The pins that connected the wings to the fuselage were maybe 3/16" in diameter. There are also support wires triangulating the bottom of the fuselage and the wings. I have to compliment the team on their engineering.

Like most gliders, the more we rigged and de-rigged, the better at it we got. In the end, *Snowbird* was one of the easiest to rig on the field. We had it down to a fine art even though she is the only ship I have helped rig that requires a crane (Mike's tractor with front end loader). This is another area where glider expertise was able to assist the team. With the combined experience in rigging aircraft, we were able to refine that process. Like I said, we had it down to a fine art and other than the hour, she was a pleasant ship to rig.

The human engine What I found very interesting was the bicycle design that the entire concept was based on. Previous human-powered aircraft were based on the more traditional pedaling design, this works great when you are powering a propeller having continuous trust, not so much for wings flapping at about 0.65 Hz where the power had to be applied intermittently by thrusts of the legs with a required average power output of about 620 watts, double that of earlier propellor powered human flight aircraft like the *Daedalus*.

How Snowbird got her name

She was not named until the second year. As the team got closer to their goal, they decided that this historic bird needed a name and we were asked for suggestions. I suggested "The good ship Lollypop", after all, the famous song by Shirley Temple was about an airplane… I was voted down. So why Snowbird? Well, the first flights were in late October/November. It was cold and we had to contend with seriously heavy frost. There were lots of jokes about de-icing before the flight and guesses as to which would weigh more: frost, de-icing fluid, or airplane.

With the aircraft nearing flight test, Todd ramped up his training. When the flight testing finally progressed to flapping, Todd discovered that he had been using the wrong training method – he had been training for endurance but he needed to train more for strength. There was a last minute change to weight training and 30 second sprints. An integral part of his regime was to stay quite close to 160 pounds also. The weight tolerances were very tight and the calculations included the pilot; on the record flight day he weighed in at 70.8 kg (156 lbs). Since the flight, Todd has gained 30 lbs I'm happy to say, he had been looking a little sunken in the cheeks.

Flight testing The first few flights were planned as straight gliding flights to allow Todd time to get comfortable with controlling the aircraft before he started attempts at flapping. I was impressed with the methodical nature of the team as they approached the flight testing phase. With multiple page checklists including everything from assembly, pre-launch checks and post-flight debriefs, the entire operation was run with an air of professionalism with safety as the primary consideration.

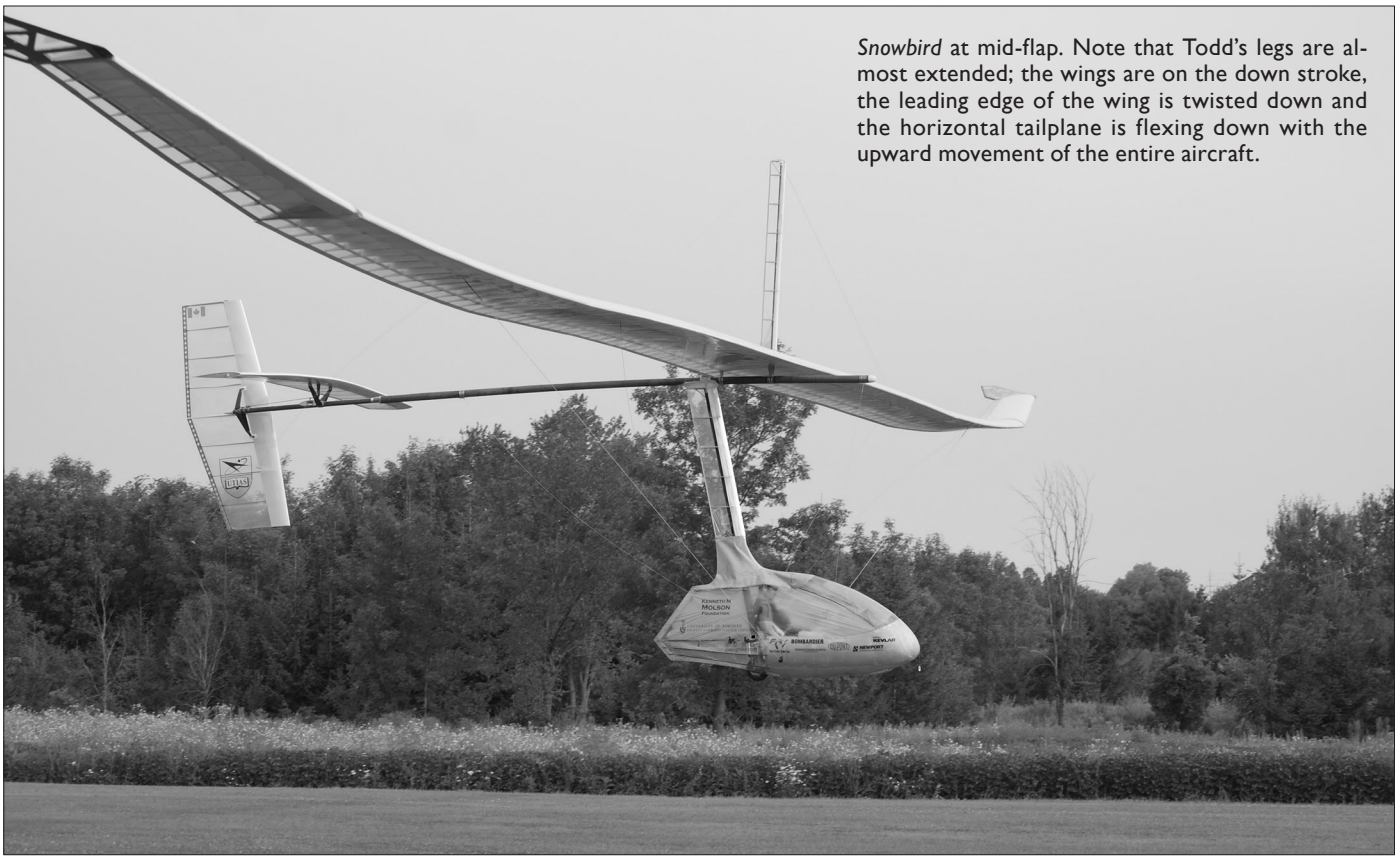
The wing loading was so low that even the slightest of movement in the air would cause a reaction. She would let us know when the breeze started long before we would feel it. This created the need for very still air during the flight tests so the flights were conducted either in the very early morning or late evening. This led to 4am wake-up calls to rig for dawn launches. On the plus side, I could still make it to work at a reasonable hour.

As with many experimental aircraft that are at the edge of the envelope, *Snowbird* was on the verge of structural failure at any given point. The ground crew was under strict orders not to attempt to catch a wing on landing as that would cause more damage than the tip touching the ground. For take-off, there was a wing runner positioned under each wing holding a piece of string to keep the wings level. They added a little wooden toggle after the first day of flights to make it easier to hold the string.

The drill was for the launching wing runners to run until they could not keep up. By that time, the wings were lifting and she would stay upright without assistance. One would start with the toggle at waist level and it would be over your head when you could not keep up.

On landing, there were a series of wing runners (usually six) stationed at intervals down the runway to catch the toggles as she landed and keep the wings level. This worked most of the time. There were a couple of days when the crosswind caused her to drift off into the beans – as a testament to the designers, there was no damage beyond the skin itself.

Fly it like a Boeing It being a single seat, one-of-a-kind airplane, we were not able to provide an accurate briefing of her flight characteristics – that was up to Todd to figure out. Todd started flying *Snowbird* just as he went solo in the glider. I had to step up his flight training to ensure that he was ready at the same time as his aircraft. I would leave work a little early, head straight to the field to get in a couple of flights with him before sunset.



Snowbird at mid-flap. Note that Todd's legs are almost extended; the wings are on the down stroke, the leading edge of the wing is twisted down and the horizontal tailplane is flexing down with the upward movement of the entire aircraft.

One of my favourite memories of the whole experience was when I was briefing Todd for his first solo flight in our *Krosno*. He interrupted me and said, "Sorry, could you repeat that – I didn't hear anything after, 'You're going solo." As a student he was a pleasure to work with, very enthusiastic yet professional and a quick study. In retrospect, it was probably a good thing that he was so new to being a pilot, he did not have to unlearn any ingrained habits, which is a common training problem. And being at that age where new tricks are learned much easier than by us old dogs didn't hurt either.

With a flying speed of about 27 km/h (official claim was at 25.6 km/h average), a wing span of 32m, and two-axis control, she was slow to respond to the controls. In preparation for Todd's flights we did a number of slow flight, secondary effects of rudder exercises because, with no ailerons, it was the rudder that was controlling *Snowbird's* roll. Early in the flight testing Todd was questioning if the controls were working and it was Mike who provided the magic words that really brought it home:

"Fly it like a Boeing – put in a control input and then go for coffee."

You really needed to be out in front of this aircraft, anticipating what is happening, putting control inputs in early and then waiting for the response. To Todd's credit he was able to overcome his relative inexperience quickly and became quite skilful at piloting *Snowbird*.

Smooth sailing It is expected with this type of project that there would be failures, lessons learned, and adjustments made. This project was no exception; however, all things considered it went very well.

Once flight testing started there were only two major events that occurred. The first was a failure in the flight control system. As mentioned, the flight controls were handled by RC servos. This meant that the control inputs were transmitted as electrical signals from the two joysticks to the servos mounted on the tail. The battery was plugged in for each flight and the "battery on" time was carefully monitored, switching out batteries after only a few minutes of use. The problem was with the temporary plug-in connections and other wiring, it was easy for the signal to be interrupted.

We had at least three flights where there was a question whether the flight controls were responding or not. A video camera was set up in a chase vehicle to follow the flight, with an immediate debrief of the control deflections and review of the tape to confirm corresponding control surface movements. This led to an upgrade in the control system.

Nearing the end of the 2009 season we had the only accident with *Snowbird*. Flight tests were progressing well. We arrived early one morning and rigged as normal. By this point in the program, we had become pretty proficient with rigging and the day progressed normally. It was on the second or third flight when, on the second flap, there was a loud bang. Todd immediately knew something was wrong and stopped flapping. We were unaware on the ground that there was a problem, as at this point in the flight testing, Todd was only just starting to flap and it was normal for him to complete a flight with only a couple of flaps. Touchdown was normal and to Todd's credit, he ensured that the touchdown was as smooth as possible for fear of structural failure. ⇨ **p23**

lumières sur la durée
a light on duration

Jean-Philippe Guillerme

some history on flying for days at a time

SI UN JOUR vous avez l'occasion de vous rendre dans le sud de la France, prenez le temps de passer par l'aérodrome de Romanin près de Saint-Rémy-de-Provence. Tout en haut de la piste, à l'orée d'un bosquet de chênes verts, vous y découvrirez une sculpture plutôt étrange et inattendue *(voir photo)*, digne d'une composition qui aurait pu sans doute faire bonne figure au Musée d'Art Moderne de New York.

Une œuvre d'art contemporain où la rouille et le béton essaient de se jouer du temps. Mais ne vous y méprenez pas car cette installation est une relique des temps héroïques où ici-même on battait les records du monde de durée en planeur. Ces puissants projecteurs servaient en effet la nuit à éclairer la pente nord des Alpilles pendant les tentatives de record de durée. Ils avaient été spécialement construits par la société Ulmer Aéronautique à Paris (cette société fournissait à l'époque surtout du matériel de balisage de piste entre autre). Les planeurs eux-mêmes étaient équipés d'un phare à l'avant du nez. Les Alpilles, cette petite chaîne de montagne typique de la Provence, sont orientées Est-Ouest et sont parfaitement perpendiculaires au Mistral, ce vent froid venu du nord, fort et régulier, qui sévit surtout en hiver et au printemps. Le site se prête donc parfaitement au vol de pente longue durée.

Les crêtes des Alpilles sont exploitables en vol à voile sur une dizaine de kilomètres environ. Pendant les opérations, le contact radio avec Louis Brun, le chef du centre, était permanent. Celui-ci soutenait activement le moral du ou des pilotes lors de leur tentatives, les aidait à combattre l'ennemi invisible et sournois, le sommeil, qui les guettait une ou deux nuits durant. Une équipe de contrôleurs vérifiait dans l'obscurité si les feux de position rouge et vert des planeurs étaient bien visibles à chaque aller-retour, ce qui était très réconfortant pour les équipages qui affrontaient la nuit froide de l'hiver. Ce type de vol était particulièrement éprouvant pour l'organisme humain : engourdissement dû aux basses températures, somnolence, nausées, crampes, relâchement de l'attention et même hallucinations durant la deuxième nuit (tous les pilotes racontent en avoir eu à des degrés divers).

L'utilisation de la pente des Alpilles ne date pas d'hier en vérité. Dans les années 20, un certain Joseph Thoret, alias Thoret-Mont-Blanc, expérimente le vol dynamique intense à bord d'un avion biplane militaire biplace Hanriot HD-14, hélice calée. En 1924, l'École des Remous est née en ces

IF YOU ARE EVER TRAVELLING in southern France, take some time to visit the Romanin airfield at Saint-Rémy-de-Provence. At the top of the runway, almost hidden now at the edge of a grove of oak trees, you will find a strange sculpture. It is worthy of showing at the Museum of Modern Art in New York – a work of rusty metal shapes and pitted concrete, losing a fight with time *(see photo above)*. It is a relic of the heroic times when world glider duration records were broken here several times. These powerful spotlights were used to illuminate the north slope of the Alpilles at night during the record attempts. These lights were especially designed by Ulmer Aéronautique in Paris, who also supplied runway lights and other things.

The Alpilles, a typical small mountain range in the landscape of Provence, face perpendicular to the Mistral, a strong and steady cold north wind, blowing above in winter and spring. So this spot was perfect for long slope soaring flights. The crests of the Alpilles are usable here for soaring over about 10 km. During the flights, a radio link with Louis Brun, the chief of the gliding center, was permanent. The chief actively supported the good spirits of the pilots during their attempts, helping them fighting their invisible sly enemy, sleep. A staff of controllers checked to see if the red-green running lights of the sailplanes were still visible after each round trip – very comforting for the pilots facing the cold winter night. That kind of flying was really afflicting on the body: loss of attention, numbness from the low temperature, drowsiness, waves of nausea, cramps, and even hallucinations during the second night (all pilots tell that they had them to different degrees at times).

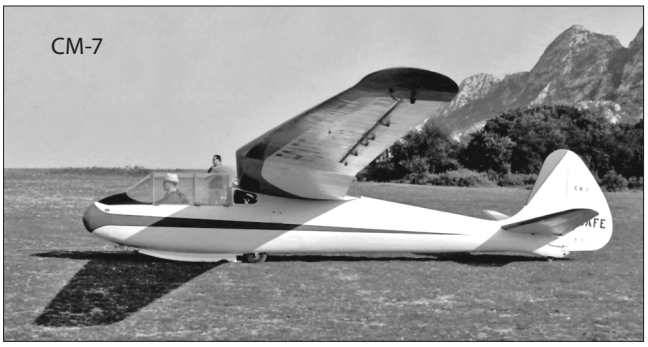
Slope soaring the Alpilles (also known as Thoret-Mont-Blanc) was not very new. In the 1920s, a Joseph Thoret tested out the intense dynamic flight in a military two-place biplane, the Hanriot HD-14, with its engine off. In 1924, the École des Remous began in this prestigious spot. Thoret regularly took a passenger who most often had to end the flight at the infirmary, frightened to death!

After WWII, the gliding club of Romanin concentrated its activity on duration records, and world records were broken one after the other starting in 1948.

lieux devenus prestigieux. Thoret emmenait régulièrement avec lui un passager qui souvent finissait à l'infirmerie après le vol, mort de peur !

Ce n'est qu'après la Seconde Guerre Mondiale que le club s'oriente définitivement vers le record de durée en planeur. Et les premiers records tombent les uns après les autres dès 1948.

19-20 novembre 1948 Marcelle Choisnet-Gohard sur Air-100 s'approprie le record de France féminin de durée avec un vol de 35h07. Départ à 08:30 pour se poser deux jours plus tard en pleine nuit à 00:36. Louis Brun lui demande d'atterrir. Choisnet est déjà détentrice d'un certain nombre de records nationaux et internationaux de distance et de gain d'altitude.


CM-7

Ce qui ne l'empêche pas les 4, 5 et 6 février 1952, en compagnie d'Yvette Mazeiller, d'établir un nouveau record du monde de durée biplace sur CM-7 avec un temps de 28h51, record qui sera battu deux ans plus tard avec une autre équipe, toujours sur CM-7. La FAI lui décerne sa première médaille aéronautique. Marcelle Choisnet décède en 1974 suite à un accident de planeur.

L'année suivante en 1949, le 16 mars, Guy Marchand qui n'a alors que 200 heures de vol, s'octroie le record du monde monoplace sur Nord-2000 (version française du Meise allemand), avec un vol de 40h51. L'équipe qui vient à sa rencontre à l'atterrissage le trouve endormi aux commandes.

4-6 février 1952 Après avoir décollé à 13:00, l'équipage Albert Carraz et Jean Branswick s'accapare le nouveau record du monde biplace masculin avec 53h00. Le Mistral est alors bien établi et souffle parfois à plus de 100 km/h, avec des températures oscillant entre -4 et 10 degrés, tantôt raclant la pente à 300 m, jusqu'à 2000 m d'altitude.

2-4 avril 1952 Cette fois-ci il s'agit du record de durée masculin monoplace. Le héros du jour (des jours) s'appelle Charles Atger. Son Air-100 a tenu l'air 56h15 dans des conditions apocalyptiques, le Mistral étant particulièrement violent, ce qui le rendra malade en plein vol. Enfin il atterrit complètement vidé, ayant perdu plus de 5 kg, et fera une syncope quelques instants après s'être extrait du cockpit. L'Air-100 fut immédiatement interdit de vol, le jeu des axes des ailerons n'étant plus dans les tolérances. Charles Atger n'avait certainement pas improvisé son vol. Quelques mois avant son fameux décollage, comme il était agriculteur, il avait pu s'entraîner régulièrement des nuits entières à labourer ses champs afin que son corp apprenne à résister au sommeil. D'autre part, lors du vol, il avait ⇨ **p28**

19-20 November 1948 Marcelle Choisnet-Gohard in an Air-100 takes the feminine French duration record with a flight of 35:07 hours. Take-off at 08:30, a landing two days later at 00:36 after Louis Brun asked her to land. Before that, Choisnet held several national and international records for distance and altitude.

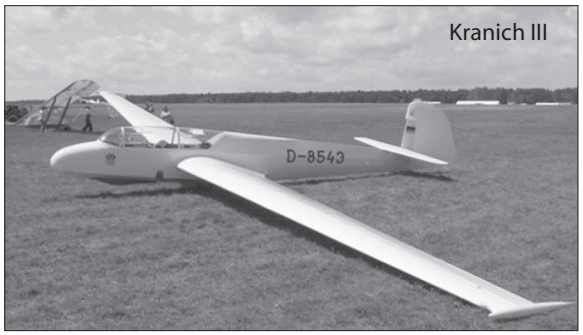
Air-100

On 4-6 February 1952, with Yvette Mazeiller, she makes a new two-seat world duration record in the CM-7 with a flight of 28:51 hours. This record is broken just two years later with another crew, still with the CM-7. The FAI awards her with its very first medal. Marcelle Choisnet will die in 1974 after a crash with her glider.

The next year, on 16 March 1949, Guy Marchand who has only 200 hours in his logbook, wins the World record single-seater on a Nord-2000 (French version of the German Meise). He stays airborne for 40:51 hours. The assistants on the ground find the pilot asleep in the cockpit just after landing.

4-6 February 1952 Taking off at 13:00, the crew of Albert Carraz and Jean Branswick monopolizes the new men's world duration record with a time of 53:00 hours. The Mistral blows regularly, sometimes at 100 km/h, temperatures are oscillating between -4°C and 10°C, sometimes slope soaring down at 300 m, later at 2000 m.

2-4 April 1952 This time it's a single-seat duration record. The hero of the day (rather, days) is Charles Atger. His Air-100 stays above the slope for 56:15 hours, in very rough conditions as the Mistral is particularly strong and it makes him sick. He lands completely exhausted, losing more than five kilograms, and he blacks out just after getting out of the cockpit. The glider is grounded immediately for excessive play in the ailerons. Charles Atger was a farmer, and months before he tries the record, he trains regularly by plowing his fields all night long so that his body learns to resist sleeping. During the flight he carried a bottle of eau de Cologne which he sprayed in his eyes when he started to sleep. He was awarded ⇨ **p28**



Kranich III

Joie de vivre!

Dave Springford, SOSA

THIS YOUNG GIRL, expressing an irrepressible joy of life, is Alexandra Kudo, the goddaughter of my wife, Virginia. Alexandra has developed an early interest in flying, in fact, each spring she now asks her parents when she can go flying. She is six years old and has flown six times – once a year since she was born. The Puchacz photo below right shows Alexandra at age 2 going for her second flight.

On arrival at the airfield her first mission is to find me and get in the glider. This year she wanted to learn to fly so I gave her the controls during the flight and she was able to fly straight and do some gentle turns, with a little help on the rudders since she can't quite reach them. She is not a timid flyer and always asks if we can fly upside down and I'm happy to oblige with a few wingovers. This year, her four year old sister went for her second flight. It looks like we have a couple of potential new glider pilots coming along.

The glider is a 1942 Laister-Kaufman LK-10A. It was built in a St-Louis piano factory during the Second World War and was delivered to the US Army in 1943. The Army designation for the glider was TG-4 and it was used to train the combat glider pilots who would later fly the large troop-carrying gliders during the Normandy invasion. It came to Canada in the spring of 1947 when the Queen's University Gliding Club purchased two of them from US Army surplus in Syracuse New York. The glider eventually went to the Rideau Gliding Club of Kingston in Gananoque and was flown by them until they folded.

There is some interesting family history associated with ZAJ. Larry Springford, my father, trained in and flew his first solo in this glider in the early 1960s at Gananoque (below). The glider came to SOSA in the late 1980s and is now owned by Herrie ten Cate and me. Herrie completely restored the glider in 2000 and painted it in the same colours and design as it appeared when it belonged to Queen's. I bought a share in 2003 and have used it to fly friends and lots of passengers over the years.

Some people are attracted to the shiny white gliders for their flights – others are drawn to the bright yellow and blue vintage glider. As the cover photo shows, another plus to flying in the LK-10 is the possibility for the passengers to fly open cockpit and feel the wind in their hair. ❖

There is an excellent article on the history of ZAJ by Herrie in the 2006/6 issue of Free Flight. Look it up in the archive.

The trouble with AATs

Dane Dickinson, *from Soaring NZ*

Dane provides a perspective on Assigned Area Tasks (AATs) and the problematic issues they bring to competitive gliding.

SEVERAL YEARS AGO a prominent competition pilot told me that AATs were like lotteries – you get your ticket, and you might get lucky, but probably not. I confess I didn't understand the analogy he was making at the time, but over the past few seasons I've started to see what he was getting at. I will offer an overview of my experiences with AATs and argue that they invariably increase the degree of luck present in gliding competitions – an undesirable consequence that reduces the significance of competition results.

Traditional (racing) tasks The most common task in competitions is a fixed course where pilots fly through a number of designated turnpoints. To complete the task competitors must pass every turnpoint; the winner will be the pilot who does so the fastest. Basically a race.

Although perhaps not ideal to everyone, this format of flying has evolved and been developed over the past 50 years in such a way that it is accepted by most glider pilots as a good method to determine who is the 'best' at soaring. In general, this system of tasking and the scoring that goes with it tests the following criteria: technical preparation, piloting and soaring skill, weather knowledge and sky-reading, flying efficiency (ie. speed), and a raft of psychological traits that we might simply label the "champion's psyche" or, in George Moffat's words, "one's will to win".

It is important to note two things that are not (or, at least, should not be) tested: specialized local knowledge, and luck. Testing pilots with local weather phenomena that cannot be properly understood without hundreds of hours of practice would be rather irrelevant and unfair on visitors. And if we were to purposely incorporate luck into the game, then we may as well save some money and roll dice instead. But where do AATs sit in all of this?

Assigned Area Tasks AATs are a relatively new invention, and the first point to note is that they fundamentally conflict with the concept of racing. Rather than an inflexible course of firm turnpoints, competitors are designated large areas to fly into (usually circles), and a time frame to do so. To win, a pilot must fly into each area, but must try to do so in such a way that he is faster than the other competitors. But there is no real racing involved because the nature of the tasks mean that you cannot assess your progress against others along the way. The analogy I like to draw is that AATs are akin to telling rally-car drivers to go out into the countryside for a few hours and try to come back with the highest average speed – a lot of fun maybe, but not a lot of point if you are trying to determine the best and fastest driver. The rebuttal of this argument is that gliding competitions are not only about 'racing'. This is a fair point; however, what advantages do AATs confer to gliding competitions?

One of the commonly advanced positives of AATs is that they provide a cop-out option for task setters in questionable weather, which allows for more competition days and reduced landouts. As we will see, this is not a good argument for many reasons. Other purported advantages of AATs are that: they reduce gaggle flying and increase pilot decision-making, they work well with handicapped competitions, and they are easy to complete for novice pilots. Of these, the AAT's capacity to reduce gaggle/start zone tactics is rather credible – by forcing pilots to make more decisions in the sky, more reward is put on creative talent and less on leeching skill. But what of the negatives?

An obvious detraction of AATs is that they require more work, both in tasking and in flying. But they also are troublesome in that they further complicate our sport (many pilots struggle to understand them, not to mention observers). Aside from this though, there is nothing inherently problematic about them. However we have not yet examined how AATs are commonly employed. Consider the following typical AAT scenarios:

Uniform conditions I mean uniform terrain, uniform sky, and a uniform glider fleet. This was the spawning ground for the AAT during the late-90s. It was during uniform flying conditions that the AAT's architect, former World Champion Brian Spreckley, explicitly intended for AATs to be used.

Of the 50-odd AATs that I've flown, only five or six have been in uniform conditions. Several tasks in Australia come to mind where they worked rather well. The fleet became relatively dispersed throughout the sky and the winning pilots were those who flew precisely and kept the pedal down all day. Curiously though, most task setters tend to avoid AATs in uniform conditions and set racing tasks instead.

Wide performance range It's common for a task setter, when faced with great disparity in pilot abilities and/or glider performance, to throw a big circle in a good part of the sky that will cater for everyone in the competition. Otherwise there would be a strong likelihood of undersetting, or many landouts, or possibly both.

I experienced several AATs of this type at the British Overseas Nationals in Spain (an open, handicapped event). Similar in feel to AATs of uniform conditions, these AATs weren't so much a problem because of the actual task, but simply suffered from the severe range of handicaps involved. (In my view, unhandicapped competitions remain the best and fairest form of the sport.)

Planned route AATs These normally occur at mountain sites where the circles encompass obvious energy lines, which everyone chooses to follow in a premeditated fashion. The same phenomenon can also occur over flatlands due to predominate winds and thermal streeting. Peculiarly, these tasks are very much like traditional racing tasks in retaining the character and feel of racing – everyone is flying much the same course, so gaggles and race tactics can be critical. Normally quite fun to fly, the planned AAT provides virtually no benefit over regular racing tasks. In fact, they are counterproductive to the intent of AATs and do not lead to smaller gaggles or promote individualism.

The marginal (weak) forecast Unfortunately, when faced with a poor soaring day, a task setter will often set an area task with the hope that pilots will somehow be able to find a way to the circles. Despite conditions not allowing any significant degree of 'thermal prediction', an AAT will increase the possible routes available to pilots, thus increasing the chance that some pilots will find enough lift to finish the task.

But now we need to ask if this is a desirable situation? If the weather is hopelessly weak and unpredictable, pilots will often be flying blindly, just hoping to stumble into lift. And because the AAT disperses everyone into different parts of the sky, those fortunate enough to complete the task will have done so only with a reasonable degree of luck on their side. Ironically, in these conditions a racing task (although it risks outlanding the fleet) has a greater chance of getting everyone around the task because gaggling will help cross-country speed as well as sharing the 'lucky climbs' amongst everyone. The only bonus to AATs in such conditions is that if things suddenly improve, the task is very unlikely to become underset.

One further proviso that must be mentioned about tasking in marginal conditions relates to the old adage "competitions are won and lost on the weak days". While often the best pilots will indeed come out on top in weak conditions, there have been numerous occasions where competitions have had rather peculiar winners/place getters. I can't help speculate that much of this 'noise' on score sheets is due to genuinely flukey weather, and that there is a good argument to require a minimum winning speed, say 70 km/h, in order for a task to count – but this is another issue.

The lottery This is an all-too-frequent scenario; AAT lotteries are real and they generally result from either poor visibility or very unstable weather. In both cases, pilots cannot be expected to forecast how conditions will pan out (just like tickets in a lottery – no one could rightly be expected to predict the numbers). An AAT ensures that this uncertainty is transformed into luck because the flexibility in flight paths forces all pilots to take different chances on the conditions.

On numerous occasions I have reached the first circle of an AAT and been faced with an impossible choice: do I keep going, or turn here? The problem is always that I do not have enough information to make a calculated decision. With poor visibility or uncertainty in CB development, you cannot answer the requisite questions like: Is the last sector blue? Does that street continue deep into the area? Will there be a storm in the last circle? In which direction will that shower develop? What is behind that thunderstorm?

One might say that in the face of uncertainty the most pragmatic approach would be to fly deep in the first area. The sword is double edged however; while turning early might result in coming home horrifically undertime, often conditions will evolve in a way that going deep in a circle means you won't come home at all. If you cannot get to grips with the weather because you cannot see more than 10 km or because the sky is filled with storms, there is simply no way to remove luck from the AAT equation.

Conversely, a racing task in such a sky is a different beast. Because all pilots must fly on a similar path, ultimately everyone will face the same conditions – but the best pilot will be able to use the encountered weather most effectively. Unfortunately, there is a widespread attitude amongst competition pilots that AATs should be reserved for uncertain weather, when in reality this is just bad task setting. A far better option would be to set no task at all.

Final thoughts We are reasonably fortunate in New Zealand that our topography and climate helps to insulate us from AAT lotteries. However, with the exception of catering for a wide performance range, most AATs offer no real advantage over racing tasks and therefore should rarely be set.

Having said that, there is one type of AAT that is so outstanding that I would be disappointed if the tasks vanished altogether. I'm talking about the AAT that Gavin Wills has developed for wave conditions. By using small circles (normally a radius of 5 km) and a comparatively large task distance, a happy equilibrium develops where we have all the benefits of a racing task, but with 'fuzzy' turnpoints of an AAT. The task focuses pilots on a speed race in a wave system and allows them to fully optimize the strong lift, while avoiding the unnecessary headache that comes with chasing 0.5 km turnpoints in fierce headwinds and down areas of wave.

Lastly, I should make it clear that incorporating some luck into gliding competitions is not entirely bad. Luck serves to keep things interesting and overturn stagnating result sheets once in a while. I think AATs take it too far though, and I am quite convinced that the tasks are detracting from our sport (at the top level at least). In a future article I will present a statistical analysis of competition results to (hopefully) support my conjecture that AATs are laden with luck. ❖

Dane is a young up and coming glider pilot. He's represented NZ in 3 World championships, 2008 and both non-flapped and flapped World contests in 2010. He's been flying since he was fifteen, has done a 1000k flight in a single Astir and has a BSc in Chemistry, Physics and Philosophy. He is very supportive of up and coming youth pilots.

Learning life, Learning to compete

Selena Boyle, ESC

IT'S ALWAYS HARD, on returning from an extended trip, to describe the breadth of experiences you have had, the sights and smells, the people you met, the impact they had, and how you have grown as an individual. Although family and friends are interested, they often ask questions which precipitate one-word answers to "How was your trip?", "Did you have fun?", or "Do you want to go back?" with "Good", "Yes", and "Yes!". Even creative answers yield little more than, "Fantastic!"

I could easily write about the flights I had in Australia last winter, the incredibly cool people I met, the beautiful scenery everywhere, or the time I almost ran over a koala, but I am going to try to write about some things I learned while there and about some of the people who taught them to me.

When I first made it my goal to represent Canada at the 2011 World Junior Soaring Competition in Musbach, Germany, I knew that I had very little air time compared to many others who would be at this competition. In order to gain this experience I would likely need to do what Chris Gough did in 2008 and travel to Australia to fly as much as possible.

After making the decision to take some time off from my undergraduate degree, the next obstacle would be getting enough money to accomplish this goal. With a summer's wages under my belt, I turned to working in the fall before my departure (in 2009) at the end of November. I was lucky to find two jobs in addition to the work I already did through the Air Cadet Program. I soon found myself working a 65-80 hour week, which was awesome for my bank account but dreadful for my sleep. Through this I really learned what it meant to work hard to achieve a goal, and the pride I felt in actually saving for my goal was huge.

One of the first people to mentor me in Australia was Paul Mander, one of Australia's finest pilots as demonstrated by his numerous wins in their Club Class Nationals and appearances at World contests. However, his greatest flying achievement is his strong support for the youth flying movement in Australia.

I had the marvelous opportunity to have three flights with him during the 2009 JoeyGlide Coaching Clinic. (JoeyGlide is Australia's National Junior Soaring Competition). On the ground, Paul equipped us attendees with the knowledge we needed to succeed in the air. On my first day of flying with him he discussed aspects of cross-country, teaching me how to effectively centre thermals, and taught some points of reading the sky while also demonstrating some flying techniques. I quickly learned how to vigorously "chuck a turn!" That day he helped me equip my tool kit with necessary cross-country basics. On the second flight he was forcing me to make decisions and practise the skills he had taught me. Although he answered questions we had not already addressed, he made me begin to think for myself and to put into action the things I had so recently learned.

On our third flight Paul just came along for the ride – he told me soon after take-off that he was planning to have a nap. When I asked him for advice on matters I should know he stayed silent, telling me one time that I ought to be able to make such a choice by myself. Paul did not allow me to exhibit perhaps typical 'girl' flying characteristics. In three short flights I went from a pilot who had little concept of cross-country flying to one beginning to feel confident in the decisions she was making in the air. He infused me with his knowledge and empowered me to make strong decisions. When I think back on how he guided and mentored me, I am still in awe.

It was Chris who inspired my current dream to go to the World Juniors. When he returned from the Junior Worlds in 2009 with his stories of the contest, my desire became to follow a similar path. Without Chris, now one of my closest friends, I would never be taking my current steps towards the upcoming contest. A patient mentor, he sat with me for hours explaining the intricacies of contest flying and answering every question imaginable. Chris always made himself available to help me out, although I did push the limit one morning trying to learn how to properly fill water ballast on a day he was going to attempt a 750 km (sorry!). He put up with my endless technical difficulties, understanding that computers and I will never get along. In the air Chris helped me fly my longest distance and one of my 'funnest' flights thus far with some amiable competition. He was there to push me further in flying than I thought possible, insisting that I would fly 500 km, and soon. And he was on hand ⇨ **p27**

How a sailplane is built

Friedel Weber, DG Flugzeugbau

You probably have a general idea – here are interesting specifics

I AM OFTEN ASKED TO DESCRIBE how the manufacture of a high-performance sailplane is carried out. It has nothing to do with industrial manufacturing processes, but is the result of fine manual craftsmanship.

The wing Here is a somewhat simplified description of building a wing. It is built from the outside in, using four large molds per sailplane for the right and left wing upper and lower surfaces. When a new wing is started, the workday begins at 6 am when the first of four gel coats is then sprayed in. We have to use a polyester compound; while polyurethane would combine better with the epoxy applied later, it would also form droplets on the release agent which has been applied to the mould, beading just like the water in a car wash.

At 7 am, when the actual wing workers arrive, the gel coat has partially dried and is quite sticky. Epoxy is then rolled onto this surface and a thin fibreglass layer applied and pressed into the epoxy. The main function of this layer is to prevent the weave of the following layers showing through the wing surface. Some manufacturers skip this step, but after a few years a fine diamond shaped pattern becomes visible. We do not want that.

After rolling, this thin fibreglass layer becomes almost invisible because of the saturation with epoxy. The bond between lacquer and fibres is "wet on wet" so that it can never result in the lacquer peeling off – at worst you could get hairline cracks due to rapid and extreme temperature changes during wave flying.

The next layer of fabric laid down is carbon fibre, which accounts for most of the strength of the wing surface. The orientation of the carbon fibre is diagonal for greater torsional strength. This fabric requires heavy use of epoxy, about 250 grams per square metre, and is also very expensive. A wing having an area of 11 m^2 contains about 46 m^2 of carbon fibre at 35 €/m^2. In addition, we use 11.5 kg of epoxy. The epoxy alone costs about 1,800 €.

Foam is laid on the wet outer layer of the carbon fibre fabric. The foam core is made from carefully cut plates of PVC foam about 6 mm thick, which forms the centre of the sandwich construction of the wing. The foam is carefully prepared, tapered towards the rear, with cut-outs for the dive brake boxes, etc, and a machined depression is made for the spar cap. Furthermore, the foam is perforated with a needle roller. This allows better absorption of the epoxy and prevents delaminating.

The spar caps, which must absorb the extremely high tension and compression forces due to the bending of the wings, have been pre-manufactured from hundreds of carbon fiber rovings in a special mold. The quality requirement for the spar is very, very high. A single air bubble can condemn a spar cap, and to be sure that it is not inadvertently used again, it would be cut in half with a diamond saw. A lot of labour and material has gone to waste but fortunately this is a rare occurrence.

The foam core is then layed down, the spar cap put onto it, and the inner carbon fibre fabric is layed in – again diagonally, but crosswise to the outer layer so that after curing, a stable, strong sandwich is formed. This is followed by a layer of peel ply and a perforated sheet pre-epoxied together with the inner carbon fibre fabric. (The sheet and peel ply are later removed, giving the inner wing surface a rough texture, making the gluing of the inner parts adhere better.)

Now an absorbent cloth is applied to soak up the extra epoxy and to make the removal of air easier, a plastic sheet is used to cover everything and is taped to the mold, forming a plastic bag. A few plastic pipe stubs are put in and sealed, then attached to a vacuum pump to suck out the air, forcing the entire construction tightly against the mold. At this time the mold is heated with water so that the wing can cure overnight – warm hardening. Now we can go home. Breakfast and lunch breaks on these days are not dictated by the clock as there can be no interruption of the layup process.

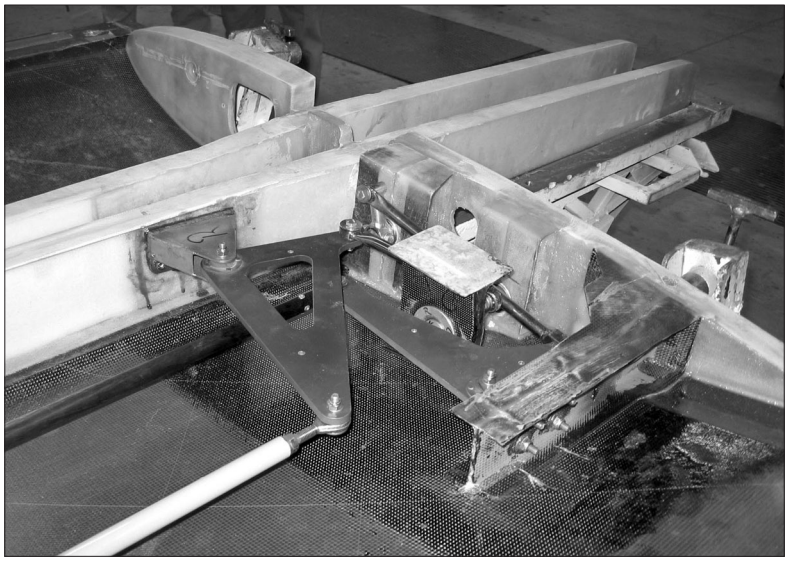
When I was "new" I had an interesting experience; I was watching a foreman cut the previously mentioned carbon fibre fabric off a roll, apparently without a pattern or tape measure. He then put it into a fuselage mold, where it extended considerably over the edges. This struck me as irregular, using guesswork as a measurement. I was about to go over and ask him to be more careful with material that was so expensive, when he took a roller and began to press the material into the mold. This caused the fabric to progressively shrink towards the middle, and especially in the nose the protruding material disapeared one centimetre at a time. About ten minutes later I was astonished to see that the protruding excess had just about disappeared, leaving only about 2 centimetres of excess material remaining. I went up to him and said, "unbelievable how you worked the material. Ten minutes ago I was going to reprimand you for wasting expensive material, but now it fits properly."

He said, "Herr Weber, I have been doing this for 25 years."

The next morning the absorbent cloth and perforated sheet are removed. The parts for the wingtip parting device, if ordered, are built in. The two spar caps per wing half are stiffened by a shear web, which is similar in cross-section to the I-beams used in steel construction. The finished spar extends from the wing tip to the wing root and into the spar end – in an 18m wing about 9.3m long. The shear web is quite massive, so it can withstand the shear forces. At the main pin, for instance, the bushings into which the main pin is inserted, must withstand forces up to 14.5 tons! The finished shear web is put into the upper wing shell and epoxied to the spar cap. For wings having tip extensions, the receptacle for the outer spar is set in. The spar cap of course ends at the part and an extra spar for the wing tip is installed.

As mentioned before, we manufacture the spar caps separately and glue them into a 3 mm deep cut-out in the foam core. There is another method of setting the spar cap into the wing skin. The rovings for the spar cap can be set "wet-on-wet" right onto the outer layer, and you will get a spar depth about 6 mm higher than we do. The advantage is that, because of the greater height, material can be saved because a deeper spar has a strength advantage. In very thin profiles, such as the DG-600, one cannot achieve the required stiffness otherwise, and this method is also less expensive. The disadvantage is that after time, the outline of the spar becomes visible on the upper wing surface. Take a look at various sailplane types, and you will be able to see the spar outlined on the wing surface. That is why DG opted for the more expensive but better method of gluing the spar cap into the foam core and fixing it to the inner fabric.

Now we begin with the installation of the controls by gluing in the bases for the control rods and supporting linkage. All parts are placed exactly by jigs which are fixed to the mold with guide pins. Other "small parts" such as root ribs, receptacles for the rudder hinges, etc. are also glued in. Our single-seaters have about 250 different bits of glass or carbon fibre and for each one there is a drawing and a special mold. After curing, the control rods are installed in the morning of the third day. These tasks take about two days. In the morning of the fourth day the preparations are made for gluing the wing halves together (which are still in their molds). This is a very critical step in the manufacture of a wing.



During flight the bonded areas carry high loads, but after closing the wing they become inaccessible forever. These "blind bonds", as they are called, must be carefully prepared and executed with great precision. To achieve this, we developed a simple but very reliable procedure.

Small strips of "play dough" are applied to all areas where the wing halves will come into contact: the leading and trailing edges, the spar, and ribs. Adhesive tape protects the bonding surfaces from grease contamination by the play dough. The upper and lower molds with the wing halves are put together, the play dough is compressed and reflects a very accurate image of the bonding gap. After separating the molds again, our quality controller inspects the bonding gap as expressed in the thickness of the play dough along the join lines. This has to stay within very tight tolerances to guarantee a long-term reliable bond.

Before permanently closing the wing, the quality controller checks everything that will become inaccessible. Each individual nut of the control linkage is verified, secured, marked, and signed off on a detailed checklist.

Our workers call the glue that closes the wing, *"mumpe"*. It is a mixture of epoxy resin and cotton flock that gives it the consistency of cookie dough. After all bonding areas have been thoroughly cleaned and roughened, the mumpe is applied with a squeeze bag, similar to icing cake. The thickness of the mumpe layer reflects exactly the gap height as previously measured with the play dough, plus an additional two millimetres. The long experience of our workers shows in the "artistry" of the optimally trapezoid-shaped mumpe layers they create with squeeze bag and wooden spatulas. The right area, exact thickness, and correct processing of the bonding layer is crucial for long-term reliability. Any attempt to save weight or cost here would compromise reliability and safety.

We have received more and more questions regarding the wing bonding process. There is no doubt that the critical process is the blind bonding step since the result becomes inaccessible forever. The highest operating load of the wing occurs during a positive g maneuver. The upper spar cap is stressed in compression, the lower spar cap in tension. This causes the lower wing shell to be firmly pressed against the spar cap, which is in turn pressed onto the shear web. The whole assembly might even stay intact without any bonding at all, but we better not gamble with that! *(More details on bond location considerations are in the sidebar on next page.)*

If the control linkages and main spar are assembled into the lower half shell of the wing, then the required blind bond between the spar and the upper half shell is exposed to delaminating forces during +g maneuvers. In such a case the bond has to be absolutely flawless to prevent the assembly from failing.

The lower wing half is put onto the upper half, adjusted exactly to the guide pins, and then compressed with many clamps. Both halves must fit exactly in all places, or the profile will not be correct. The clamping squeezes the excess epoxy mixture out between the wing halves. The wing is cured overnight at 35°C. The next morning the wing is taken out of the mold with a crane – usually accompanied by a loud crack. The excess epoxy flashing is removed in the sanding room. After the molds have been cleaned and waxed, the whole process starts over again.

The fuselage The construction methods for the fuselage is roughly equal to the wing. But here the foam sandwich method is not used, except for the carbon fibre fabric. To achieve optimal pilot safety in a potential crash, in the DG-808C, two layers of Kevlar are used between the carbon layers. This material is difficult to work with but does not splinter into sharp edges like carbon fibre. In addition, the reinforcements for the safety cockpit are glued in.

Fuselage construction is faster than the wing. But the installation of many small parts is quite complicated. Seat pan, landing gear, engine bay walls, bulkheads, lift pin tubes, ribs and shear webs in the fin, pitot and static ports with hoses, antenna, control system – all that has to be installed and tested before the fuselage halves are glued together.

Rough assembly In this stage the leading and trailing edges of the wings are trimmed, the control surfaces (flaperons) are cut out and fitted and the spar ends receive their outside glass fibre layers. Then the wings are put on the drilling jig so that the exact position for drilling the holes for the main pin bushings can be determined.

All the controls are installed into the fuselage, the canopy frame epoxied, the canopy glued on and the canopy locks installed. The tailplane and rudder are fitted, the engine doors installed, the wiring set installed, etc. The sailplane is then assembled the first time, and all controls are adjusted and a quality control inspection takes place. This rough assembly work takes three workers one week to complete.

Finish One can either invest a lot of work in the finish or keep it quite simple depending on what quality is desired. We calculate that a good finish takes about 240 hours of work at 40 €/h, and it takes a lot of training and experience before a worker can produce at this level. If gelcoat has been used, only the glue joints, certain areas like fuselage and wing fairings and canopy frame need filling and touching up with gelcoat. If paint is to be used, the whole glider is sprayed after the joints are cleaned up.

After that, it's sanding, sanding, sanding, by hand! All attempts to introduce machines for this work have produced very unsatisfactory results. Large rotary sanders could be used, but who wants to see the resulting circular patterns on the wings? We wet sand with decreasing grit. Some manufacturers stop at 600 grit, we keep going to 800 and 1000 with much water. The people in the finish section work in rubber boots, and drainage channels are built into the floor. It's a tough job, but the end result produces much satisfaction.

Final assembly The cockpit work is now done including the many electric connections for the instruments and the engine controls. The complete pre-assembled, pre-tested motor unit is installed, the wings assembled and seals for the flaperons installed. All the required Mylar seals are taped on. Installation of the instruments as ordered by the customer sometimes causes unexpected problems. Then testing the engine after installation, carburetor adjustments, weight and balance, etc.

If everything works properly, the final quality control inspection takes place. This takes about eight hours, during which time the telephone is switched off and no disturbance is tolerated. All the assemblies on the test list are checked, and all functions that can be performed on the ground are carried out.

Test flight And finally the sailplane must show in test flight programs that everything works properly. A pre-determined program is flown and every phase checked off on the checklist, and the appropriate values noted. Sometimes certain adjustments have to be made and retested. Then the sailplane really is "finished".

Of course we still need the certification and licensing by the airworthiness authorities. So you still can't fly the finished sailplane for a few more days. The large team that has made it all possible wishes you many happy hours flying your new sailplane. ❖

In today's composite wings, flexing forces are mostly absorbed by the main spar, in particular by the upper and lower spar caps. Assuming an upward flex, the upper spar cap is compressed, while the lower cap is stretched. As a result, both caps try to move towards the centreline of the spar. This is inhibited by the spar's shear web, resulting in a primarily compressing force within the shear web. A wing's upward flex during a fast pull-up represents one of its highest load cases.

This short look at wing loads explains why the bonding of the main spar during final wing assembly has this extraordinary importance, complicated by the need for a blind bond on a high-load component. The designer has the opportunity to mitigate the problems by a wise placement of this bond. Based on the usual design of the main spar with upper and lower spar caps connected by the shear web, two main choices of the bond position are available:

1. *Between spar caps and the wing shells.*
2. *Between the spar caps and the shear web.*

Variant 1 allows a separate production of the main spar outside of the wing molds. The disadvantage is the need for a blind bond to one of the wing shells. Under normal operations, a blind bond of the spar to the upper shell is the most unfavourable load case for a glue bond, mandating a top quality bonding process.

In variant 2, the final assembly of the main spar to the shear web occurs together with the final wing assembly. The important advantage of this method is opportunity to create a very intense bond between the spar caps and wing shells under completely controlled conditions. The difficulty of this variant is the precise manufacturing of the shear web. But this is more forgiving of manufacturing tolerances because the tension loads at the bond are less, particularly when the shear web bond is to the lower spar cap. DG has done this in all its designs.

A guiding light

from *SOARING*, Mar/Apr 1953

some history about a unique gliding character, Brother Hormisdas

BACK IN 1948 folks around Ottawa were startled to see a glider pilot in flowing black robes soaring around the countryside. They soon learned, , that it was Brother Hormisdas, a Catholic lay brother from Buckingham, near Ottawa, and guiding light in the newly-organized Buckingham Gliding Club.

The club, incorporated since Dec. 31st of last year [1952], was initiated by Brother Hormisdas. An instructor in the École Superieure Saint-Michel, Buckingham, Brother Hormisdas turned a flight of fancy into some fancy flying. It was his belief that a glider club could be of much benefit to the local youths and it was his purpose in organizing the club to give the boys an opportunity to learn to fly inexpensively, to bring them the advantages of this wonderful new sport and, to have them master more easily the abstract principles of physics underlying the basic theory of flight.

Brother Hormisdas soon found the truth of a bit of advice in the Schweizer's booklet, *You Can Fly Inexpensively in a Glider Club*. The authors warned that, "the initial efforts in organizing a gliding club call for the leadership of an aggressive individual."

Aggressiveness Brother Hormisdas had, but not many other qualifications. He was then 49 years old, knew nothing practical about gliding, nor did anyone around know any more. Further, not a single philanthropist would venture to sponsor such an enterprise. Nevertheless, the Buckingham Gliding Club became a reality.

Using his organizational ability, Brother Hormisdas interested the high school boys in the club project. Various and sundry social entertainments were devised and carried through to a financial success to enable the club to buy a used 1-19. With this machine and the help of the Gatineau Gliding Club, located finally after a long search, Brother Hormisdas was on his way. He acquired his glider pilot licence along with an instructor rating all in the same year.

Training then started the year following in 1949. The club had acquired a 2-22 and training was carried on between mishaps. The 1-19 was overturned twice and the 2-22 came to rest in tree tops. Fortunately, no one was hurt in the least, bringing home the conviction to Brother Hormisdas that a club operates far better with too much prudence than with too much ambition. In the last two years, nearly a thousand flights have been made by members of the club without mishap.

Today [in 1953], the club boasts twenty-five members. It owns three gliders – the 1-19, the 2-22 and a 1-20 to be flown this spring. For towing, it has a Tiger Moth and a one-ton truck. It has two trailers for retrieves.

A hangar large enough to accommodate all of the craft was built in a field three miles from Buckingham. Though the field has serious shortcomings, its cross runways – the longer one extending 2000 feet – will allow an unlimited amount of gliding, depending on the wind direction for the take-off.

Training is generally carried on at the Pendleton airfield in Ontario, the use of which has been granted by the Department of National Defence. This airfield is one and a half hours away by road, but only fifteen minutes by air.

The initial purposes of the club's organization are being gradually fulfilled. Most of the boys, Brother Hormisdas finds, will go for gliding, but a large percentage cannot afford the expenses incurred. A small number have parents who object to it because of an inborn fear of this art of motorless flying, a typical remark being that, "It is dangerous enough in an airplane!" The first objection has been overcome partially, but the second still requires more time.

Compared to other clubs, the Buckingham Gliding Club has quite attractive flying rates. Through social activities held during the winter months and proceeds from an airshow in the summer, revenues of $1000 per year have been realized. The flying deficit is balanced out of this sum and the remainder put aside for equipment. ⇨ **p27**

Gliding's great deception

John Roake, *from Gliding International*

the first ever disqualification at a World Gliding Championship

THE 23rd WORLD CHAMPIONSHIPS in Borlänge, Sweden in 1993 was somewhat of a culture shock to many, the writer included. I didn't appreciate that Borlänge is only a day's drive away from the Arctic Circle and in the middle of summer there are 23 hours and 30 minutes of daylight every day. Nevertheless, despite the awful awful weather on opening day, it was a very well organized championship, the last championship that would be conducted using the time-honoured process of having time cameras to confirm start times and turnpoint roundings.

I was one of three stewards at this event and, as the Contest Manager elect for the 24th World Championships in Omarama, I was also there to learn all the pitfalls that could befall a contest manager. I was to find that my education had been sadly neglected.

The stewards all arrived on the Wednesday preceding the start of the event. They were to immediately field approaches from a number of competition pilots who were concerned about the flying of the Hungarian pilot, Bela Guraly. While no one came out and directly said they suspected some 'foul play' from this pilot, it was obvious from the start that his past winning performances in previous European contests were not in keeping with observations of his abilities in the air. There was no doubt that 'disquiet' about Guraly existed long before the contest started.

Guraly was a well known Hungarian competition pilot, an airline captain who was also chief pilot for the Hungarian national airline. The stewards were quick to appreciate that the situation dictated that more than diplomacy was necessary in the circumstances that were evolving.

Despite the intense cold in the mornings, Days 1 and 2 turned out to be competitive flying days – taxing yes, but a good start to the competition.

After flying concluded on Day 2, a number of competitors again approached the organization with their concerns about Guraly. One pilot declared that "I started well before Guraly, was with the main gaggle all the time, only to find that his time was better than mine by almost nine minutes and I never sighted him once." No explanation could be found on what appeared to be a serious anomaly. Such was the number of expressed concerns, several hours were spent that evening studying the competitors' films. No anomalies were detected.

At the stewards meeting at 7 am on Day 3, Tuesday 15 June, the Contest Director of the event, Alf Ingesson Thoor, requested the stewards to investigate the situation with some urgency and report back. The stewards immediately met in private and invited the Contest Director for the next contest, Bob Henderson, also in Sweden to observe, to join the meeting. A two-hour debate resulted with no real conclusions, except that a way had to be found to confirm the suspicion that the use of cameras had a major flaw.

The stewards had to find a way of confirming start times, other than what the cameras were producing on film. Because the airfield at Borlänge was also being used by commercial airlines during the contest, the start line for each task had to be removed well away from the traffic pattern of the passenger aircraft landing very near to the competiton launch site and finish line. Fortuitously, the elected start line was a parking lot in the middle of the town, some five miles from the airfield.

The stewards requested help from a number of other competition officials to help them manage their planned scheme to record start times. Just viewing the crossing and noting the time could be open to dispute. With the car park open for use, a scheme was devised wherein a number of cars were moved in a changing pattern – parked in a different position every three minutes. It was like shifting checkers around a checker board. These moves were accurately recorded and, with the positions tabulated, it became an easy matter to check whether the time on a pilot's films accurately related to the car pattern time-recorded by the stewards. None of the competition pilots had any idea that when they photographed the start line, they were also photographing a 'car pattern time clock'. ⇨ **p28**

Going to school

Trevor Finney
ESC

Dave Puckrin

The 2010 SAC Western Instructor course. This year most of the participants came from ESC where the course was held. *Kneeling left to right*: Guy Blood, instructor, ESC; Trevor Finney, candidate, ESC; Ron Cattaruzza, instructor, ESC; Gary Hill, instructor, ESC; Vern Kallal, candidate, ESC; Skyler Guest, candidate, Saskatoon; *Standing left to right*: Dan Cook, course director, Vernon; Bob Hagen, towpilot, ESC; John Broomhall, instructor, ESC; Justin Gillespie, candidate, WGC.

WHEN I GOT TO THE AIRFIELD at Chipman on Sunday 18 July, I heard that Dan Cook in his Genesis was trying to make it back home after flying away from the field. He got back safely and derigged before supper. Then he got to work measuring off the lounge area in the clubhouse. Furniture was moved about and the simulator was set up.

Monday morning lectures started at 0900, and it quickly became obvious that we were in for some intense learning. Dan set a steady pace and we all soon realized that our use of training terminology as to what students should do was not specific enough. It seemed that we all needed to learn the language of instructing. Trying to fly the simulator and concentrate on the new "patter" was really difficult at first, but as the days went on we got the hang of it.

Our local instructors Guy Blood, John Broomhall, Gary Hill and Henry Wyatt were to be our "pupils". Although gentle previously, they morphed into terrifyingly uncoordinated pilots, pulling as many hairy tricks on us as they could. Sitting in the corner quietly observing the goings on was our steady, solid tug pilot and instructor, Bob Hagen. We four candidates: Justin from Winnipeg, Skyler from Saskatoon, and Vern & Trevor from ESC, got their first flights with the "pupils" on Monday afternoon after the rain had stopped. It was tough to try to instruct and fly at the same time. That evening we visited the Chipman pub for supper and got to bed before midnight. We thought that this would be the general flow of the course, but we were in for a surprise. Tuesday's program was morning lectures and simulations with three flights in the afternoon. Each flight had a more advanced set of flight skills to perfect ourselves before teaching them to our students. Bob and Dave Puckrin dusted off the Ogar, showing us the old girl could still fly. That evening we had a quick supper and then lectures with more simulations until 11 pm.

Wednesday morning started in typical ESC fashion with Dave cooking us breakfast. We knew he was feeling better because his language was choice and he was his usual obnoxious self. We had lectures, simulations, and a test before lunch. Then three more flights with our uncoordinated "pupils". At least we managed to get some of our own back on the pupils by demonstrating spins and spiral dives. They then got to do it to us – the increased pucker factor was obvious. Again we had a late night with lectures and simulations.

Thursday morning started with a Puckrin breakfast followed by lectures, marking of the test and simulations. Then back into the air for three more flights with spins, steep turns and aerotows from the pupils. That evening, Dan pushed us on until late to cover the syllabus. By this time we, the candidates, were starting to get the hang of the lingo and the level of commitment and intensity that Dan expected of us. Friday was the chance each candidate was given to deliver a lecture and to feel what Dan had been doing the whole week. The information delivered by the candidates added to our mutual knowledge and Dan's constructive criticism on each lecture was much appreciated. Then the test arrived. We four candidates sweated to dredge up the answers. ⇨ **p29**

SAC AGM & Instructor Seminar
Colloque d'instructeur
18-20 March, 2011

Hôtel Château Laurier
1220, Place George-V Ouest, Québec
(418) 522-8108, 1-877-522-8108
<laurier@vieuxquebec.com>
Lat: 46.8068183, Long: -71.2152249

Vendredi 9:00-17:00 Réunions Directeurs SAC et comité de FTSC
19:00 Souper

Samedi 8:00 Déjeuner à l'hôtel
9:00 Colloque d'instructeur – Accueil et mots de bienvenue
9:30 Processus de gestion des risques
10:30 Gestion de l'évolution du trafic autour d'un aéroport
11:45 **Diner et AGM – Remise de trophées ACVV/SAC**
14:00 Espace aérien
15:00 Préparation à un test en vol, et
Dans une deuxième salle : Introduction au vol voyage (1h30)
16:00 Formation périodique – Dan Cook, président FTSC
16:30 Power Flarm – avantages et principe de fonctionnement
17:00 Cocktail et Souper

Dimanche 8:00 Déjeuner à l'hôtel
9:00-12:00 Séminaire d'instructeur FTSC ACVV/SAC
Discussions de nouvelles techniques de formation
Exercices sur simulateur de planeur
13:00-16:00 Réunion Directeurs ACVV/ SAC

Friday 9:00-17:00 SAC Directors & FTSC meetings
19:00 Dinner

Saturday 8 am breakfast at the hotel
9:00 Instructor seminar – welcome and introduction
9:30 Risk management process
10:30 Traffic management around an airport
11:45 **SAC Lunch and AGM – SAC awards & trophies**
14:00 Airspace management
15:00 Preparation of a flight test, and concurrent
Novice soaring talk by a World competitor (1h30)
16:00 Recurrent training – Dan Cook, chairman FT&SC
16:30 Power Flarm – how does it work?
17:00 Cocktails and dinner

Sunday 8 am breakfast at the hotel
9:00-12:00 FTSC Instructor's seminar:
- Discussions on new training techniques
- Glider simulator exercises

13:00-16:00 SAC Board of director's meeting

Checklist mis-use

Here are some FT&SC "pet peeves" on the use of the Pre-Launch Checklist arising from instructor course observations:

Controls – Don't just go through the motions. Check to feel the mechanical "stops". It should not be soft, but metal on metal. Frictional resistance is not good. Find out why? Rudder pedals should be adjusted so that the knees are slightly bent, enabling the use of quad muscles, not just calf muscles, during spin recovery.

Instruments – Don't forget the compass (heading and fluid) and yaw string (attached and free end) in your check. I have seen canopy closed on the string.

Straps – Also see if you can reach all control knobs and switches with the straps tightened down for turbulence. Note cushions behind pilot which, when compressed, can shorten the reach to move the stick forward. I have seen pilots lean back in spin and not get the stick forward enough to recover, although arm was fully extended.

Trim and Ballast – Check full range of trim, visually if possible. Ballast must be visually checked if secure and for the correct weight and position, or even if it should be there following a previous flight.

Release – Also check to see if you can still reach the knob/handle. If already tested in the DI, it is not necessary to test again unless in doubt (note that the Tost hook has limited cycles of use before requiring overhaul).

Spoilers/Flaps – Not just if handle moves but at both wings above and below as appropriate for correct function and return to closed position, then lock if possible.

Canopy – Check that the lock mechanism is secure and the hardware is not loose, and the mechanism is properly closed front and back on tandem canopy locks. Several canopy openings have occurred due to loose or improper closing.

Remind the passenger (and pilot too) not to adjust vent during take-off phase. I can't tell you how often I see pilots do this just after take-off!

Options – You should include a process such as the mnemonic "WROLL" – wind assessment for speed and direction which will give you an approach speed and turn direction for launch interruptions and crosswind technique required, pilot initiated release assessment, obstacle and landable area assessment, and launch interruption assessment. Plan for emergencies *before* the take-off.

Talk to locals about obstacles and landable areas out of view before take-off at less familiar fields.

Passenger briefing – Has your passenger been briefed as what is expected of them in emergencies, seat belt operation, emergency egress, parachute use if wearing one, what to do with hands and feet (feet off the peddles, hands grab shoulder harness), location of first aid kit, etc?

Dan Cook

Only some of us learn from other people's mistakes, the rest of us are the other people.

Distractions are the number one cause of forgetting things

There are two main reasons for this. The first is we are always thinking ahead of what we are doing. Therefore, when we are distracted, we tend to think we were further along in our task than we actually were. The second is that our short-term memory is very short so any distraction may cause us to lose what we were thinking of when distracted.

A rental pilot was performing a pre-flight inspection on a C-172 when the three friends he was taking on a sightseeing flight arrived at the airfield fence. The young pilot stopped what he was doing and let his friends in. He then completed his inspection, loaded his passengers and began taxiing the aircraft. The FBO owner saw the aircraft taxiing with the tow bar still attached to the nose wheel and called the FSS specialist to request that the aircraft be stopped and shut down so the tow bar could be removed.

It is easy to forget steps when distracted. A good rule to follow whenever we are distracted or interrupted is to go back at least three steps from where we thought we were when distracted. If unsure, start over. The phone is one of the most common distractions, and most calls can wait. The length of our short-term memories compounds this. Our short-term memory lasts only about 30 seconds. We must do something specific to transfer information from short- to long-term memory. It does take some concentration, but we normally do this subconsciously. The other problem with short-term memory is that it has a limited capacity of six to seven unrelated items. Maybe that is a good thing. When we get distracted, there are a limited number of things we can forget.

Fatigue and stress directly affect our ability to transfer information to long-term memory and to access information from it. Therefore, when tired or stressed, we significantly increase our chances of forgetting to do the things that we intend to do. We are all tired or stressed at times. When we are, we must avoid distractions and multi-tasking. Multi-tasking is actually self-distraction. We are not as capable of multi-tasking as we think we are. This is why cell phone use while driving is being banned.

The number one distraction for all of us is the phone/cell phone. There are times when the phone should be turned off. The vast majority of the calls we receive could be missed without the world ending. The next most common distraction is people directly wanting our attention. This includes friends, significant others, co-workers and bosses. When we wish to talk to someone, we seldom, if ever, observe what they are doing before we interrupt them. We are a social society and most of us do not mind being talked to.

There are times, though, when we do not wish to be disturbed and times when we should *not* be disturbed. Be courteous and take the time to observe those you wish to talk to, to determine if now is a good time to do so. If we are not sure, we can ask if the individual has a moment. This will give them the opportunity to complete a task or to at least put themselves in a position to transfer information to long-term memory and be prepared to pay full attention to us.

Distractions affect all of us. The best we can do is to minimize them. Mistakes caused by distractions are, at least, embarrassing and, at worst, damaging.

Dale Nielsen

...17 flaps

from page 9

As she decelerated, the skid came down and the vertical tube failed; the aircraft effectively folded over. If you watch the *Youtube* video you can see the pilot pod fold to one side as the wings, fuselage and tail do a nose dive into the ground. Other than some minor damage to the leading edge of one wing and of course the failed vertical tube inside the pilot pod, the aircraft was in good shape; damaged, but repairable. It looked as though operations would be shut down for the season, but with some hard work and late nights *Snowbird* was back in the air before 2009 drew to a close.

The failure in the downtube was the result of some extra holes that were drilled into the downtube for mounting a bracket that was not a part of the original design and actually not used in the end. With a repaired and strengthened downtube she was back in the air and ready to make history.

Making history The big day came on August 2 and there was a real buzz on the field. We had all been sworn to secrecy as the team did not want to go public until they had made the flight claim and been awarded the record. We had seen flapping flights and they were much longer, was it good enough? When she made her first few tentative hops there was a flurry of interest. As the flight testing progressed into routine it became increasingly difficult to get volunteers out for flights. When it was announced that they were close to attempting the record, the interest and volunteers returned en masse.

On the big day we had a representative from Aero Club of Canada on the field to be the FAI's record Official Observer, as well as an unusual number of helpers and spectators.

The record flight went into the log book at 6:35 am. The decision was made to no longer fly *Snowbird*; it was the pragmatic thing to do since there was nothing more to be gained from further flights and the danger of serious damage was ever-present. She is to be preserved for display in an aviation museum; the decision that remains is which one?

Hallowed ground Since the historic flight was made public, we have had several guests asking if they could see *Snowbird*. Mike received a phone call from a Japanese gentleman asking permission to bring his father for a visit. After a tour of the barn and viewing *Snowbird* the father asked if they could see the runway. They walked down to the end of the runway and, with a glint in his eye he exclaimed, "This is sacred ground!" ❖

miscellany

How to measure upcoming altitude records?

IGC committees are working on what can be expected of both pressure altitude and GPS altitude recording at very high altitudes. This is necessary now so that the pressurized sailplane (Perlan) that is being built will have a viable altitude recording system approved by IGC for altitudes of, say, 20 km (65,617 feet) and above. There is reluctance to change the present situation that firmly states that pressure altitude is the only system allowed. At "normal" heights this is not under dispute.

The main point of current discussion is to establish whether there is a pressure altitude at which existing IGC techniques for pressure altitude calibration run out of credibility because of the very low pressure gradients at record altitude levels. If so, this would need a Sporting Code change. There is also the question of how the transition between pressure altitude and GPS altitude would be handled.

A small error at sea level is not significant for IGC pressure altitude instruments and calibrations, because 1 mb is equivalent to about 8.2m or 27 ft. But at an altitude of 20 km this has increased about twelve times, 1 mb being equivalent to about 100 metres. At 30 km, 1 mb is equivalent to nearly 450 metres! So where is the upper limit of the existing IGC pressure altitude measurement system?

The current world record is 15,460m (50,722 ft), and pressure altitude works at 15 km. But between 15 and 30 km there will be an altitude at which IGC pressure recording will be no longer viable.

That is why the flight recorder committee (GFAC) is studying how GPS altitude figures from an improved standard of approved recorders can be made accurate and reliable for the few flights that may take place up there.

GFAC is also working on a type of recorder in which post-flight processing can be made of the actual position lines used in the GPS fixes. By doing this, any anomalous ones can be eliminated to enhance the reliability and accuracy of GPS altitude figures. In addition, modern GPS receivers with 16 parallel channels have much better performance than receivers seen in earlier FRs. If necessary, for such very high altitude flights, the IGC could require a higher standard of GPS receiver.

At present, there are no IGC-approved FRs that have pressure altitude systems that go that high, so a special recorder would have to be designed and carried. GFAC is exploring the best way that this should be done. The measurement problem is not restricted to our sport; ballooning height records will require a similar solution.

from some IGC GFAC committee e-mails

Final glide – Udo Rumpf

Udo, 64, passed away from cancer on 16 December. Udo was a skilled aerodynamicist, craftsman and pilot. He turned to soaring relatively late in life, having first occupied his interests with power flying and then model soaring. I believe he represented Canada at a model world championship in Australia.

I got to know Udo due to his interest in competition soaring. He was a quick learner and made many good competition flights. However, I think his greatest legacy is with his development of the Super HP-18. He took a basic HP-18 and converted the fuselage to a conventional stick arrangement, heightened the cockpit and turtle deck area, made a front hinged canopy and then modified the wing airfoil from the older Wortman design to a more modern one. This glider flew superbly and he competed with it successfully in many contests. An article on the glider is available at *<www.soaridaho.com/Schreder/HP-18/SUPER_HP_18>*. Later he changed to an ASW-24 and then an ASW-27 mainly because rigging these gliders was much easier.

A few years ago Udo competed with the HP in a US Nationals in Pennsylvania and won the first day, beating all the experienced ridge runners and top US competition pilots. That was the high point of his competition career, although he continued to fly in many US senior and regional competitions.

Udo crewed for me at the 1999 World Championships at Bayreuth, Germany. He did an excellent job and was a great support during the whole of the contest.

He was always eager to help anyone who needed help with gliding, particularly in solving mechanical and aerodynamic questions. He was a unique individual who will be greatly missed in Canadian gliding.

Ulli Werneburg

2010 SOSA Junior Camp

Gliding clubs in Canada are not making enough new pilots. Even the biggest clubs in the country are only producing a handful of solos. Meanwhile each year the Air Cadet Gliding Program licenses around 300 cadet pilots. These newly-licensed pilots have had little experience with soaring but are keen to fly any way they can. The SOSA Junior Camp aims to show these new pilots what soaring can offer them and make an effort to help reverse the downward trend of this country's soaring population.

The camp is ten days long and open to any junior pilot in Canada but focuses on cadets freshly off course. Registration is $50 and a reduced glider rental rate is used for the camp. The juniors bring their tents and use the SOSA clubhouse kitchen to keep costs down.

The camp has been organized by Tom Coulson for the past few years. Tom is consistently one of our busiest instructors at SOSA. Shirley Dashper assists, as she always does capably. Adam Oke has taken care of registration and promotions for the camp. Both Tom and Adam instructed on the course with Mark Voysey and myself filling out the instructor roster. Adam and I had been instructors at the Cadet Camp in Trenton this summer, and we were pleased to see some of our pupils attend the camp. This year twelve new pilots participated, which is the number we can handle comfortably with this level of support. All participants except one from Great Lakes Gliding Club were from the cadet program.

The cadets have only flown Schweizer 2-33s, so the first order of business is to transition them to SOSA's ASK-21s. They are excited to fly a sleek fiberglass glider in contrast to the steel and fabric they are accustomed to. Thermaling is encouraged from the first flight. All the students were ecstatic after their first half hour or more soaring flight. The pilots solo the ASK-21 and then transition to SOSA's fittingly named SZD-51-1 Junior. Along the way we encourage the pilots to attempt a badge flight, and this year four successfully completed their one hour C badge.

I encourage all the clubs across Canada to embrace any cadets who come to their clubs. The cadet program produces graduates with little soaring knowledge and experience but you will discover they catch on quickly and in a very few flights will become competent soaring pilots. It is important to show these young men and women the respect they deserve. They have worked hard to get on

their gliding courses and earned a glider pilot licence; with little effort they can become valued members of your club.

Making flying affordable for them is also of great importance. SOSA has shown initiative by offering $200 junior memberships and discounted flat rate glider rental packages and running the junior camp. We have had attendees from right across the country, proving that there is interest everywhere for these kinds of programs. Is your gliding club encouraging youth with accessible facilities and affordable membership?

Chris Gough

Some IGC Bureau meeting notes

The meeting was held in Dublin on 3-4 Oct. There was some interesting feedback from 2010 World Gliding Championships (WGC).

The chief stewards and jury presidents reports from Prievidza and Szeged were analyzed. In Prievidza there were three serious accidents with one fatality. The reports from Szeged, as well as feedback from the participating teams, raised a number of concerns about the quality of the event.

It was agreed that the quality of the competition in Szeged did not reflect the usual standard of WGCs. There is a need to review the way we organize and manage major events in order to better capture problems like the ones we experienced in Szeged before the event takes place. The Bureau had a number of ideas and proposals. Some of these proposals will radically change the way we manage our competitions, and change the relationship between the IGC and the local organizer. Before implementing these, the proposals will be tabled at the 2011 Plenary for discussion with the delegates.

A number of protests were received that were not in line with good sportsmanship, but made to put pressure on competing pilots. This is not acceptable. The protest fee will be increased to a minimum of 250 euros as a countermeasure. There is also a need to ask championships directors and jury presidents to review the correct protest procedures and to apply them strictly.

A clearer definition of dangerous flying is needed. Time will be devoted to that at the chief steward meeting in March 2011, and to include discussion on dangerous flying in the 2011 steward training course.

The Bureau had previously decided to produce safety videos. This has not been possible so far due to lack of manpower. It was agreed to try to combine this action with the support required to analyze IGC files during competitions and to visualize potential dangerous situations that have occurred, as well as screening files to provide statistical material about safety-related performance indicators. It is envisaged to outsource these activities to an external source to combine the two issues.

The Bureau discussed the concept of adding the position of a Sporting Director to our competitions. Although it is important for us to understand reasons for serious accidents during competitions as soon as possible after the occurrence, we must respect the work of authorities who are conducting the investigation of the event. Scrutineering in the future will include the provision of IGC files from flight recorders.

In order to increase safety around the arrival and landing phases, it was agreed to make the finish ring the default finish procedure for WGCs. The finish line will remain in the Sporting Code and can be used should local conditions require that. At least one incident in Szeged was caused by the lack of knowledge about local procedures. It was recommended to make participation by competing pilots on the last practice day obligatory, certainly for what concerns briefing and gridding, possibly also flying.

It is also recommended to competition organizers to consider if each class should have individual task control points to align the arrivals with the runway in order to avoid having gliders arrive over the same point from different directions.

The Bureau believes that these changes are required in order to improve flight safety and the general quality of the events.

Okay – say you are a police officer …

In times not so past, the Orange County Soaring Association [in California] had completed an upgrade on our winch, with the goal of smoothing its acceleration curve, and it was time to test it. The test would involve towing a vehicle along the ground rather than an aircraft into the air in order to get accurate readings from the vehicle's speedometer. For those who may be raising eyebrows, this is not a new or original method of testing. The "winch test team" decided to find a quiet early morning section of open road in an industrial area for the test.

Steve was in the vehicle to be towed while Nick was to drive the winch. They spooled out about 3000 feet of line and rechecked everything. Then the order was given to "take up slack", followed by "launch, launch, launch" and the vehicle was accelerated quickly against a slight uphill grade: 20, 40, 55, and finally 60 mi/hr! Steve noted the smoothness of acceleration, while perhaps unconsciously pulling back gently on the steering column … yes, the winch upgrade was working.

Just as the test was completed, the first police car stormed into the test area. The test team explained to the first unhappy police officer on the scene that this was a winch for launching gliders, not cars, and we were just testing it with a car. The officer scowled in disbelief and said, "This is a public street for cars!" But in frustration he quickly realized the obvious … we were towing a car.

The second officer to arrive asked only two questions: how fast do you have to go to launch a glider and what speed did you get to? Both officers walked away to talk, then came back smiling. They seemed happy that the problem was resolved. They had found a rule in the California Dept. of Motor Vehicles black book that fit our violation: "towing a vehicle faster than 55 mi/hr".

When the only thing left to do was to write the ticket, the two officers began to argue – who should get the ticket, the driver of the winch, which was stationary, or the driver of the car, who wasn't towing anything!? The officers finally let our intrepid test team go with the promise not to do it again.

Steve Williams & **Nick Ounanian**, from *SOARING*

Thank God I'm a Country Boy

recorded by John Denver

Well life's on a farm is kinda laid back,
Ain't much an old country boy like me can hack.
It's early to rise, early in the sack,
Thank God I'm a country boy.

A simple kind of life never did me no harm,
Raisin' me a family and workin' on a farm.
My days are all filled with an easy country charm
Thank God I'm a country boy.

Well I got me a fine wife, I got me old fiddle.
When the sun's comin' up I got cakes on the griddle;
And life ain't nothin' but a funny, funny riddle:
Thank God I'm a country boy.

When the work's all done and the sun's settin' low,
I pull out my fiddle and I rosin up the bow.
But the kids are asleep so I keep it kinda low
Thank God I'm a country boy.

I'd play "Sally Goodin" all day if I could,
But the Lord and my wife wouldn't take it very good.
So I fiddle when I can and I work when I should
Thank God I'm a country boy.

Well I got me a fine wife, I got me old fiddle.
When the sun's comin' up I got cakes on the griddle;
And life ain't nothin' but a funny, funny riddle:
Thank God I'm a country boy.

Well, I wouldn't trade my life for diamonds or jewels,
I never was one of them money hungry fools.
I'd rather have my fiddle and my farmin' tools
Thank God I'm a country boy.

Yeah, city folk drivin' in a black limousine,
A lotta sad people thinkin' that's mighty keen.
Well, son let me tell you now exactly what I mean
Thank God I'm a country boy.

Well I got me a fine wife, I got me old fiddle.
When the sun's comin' up I got cakes on the griddle;
And life ain't nothin' but a funny, funny riddle:
Thank God I'm a country boy.

Thank God I'm a Glider Man

morphed by the Bald Eagle

Well life at the club is kinda laid back,
Ain't nothin' an old glider man he can't hack.
Cu's lookin' good, I'm stayin' on track,
Thank God I'm a glider man.

Soarin' all day never did me no harm,
Fly around some then land on a farm.
Knock on the door, show his daughter some charm,
Thank God I'm a glider man.

Well my wife won't crew, but I think that my kid'l
Now the cu's linin' up but there's blue in the middle,
How to plan the task is a funny, funny riddle,
Thank God I'm a glider man.

When the task's all done and the sun's settin' low,
I thank the tug pilot for givin' me the tow,
Check the weather for tomorrow, see where's the flow.
Thank God I'm a glider man.

I'd fly my LS-8 all day if I could,
But the club and my crew wouldn't take it very good.
So I soar when I can, and instruct when I should
Thank God I'm a glider man.

Well my wife won't crew, but I think that my kid'l
Now the cu's linin' up but there's blue in the middle,
How to plan the task is a funny funny riddle,
Thank God I'm a glider man.

Well, I wouldn't trade my lift for diamonds nor jewels,
I never was one of those power plane fools.
I'd rather live my life where cross-country rules!
Thank God I'm a glider man.

Yeah big airliners flyin' up in the jetstream,
A lotta those people thinkin' that's mighty keen.
Well, son let me tell you now 'xactly what I mean,
Thank God I'm a glider man.

Well my wife won't crew, but I think that my kid'l
Now the cu's linin' up but there's blue in the middle,
How to plan the task is a funny funny riddle,
Thank God I'm a glider man.

Letters

from page 5

Nowhere man

There are very few things as representative of Canada as canoes and Farley Mowat. For all of our foreign-born club members, that info should have been on your citizenship test, right between "Who was Tim Horton?" and "Where is Cowley?" Sometimes, famous people aren't recognized for who they really are. There is a great story of Farley trying to enter The Canadian Canoe Museum, in Peterborough, ON, and saying to the attendant,

"Hello, I'm Farley Mowat."
"That'll be eight bucks."
"But I want to donate to the museum the canoe in which I was conceived."
"That'll be eight bucks."

Let me tell you I can relate to that incident – not the "conceiving-in-a-canoe" part, the non-recognition part.

From time to time, I like to visit the folks at other glider clubs. Bill Cole, the 2010 Club Class winner from Toronto Soaring, says that I do this only to find a fresh audience for what he calls "My Stories." He is envious of course, having no stories of his own, except that he is a National Champion and I am not.

On my club visits I usually find great hospitality and new glider types to fly. I am up to 20 gliders and 13 towplanes in four provinces. One of the special attractions is the offer of flying at local club rates. This summer I dropped in at a small club with a member flat rate of $30 per flight, tow fees included. I asked to go for a ride, and was told,

"That'll be a hundred bucks."
"But I'm a SAC member," I complained.
"That'll be a hundred bucks."
"But I was the CD for the 2010 Nationals."
"We don't do cross-country here, we just do intros. That'll be a hundred bucks."
"But I just had *three* articles in the latest issue of *free flight*, a personal best for me and, I think, a domestic record."
"We don't read *free flight* here, that's just for effete intellectual snobs, that'll be a hundred bucks."

Then, as it often occurs on weekends, it began to rain so the discussion, and my fleeting fame, ended.

Yours truly, **Doug Scott**

The support of members to SAC

The generous support of members such as yourself sends an important and welcome message to our many volunteers that they are not alone in contributing at the national level and that their efforts are appreciated. The Pioneer Fund investment earnings are an important factor in maintaining fees with no annual increase. As well, SAC has been able to offer expanded assistance to World Team and Junior Team members representing Canada in international competitions and can fund twenty youth bursaries across Canada.

The Pioneer Fund capital is not drawn upon and provision is made for the fund to sustain and grow. Thus, a donation is a permanent contribution to the future of the sport.

Eligible funds include the Pioneer Fund, Wolf Mix Fund, Peter Corley Fund, Air Cadet Fund, and the newly established Youth Bursary Fund.

Le support de membres à SAC

Le support généreux de membres comme vous, envoie un message important et de bienvenu à tous nos bénévoles, qu'ils ne sont pas seuls à contribuer au niveau national et que leurs efforts sont appréciés. Les gains des investissements du Fond des Pionniers sont un facteur important pour maintenir les coûts des adhésions annuels sans augmentation. Aussi la SAC a pu offrir une assistance additionnelle aux équipes World Team et Junior Team, représentant le Canada dans les compétitions internationales et a contribué à 20 bourses des jeunes au travers le Canada.

Le capital du Fond des Pionniers n'est jamais retiré et ce fond est provisionné pour se soutenir et grandir. Un don est une contribution permanente pour le futur du sport.

Les Fonds éligible inclus le Fond des Pionniers, le Fond Wolf Mix, le Fond Peter Corley et le nouveau Fond Bourse aux Jeunes.

learning to compete from page 15

to help on the day I declared that "this day would end in a 500 or a field" – it was a field.

My tale would be lacking if I neglected to tell you about Angela Comer, my best friend who I convinced to join me on my Aussie adventure. She soon became just as excited as I was to share my winter of gliding. There, we planned groceries and adventures across the countryside. She reminded me not to be too serious and to enjoy myself in the air and on the ground. Angela helped me learn how to pursue my dreams without being selfish along the way. And she was always there to give me some tough love when I was facing insecurities about gliding. I've grown up a lot in the past year, in large part due to our great friendship!

I must also mention all of the incredible people I met in Australia and around the world who took the time to talk with me about flying last year. Nathan, Andrew, John, Lars, Brendan, Graham, and many others answered my questions, looked over flights with me, and taught me a myriad things about flying. Thank you!

I have learned a lot of things from other people, but my own flying and preparation has been teaching me heaps as well. On the ground I have been learning self-discipline before flight, ensuring I get proper sleep, hydration, and diet. In the air staying completely focused on the flight teaches me mental discipline. When I get low during a flight I learn to persevere and be tenacious. The non-stop decisions that must be made in the air teach me to be decisive, and encourage clear and logical thinking as well.

It is hard to articulate how these qualities have grown in me, I hope this can be seen by people who meet and talk with me. Sometimes I struggle with thinking that flying is a selfish sport, but then I realize that in growing as an individual, I will have more to contribute to others. My dream of flying at the Junior Worlds has taught me that it is possible to have lofty dreams, and that through hard work and dedication I can succeed at what I set my heart on.

If you talk to me for long you will quickly see that I am absolutely in love with the sky – addicted even. But I am equally passionate about getting more young people involved in this sport. Why? I dream of seeing other young people grow and learn life-long positive personal attributes the way I am through gliding. Is there a young keen pilot at your club? If so, take the time to invest in them. Enjoy the process of watching them learn and blossom. Who knows, perhaps they will appear in a future issue of *free flight!*

You can follow my gliding adventures more closely on my blog at <*www.selenapb.blogspot.com*>. An article on my current trip in Australia will be written in the near future. ❖

a guiding light from page 19

Thus, rates are low. Membership is $10 per year, and aerotow is $1.00 to 1000 feet and 25¢ per car tow to about 200 feet.

Of all the methods of training that have been tried out, the following has given the best results and has been adopted as standard. The pupil is started off with 10 dual flights in the 2-22 and given full control after release, so long as he does not put the ship into a dangerous attitude. He learns quickly the effects of the controls, their proper settings in straight flight and in medium and steep turns. Then he is given 15 car tows in the 1-19 with a 300 foot rope, the instructor signaling to him from the tow car. Having mastered his takeoff and landing technique he is returned to the 2-22 for instruction in aerotowing and preparing an approach. A check then reveals usually that the pupil is ready for his solo flight in the 1-19 in calm weather.

Members of the club have earned 11 "C", 7 "B", and 3 "A" certificates.

The club has three towpilots. Seven members of the gliding club, not content with gliding, took up power flying with Bradley Air Services. Three of them are now completing their Commercial rating.

The gliding club has also been filmed by the National Film Board. The film called *Higher Learning* is part of a series entitled *Eye Witness*. This aspiring young club also claims to have the youngest glider pilot in Canada at present, a boy of fourteen. Winter flying is to be carried out this winter on the frozen river just outside the town, where power flying there was quite an attraction last year.

Regardless of the future of the Buckingham Gliding Club, it will nevertheless stand as tangible evidence that gliding is a very desirable high school activity, and that it can open new horizons as well as new careers for the youth.

For his work with youth, Brother Hormisdas Gamelin was awarded the Order of Canada in 1985. The secondary school in Gatineau, QC is named in his honour. He died in 1989. Tony ❖

a light on duration – lumières sur la durée

from page 11

emmené avec lui un flacon d'eau de Cologne dont il s'aspergeait les yeux lorsque le sommeil le gagnait trop. La médaille Lilienthal de Vol à Voile lui est décernée la même année par la FAI.

16 février 1953 Jacques Lebeau et Félicien Noin décollent à bord du CM-7 pour tenter de ravir le record à Carraz-Branswick. Leur tentative échoue après 31h23 de vol, le Mistral ayant décidé de s'arrêter.

30-31 décembre 1953 - 1er janvier 1954 Toujours en catégorie biplace masculin, c'est au tour de Claude Fronteau et Jacques Lebeau de s'adjuger le record du monde, avec l'inusable CM-7. Temps de vol : 56h11. Mais ce record ne passera pas à la postérité car il sera de nouveau battu quatre mois plus tard.

11-12 janvier 1954 38h41. C'est le nouveau record du monde féminin de durée en biplace. Marinette Garbarino et Jacqueline Mathé atterrissent de nuit et laisse le brave CM-7 se remettre de ses émotions car il ne le sait pas encore mais c'était là son dernier exploit pour ce qui est de la durée. Comme d'habitude, Louis Brun a supervisé par radio toute l'opération, ce qu'il fera de 1948 à 1954.

6-8 avril 1954 Cette fois-ci, c'est le Kranich III qui sera de service pour ce dernier record du monde de durée. À bord deux jeunes gens prennent place : Bertrand Dauvin et Henri Couston. Le vol est tendu et très pénible, sous une pluie glacée, le Mistral étant plutôt mou ces jours-là. Néanmoins le record est battu avec 57h10. L'équipage aurait pu encore prolonger le vol, mais il atterrit croyant qu'on leur avait ordonné, ce qui était faux.

26 décembre 1954 Le jeune Bertrand Dauvin, aguerri par son record en biplace, décide de ravir le record masculin en monoplace à Charles Atger. Le lendemain de Noël, il décolle seul à bord du Kranich III F-CATZ no 75 mais suite à un silence radio inquiétant et de difficiles recherches dans la nuit, le matin suivant, l'épave de son planeur sera retrouvée disséminée sur la pente des Alpilles, le pilote étant décédé vraisemblablement sur le coup.

Ce tragique accident marquera la fin des records de durée, la FAI décidant en 1956 de mettre un terme à cette catégorie qui finalement, hormis de devenir dangereuse, ne prouvait rien sur le plan du vol à voile, sinon la capacité d'hommes et de femmes à résister au sommeil. Tous ces records de durée seront donc à jamais inscrits sur les tablettes de la FAI comme records pour l'éternité… ❖

the 1952 FAI Lilienthal Medal for Gliding for this flight.

16 February 1953 Jacques Lebeau and Félicien Noin, in the CM-7, launch to attempt the Carraz-Branswick record – it fails at 31:23 hours when the Mistral stops blowing.

30-31 December 1953 - 1 January 1954 Still in the two-seat category, the next try is by Claude Fronteau and Jacques Lebeau who break the world record in the unbreakable CM-7 with a time of 56:11 hours.

11-12 January 1954 38:41 hours for a new feminine two-seat world duration record. Marinette Garbarino and Jacqueline Mathé land at night and say goodbye to the brave CM-7, which still doesn't know that it's the last time for it for duration flights. As usual, Louis Brun supervised the operations, which he did until this year.

6-8 April 1954 Now it's time for the Kranich III to prove itself. On board there are two young people, Bertrand Dauvin and Henri Couston. The flight, in an icy rain, is particularly difficult and painful, and the Mistral is rather weak over those days. Nevertheless the record is broken with a flight of 57:10 hours. The crew could have flown longer but they mistakenly thought that they had a call on the radio to land.

26 December 1954 Bertrand Dauvin, hardened by his record flight in April, goes for the single-seater record held by Charles Atger. He takes off in the Kranich III, F-CATZ. After a long worrying time without radio contact and an all-night search, the wreckage of the glider is found the next morning scattered between the rocks of the slope, the pilot dead.

This tragedy marked the end of the duration records; the FAI stopped this category of performance in 1956 because it had become too dangerous and really proved nothing about soaring – just the capacity of humans to resist sleep. All these records registered by the FAI will never change … ❖

the great deception

from page 20

We couldn't wait to see the developed films for the day and sure enough, our surveillance produced irrefutable evidence that Guraly was actually manipulating his two cameras and recording a start gate time later than actual. So for the stewards it was "bingo!" – a result that put the matter beyond doubt!

Our meeting with the CD to show what we had achieved meant there was a need to confirm just how Guraly was effecting a time difference between taking the photo and imprinting a later time on the film. We requested the Hungarian team manager to produce Guraly's cameras. They were both of a popular standard time-dating variety, but were from two different manufacturers.

The tests that were carried out confirmed that they had been altered to only advance the film after every second click. The first click took the photo without advancing the film, and the second click with the lens cap on printed the time and date and then advanced the film. Both cameras worked the same and the trials confirmed that it took only 11 seconds to produce the same false time on both films, thus ensuring that scrutineers checking starts and turnpoints would see the same time on each film.

Our "think-tank" took the best part of a day conducting tests and endeavouring to work out conclusively how he did it. Fortunately Day 4 was a no-contest day. The meeting to confront Guraly with the facts as we had found them was a very tense affair.

The CD had made up his mind that a case had been proven against Guraly and, in front of the Hungarian team manager, Guraly was formally advised that he was disqualified from the championships. This was the first time a disqualification had ever been applied at a World Gliding Championship.

It was history-making stuff and, as readers will appreciate, it was a very unpleasant element for the Championship. All sorts of rumours quickly circulated amongst competitors, crew, and officials. Pilots, especially those who introduced the subject to the organizers, found the situation particularly disturbing.

Neither Guraly nor his team manager elected to lodge an appeal to the International Jury, as was their right, so the subject was quickly closed, allowing the organization to get on with running the Championship, which they did very well. Guraly immediately left the scene at Borlänge and returned to Hungary to be faced with the wrath of his employers. By this time, it was headline news in Hungary. I subsequently learned that Guraly lost his job with the airline over the incident.

However, it appears he did not discard gliding forever as his name appears regularly in minutes and documents relating to FAI's CIVA, the sporting organization for glider aerobatics. ❖

FAI badges

Walter Weir

3 Sumac Court, Burketon, RR2, Blackstock, ON L0B 1B0
(905) 263-4374, <2waltweir"at"gmail.com>

These Badges and Badge legs were recorded in the Canadian Soaring Register during the period 12 September to 24 November 2010.

SILVER BADGE

1049	Ronald Cooke	Quebec
1050	Drew Hammond	Central Alberta
1051	Luis Santos	SOSA

DIAMOND DISTANCE (500 km goal flight)

	Randy Neilson	Great Lakes	512.5	ASW-19	Parowan, Utah

DIAMOND GOAL & GOLD DISTANCE (300 km goal flight)

	Drew Hammond	Cent. Alberta	323.7	RS-15	Innisfail, AB

DIAMOND ALTITUDE (5000m height gain)

	Jean Provencher	Quebec	5655	SZD-55	Baie St-Paul, QC
	Guy Blood	Edmonton	5250	Libelle 201	Cowley, AB

GOLD ALTITUDE (3000m height gain)

	Guy Blood	Edmonton	5250	Libelle 201	Cowley, AB
	Richard Garvis	Montreal	3150	Discus	Minden, NV

SILVER DISTANCE (50 km flight)

	Ronald Cooke	Quebec	53.2	Jantar	St-Raymond, QC
	James Miller	Great Lakes	53.3	Ka6E	Colgan, ON
	Luis Santos	SOSA	61.9	SZD-51	Rockton, ON

SILVER ALTITUDE (1000 m gain)

	Luis Santos	SOSA	1210	SZD-51	Rockton, ON
	Glen Barrett	SOSA	1410	SZD-51	Rockton, ON
	Richard Garvis	Montreal	3150	Discus	Minden, NV

SILVER/GOLD DURATION (5 hour flight)

	Farid Ibrahim	SOSA	5:18	ASK-21	Rockton, ON
	Jan Zachemski	SOSA	6:19	SZD-51	Rockton, ON
	James Miller	Great Lakes	6:08	Ka6E	Colgan, ON
	Martin Camenietzki	SOSA	5:43	SZD-51	Rockton, ON
	Michael Kinsner	SOSA	6:03	SZD-51	Rockton, ON
	Drew Hammond	Cent. Alberta	5:24	RS-15	Innisfail, AB
	Luis Santos	SOSA	6:38	SZD-51	Rockton, ON
	Glen Barrett	SOSA	5:17	SZD-51	Rockton, ON

going to school

from page 21

The papers took almost as long to mark as we took to answer them. That shows thorough marking. Finally our last flight with off-field landings by the pupil got most of the candidate's heart rates up.

Impression of the course? This was a challenge! The standard that Dan set was consistently high and he kept encouraging and cajoling us to lift our standards to the highest level. In particular the accuracy and uniformity of terminology expected was intense. Then he expected us to fly to those same standards along with regular scanning and an equivalent level of safety. Never during the course did we feel threatened, but always encouraged to do better.

Dan's steady, solid competence and assurance that this is where the standard should be set, lifted all our standards. Our long suffering pupils gave us a taste of what to expect from actual student pilots. If nothing else comes of this course for me, I *know* my flying skills have improved and my awareness of the necessity of a good lookout will be a constant companion. ❖

FAI records

Roger Hildesheim

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

Pilot	**Adam Zieba**
Date/Place	9 May 2010, Mifflin, PA, USA
Record type	Speed to Goal, 200 km, 300 km, 400 km Open, 15m, Club (all citizen)
FAI Category	SAC
Sailplane	SZD 55-1
Speed	151.7 km/h Open & 15m, 142.5 km/h Club
Task	Tazewell to Williamsport
Previous record(s)	
200 km	Open – 143.0 km/h, Walter Weir, 1995 15m unclaimed
200 km	Club – 127.6 km/h Jerzy Szemplinski, 2007
300 km	Open – 145.9 km/h Walter Weir, 1994 15m unclaimed
300 km	Club – 112.8 km/h, Tim Wood, 2008
400 km	Open, 15m, Club – unclaimed

C BADGE (1 hour flight)

2933	Farid Ibrahim	SOSA	5:18	ASK-21	Rockton, ON
2934	Scott Russell	York	2:20	2-33	Arthur E, ON
2935	Jan Zachemski	SOSA	6:19	SZD-51	Rockton, ON
2936	Martin Camenietzki	SOSA	5:43	SZD-51	Rockton, ON
2937	Michael Kinsner	SOSA	6:03	SZD-51	Rockton, ON
2938	Adam Vasey	SOSA	1:08	ASK-21	Rockton, ON
2939	Valerie Deschamps	Cent. Alberta	1:37	1-26	Innisfail, AB
2940	Luis Santos	SOSA	6:38	SZD-51	Rockton, ON
2941	Glen Barrett	SOSA	5:17	SZD-51	Rockton, ON
2942	Richard Garvis	Montreal	3:36	Discus	Minden, NV

not your average birthday flight

from page 4

wrote a long story about his pre-war gliding training experiences *("70 years and Counting")* in the 2007/3 issue of *free flight*. Following the war, he moved to Canada and got a private pilot licence in 1960, but work and family kept him from doing much flying, although he flew a Grumman *Yankee* for some time.

Then, 37 years after his last gliding flight in 1944, he joined the Grande Prairie Soaring Society in 1981 and hasn't stopped soaring since. He was an instructor and then CFI at GPSS until 2008. He got a share in a Ka6E in 1982 (unfortunately wrecked by a partner in 1984) and became a determined cross-country soaring pilot. In 2001 he bought his Open Cirrus (the 'flying rocking chair', he calls it) and really began building up the distances. Some notable soaring flights were:

- 1983, Gold distance, Ka6, 334 km from Cowley to Maple Creek, SK.
- 1984, Ka6, 254 km, Grande Prairie to Slave Lake, AB (Canada's most northerly X-C, look at *that* on your map).
- 2008, Open Cirrus, 367 km straight distance, Cowley to Stettler, AB.
- 2009, Open Cirrus, 329 km, 3TP flight from Chipman, AB.
- and, 2009, Diamond distance, 332 km – a Chipman, Killam, Vermillion, AB triangle.

Walter has totalled 860 hours of glider time (about half in the Cirrus), done much cross-country flying, and doesn't plan on quitting any time soon.

He contributed his thoughts on the limits of gliding as an older pilot in an article *("Hanging up One's Wings")* in the 2003/2 issue of *free flight* that all you seniors should read again.

For my report here he wrote, "I would like to point out that I in no way think of myself as aviation expert, flying ace, or top-notch soaring pilot – I am just an average pilot who was enthusiastic as a teenager about flying and has kept this enthusiasm to his 90th birthday and hopefully a little while longer. And when it is all over, I will look back on a retirement hobby that very few seniors can match."

A very big amen to that, Walter.

Tony Burton

magazines

GLIDING INTERNATIONAL — the monthly world gliding publication by John Roake. Read worldwide, with a great reputation for being the first with the latest news. US$64/120, 1/2 yrs airmail. Personal cheque or credit cards accepted. <*office@glidinginternational.com*>. Register on line: <*www.glidinginternational.com*>.

SAILPLANE & GLIDING — the bimonthly journal of the BGA. £39/yr airmail, £22.75 surface. <*www.gliding.co.uk/sailplaneandgliding/subscriptions.htm*>.

SOARING — the monthly journal of the Soaring Society of America. Subscriptions, US$46. Credit cards accepted. Box 2100, Hobbs, NM 88241-2100. <*feedback@ssa.org*>. (505) 392-1177.

SOARING AUSTRALIA — monthly joint journal of the Gliding Federation of Australia and the Hang Gliding Federation of Australia. <*www.soaring.com.au*>.

SOARING NZ — Editor, Jill McCaw. Personal cheque or credit cards accepted, NZ$122. McCaw Media Ltd., 430 Halswell Rd, Christchurch, NZ <*j.mccaw@xtra.co.nz*>.

SAC Clubs SAC Clubs

Eastern Zone

AIR CURRENCY ENHANCEMENT SOC.
Debert, NS
robfrancis@tru.eastlink.ca

AÉRO CLUB DES CANTONS DE L'EST
Valcourt, QC
Marc Arsenault
marcarsenault@sympatico.ca

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

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

MONTREAL SOARING COUNCIL
CLUB DE VOL À VOILE DE MONTRÉAL
Hawkesbury, ON
club phone (613) 632-5438
www.flymsc.org

Ontario Zone

BONNECHERE SOARING
5.5 km N of Chalk River, ON
Iver Theilmann (613) 687-6836

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

GATINEAU GLIDING CLUB
Pendleton, ON
www.gatineauglidingclub.ca

GREAT LAKES GLIDING
NW of Tottenham, ON
www.greatlakesgliding.com

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

RIDEAU VALLEY SOARING
35 km S of Ottawa, ON
club phone (613) 489-2691
www.rideauvalleysoaring.com

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

TORONTO SOARING CLUB
airfield: 24 km W of Shelburne, ON
www.torontosoaring.ca

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

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.ssc.soar.sk.ca

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, AB
www.cagcsoaring.ca

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

EDMONTON SOARING CLUB
N of Chipman, AB
www.edmontonsoaringclub.com

GRANDE PRAIRIE SOARING SOCIETY
Beaverlodge A/P, AB
www.soaring.ab.ca/gpss/

Pacific Zone

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

CANADIAN ROCKIES SOARING CLUB
Invermere A/P, BC
www.canadianrockiessoaring.com

PEMBERTON SOARING
Pemberton A/P, BC
www.pembertonsoaring.com

SILVER STAR SOARING ASSN
Vernon A/P, BC
www.silverstarsoaring.org/

VANCOUVER SOARING ASSOCIATION
Hope A/P, BC
club phone: (604) 869-7211
hope.gliding@yahoo.com

Directors & Officers

President & Eastern
Sylvain Bourque
cell (514) 592-0283
bourques@videotron.ca

Ontario
Eric Gillespie
(416) 703-6362
ekg@cunningham-gillespie.com

Prairie & Past President
John Toles
(306) 652-7909 (H)
j.toles@shaw.ca

Alberta & Secretary/VP
John Mulder
(403) 945-8072 (H)
johnmulder@shaw.ca

Pacific & Treasurer
David Collard
1-866-745-1440
dacollard@telus.net

National Safety Program
John Toles — director

Committees

Air Cadets
National Office

Airspace
Scott McMaster
(519) 884-2303 & 620-0447 (H)
scott@mcmail.cis.mcmaster.ca
Roger Harris
rharris@petrillobujold.ca
Ian Grant (advisor)

FAI Awards
Walter Weir (905) 263-4374 (H)
2waltweir@gmail.com

FAI Records
Roger Hildesheim (613) 838-4470
rogerh@ca.inter.net

Flight Training & Safety
Dan Cook, (250) 938-1300
cookdaniel@shaw.ca
Gabriel Duford
gabriel.duford@videotron.ca
Dan Daly
dgdaly@hotmail.com
Joe Gegenbauer *gegb@shaw.ca*
Richard Sawyer
cfzcw@sympatico.ca

Medical
Dr. Richard Lewanczuk
(780) 439-7272
rlewancz@gpu.srv.ualberta.ca

This is a hint to actually read all the **fine print** to see if club contact info, etc. etc. is correct.

Insurance
Keith Hay (403) 949-2509
insurance@sac.ca

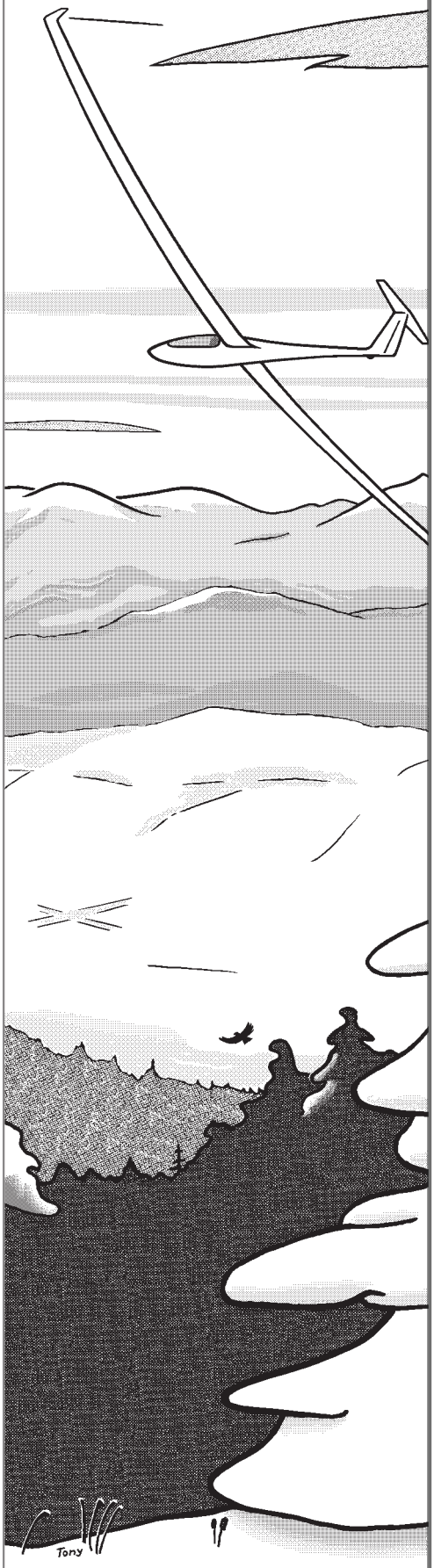
Sporting
Jörg Stieber
519-662-3218 (H), 662-4000 (B)
joerg@odg.com
Derek Mackie *itshdwrk@gmail.com*
Walter Weir *2waltweir@gmail.com*
Contest Letters Chris Gough
christophermgough@gmail.com

Technical
Paul Fortier (613) 258-4297 (H)
paulfortier1@juno.com
Chris Eaves *mail@xu-aviation.com*
Wolfgang Weichert
wkweichert@gmail.com

Trophies
Phil Stade (403) 813-6658 (H)
asc@stade.ca

Video Library
Ted Froelich (613) 824-6503 (H&F)
2552 Cleroux Crescent
Gloucester, ON K1W 1B5
fsacvideo@aol.ca

Web site maintenance
volunteer REALLY needed



Season's greetings
good soaring in 2011

CANADA POSTES
POST CANADA

Publications mail agreement no.
40013347