

# free flight fibre



2015/2



**W**E ARE FORTUNATE to be surrounded by a wonderful team of volunteer directors, committee chairmen and committee members with different professional skills, backgrounds, and aeronautical experience who complement each other in the tasks that need to be done in our association. I thank them for their hard work. I'm proud to be part of this passionate Board that has such a good variety of backgrounds and a huge involvement in the soaring community. The members of the Board of Directors are:

**Sylvain Bourque** has been the Eastern Zone Director since 2006. He was SAC VP from 2008 until 2010 and SAC President since 2010. He started gliding in 1994, and is a very active member of AVV Champlain involved in instructing and towing. He was the president of Champlain in 98 and 99 and has been its treasurer for the last 20 years. He has a commercial pilot licence, is an aeronautical radio certificate examiner, aviation language proficiency test examiner, and an authorized person for glider pilot licensing. Sylvain owns a Pegase with two other partners. He works as a field production cameraman instructor and supervising technician for CBC/Radio-Canada in Montreal.

**George Domaradzki** is the director for the newly-formed Eastern Ontario Zone since 2014. The zone consists of Gatineau Gliding Club, Rideau Valley Soaring, Bonnechere Soaring and Montreal Soaring Council. George has been flying gliders since 1998 and has been an instructor since 2004. He is currently the president of Rideau Valley Soaring. He coordinates the Ottawa Area Glider Pilot Ground School on alternate years. George flies his ASW-20 whenever he is not scheduled to instruct. He was a federal government demographer, and has been retired since 2012, enabling him to now carry out mid-week flying and instructing duties.

**Stephen Szikora**, the Southern Ontario Zone Director since 2012, was our VP for the last two years, and is our new SAC Treasurer. He started gliding as an Air Cadet in 1978 and earned his PPL in 1988 and his GPL in 1989. Stephen is a member of York Soaring, was previously at Toronto Soaring, and at Air Sailing where he was club president for eight years. His motivation for joining the Board includes improving the governance process and communication within the organization. When not flying gliders, towing gliders, pushing gliders, or fixing gliders, he likes to cut the grass.

**Jay Allardyce**, the Prairie Zone Director since 2010, representing the clubs in Saskatchewan and Manitoba, and is the SAC Secretary. Jay flies out of the Winnipeg Gliding Club, owns an ASW-19 with two other partners and is an avid cross-country pilot. He is also an active instructor and towpilot and works in the aerospace industry to pay for his gliding.

**Alan Hoar** is the Alberta Zone Director since 2013. Al has been involved in the soaring scene in Alberta since 1992, mostly with the Cu Nim Gliding Club. Some soaring highlights of this time have been many Cowley camps in summer and in fall, Diamond distance and altitude flights, Valemount BC soaring camps, and the North Battleford National Contest. Al was president of Cu Nim as the club house was constructed, CFI of Cu Nim twice, and also on the executive of the Alberta Soaring Council. He has found it interesting to be involved with the details of SAC.

I want to take this opportunity to thank David Collard, who stepped down as the Pacific Zone Director, for all the volunteer work he did for SAC over the past eight years and six years as our volunteer Treasurer. (The new Pacific Zone Director had not been chosen when we wrote these lines – Alan Hoar will be the BoD liaison with the zone until then.) David took on the job of Treasurer after Jim McCollum retired as the SAC Executive Director & Treasurer. Dave was the liaison person with the COPA office for SAC management, monitoring this on a regular basis. The Treasurer is a key position on the Board; it needs expertise and commitment to take on the job, and for that we thank David for the important work he has done for SAC. His highly valuable contribution will be missed.

I invite you to read the complete 2014 SAC annual reports & 2015 AGM minutes document available in the Docs section of the new SAC website. It reports what SAC volunteers are doing for you. You should read it, especially if you → **p24**

# free flight

vol libre



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

ISSN 0827 – 2557

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



The end of a cross-country and on final to an airstrip somewhere in Europe.

photo: Chris Hiller

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# Flight Training

## annual report for 2014



### 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 organization representing Canada at the Fédération Aéronautique Internationale (FAI), the world sport aviation governing body composed of the national aero clubs. The ACC delegates to SAC the supervision of FAI-related soaring activities such as competition sanctions, processing FAI badge and record claims, and the selection of Canadian team pilots for world soaring championships.

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

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

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

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

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

For change of address contact the SAC office at [sac@sac.ca](mailto:sac@sac.ca). Copies in .pdf format are free from the SAC website, [www.sac.ca](http://www.sac.ca).

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Deadline for contributions:

**10** March, June  
September, December

**Safety report** See the national safety report on page 18. The club safety reports reflect, for the most part, the same accidents being made by different pilots. Some clubs might not follow the safety recommendations to the same level of implementation. Glider pilots are part of general aviation (GA) and, as the United States FAA has pointed out, the GA safety record is not good compared to commercial aviation. The reason for this may be twofold. First, there is less pilot self-discipline to follow checklists, operating procedures, standard safe practices, etc. The second is because GA flying is not an "employment", pilots are not responsible to employers and are not risking their livelihood. They are therefore likely willing to take more risks in the pursuit of some payout, whether it be adrenaline rush, bragging rights, or points in a contest.

What is the answer for GA and the soaring component? Unless safety is imposed by government regulation or some "accountable authority" such as in commercial aviation, the only way ahead will be in efforts towards improved safety culture (see safety psychologist David Broadbent's articles on "A Second on Safety" at [Transformationalsafety.com](http://Transformationalsafety.com)). In general, clubs with excellent safety records have good safety cultures. However, "buy in" is required from most participants for it to work.

Stall/spin remains as our major risk area for fatal accidents followed by mid-air collisions. FT&SC has made education in these areas and the use of FLARM as a major effort.

**Instructor training** FT&SC assisted with standards for two instructor courses in 2014. The eastern course was at SOSA for seven candidates with four instructors, and the western course at Cu Nim for eight candidates, with nine instructors assisting and working on upgrades to Class II and Class I. Ontario Zone FT&SC representative Dean Toplis participated in the eastern course and is now familiar with the instructor course standards function and should be able to assist clubs in Ontario. FT&SC has assisted with and issued 12 new Class III ratings, 9 Class II upgrades (journeyman), and 9 Class I (CFI/examiner) ratings in 2014. The new format of the club conducting the course with FT&SC standards assistance for content has been working very well and is a positive experience for the clubs.

**Training standards** We have a dedicated instructor cadre doing a professional job. However, our ability to deliver thorough preparatory ground instruction (as required by CARs) may not always be to the same standard. FT&SC will be publishing some training notes for instructors on what they should consider including and will put more effort into completing the video series for this. Within the clubs implementation is mostly a leadership issue.

I have been reviewing some clubs ground school materials and I have found a few cases not in line with the SAC manuals for explaining flying technique. This may be confusing for students. Most of my attention is on explanations of spin recovery technique that is not in line with CS-22 (the standard recovery technique manufacturers are designing gliders to). Unfortunately, a recovery technique that is good for all airfoils is not possible, but stating only a technique in our ground school that may be adequate for a particular type and not including the standard recovery method is a disservice to students. The POH spin recovery technique for each glider supersedes the standard method, but teaching a method only suitable to two-seat training aircraft and not suitable to most single-seat gliders will not improve our fatal accident record. FT&SC has made this a priority to standardize the minimum spin training in Canada. We are also putting together a SAC ground school package based on club submissions but vetted for these conflicts and issues.

We have also been watching circuits flown by instructor candidates in the last few years and based on these observations we seem to be having some problems flying proper circuits. This has nothing to do with the FT&SC "offset circuit" but more about flying towards

## ASSOCIATION CANADIENNE DE VOL À VOILE

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

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

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

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

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

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

Pour un changement d'adresse, communiquez par [sac@sac.ca](mailto:sac@sac.ca). La revue est disponible gratuitement, en format "pdf" au [www.sac.ca](http://www.sac.ca).

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the runway (crowding) rather than parallel, turning base too soon in no-wind conditions, having to make full air brake approaches/landings to prevent overshoots. It is almost impossible to teach students stabilized approaches if the demo is not a standard circuit. I also believe many of the landing problems for all pilots start with poor circuits. We would suggest that, within clubs, FLARM traces start to be reviewed and discussed at club pilot meetings. This was done at the last Nationals and the circuits started to improve greatly in following reviews.

Many clubs do not have a formal safety training program in place outside of primary flight instruction – at most it is ad hoc. All the accident report summaries are published on the website. We have been told that some club decision-makers feel that this will scare students away from the sport, so they don't use that information. Letting them discover errors on their own is not a better alternative. Perhaps a re-think of club safety culture is necessary.

**PowerFLARM** PowerFLARM acceptance is generally greater in the east than in the west, with Quebec clubs at 95% (western exception is Invermere at 100%). Some clubs have made it mandatory to be towed at their field. Most pilots who fly with one where most of the other gliders are equipped do not want to fly without one afterwards. If you have not experienced flight with one you need to fly at a club that has them in use. FT&SC has prepared a list of FLARM drills to help maximize the effectiveness of the device. In addition, the devices can be used to find a missing aircraft at contests by examination of flight traces from other gliders. PowerFLARM can be contacted to provide this assistance.

**Contest Safety** More pilots are using PowerFLARM at contests. At US contests use is close to 95%. As with radios and parachutes for contests, FT&SC recommends FLARM be mandatory equipment. Low passes at contests have been discussed on the SAC Forum. FT&SC has recommended that these not be incorporated into SAC contests as they increase the collision risk. Contest rules were recommended for review of items that may reward unnecessary risk taking. A decision during a contest (or any cross-country flight for that matter), to not landout or to avoid a landout, will force the pilot consciously or subconsciously to accept higher risk with potentially fatal consequences. Personal limits used for benign days must be raised for wind, turbulence, or thermal shear strength. Implementing a "red hat" policy is recommended (a pilot wearing a red hat during a DI does not want to be interrupted.) A *Contest Pilot Risk Matrix Assessment* was introduced at the last Nationals utilizing FLARM trace data as a tool to evaluate the quality of circuits. These tools have been met with positive feedback.

**Instructor standards workshop** FT&SC has assisted SAC clubs with training standards. This was identified as a risk area to be mitigated if possible. The workshops have proven to be successful in providing the information and rationale for standards. Accepted standards across SAC help reduce student anxiety, improve student learning, and increase safety. SAC standards are based on 15 years of Canadian accident/incident analysis and validated against the millions of flights and accident/incident analysis data from OSTIV. SAC standards were developed to mitigate unintended consequences of training and to make our pilots safer long past the licence stage into their cross-country flying. Standards workshops were combined with instructor courses, SAC conversion courses, instructor upgrades and refresher training at several clubs. Participants (estimated about 30–50% of club instructors) from clubs included MSC, GGC, RVSS, SOSA, Saskatoon Soaring, ESC, Cu Nim and VSC. All CFIs should now be familiar with the content of these standards presentations.

**Personnel changes** Dan Daly left the FT&SC as the zone representative and Safety Officer. We hope that he may return to the committee at some future time but has been willing to function as a consultant.

Ian Oldaker, chairman of the OSTIV Training & Safety Panel (TSP), was nominated by the president of OSTIV and then appointed by the FAI to the newly-formed Safety Expert Group, tasked with making recommendations for improving safety at all FAI sanctioned airports events. The group first developed the FAI Safety Policy; work continues, ⇨ p26

# The glider pilot personality



Paul Moggach

## the personality - safety link

OVER THE LAST THIRTY YEARS FLYING AT YORK, I have held several operational positions at the club, including CFI and Safety Officer. Promoting safety has always been a prime concern of mine and, for the most part, I have taken the traditional approach of acquiring and disseminating knowledge to combat errors and unsafe practices. However, over time, this has been a frustrating exercise as we seem to be stuck. Our safety record is either the same or deteriorating slightly. It cannot be attributed to a lack of materials or presentations on safe practices and procedures. I have much better information and means of collecting and delivering it than I did in the past. Assuming that sane pilots aren't trying to have accidents, what's the cause of our stagnation?

In spite of evidence to the contrary each year, the simple answer is that glider pilots consider they are safe enough. So what makes us so sure of ourselves? I think one of the factors might be pilot personality.

Personality may be characterized as the preferred manner in which we both perceive and relate to the world. Further, while the general population has quite a mixture of different personality types, I was confident that glider pilots are a more uniform group. My guess is that the majority of us are introverted, analytical types, and that we're a bit obsessive about getting things 'right'.

To put some numbers to this idea I decided to use the widely accessible "Meyers-Briggs personality classification". Meyers-Briggs suggests that, according to a number of preferences in our social interactions, we can be grouped into four contrasting pairs of traits ([www.davidmarkley.com/personality](http://www.davidmarkley.com/personality)). I asked some glider pilots to do a simple on-line test ([www.humanmetrics.com](http://www.humanmetrics.com)) and 28 responded. The Meyers-Briggs pairings are as follows:

**Extraversion/Introversion (E or I)** A tendency to focus on the outer world of people and things vs a tendency to focus on the inner world of ideas and impressions.

**Sensing/Intuition (S or N)** A tendency to focus on the present and the concrete information gained from their senses vs a tendency to focus on the future, with a view toward patterns and possibilities.

**Thinking/Feeling (T or F)** A tendency to base decisions on logic and objective analysis of cause and effect vs a tendency to base decisions on values and subjective evaluation of person-centred concerns.

**Judgement/Perception (J or P)** A tendency to prefer a planned and organized approach to life and to have things settled – to schedule activities vs having flexible and spontaneous approaches ("the destination" over "the journey").

There are 16 possible combinations of these traits; however, their distribution in the general population is not uniform. The most dominant type is the "ISTJ" at 14-19% of males (and is also the type found often in airline and military pilots). This did not show up at all in our glider pilot sample. While my sample size was small, I think that it was not far off from my original estimations that, in their general personality, glider pilots represent a pretty cohesive group.

Of the 28, Introversion was scored in 21, iNtuition in 20, Judgement in 25, and Thinking in 19. The "INTJ" type was fully 32% of our sample vs 2-6% of the general population. The "INFJ" type for our group was strikingly different from the general population, scoring 18% vs only 1-2%. Distribution of Meyers-Briggs personality traits for the general male population was:

Extraversion	45%	–	Introversion	55%
Sensing	65%	–	iNtuition	35%
Thinking	55%	–	Feeling	45%
Judging	52%	–	Perceiving	48%

while in my sample of glider pilots it was:

Extraversion	25%	–	Introversion	75%
Sensing	29%	–	iNtuition	71%
Thinking	68%	–	Feeling	32%
Judging	90%	–	Perceiving	10%

Whether or not you subscribe to the Meyers-Briggs personality classifications, it does lend credence to the general picture. More comprehensive testing was done by Dr. Dan Matzke, who in his 1983 PhD study noted that soaring pilots "...scored significantly different from norms

for adult males on a total of 18 out of 33 factors analyzed. These included scoring higher on scales measuring levels of personal adjustment, self-confidence, ideal self, and leadership. Soaring pilots also scored higher on scales measuring the need/drive for Achievement, Exhibition, Autonomy, Dominance, Change, and Heterosexuality. They scored lower on scales measuring the need for Aggression, Order, Deference, Support, and Inferiority." And, compared to other pilot groups such as general aviation and Navy jet pilots, soaring pilots "... scored significantly higher overall on scales measuring Autonomy and Nurturance, and lower overall on scales measuring Aggression, Order, and Deference."

So without getting deeply analytical, the general picture is that as a group we prefer:

- our own inner council
- looking for patterns and possibilities
- our own analysis of cause and effect
- an organized, planned approach to tasks
- to be our own authority, and are not easily moved from the beliefs that we develop.

Virtually all of the goals in our sport represent solitary achievements, which are aided by these dominant personality characteristics. Furthermore, we generally don't socialize easily outside our group.

So what has this got to do with the safety record in gliding? At first glance, it would seem that we would be an ideal group to have a good safety record, with our preferences for analysis, planning, and getting things right. However, strengths and weaknesses are often different sides of the same coin. Just as our group has its particular personality tendencies, we are also likely have our own 'preferred' pathway to incidents and accidents. Perhaps a few stories will illustrate this:

- I see a pilot walking away from a parked glider with the canopy open. I bring this to his attention. His first response is not 'thank you', but that "The winds are light today, so it's okay". A thermal swirls through the area and rattles the canopy a bit.
- A pilot lands on the runway and does not get out of his glider promptly. I arrive and suggest that he should get a move on. The reply was, "There is no one else in the circuit, so what are you upset about? I come here to enjoy myself." He then gets out and sees that he is an obstruction to the three gliders that are now landing.
- Cloud flying is illegal in Canada. On a low-ceiling day, I observe a glider flying a cloudstreet near our club, dolphining in and out of cloud. The pilot's explanation was that in his judgement, the lift was weak and no one else would be soaring in this manner, so it was okay (I didn't share that sentiment...).
- On reading BGA accident summaries, I noted that two fatal accidents involved aerotow launches with CG hooks, that the pilots were both experienced and current on type. In each case the pilots attempted to make low-level

directional corrections to re-align themselves with the towplane, rather than abort the launch.

- A pilot crashed and died during an off-field landing at a contest. The pilot was current, experienced, and there were plenty of suitable, level fields on his course line. This pilot was also scheduled to give a talk on off-field landing techniques to his fellow contest pilots, as he was considered knowledgeable on the proper technique.

These incidents are not at all unusual in our sport, and I believe have a common thread in our personality preferences. Our type of pilot error commonly does not stem from a lack of knowledge or skill. Rather we seem to be continually analyzing and judging our situation and deciding when to bend the rules. I suggest that our collective personality is one where we get used to flying by ourselves, for ourselves. We become skillful and self-reliant; however, this is our undoing as well. While knowledge and skill are valuable, these often serve to lower our margins for safety. While our introversion helps us concentrate on our immediate performance, it can also see us retreating to this inner world and shutting out the bigger picture. Even when we interact with other pilots, our introversion can also lead us to deviate from normal procedures, and then fail to understand why other pilots do not automatically see the logic in our actions.

While in other areas safety is promoted by the involvement of co-workers, that is not the case with ours. We are so ingrained with doing things by ourselves and being solely responsible, that we see our activities as nobody else's business (except of course when we are assigning blame ...)

The safety traditionalists bring forward increasingly complex systems that mainly address the structure of our operations. While this affords us better documentation and analysis, we seem to make very little inroads on poor pilot behaviour. Even the more recent judgement training techniques suffer as they provide little insight into the 'why' of things. They still resonate with the old advice after accidents, which is mainly "don't do that". Further, compliance is always an issue if a pilot does not believe that what is requested is worthwhile. Even military and commercial pilots show marked levels of noncompliance to safe procedures and practices.

If we really want to improve on our safety record, I maintain that we must work on our weaknesses, not our strengths. Our strengths are in analysis, developing procedures, and to some extent acquiring and maintaining basic skills. Our weakness is in actually *using* these tools properly.

**Tackling the problem** Our general 'weakness' is that we like our internal viewpoint of the world. Consequently, we often shy away from involvement with others, and base the logic of our actions on faulty criteria.

The first step then is to more actively seek the help of others, even though this is not our preference. ⇒ p25

# INSURANCE

Keith Hay, SAC Insurance chairman

**Y**OU CAN SEE the main statistics on the SAC Insurance Group Plan in the graph below. Even though we did have a high loss ratio in 2014, our loss ratio continues to trend down from our high points in 2008-2009 where hull claims were greater than the premiums collected those years. The loss ratio is the percentage of premiums paid out in claims to aircraft owners. It is a prime determinant of the plan's premium rates so the continued downward trend bodes well for our safety efforts as well as our ongoing premium rates and insurability as a group.

Through the plan, we continue to credit those private owners and clubs with a 3 year claims-free record with a "No Claim Credit" at their renewal. This recognizes those keeping safety foremost in their flying practices. For 2014, the plan again credited an average of 3% to those owners and clubs with claims-free records.

During 2014, our underwriter, CAIG, continued to offer a 5% discount to those owners who have invested in safety by installing FLARM units in their glider. The discount is available to all gliders and towplanes insured in the plan with an installed FLARM unit. CAIG continues to recognize the initiative of the soaring community to actively work towards our own and others' safety in the air.

As of the beginning of the 2014 season, FLARM equipped aircraft have increased from 1/3 to almost 1/2 of the aircraft in the SAC Group Plan. We expect the portion of the total fleet with FLARM installed to continue to increase. Several clubs have now equipped their full club fleet with FLARMS and an increasing number of private owners are also completing their FLARM installations.

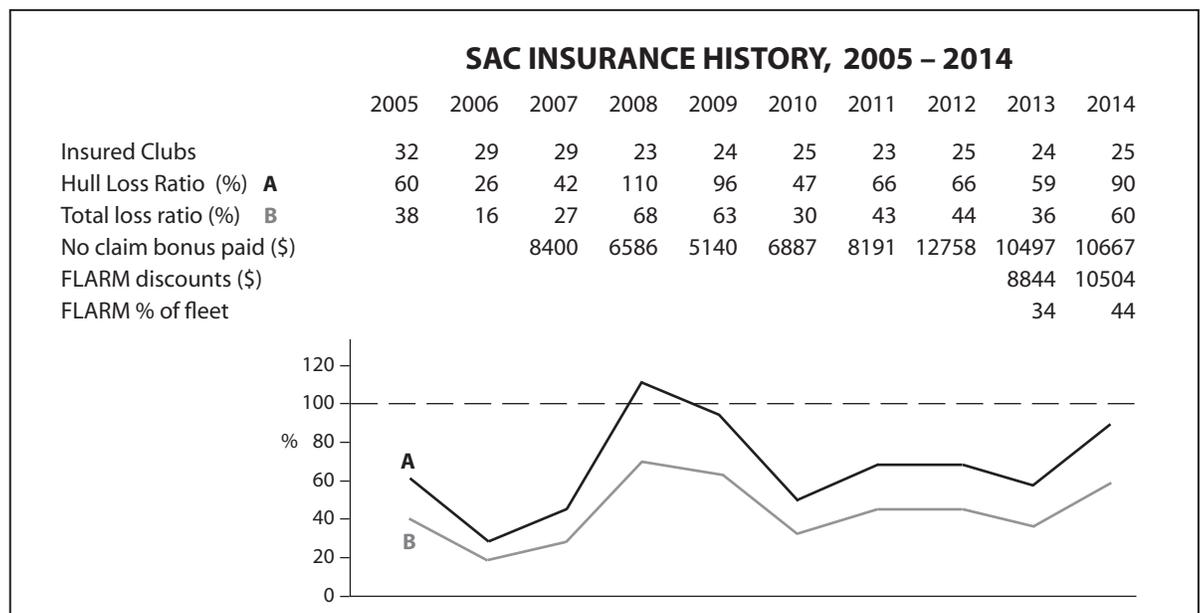
## Some fleet "demographics"

The chart below shows how the value range of SAC aircraft fleet has changed over the years. The chart expresses each value range as a proportion of the total fleet. As you can see, there has been a significant decrease in the relative size of the 20K range of gliders and a significant increase in the proportion of the fleet values in the 100K+ range. This has, in part, been driven by the upgrade of club two-seaters, the general movement of the "high-end" gliders up the price scale, and the "retirement" of many of the older ships such as the 2-33. This is great from a soaring perspective. From an insurance perspective however, it is quite easy for one loss to account for one-half or more of total losses in a given year and generate a quick spike in loss ratio as we saw in 2014.

One of the other changes we've seen is an increase in club ships relative to private ships. Club ships were 39% of the total (club + private) fleet in 2008, and this has climbed to 45% in 2014.

**2015 renewals** As I write this report, we are in the process of negotiating the plan renewal with the underwriting companies. Our usual process, through our broker Jones Brown, is to request quotes from interested underwriters. Once the submissions have been reviewed and final rates have been negotiated, we will finalize any changes for the 2015 plan.

The 2015 policy year runs from 31 March 2015 to 31 March 2016. As usual, coverage will be extended through 30 April 2015 to renewing owners to allow for the renewal process; however it is important to complete your renewal as early as possible before 30 April. Failure to renew your coverage and submit premiums can cause your coverage to be void in case of an incident, with no payment of your claim. Owners will once again be able to pay on-line for their renewal and receive their proof-of-insurance via e-mail.



Your SAC membership “validates” your insurance coverage, so please ensure that you deal with your SAC membership promptly in April or May by submitting your membership to your club. Failure to be a current SAC member could create difficulties in quickly handling your claim. It’s *equally important* that clubs forward their membership updates to the SAC Office in a timely manner. Ensure that member information and fees as applicable are submitted for all club members to ensure coverage.

SAC does not provide insurance itself. The SAC plan is currently underwritten by Canadian Aviation Insurance Group (CAIG) and administered through our broker, Jones Brown. While we have dealt with other brokers in the past, both Jones Brown and CAIG have provided SAC with consistently high quality service over the years. Collectively, they represent many years of experience in aviation insurance, especially in Canada and soaring in particular. We have always had excellent claims service, with claims being settled fairly and promptly.

The goal of a group insurance plan such as SAC offers is to offer stable, reasonable rates to the group, while providing the best possible coverage to the group as a whole. This may not always offer the lowest possible rate to any one individual, but often the real difference is relatively minor, particularly when considered against the broad coverage available to the extended group and not just an individual’s risk.

Over the years, the plan has evolved and responded to provide a full aviation umbrella to all those involved in SAC, be they clubs, associated commercial operators, glider pilots, club executive, instructors, towpilots, wing runners and SAC club members. Coverage is also automatically extended to other FAI affiliated (SSA, BGA, etc.) soaring members who visit to fly SAC insured gliders and towplanes. All SAC members and clubs and their visitors benefit from the consistent reliable coverage being available to them. It is a policy that provides coverage tailored to soaring pilots and our clubs.

The SAC group insurance plan has provided full, competitive coverage to all SAC clubs and private owners, regardless of

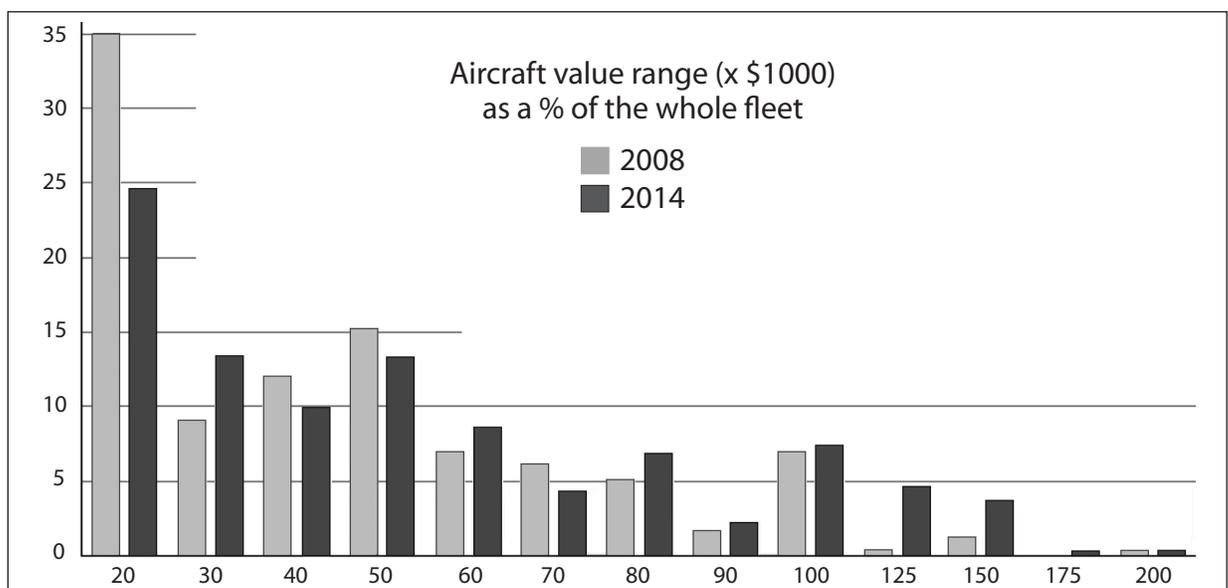
experience and location, for over 25 years. During some of those years we had extremely high claims experience, but our insurance company worked with us to try and hold premium changes to a reasonable level and did not leave the soaring community stranded, as some other underwriters have in the past.

As a collective group, SAC has been able to ensure that insurance has always been available at reasonable rates to everyone participating in Canadian soaring.

**Some benefits of the SAC plan**

1. A true group plan, with SAC holding the master insurance policy that provides coverage for all clubs, private owners, and individual members. Our rates are based on our experience as a group, and are set regardless of individual experience level or history. The SAC plan supports soaring in Canada with a unique all-risks policy that covers not only the owner, but all those participating in soaring flight operations.
2. Options for aircraft coverage:
  - a. Combined aircraft Hull and Liability insurance,
  - b. Aircraft Liability-only insurance,
  - c. Optional trailer coverage.
3. Club premises liability coverage for clubs.
4. Winch operations coverage.
5. Specific additional liability coverage for instructors.
6. Premium credits for clubs and owners with no claims.
7. Premium discounts for FLARM installation and use.
8. No limitations or notifications required for contest participation.
9. Support by the underwriter (CAIG) for SAC safety and training programs by the Flight Training and Safety Committee (FT&SC).
10. Reliable, prompt claims settlement and service.
11. Full legal representation for liability claims.

For those with questions or comments regarding the insurance plan, please use the SAC insurance address, [insurance@sac.ca](mailto:insurance@sac.ca), as it is usually the most reliable way to reach me. I am usually able to reply back to people within a couple of days. ❖



# Sporting committee 2014 report

Jörg Stieber, chairman

**IGC 2014 Plenary Meeting** I attended the IGC Plenary Meeting in Varese, Italy, 7-8 March 2014. The main focus of the meeting was the implementation proposal from the Sporting Code committee to simplify and update the Sporting Code for badges and records. During the months leading up to the meeting there was an intense on-line exchange among international pilots about the proposed changes. It became clear that the record community was strongly opposed to many of the proposed changes to the Sporting Code.

Most of the fundamental changes were rejected by the Plenary, mainly to preserve continuity with past records and due to the strong opposition of the top level record holders. The following changes were approved:

- separating the badge rules from the record rules. This will result in a much clearer presentation of the rules for badges.
- removing provisions for mechanical barographs.
- a 3 km start/finish line.
- for Silver distance performance, the pilot must achieve a minimum distance from the release point of 50 km.
- digital photo of paper declaration with time stamp acceptable for Silver and Gold badges.
- new record category for 13.5 m class gliders.

## Canadian Nationals 2014 at SOSA, 25 June – 5 July

The Canadian Nationals at SOSA were well attended with a total of 26 pilots (12 FAI Class, 14 Club Class). CD Tom Coulson directed the contest with safety as the overriding priority. There were no accidents and to my knowledge no incidents. The conditions during the competition days were fairly good and provided a wide range of challenges for the pilots. Unfortunately we also had such a lengthy string of bad weather that at the end of July 4, officially the last day of the competition, we had only three scoring days. Rather than declaring a no-contest, it was decided with unanimous consent of all contestants, obtained by secret ballot, to add Saturday, July 5 as an additional competition day. Going forward, this needs to be reflected in a change of the rules for National Competitions. The winners were:

### FAI Class:

1. Jerzy Szemplinski	ASG-29	3931 pts	100.0%
2. Dave Springford	ASG-29	3836 pts	97.6%
3. Sergei Morozov	ASG-29	3794 pts	96.5%

### Club Class:

1. Anthony Kawzowicz	LS-4	3824 pts	100.0%
2. Krzysztof Wiercioch	SZD-51	3707 pts	96.9%
3. Roger Hildesheim	SZD-55	3536 pts	92.5%

**2014 Competition Seeding List** The main factor for the 2014 Seeding List was the results of the Canadian Nationals.

### Group A (FAI Class):

1	Jerzy Szemplinski	102.20
2	Dave Springford	99.82
3	Jörg Stieber	97.34
4	Sergei Morozov	95.30
5	Luke Szczepaniak	87.88

### Group B (Club Class):

1	Krzysztof Wiercioch	90.28
2	Bill Cole	82.01
3	Anthony Kawzowicz	60.00
4	Roger Hildesheim	55.48
5	David Cole	53.80

The complete 2014 Seeding Scores are posted at:

<<http://www.sac.ca/website/index.php/en/documents/competition-information>>.

An ongoing and so far unresolved concern is how to compensate for the different levels of competitiveness between Group A and B.

## International pilot ranking list

We have been entering Nationals results for a number of years now. After the 2014 results were entered, several Canadian pilots moved up over 1000 places. A list and ranking of all Canadian pilots can be obtained by entering Canada in the nationality field. <[www.sgp.aero/igcrankings/pilots/search.aspx?contestID=9271](http://www.sgp.aero/igcrankings/pilots/search.aspx?contestID=9271)>. The cost is 4€ per pilot with a minimum of 100€ per contest.

## 33rd Worlds in Leszno

Dave Springford and Jerzy Szemplinski represented Canada in 15m and 18m Classes with Jarek Twardowski as Team Captain. Unfortunately, Jerzy experienced a frustrating string of technical issues with his rented glider. This added to the challenge of competing as single pilots in their respective classes against large European teams who team fly and make use of "sacrificial lambs". The outcome was somewhat disappointing:

15m Class: Dave Springford:

41st place of 46 – 64.6% of the winner's score

18m Class: Jerzy Szemplinski:

38th place of 46 – 77.9 % of the winner's score

Jerzy lost nearly a full day's score due to an accidental airspace violation.

### Canadian participation in US competitions

In 2014 there were no Canadian competitors in US Nationals. However, there was strong Canadian representation in the following Regional contests:

Seniors Championship, Seminole Lake FL; Region 5N, Perry SC; Region 5E Lancaster SC; Region 2 Reedsville PS; Region 5S Cordele GA; Region 8 Ephrata WA; and Region 9N Nephi UT.

**OLC Canada 2014** It was a good season with the highest number of participants over the last four years and the 2nd highest number of flights as well as total kilometres flown. As it was the case in previous years, some extraordinary achievements were documented by way of the OLC.

<i>Flts scored in Canada in the last 4 years</i>	2011	2012	2013	2014
No. participants	250	279	265	292
Total flts in Canada	2513	3041	2554	2680
Total km in Canada	410,056	516,587	423,948	436,200
Highest pilot (km) <i>Trevor Florence (131 flts)</i>	15,781	16,661	17,559	17,748
Highest club (km) <i>Canadian Rockies</i>	70,092	78,187	49,844	89,054

### Winners and achievements:

Best OLC flight, Canada

*Chris Gough*; ASW-15; Chipman, AB, 11 May, 692 km, 922 pts

Best OLC flight, North America

*Wilf Krueger*; DG-800B-18; Ely, NV, 3 July, 1038 km; 1069 pts

OLC Canada Champions (6 best flights):

1. *Ian Spence*, Canadian Rockies Soaring Club 4267 pts
2. *Trevor Florence*, Canadian Rockies Soaring 3851 pts
3. *Anthony Kawzowicz*, SOSA 3829 pts

OLC Canada Junior Champions (6 best flights):

1. *Thomas Butts*, SOSA Gliding Club 2286 pts
2. *Chris Hildebrand*, Canadian Rockies 2153 pts
3. *Timothy Belchior*, York Soaring 2127 pts

Top Canadians in the OLC North America (6 best flights):

1. *Wilfried Krueger*, York Soaring 4671 pts – 23rd overall
2. *Ian Spence*, Canadian Rockies 4267 pts – 42nd overall
3. *Trevor Florence*, Canadian Rockies 3851 pts – 58th overall

### The 2015 season

1st FAI Pan American Gliding Championships, 6-17 April

The PAGC is the first level one competition in the Americas. It is the result of a joint initiative of Canada, USA, Argentina and Chile. Broad Canadian participation will give us the opportunity to significantly improve Canada's country score in the International Pilot Ranking list (presently #24). Every participating nation from the Americas is guaranteed 5 pilots each in 15m Class and Club Class. The official entries have been submitted and entry fees paid. The Canadian Team is:

Team Captain: Jarek Twardowski (he was Captain in Leszno)

*15m Class*

Jerzy Szemplinski

Sergei Morozov

Luke Szczepaniak

*Club Class*

Krzysztof Wiercioch

Bill Cole

Jörg Stieber

Roger Hildesheim

The team thanks SAC and the Canadian gliding community for the support to cover the US\$600 entry fee per pilot.

**Canadian Nationals 2015** The 2015 Nationals will be in Olds/Netook, AB, hosted by Central Alberta Gliding Club. The dates are 10-19 June with practice days 8-9 June. The SAC Competition Hosting Grant has made it much easier to find clubs willing to host Nationals. There was also interest from Winnipeg with York Soaring as a back-up.

**Junior Worlds** – Narromine, Australia – December 2015

We have possibly three candidates: Emmanuel Cadieux, Tom Butts, and Robert Zachemski. Depending on available funding, we will have to make a decision soon how many pilots and who to support. Going forward, I feel it would be beneficial to have a discussion about the benefits of supporting Juniors for World Championships. Perhaps it would be better to use the funds to support a broader range of Junior pilots in US competitions.

### Ongoing projects

Overhaul of the Seeding List Rules as outlined in the 2013 Annual Report and Nationals Rules 2015 update.

### Youth development

The biggest factor for young pilots to reach a stage where they can successfully compete is access to suitable equipment (gliders). We have to find ways to get talented Juniors into planes!

In every club there are (usually older) members who own gliders but for one reason or another rarely fly it. Rather than letting the glider sit in a trailer where it will slowly deteriorate due to moisture, these pilots should consider teaming up with a young pilot for a win/win deal. The junior pilot pays for the insurance, looks after the annual inspection and generally keeps plane and trailer in good shape – in return he gets to fly. The owner's advantage when he comes out to fly is that he has a plane that is insured, has a current annual, the batteries are charged, the tires are inflated, and the trailer is operational. He also has an expert helper to give him a hand to rig and perhaps retrieve him. Maybe the junior's youthful energy rubs off on the senior and he will get motivated to fly more often.

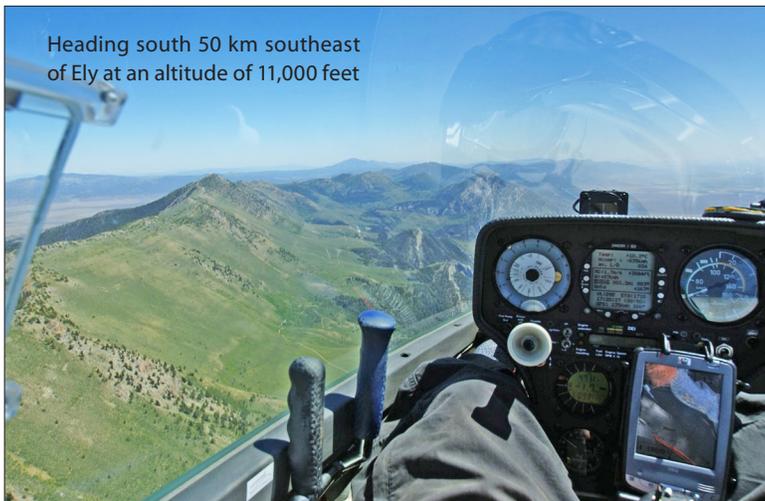
We should also look into the possibility to that SAC purchases one or two Club Class gliders for Juniors to use. ❖

# Soaring in Ely

Wilfried Krueger, York Soaring

Where you can fly 1000 km at incredible speeds and enjoy flying high over rugged mountain ranges and flat desert plains and basins

**E**LY, POPULATION 4000, lies in the middle of nowhere in one of Great Basin valleys in Nevada. The Great Basin desert topography occupies the land between the Sierra Nevada and Wasatch Mountains. It is made up of several basins and many mountain ranges running in a north/south direction. The 150 mountain ranges in the Great Basin are separated by flat desert plains and basins, and the hot desert climate and the extreme day-night temperature differential can generate lift up to 21,000 feet and thermals up to 1600 ft/min. Flying high over this terrain is breathtaking, especially the 13,000 foot Wheeler Peak, 60 km southeast of Ely. The park, particularly the area around Mt. Wheeler, is a tourist attraction. One of the park roads winds up towards the peak, the road ends at 10,000 and a trail leads to the summit and the region's only glacier, near 4000 year old bristlecone pines.



The airport is close to town and has two concrete runways 6000 and 5000 feet long. Its 6500 foot elevation keeps the temperature on the ground comfortable during the summer. When my wife Helga and I arrived in June, the night time temperature was below freezing. Ely is an old mining town with good restaurants and hotels. It is also the home of the Northern Railway museum that features the Ghost Train of old Ely. The drive from Toronto in my RV, towing the DG-808B, takes about four days. Sometimes we take a break along the way at the Moab, Utah airport. From there I had some beautiful flights over the famous Canyonlands and Arches National Parks, and Lake Powell.

## What can we expect at the airport?

There are one and sometimes two Pony towplanes available. We take off at 10-11 am and land 7-10 hours later. James Adams, the manager of the Ely Jet Center is the towpilot; he and his crew are very helpful at the field and at off-field landings. James allows us the use of the large hangar for our get-togethers and barbeques. I keep my glider rigged and tied down on the ramp. My RV is also parked at the airport and power, water, washrooms and oxygen, etc. are available. Everything is uncomplicated – all you need is a glider (rentals are not available). By the end of June there are sometimes fifteen gliders on the ramp, about half are motorgliders. Pilots come from Europe, New Zealand, Canada and the USA. The last ten years I have spent part of June-July in Ely. The only Canadian pilots I have met in Ely are Rolf Siebert and Uwe Kleinhempel. Both completed excellent flights over 1000 km. Overall there is a great social atmosphere at the airport and Helga and I enjoy sharing stories with old and new friends.

## Flying 1236 km in 7-½ hours

My fastest flight in Ely was completed at 167 km/h. The day began with a *Dr. Jack* forecast of an 18,000 foot cloud base and thermals over 1000 ft/min. Since I had just completed a 1000 km flight, a rest day was planned. However, the forecast was too good to think about resting so I prepared myself for another long flight. At 10 am I was ready to go but the sky was still blue. By 11 the first wisps were on the horizon and up I went. At 1500 agl I centered a thermal, retracted the engine after a few turns, and thermalled at 800 ft/min to 15,000. It was another beautiful day with clouds forming towards the south along the Shell Creek Range on the east side of Ely.

The first turnpoint, Highland Peak, was 178 km away. So the race began and soon I'm cruising southwards against a light headwind above and alongside the mountains and a cloud street. Taking thermals from time to time I was able to stay at 15,000 to 17,500 feet. During the flight I saw the panorama of Mt. Wheeler past Mt. Wilson and Mt. Grafton on the south side of the Shell Creek Range. With no problems I reached the turnpoint at an average speed of 134 km/h. Now it was time to change course and head northwards. Because of stronger lift and better cloud formation I was able to fly straight without thermalling while still maintaining 15–17,500 feet.

Close to the second turnpoint I ran into overdevelopment and large curtains of virga. To avoid the storm but ⇨ p14

# The humidity effect

Bernard Eckey

**sometimes the best thermal is over the swamp!**

**D**URING YOUR BASIC THEORETICAL TRAINING you were probably taught that elevated ground temperatures are the driving force behind thermal activity. Also, you would have learned that the warm air ascends until the air temperature in the thermal is equal to the temperature of the surrounding air mass.

In my book, "Advanced Soaring Made Easy", it is repeatedly stated that moisture is a significant contributor to the height and the strength of thermals. Some inquisitive readers have asked me to elaborate so we will now look a little deeper into the matter with the help of two German specialists in this field, meteorologist Dieter Etling and meteorology lecturer and long-time competition pilot Carsten Lindemann.

Research dating back to the first half of the last century indicates that a temperature gradient of 3.4°C per 100 metres in the superadiabatic layer is sufficient for the generation of thermals. This positive buoyancy creates a force that is not only responsible for the thermal's initial vertical acceleration, but also for the usual sink right next to updrafts. It is important to note that a thermal's ascent doesn't come to a sudden hold when the acceleration has reduced to zero. The thermal's vertical speed, however, gradually diminishes due to the ever-present friction along the line of contact with the surrounding air mass.

Field research by Lindeman has provided us with concrete figures. Using a highly sensitive temperature and humidity recording system on board of his ASK-16 motorglider in Germany he compared the temperature differentials between the air within a thermal and the surrounding air mass on a day with a 4000 foot cloud base and with a maximum ground temperature of 30°C. Even quite large temperature differentials just above the ground shrank to 0.3°C at an altitude of 200m (656 feet). At an altitude of 600m (1968 ft) the temperature difference was down to 0.15°C, and at 1000 m (3280 ft) a temperature difference could no longer be detected.

It must be pointed out that there can be much larger temperature differences in other parts of the world and that the vertical extent of thermal development also plays a role, but this proves beyond doubt that thermals don't come to a hold when the temperature of the rising air equals the temperature of the ambient air. Other scientists fully agree and believe that on most days the temperature differences are eroded by the time thermals have risen to half their convection height. One of the reasons for the continuing ascent has been discussed above but another reason is the momentum of the huge mass of rising air. Given that a thermal can contain between 80,000 and about 300,000 tons (!)

of air, it is quite plausible that the ascending air mass can overshoot the equilibrium level due to its inertia.

Now let's consider what role moisture plays in all of this. To start with we need to remember this – *moist air is less dense than dry air*. If you find this hard to believe, imagine having a long shower and try to think whether condensation will first appear at the top or at the bottom of the bathroom mirror. Yes, condensation first appears at the top because water vapor has a lower molecular weight (18) than dry air (~29). Put another way, some of the oxygen and nitrogen molecules of the dry air are replaced by lighter water vapor molecules, which makes the moist air rise above the dryer air. Condensation will occur as soon as the air around the top of the mirror is 100 % saturated.

At ground level there is usually a relatively uniform moisture level in any given parcel of air. This "specific humidity" remains unchanged during a thermal ascent as long as there is no entrainment of ambient air. However, the *relative* humidity is changing quite rapidly as the thermal begins to rise. The reason is simple, the air gradually expands with increasing altitude, leading to a reduction in temperature and in turn to a reduced ability to absorb moisture. The end result is an increased level of relative humidity.

Table 1 below shows the maximum possible moisture content at various temperatures at an ambient pressure of 1000 hPa.

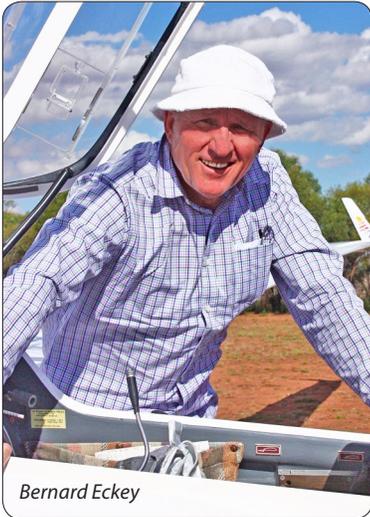
Temp (°C)	-10	0	10	20	30
Moisture content (g/kg of air)	1.8	3.8	7.8	15	28
$\Delta T$ (°C)	0.3	0.6	1.3	2.6	5.1

If we ignore the bottom row for a moment we can see that at a temperature of 20°C the air can hold 15 grams of water vapor but at 10°C it can only hold 7.8 grams or just over half the moisture content. As the thermal ascends the air cools down and, as long as there is no inversion, it will eventually reach an altitude where the relative humidity reaches 100% (the air is fully saturated) and a cumulus cloud will then form. The important point to remember is that due to a reduction in temperature, the thermal's low initial relative humidity at ground level has gradually increased to 100% at cloud base.

Meteorologists use the term “Virtual Temperature” when they want to compare the density of various air masses with different temperatures and humidity. Virtual temperature is the temperature dry air would have in order to possess the same density as moist air at the same pressure. This temperature is always higher than the measured temperature. With this knowledge let’s now focus on the bottom row of Table 1. It shows the additional temperature ( $\Delta T$ ) required to provide a parcel of dry air with the same density as air of the same temperature but

containing the maximum amount of moisture. If we consider a dry parcel of air with a temperature of 30°C, we can see that it needs to be 5.1°C warmer to have the same density as the same air that is 100% saturated – its virtual temperature would be 35.1°C.

Since you now want to know what all of this has to do with the strength of thermals, I asked Dieter Etling to come up with tangible figures. He based his calculations on an ascending parcel of air having a



Bernard Eckey

pressure of 1000 hPa, a temperature of 20°C, and a specific humidity of 6 g/kg (equal to a relative humidity of 40%). The table below is based on different temperatures and moisture content of the surrounding ambient air mass. The **bold figures in italic** show the percentage contribution of moisture to the strength of this updraft.

Now we have discovered a third and perhaps the most significant reason why thermals continue to rise even after the initial temperature advantage has been eroded. Perhaps we have also discovered why thermals seem to be smoother and often significantly stronger on cumulus days and why the effect of humidity on updrafts becomes especially significant when thermals penetrate the usually dryer air of the inversion layer.

Do we need to revise our theories on thermals? Certainly not, but it might be a good idea to consider amending some of the textbooks on gliding. ❖

*Contribution to the strength of an updraft (in %) due to its humidity for different values of temperature and humidity of the ambient air*

Temp. (°C)	specific humidity [g/kg of air]		relative humidity (%)	
	5.5 (36)	5.0 (33)	4.5 (30)	4.0 (26)
19.5	<b>14%</b>	<b>26%</b>	<b>34%</b>	<b>42%</b>
19.0	<b>8</b>	<b>15</b>	<b>21</b>	<b>27</b>
18.5	<b>5</b>	<b>10</b>	<b>15</b>	<b>19</b>

## Soaring in Ely ...

utilizing the lift under the virga, I diverted towards the west but still completed the 215 km leg with an average speed of 228 km/h. What a great day!

For the next 221 km leg towards the south I followed the west side of the Egan Range towards Dray Lake valley. This is quite an empty uninhabited area, a lot of desert with small dried salt lakes and no roads, but not a problem since I was able to stay high. Finally I reached turnpoint 3 with an average speed of 145 km/h. The weather was still excellent when I changed course and headed north towards turnpoint 4, Current Mountain.

Cloud base at this time was above 20,000 feet; too bad we are limited to 18,000. Even though I was wearing thermal socks and long johns, I was still cold. Maintaining altitude was again not a problem and I was able to fly the 226 km leg with an average speed of 199 km/h. Sightseeing along this route over the high lofty White Mountains crest of Try Peak, over pine-covered mountain ranges, grassy slopes and desert flats was breathtaking. Since there were still lots of cloud streets along the mountain ranges, I started the next 224 km leg towards the southeast. It turned out to be an easy ride and I reached the last turnpoint, Queen City Summit, with a speed of 154 km/h.

Now 181 km away from Ely, the weather is still okay and it shouldn't be a problem to make it home. For the first 100 km I was able to use a cloud street but conditions

changed rapidly and the whole area towards Duck Creek valley was already overcast. The only bright spot I saw was north of Current, 30 degrees off course. I decided to detour, lost 4000 feet but was able to find a good thermal and gained enough altitude to start my 70 km final glide. I rolled onto the intersection on runway 18 before 7 pm where Helga and my dog Rufus greeted me. The final leg was completed at a speed of 172 km/h.

### Long distance flights from Ely

The long distance flying season starts mid-June and ends in July. During this time 20-30 flights over 1000 km are usually downloaded on OLC. Considering that we are a small group, most of us go home with a number of flights over 1000. The first world record, a 1250 km FAI triangle was flown here years ago. Since then a few 1250 km and a lot of 1000 km FAI triangles have been completed, some of them in 15m gliders like the ASW-27. Also a Club Class glider, the lightweight Sparrowhawk R, flew a 750 FAI triangle and a LAK-12 flew over 1000. Other long distance flights by our friends from New Zealand went to the Grand Canyon, the White Mountains in California, and to Minden.

### Conclusion

Ely is indeed a paradise for glider pilots and one of the best thermal soaring regions of the world. The source for this super soaring condition are the many mountain ranges, the hot desert climate and the extreme day-night temperature differential. I have flown gliders in South America, New Zealand and Australia but found Ely by far the best place except for wave flying. ❖

# **RISK** are you becoming addicted?

Tom Johnson, from SSA Soaring Safety Foundation

**L**ET'S FACE IT, you are reading this now, so you enjoy a certain amount of risk above the norm. Think about it, you willingly strap into a fibreglass tub and climb up to the Flight Levels or fly long distances at low altitudes regularly in an aircraft with no engine. You think this is normal and exciting. It is something you like doing.

Throughout the course of your soaring adventures, you have unconsciously learned to manage and mitigate the risks associated with our beloved sport. You have learned what behaviours increase your risk and what practices minimize them. You have watched and learned from your peers what good sailplane pilots do. The culture of your club has reinforced this way of flying through its policies and attitudes.

Something happens as you get increasingly comfortable in the environment you aviate in. Your skills increase and your perception of what is happening increase. The rush you get from skirting along the ridge, or climbing up in the wave, or bombing out of a big thermal starts to go away. This is normal and predictable. Admit it, you like the rush, and some of you may even crave it. So what do you do? You introduce risk to further the rush.

Naval aviation realized this a long time ago. Low level tactical flying at 200 feet agl was initially a big rush. However, after 200 nm at this altitude, it actually seems to get very routine and almost boring. So you start to fly lower and lower to keep the rush alive until you are looking sideways at the farmhouses. Your margin for error is decreasing to almost nothing while your comfort level is becoming very high.

We had a radio altimeter and a squadron Standard Operating Procedure of what minimum altitude to set to try to combat this. I will admit that on a nice day, with a navigator I trusted, I would set the altitude bug to 100 feet agl. I did not realize these limits were written in the blood of others because, you know, accidents happen to the other guy ... I scared myself silly a couple of times.

As I got older and began to realize I was not bulletproof, I began to see the wisdom of tailoring the risk to the mission. Flight maneuvers and such that did not further the completion of the mission were to be excluded. Once I accepted the concept that the mission was paramount, it became easy to exclude maneuvers that introduced unnecessary risk.

You have to do a personal analysis to evaluate when the benefit outweighs the risk. Personally and professionally, I start with myself standing at the end of the long green table

where I do not have a coffee cup, and I have to justify what I did. If I cannot envision that, I look for a different course of action. How you chose to evaluate is something only you can determine:

- a high speed pass after finishing the flight does not further the mission,
- a quasi-split-S in the towplane after release does not further the mission,
- thermalling below circuit height does not further the mission,
- you can name others ...

When I bring this topic up at courses throughout the soaring community, a reliable push-back is that I am try-ing to take all the fun out of soaring. If the mission you are on: cross-country, altitude climb, or a sailplane race is not fun enough, maybe you should re-evaluate your definition of what fun is. Can you think of anything more satisfying than flying your sailplane to the limit of your capabilities – and maybe stretch them a bit – to complete the mission?

I recently flew in my first aerobatic contest. Safety was paramount: low altitude penalties were strictly enforced, aircraft and equipment were inspected, and personal documentation was required to compete. One contestant was publicly admonished for an unsafe approach. People applauded this and thanked the organizers for addressing it. Prying eyes were watching and critiquing my every move. Despite all of this, I still had a great time. It was the norm, as far as I knew, and had always been that way. It enhanced my enjoyment of the event.

So, the next time you see someone introducing unnecessary risk that does not further the mission, call them on it. Make it socially unacceptable to risk damage to a beautiful sailplane and themselves. Let them know that you do not appreciate them placing you in a position where you may have to clean up their mess. Have people extoll their exploits of the successful cross-country without the low altitude save, the climb to the top of the thermal, or their wonderful first solo. Promote completion of the mission as the measurement of success, not whether you look cool at the end of the flight or had a harrowing tale to tell.

The next person who messes up a high speed pass or a low altitude save, or whatever non-mission specific maneuver, will not be the first. But we all need to try to make sure that person is the last. ❖

## Sometimes everybody gets it right

I HAD AN INTERESTING MOMENT while flying this weekend that could be classified as a near miss, but I think it could also be looked at as a positive experience that illustrates the good safety culture we have at the club right now. Also I think it's a good learning experience.

In brief, what happened was the towplane pilot and I both entered downwind, for different runways, at about the same time, and would have landed at about the same time, so a possible conflict there, *and* there was a glider being retrieved on one of the runways as well, reducing the amount of usable runway (the different runway usage was because of some variable winds). I was flying an unfamiliar glider and wasn't sure I could guarantee a precision landing, so I asked the towplane pilot to wait, which he did. I landed and was able to "taxi" off to the side of the runway. The glider being retrieved moved out of the way between the two landings. Everyone landed with plenty of space.

I'd like to tell you a little more about all the layers of protection that, in my opinion, did work properly to prevent a scary runway conflict or maybe even a crash. In other words, here comes a novel!

First was good radio comm about the variable winds. I could hear the ground station, the towpilot, and the recently-launched glider discussing the launch and deciding to change runways for the next launch.

There was some uncertainty, because the wind was changing in direction and intensity. This layer of protection could have been improved – as far as I am aware, there was no field manager to make a firm decision. My recollection (which may be wrong) is that no decision was made about which runway would be active for landings, and it was left up to the pilots' discretion.

Actually I could have provided input to this as well – my observation while flying was that winds aloft were stronger and more definite in direction than on the ground. So that might have influenced a decision about runways, if the ground station knew about it.

The second layer of protection that worked was good position reports. Because of my impression that there had been no firm

decision about the runway, I broadcast my intention to land on the same runway that was going to be used for the next launch. The towplane pilot immediately asked me to clarify my position, which I did. Turns out we were both heading for the high key area at the same time, at the same altitude (here I had a mild heart attack) for different runways – heart attack averted as I got a visual on him.

The third layer of protection that worked was the golf cart having a radio in it. Having heard all this, the golf cart retrieving the glider was able to move well out of the way (and quickly advise us that they had done so and were aware of the possible runway conflict).

The fourth layer of protection is our good safety culture. It's been my experience that for the most part, in our club if someone points out what they think is a safety issue, people will stop, think about it, and do something if it's appropriate. So when the towpilot suggested that we could both land at the same time, if we were careful about where we set down, I had no hesitation in saying basically "I'm really new to this airplane, I can't guarantee I'll be able to dodge the glider on retrieve *and* stay out of your way, can you please wait." Which he did, also with no hesitation, as I was sure he would.

I'm not going to comment on legal right of way here, because (a), it's possible to have the right of way and still be "dead wrong" and (b), it's not that unusual for us to have aircraft movement on two runways at once, or even aircraft movement in more than one place on the same runway at the same time. It's generally not a problem with our nice wide runways. Anyway, we may not even have known there was a potential right of way conflict if we hadn't both been on the radio.

This all took place while I was flying my downwind leg. I ended up too high at the low key point because I lost track a bit of my altitude during the conversation, but it worked out okay as I was able to fix it with spoiler and a bit of widening my circuit, and there was also a noticeable wind gradient by then which kept me closer to the threshold than I'd have otherwise been from that height. (Fifth layer of protection – good training that allowed me to apply the *SOAR* technique and fix the issues with my circuit!)

So I think that was a good outcome, and *thanks* everyone (especially those involved

in the situation I've described) for fostering an environment where we look out for each other, and feel comfortable asking each other for just a little more time or space to do things carefully when we feel we need that little extra safety margin.

**Erin Doerffer**

## Common glider accidents in training – avoiding unplanned landouts –

The following information is primarily aimed at instructors but all pilots can benefit. Most of this information is covered on the current SAC instructor courses. Based on the major accidents over the last decade in Canada, FT&SC has prepared a list of training points that instructors can use to mitigate the chance of having similar accidents with a student or will help students avoid similar accidents when the student is solo/post licence. These points should be reviewed each spring by instructors. A further good reference for these points is Derek Piggott's *Gliding Safety and Understanding Gliding* available at most glider pilot supply sources.

- Early in training establish boundaries for local flying that have safety margins for sink built in to return to the field (minimum sector altitudes). In stronger winds have them stay upwind of the airfield.
- Teach distance to glide and range estimations using the eye and map. Practise flight towards next cloud and estimating anticipated height loss using L/D, including into wind situations where speed needs to be increased for penetration.
- Practise students in final glides and estimating glide angle to the surface (while maintaining safe altitudes). Student to select point of contact with ground if glide is continued.
- Teach what to look for in clouds to find lift and actions to take in sink.
- Have a glide calculator in glider and demonstrate its use.
- Teach how to be observant to changing weather patterns and fronts and the effect on winds/gusts and available lift (include basic cloud reading).

**Dan Cook**

## Canopy opening in flight

In an e-mail to the Flight Training & Safety committee, John Firth noted that the unlocked canopy seems still to be too frequent. He wrote: "The importance of locking the canopy was driven home to me 45 years ago when I witnessed the canopy open on take-off on a 2-32; the distracted pilot got too low on tow, was dumped and tried to turn

back; the resulting spin was fatal. When I was instructing, I emphasized physical check of the canopy lock by pushing up above one's head. I would close the canopy as the student was doing his cockpit check and wait to see if they locked it. The question, "have you completed your check" was usually answered "yes" and I allowed the take-off to start, whereupon I pushed the canopy open and released the rope (I became notorious for this trick). I think this drove the point home, as I do not recall any unlocked canopy incidents at the club during that period. Does the present check list include a physical canopy check?"

**Dan Cook replies:** It is unfortunate that canopy opening has led to many fatalities. Preoccupation with an open canopy has caused enough distraction that the pilot stops flying the airplane. Recently in Ephrata, a pilot pulled the emergency canopy release instead of the tow release due to confusion based on where the release is positioned in the aircraft he was flying compared to where it was in the Blanik he was trained in. The resulting surprise blast of air made him pull back on the stick and upset the tug. Both pilots recovered and landed safely. We have seen a video of a pilot who is using a real life experience to explain his inadvertent canopy opening, and justifying his actions to delay aborting the take-off. He should have immediately released and landed, but continued the flight to circuit height. On instructor courses we teach that, in the pre-flight planning phase, it is better for the pilot to plan to release and fly the glider first and leave the canopy alone until landing.

In the *SOAR* manual for CISTRSC-O (p15), it states for: "C – Canopy Close and lock; then check physically, by pushing up on the frame, that it is locked". We emphasized pushing up on the frame because we have had cases of canopies being pushed up off the canopy frame. Copies of the latest *SOAR* manual are on the SAC website Documents section. And the latest *SAC Instructor Manual, Part B*, p13 states, "C - Canopy Close and lock it, and instruct the student also to check that your door or canopy is closed and locked. Now have the rope or cable connected, but only when the pilot is ready (never connect to an empty glider)." The instructor course training videos on what the instructor should be saying to the students includes (under CISTRSC-O, "OPTIONS" for "Release" – top ten reasons for release) planning an early release on the launch if the canopy opens – not to attempt closing it.

We also warn instructors about the unintended consequences of the way we conduct training. We had a case where the instructors were always closing the canopy in a K-13 during the training and locking the canopy from the back. The student wasn't in habit of checking the back lock, only the front lock. When solo, they did what they always did and didn't check the back lock. In another incident, the bolt had gone over the locking tube and not in it. It passed the positive push on the canopy rails but the take-off vibrations popped the canopy loose. The pilot released and landed ahead safely. He said all he could hear in his head was his instructor's voice saying, "fly the airplane, fly the airplane".

The subject is covered in the training material, but may not be emphasized adequately by all instructors, especially those who may not be familiar with the latest manuals. It is a human factor that pilots try to save face by not wanting to admit that they missed a checklist item, so they may try to fix the problem in flight and avoid a potential embarrassing early release that they would have to explain.

We have been trying to get the point you have raised across in instructor clinics, but it is difficult to get the message to all instructors. Most frustrating is watching new pilots repeat the same mistakes others have made despite the changes to the training curriculum. I think one of the problems is that many clubs do not have a formal safety training program in place outside of primary flight instruction – or it is *ad hoc* at most.

All the accident reports summaries are published on the SAC website. Some club leaders feel that this will scare students away from the sport, so they don't use that information. We do not agree the alternative is better. Perhaps a rethink of safety culture is necessary.

*Doug Scott notes:* I have had six experiences with canopies opening on take-off or initial climb, and I am pleased to say that in all cases the pilot continued to fly the airplane safely. In those cases, I was either a low-time solo pilot, an instructor with a student, or a tow-pilot. I have also had five engine failures in power planes, and I can attest to the amount of distraction that is present and how much concentration is required to "continue to fly the airplane." ❖



THIS YEAR we had 10 accidents and no fatalities, bringing down the 10 year average to 12 accidents and 1 fatality per year, from the 19 and 1.5 as reported in 2007. This year is a great improvement (or lucky, when you read the incidents) but we have the opportunity to make real progress by looking at our safety culture and examining what we are doing to reduce risks. Do not draw any conclusions based on the number of incidents as they are likely under-reported, but take note about what happened in the accident/incident. Compare the incident report list to your club operations and ask yourself “what mitigating action have I or my club taken to minimize the risk of a similar accident/incident occurring at my field?”

### ACCIDENTS 2014

- ASW-20 written off and serious spinal injuries during failed take-off when elevator control rod was not connected during assembly. The pilot was disturbed during the assembly to help rigging with another glider and by new electronics installed which he had not yet used. A critical assembly check was not performed and the controls check before take-off was not performed properly. The pilot had gone through emotionally

challenging moments in the preceding weeks and days.

- ASW-27-18 was conducting a local flight about 13.7 nm east of the airport and made an off-field landing. As it touched down on soft ground, the aircraft did a ground loop and the fuselage was severed at the vertical stabilizer. (CADORS 2014Q0977)
- Mini Nimbus HS7 glider was being towed by Pawnee and about the halfway down the runway towplane reduced power and the pilot radioed “fuel leak”. The towplane had not left the runway and the glider went right as the towplane turned right. The glider’s right wing struck the ground trying to avoid a collision. The left wing overflowed the towplane cabin, but hit the propeller from above. The glider’s tail struck the right wing of the towplane. The glider suddenly dropped about five feet. The towplane’s right wing was crushed at the tip and the propeller was bent. The fuel leak turned out to be excess fuel that splashed off the cap after a refueling. Towplane and glider collided 175-200 feet to the right of the runway and with the glider stopping about 250 feet to the right of the runway just short of the edge of the taxiway. The vertical, rudder and elevator had separated from the glider and laid about 50

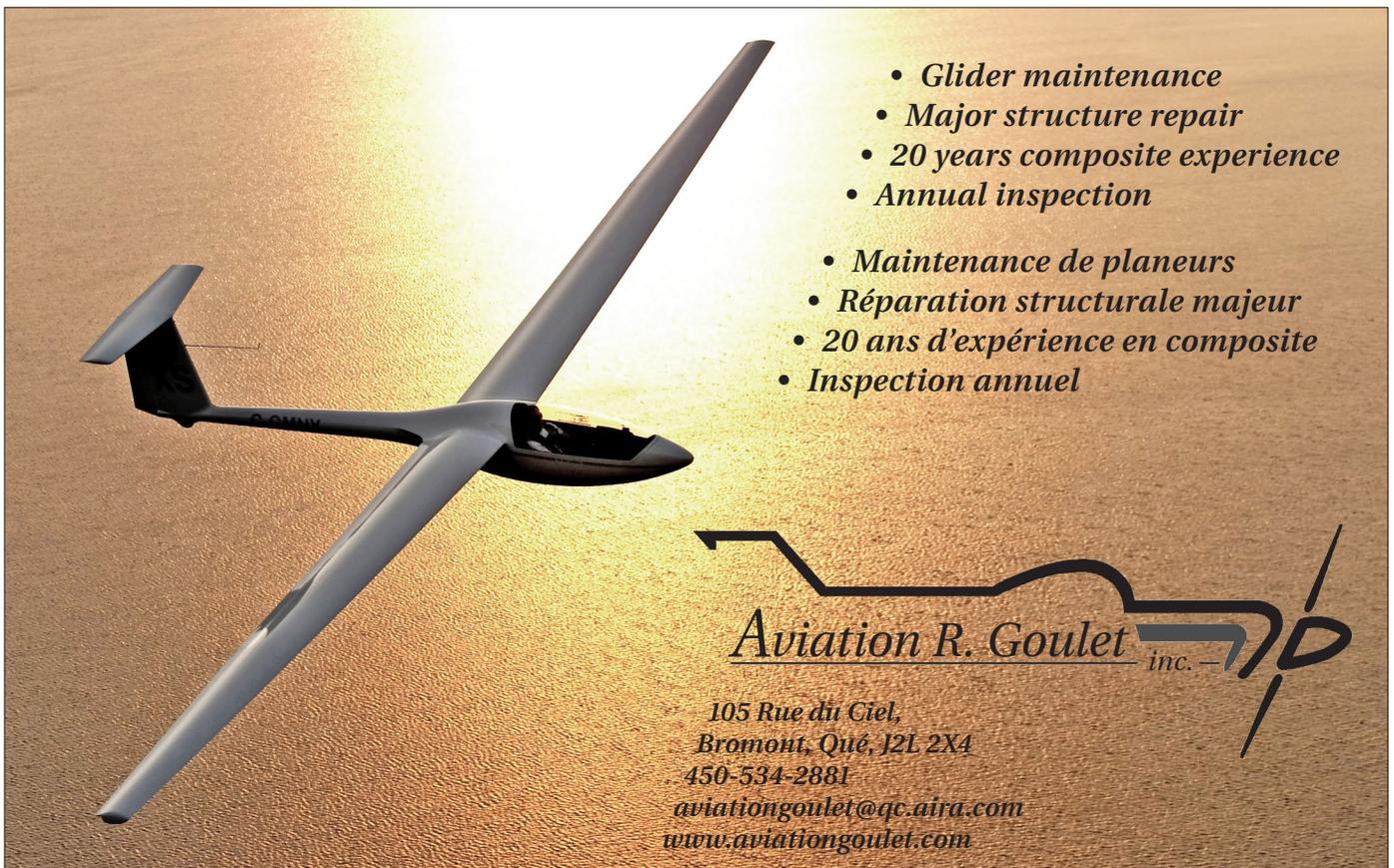
feet behind the cockpit. The glider’s left wing had been cut through in two strikes about 12 feet from the seat. (CADORS 2014H0180)

- Jantar off-field landing in soft ploughed field while contest flying in Pennsylvania. Wing tip touched sloped ground, ground-looping 90 degrees and sliding 10 feet sideways, damaging fuselage.
- Jantar off airport landing in a field in Pennsylvania. The pilot refused treatment and the aircraft sustained minor damage to the nose. (CADORS 2014H0072)
- Jantar canopy blew off during aerotow and was damaged. Glider landed safely.
- Towplane nosed over and damaged prop/engine. Pilot applied full T/O power and moved stick ahead to raise tail in quartering tailwind and a gust lifted tail.

### INCIDENTS 2014

#### Assembly/Disassembly/Maintenance/DI

- Demonstrated glider assembly for student. Multiple other conversations took place during rigging. Pilot did not install the main spar safety pin. On climb-out, pilot didn’t recall installing it, and could not determine visually, so released and landed.



- *Glider maintenance*
- *Major structure repair*
- *20 years composite experience*
- *Annual inspection*

- *Maintenance de planeurs*
- *Réparation structurale majeur*
- *20 ans d'expérience en composite*
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- During Junior Camp, a cadet was found wearing a parachute incorrectly.
- Mud wasp plugged tube in rear fuselage of our Jantar that was an adventure to reconnect. We added a cover to the static on the bottom of the fuse, half way aft on the tail boom. Not previously aware of location of this static port.
- Static not properly connected on Jantar after annual inspection/maintenance – reminder – the first flight after maintenance is the most likely time to have a system failure.
- Mice chewed through static tube on Cirrus. This is not the first mouse incident with this aircraft, the previous owner also had a mouse nest. First season with the new owner, he is planning on putting mouse traps and/or poison.
- Club Ka6 was left unattended in fuselage stand with the tail dolly on, and it weather-cocked. No damage as was caught in time.
- A private single-seater that had been rigged that day, and while sitting in take-off position with some time to waste, the pilot asked me to perform a positive control check. To our horror we discovered that his right aileron was disconnected.
- When hangar storing a K-21 at end of day, helper walked under wing as pilot lifted wing and sharp corner of aileron gashed side of his head – stitches required.
- During glider assembly the pitot and TE probes were switched. During the launch the airspeed was registering zero. Switching to the second pitot in the nose solved the airspeed issue but the variometer remained uncompensated through-out the flight.
- Flight performed with badly-locked tailplane on SZD-55-1. No damage or lack of control. The lock pin of the tailplane was not fully pushed in place, creating a greater than normal play in the whole unit. A successive positive control check was performed. It is only upon derigging that the problem was noticed.
- The pilot couldn't close the spoilers after checking them during downwind. The circuit was not modified properly for the increased sink rate and the pilot landed short of the runway but was able to run on to it. Upon investigation, it was revealed that the cable for adjusting the seatback was caught in the spoilers mechanism.
- The LS-4 pilot, having not performed a critical assembly check, was asked on the flight line (while waiting for the towplane) if he wanted a positive control check. The check revealed a disconnected aileron. The control was in place but the vibration during pulling the glider caused it to disconnect.
- Before rigging, the gear was lowered but the glider was not high enough and the tire was touching the ground, preventing the mechanism to lock. When the glider was

pushed off the dolly, the wheel retracted.

- Water in the LS-4 spoiler box.
- Tow with malfunctioning mags.
- Ran out of fuel for a simple circuit.
- Loss of power on towplane during take-off. Neighbours heard strange noise.
- Pushed trailing edge of tail into beam while swinging trainer into hangar. Only two persons for tight space.
- Many incidents of Hotellier connectors found not being properly fastened.

#### Launch

- Soft runway slowed progress and towpilot lifted off and held towplane low in ground effect to build airspeed. Glider P2 was slow to respond at initial climb, resulting in inadvertent low-tow flight path over a small forest with few, if any, immediate options if there was a rope break or towplane upset.
- Interrupted take-off due to towplane engine problem.
- Puchacz was too high on tow at 100 feet. The front seat student was initially flying and was adjusting the vent window just off the ground. The pilot pitched forward, touched the ground and bounced into a high position and both aircraft released. The rear seat pilot took control and pitched down to increase airspeed and made a left turn initially toward a field directly north of the airport. The pilot then made another turn at very low altitude and low speed to land diagonally downwind. The pilot stated making a turn back to the airfield was an instinctive decision.
- Radio failure while taking up slack. Glider pilot told wing runner to abort and wing was lowered to ground. Towplane continued launch. Pilot didn't release. Launch continued without incident.
- Glider too low on tow during take-off.
- Low altitude tow due to towplane performance not matched to Twin Grob weight. No one considered moving launch point back.
- Glider dropped wing on start of roll and immediately released (correct action).
- Winch launched a K-21 by nose hook instead of CG hook.
- During preparation for a winch launch, the wing runner was holding the winch cable getting ready to hook it to the glider. At the same time, the glider pilot called the winch to 'start engine for warm-up'. When the winch started its engine, the cable was yanked unexpectedly and violently off the wing runner's hand, but without injury.
- On a very windy day, instructor and student had windows and scoops closed and the wind noise kept the runner from hearing verbal launch instructions, crew was also communicating with towpilot thru radio. When the launch sequence started, the wing runner was not aware of it, or if the pilots were talking to towpilot or not. The result

was confusion for the wing runner and with very poor glider alignment down the runway with a student at the controls.

- Spoilers were not locked during the checks on K-21 and got sucked out during initial climb. The pilot closed/locked them immediately.
- ASW-20 flaps not properly set in position.
- Pilot took off on aerotow and seconds later severe turbulence opened his spoilers without pilot noticing. A ground call was immediately made to the glider pilot and spoilers were closed immediately. Spoilers believed not to be locked.
- Groundloop at take-off. No damage. A water ballasted glider was launched by an inexperienced wingman who did not balance the water before giving the all out.

#### Rope breaks

- At 4500 feet during slack rope exercise.
- While practising descending on tow.
- Rope caught and cut by L-19 wing on aerotow.
- Failure at towplane end. End of rope had been heated to form hard knob. This was threaded into rope and was point of failure.

#### Canopies opening

- Puchacz had an inflight open canopy incident while flying. The Pilot-in-Command was demonstrating a left wing low forward slip when the canopy suddenly opened. It is unlikely the rear passenger unlatched the canopy by accident. The club fleet maintenance supervisor stated that the latch tension was checked during its annual in the winter. The canopy cross-member was found bent and delaminated from one side after landing.
- Canopy partially open on ground roll.
- Canopy released in flight on tow when wrong handle pulled. Canopy emergency release knob on type was in position similar to the L-13 Blanik tow release. Visual confirmation was not made before release. This also led to a towplane upset as the pilot reacted to wind blast by moving stick back and lifting towplane tail. There was sufficient altitude for towplane to recover.
- Canopy opened on tow. Aircraft was 2/3 down the field at about 50 feet, released around 100 feet and executed 90° turn and landed on adjacent field to the right.
- Pilot almost took off in the K-21 with the rear canopy unsecured.
- Take-off with unlocked front canopy barely avoided in ASK-21, no damage. When the pilot gave the all-out signal the wingman noticed that the front canopy was not locked and aborted the take-off.

#### Landing

- Puchacz sustained minor damage in a hard landing. Student converting from power

flying rotated at low speed and opened airbrakes fully leading to a tail strike just as instructor took over. Instructor's complacency was due to the student's good performance before the landing (halo effect?).

- A landing glider taxied while on rollout towards the hangar area and struck right wing tip on metal dolly used to move gliders in and out of hangar. Minor damage to wing-tip extension.

- During the roll-out and just before stopping the left tip caught the winglet on the right wing of the glider parked on the taxiway. The wing wheel and tail wheel were on the parked glider. The stationary glider pivoted and the left wing hit a member.

- Pilot thermalling at 580 ft, well below procedurally required lowest altitude and certainly generally acceptable minimum altitude.

- Two separate incidents of tailwheel tire rupture on a Duo Discus. Found wheel well inner fairing detached from fuselage structure. On landing with wheel touchdown on pavement inner fairing was rubbing on tire.

- Pilot got low while flying L-33 and landed safely in a field just short of runway.

- ASK-21, with a check instructor on board, completed a low circuit with a turn to final at 50 feet.

- Glider made a low approach over road on end of field.

- Aircraft landing over *Spectra* winch line laid out along intersecting runway. Potential to draw rope into wheel of aircraft or damage *Spectra* cable. Strength is in longitudinal axis of cable only.

- Glider made a simulated rope break at 1000 ft agl and turned back to field to land while another glider was on final.

- A licensed pilot began his circuit rather low. He was number two on downwind. After passing up the opportunity to land on other available runways, he proceeded to cut inside the glider ahead of him in the circuit and landed long.

- While on final approach, a seagull was struck with the wing of the 2-33. No damage to the glider.

- Elected to land on runway with some crosswind. On touchdown hit bump, rolled left and touched left wing tip on ground. Slight ripple on fabric noticed at rear of last wing rib beside end of aileron.

- Single-seat glider was downwind and low (500 ft). It appeared to enter an abbreviated circuit on base leg. At the turn to final at 400 ft the glider began to thermal.

- PIK-20B pilot deliberately induced groundloop to avoid overshooting during the ground roll. The pilot landed with a very slight downwind and touched down at a speed higher than recommended (50 kt). Immediately after touch down, the pilot

raised the flaps to neutral. Approaching the end of runway, the pilot braked but the brake cable failed.

- Groundloop after landing attempting to clear the runway during wave camp.

- Pilot attempted to taxi aircraft off active runway to intersection too fast. Pilot lost control and slid and groundlooped.

- Winch training exercise released at 200 feet, pilot attempted to turn to land on another runway and not straight ahead, caught wing tip and bounced. Instructor not current.

- Many incidents in circuit from poor lookouts, improper patterns, using spoilers on downwind when not needed, lack of communication radio calls, inattentiveness of radio calls, non-serviceable radios, not following operating procedures on roll out.

### Gear-up landings

- ASW-15. The pilot had selected the gear down position but the handle was not properly locked. There is a pin on the gear handle that can visually be checked to confirm the gear is locked and it is suspected it was not checked. During annual inspection over the winter, damage to the gear area was found. It is likely the damage was from this incident but not known for certain.

- Gear up landing in muddy field during off-field landing when PIK-20E engine did not start.

### Landouts

- Landout completed from low circuit after experiencing wave-like high sink on way to dust devil in farmer's field and landed not in ideal position of the field. Disassembled glider had to be carried out of farmer's soft field. *A promise not to landout before a XC flight is counter-productive to flight safety.*

- LS-4 pilot committed to landing out in a field that appeared great from the air and during the downwind. On final, with the lower sun, the field appeared less good and the pilot decided to land on the adjacent plowed field. The original field was a newly-harvested hay field, perfect for landing.

- During a ferry flight, Puchacz was outlanded and experienced a hard landing.

- Pilot thermalling, accidentally flew far away from the airfield and lost the sight of the airfield, and had to land out. During the landing, pilot passed the power line, touched down in a field and jumped over a ditch.

- Landout in a corn field right at the end and beside the runway. This was pilot's first flight on type in L-S4, no damage. The circuit started 300 feet lower than usual and circuit was not modified for additional sink. A ground loop occurred on touchdown. Upon disassembly of the glider, it was noticed that the l'Hotellier connectors were not all locked.

Air brakes were unlocked at pre-landing check and believed to reduce L/D on type during circuit.

### Air proxies

- Single-seat glider was on left base for runway 09. Coming head-on was a two-seat homebuilt power plane, turning right base for 09. Homebuilt had engine issues, had radioed intent, however nobody heard it. Glider pilot took corrective action and both landed safely.

- A glider crossing midfield at close to circuit height in an attempt to soar on the circuit side of the field while another glider was on downwind.

- ASK-21 on a local flight entered Class C airspace without a clearance or a functioning transponder at an altitude of 2600 asl.

- Towplane got a FLARM traffic alert. Both pilots looked out and pulled off to avoid an incoming unreported RV-7 (airport has a MF).
- Towplane with glider on tow and another glider near miss.

- Two airfield infringements; one, a jet passed overhead a glider on tow, they were about 1000 agl. The second was a commercial helicopter that transitioned the field at 1000 agl, altitude verified by returning towplane. Both were on solid overcast days.

- Near miss, the PowerFLARM was shut off, checkflight demonstrating a steep turn when the towplane called on downwind and passed very close to the glider. Glider was outside glider circuit but near the wider tow circuit.

- Glider passes within 100 feet over towplane towing a glider at 3500 feet.

- After an ambiguous communication, the pilot assumed the wave window was opened and climbed to 20,000 feet, PowerFLARM beeps indicating a rapidly approaching transponder. An airliner passed from behind, 50 feet higher and 150 feet to the right.

- PowerFLARM didn't alert during a conflict between towplane and glider.

- Twin-engine conflict during wave camp. PowerFLARM didn't alert.

### Towplanes

- Towpilot snagged rope on fence on a shallow approach to runway, no damage to aircraft.

- Towplane experienced engine problem near start of tow and signalled glider to release by rocking wings. Due to rough air conditions signal wasn't immediately acted on until radio broadcast to release confirmed.

- Towplane lost braking on one side while taxiing. Loss of fluid detected on ground. Brake pads found worn out.

- Towpilot chose the circuit in favour of noise abatement when should have gone to the other side, this led to a scary turn to final

and we re-established our circuit based on wind, not noise.

- Towplane overflew two gliders and dropped the rope. The rope narrowly missed the glider parked on the north side.
- Non-attached gas cap was found to not be in place on the tank (and was found on the nose) at the start of operations the following day (two occurrences). On the third occurrence the towplane was started, taxied to position, hooked up, and took off with glider in tow with both caps still on the nose of the aircraft. On climb out the towpilot saw both caps slide off the nose.
- Glider towed at 75-80 knots, glider redline is 65 knots. Glider pilot released late and returned to field (approximately 250 feet).
- On normal landing, tailwheel attachment bolt sheared on touchdown. Tailwheel struck bottom of rudder causing minor damage.
- Tow rope struck power line at threshold of runway on approach following a runway change. Short link on tow hook end snapped, thus saving the towplane, tow rope, and the power line. Pilot was unaware of power line.
- Towpilot suggested "hot swap" to another towpilot, which was declined.
- Several incidents of mags and master being left on and incorrect gas cap placement venting out, not in.

### Runway incursions

- Glider operations contacted ground to advise two pedestrians walked on Runway 08L towards the gliding area. Pedestrians were unaware of airport operations and had come through an unmanned gate.
- Glider operators advised that a Cessna 152 flew over the airfield at 300 feet without radio contact, while the area was active.
- The towplane had just announced its intention to enter the active runway and was maneuvering to position. No calls received/transmitted by another arriving aircraft. After the aircraft completed the overshoot it departed the circuit and circled to prepare for a landing. Aircraft possibly on wrong frequency.
- Several incidents of lawn tractors heading to retrieve a landed glider, pulled out onto the runway just as the towplane and glider were starting their launch, or towing a retrieved glider in front of landing glider.
- Near miss with a deer during landing. Instructor took control, no damage.
- Landing on a crowded runway while a take-off happening (landing glider has right of way)
- Wingman didn't notice a glider on final, the glider didn't communicate either.
- Class C airspace incursion by glider.
- Commercial jet passed near glider activating FLARM in Class E airspace.

### Analysis

There are a significant number of ground-loops occurring on landing (especially on MG) in modern gliders with the CG farther aft than on trainers. These gliders are more prone to groundlooping if the tail is not held down on landing above minimum energy touch down. Any braking or ground resistance exacerbates the problem. Is the issue inadequate type conversion or relaxed standards for landings during training? This also applies to several hard landing incidents. Re-read "How to Avoid Hard Landings" in *free flight 2014/2*.

How can we reduce runway incursions and collision risks in the circuit? PowerFLARM (PF) use can definitely help on both counts. Having the towplane landing light on from engine start to stop may help prevent runway incursions and reduce risk in the circuit. Disciplined radio use similar to MF procedures will also help greatly. Some larger clubs want little chatter on radios and others want position reports from pilots when there is a significant change to position. This can be achieved if the ATF is not very busy; this is a preferred solution. However, using a glider frequency (123.4 MHz) means local power traffic will not hear position reports so the ATF is best. Some glider pilots have a reluctance to give position reports because of inexperience. This must be incorporated into the training.

I have seen airfields with the ATF chalked into the turf or painted on aprons. Pilots are also reluctant to talk to ATC. If you are near traffic areas get accustomed to contacting them and letting them know where you are going.

Along with poor communications in the circuit we are having difficulty executing proper circuits and the resultant low approaches in general or modifying the circuit. Spring refresher training must focus on this issue.

PowerFLARM has been reported not to function in all proxy cases. Attention has to be paid to antennae location and there is a tool on the PF website to analyze effectiveness. In addition, powered aircraft may not have transponder on or may not be interrogated by radar. Lastly, PF is a tool to aide visual scanning, *not* replacing or reducing this effort. PF use has increased dramatically across Canada which is a positive safety measure and reflection on safety culture. Many incidents are now being reported where PF has warned the pilot of a conflict. These likely happened before PF use but the pilot was just unaware.

Canopy openings continue to plague us. Puchacz canopy replacement is about a \$10K repair. Fatalities have occurred in the past from pilot distraction over an open canopy. Like landing gear operation, often we are just going through the motions and not paying enough attention to detail. Visually confirming that it is locked, pre-flying the hardware (screws are tight), and disciplined use of checklists will mitigate such losses.

Most disturbing is flight without completed control hook ups or safety locks. This is the most easily mitigated but too common a safety problem that leads to fatalities. We can get distracted, complacent or undisciplined. A double-check method and use of teamwork to help each other can mitigate risk. Checklists, Positive Control Checks, Critical Assembly Checks, and a "Red Hat" policy at the club are tools that reduce risk. Also, pilots should also complete a "walk around" before a flight each time the PiC steps out of a glider or towplane. You might notice the tail dolly left on when you moved the glider!

Many of our incidents/accidents can be traced back to something we did or did not do before we got into the aircraft. Promising yourself or someone else you will not land out, no matter how conservative you plan to fly or how skilled you are, is setting yourself up psychologically for making some bad decisions in the future. It may be turbulence and a stall/spin that causes the fatality but the groundwork may have been established hours before the flight. Don't under-estimate the effect of your emotional state of mind on your decision-making capability (IAMSAFE).

Some clubs have reported that most of their incidents seem to be in the spring, indicating currency in our safety thinking also needs a refresher. Some clubs have also reported few or no incidents. This may be good on the surface but may also indicate your reporting system is not working well. Just think about your own flying. Did you do everything perfectly well all season? Multiply that by all the members in your club and you will have an idea of the number of incidents that you should be hearing about. Have a pilot meeting and open the discussion with a few of your own learning experiences from 2014 and the taps will open. ❖

*As a pilot only two bad things can happen to you and one of them will:*

1. **One day you will walk out to the glider knowing that it is your last flight.**
2. **One day you will walk out to the glider not knowing that it is your last flight.**

## A unique gentleman

The end of this year's soaring season has served as a reminder for Canadian Rockies Soaring Club to express our appreciation to SAC for its Youth Bursary Program. While 25% of the membership fees from regular members go to fund our youth flight program, the grants our students received this past summer were a tremendous help in allowing the club to provide glider training from ab initio to solo for these four youths. Two of the students were local Invermere residents while the third was a resident of Vancouver and the fourth was from Ontario and the son of a past VSA member.

These young people provide a welcome injection of youthful exuberance to the atmosphere at our club. They also make a significant contribution to the daily operations of the club by moving gliders around and running the tow rope. During the morning hours they receive lessons in the theory of flight plus instructional flights. Each student typically gets three instructional flights each morning.

During the afternoon, after soaring conditions develop, the students help move private gliders onto the runway and run the tow ropes. After all the private gliders have launched, the students usually get an additional flight so that they can experience soaring conditions. All of our students were able to complete their training and go solo. Each had a memorable experience and we are sure the hook has been set for their continued interest in gliding. The students were Patrick Dibb, Damian deWet, Lewis Janzen, and Hayden Pfeiffer.

One of our Bursary students seven years ago has been a very active member of the club ever since. Two years ago he achieved his instructors rating and since then has helped Trevor with the training of students. This is a perfect example of the benefits a club can experience through a youth program.

One special event of the summer was an unexpected visit we had from a unique individual. It began one morning when an elderly gentleman drove up to the airfield and inquired about taking some gliding lessons. The gentleman admitted that it had been more than 40 years since he had last flown as

P1. However, he said, he didn't feel that this would be a problem as his primary objective was simply to keep his brain cells from atrophying! Our visitor was Geoffrey Melvill-Jones, he was 91 and a WWII veteran.

Fortunately the soaring conditions were excellent that day, so Trevor was able to take him for a mountain flight over the Purcell Mountains. The mountain flight typically includes flying over Mt. Nelson, the high peak west of Invermere, then carrying on a bit further to the Lake of the Hanging Glacier. From there Trevor heads north to the glaciers and peaks of the Bugaboos. On landing back at the airport, Geoffrey was absolutely ecstatic, and exclaimed that never in his life had he experienced such a thrilling glider flight! The combination of mountain peaks stretching as far as the eye could see interspersed with expanses of snowfields was a view he had never seen before.

We felt very privileged to have him join us at our evening BBQs for several days and share some of his war time experiences with us. He's an absolutely proper English gentleman and, as such, a very engaging conversationalist. It was so interesting listening to him recount episodes from his time in the RAF.

Geoffrey stayed with us for four days, each day joining our youth students for some training flights in our venerable old 2-33. Geoffrey was totally impressed with the student's focus on learning to soar while at the same time totally enjoying their experience. He was especially impressed with how they maintained their enthusiasm, even while washing the dishes after each evening's BBQ! In fact, he was impressed to such an extent that he donated \$500 to our Youth Training Program.

**Mel Blackburn**

## Raouf Ismail †

Raouf Ismail died in November, 2014. He was a significant game changer in the instrument business and was the founder of Cambridge Aero Instruments. After an engineering degree from Cambridge University, and a spell in UK industry, he emigrated to the USA to a job with Honeywell.

The first CAMBRIDGE product was a sensitive electric variometer housed in a 3-1/2" case

measuring flow from a 1/2 litre flask. It used tiny thermistors in a bridge circuit. Much effort was devoted to making the zero point stable and the display accurate, features missing from other electric variometers at the time. Cambridge developed into a worldwide business. Accessories such as an audio and a true averager were added to the vario design, complemented by the gust filter and total energy probe.

Some years later the glider instrument business was sold and the technology incorporated into *Cambridge AeroFlo*, to measure airflows and temperature at multiple stations. This again was a business success.

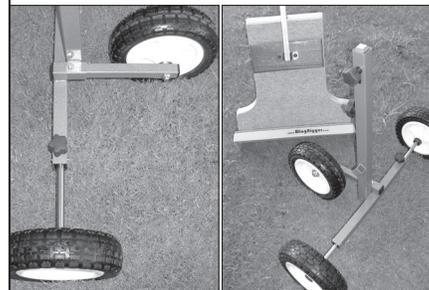
Raouf was a lifelong friend and accomplished glider pilot and towpilot. He was a longtime member of the Sugarbush Soaring Association in Warren, VT and was its president for several years, an indication of the respect in which he was held and of his ability to connect with people. Raouf is survived by his wife Sally and a daughter.

**John Firth**

*Here is a reminiscence from Dave Adler, "Raouf was the Schempp-Hirth dealer at the time and persuaded me to order the new-on-the-market Ventus. This eventually led to the infamous, "Two gliders, no house, angry fiancée, must sell one of them ..." advert in SOARING. I got zero calls (nobody believed I'd sell a glider), but my fiancée's Dad did fall off the toilet reading the ad ..."*

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Sunrise silhouette at VSA – Andrew Lau

### overhauling A-14 O<sub>2</sub> regulators

There are still some decades-old A14 regulators in some of our gliders being used for wave flying, and the RCAF has not been able to overhaul them for years since they have been replaced in military aircraft. Recently, this was on *rec.aviation.soaring*:

Seems like all the old shops of yesteryear that would perform overhauls have gone away. A firm called *Fluid Power Inc.* have the rights to overhaul older A-14 units or manufacture brand new ones. Purchasing a new A-14 will cost about \$1500 for the regulator and \$500 for the blinker unit.

Other options with *FPI* are overhauls that run about \$600, but there's a catch; the unit can't be too old. Apparently there was an internal design change and they can only service the newer units, say from the later 1970s and beyond. So try to give them a serial number before you waste your money.

The other option with *FPI* is that they will sell a refurbishment kit for the guts of the A-14. One version is a 'soft' kit that's about \$150 and includes all new baffles, seals, and rubber parts that most of us are in need of, I think. The other is a 'hard' kit that is more

expensive of course and includes a myriad of other items (springs and mechanical bits) that they replace when performing the overhaul.

If they receive your business they will build you a unit or overhaul your not-too-old one.

In that process they have a small chamber to test the unit up to altitude to ensure everything is working properly based on the different chambers the oxygen moves through – diluter demand, 100% O<sub>2</sub>, and pressure breathing. Expect a three month turn-around if you either purchase or send them anything as they are a small shop and don't keep things on the shelf.

### 2015 Sporting Code changes

The IGC Plenary annual meeting was held at the end of February. It addressed a long list of proposed changes to the Code, mostly related to a 2-year program of the Sporting Code committee to simplify it.

The following changes were approved and will come into effect 1 October 2015:

- Use of mechanical barographs no longer allowed (height from FR or PRs only).

- On a Silver distance task the pilot must reach a point at least 50 km from release, with height loss measured on the claimed leg rather than the whole flight. No longer can you claim a 50+ km leg that has the club somewhere in the middle (potentially hardly ever getting out of sight of home), getting the task back to what it was historically.

- Start or finish a task only by crossing a 1 (not 3) km long start or finish line (the use of the FAI sector is deleted).

- The requirement for a 10 km separation of turnpoints on 3TP distance tasks deleted.

- With the demise of the *PW-5* record class, a *13.5m* record class replaces it.

Defeated proposals were:

to include the Diamond Goal flight in tasks that can use a PR, and to use only the FAI sector as the turnpoint OZ (for simplicity, to eliminate the cylinder OZ as now being unnecessary).

Pilots and OOs are encouraged to download a copy of the new Code, which as been extensively rewritten to make it easier for badge pilots to follow (all requirements have been consolidated into a single chapter).

**Tony Burton**

## A new line of 13.5m gliders

As of this year, a 13.5m record and competition class of gliders replaces the PW-5 Class. Peszke S.C. has announced a new line of gliders, the GP series, for this new market. Three models will be produced in its Krosno, Poland facility. Designed by Grzegorz Peszke, the GP series consists of the GP-11 *Pulse*, plus the GP-12 *Flex* and GP-14 *Velo* that are successive upgrades of the *Pulse* including options such as an electric self-launching 15 kW motor. Delivery is 10 months from order.

The battery capacity expected to give a 3 x 1500 foot climb or ~100 km range, but battery and motor power are the subject of ongoing development.

"I designed the GP series to be innovative in every way," says Peszke. "I want to produce a totally new glider that gives pilots what they need and want." These designs break new ground in sailplane design and construction with exceptional performance and safety features.

Multiple world champion Sebastian Kawa plans to fly the *Velo* in the first 13.5m Class FAI World Gliding Championship in Lithuania in August 2015, and will also serve as a technical consultant.

The new North American dealer for these gliders is Tim McAllister, and his report on the origins of the design are on his blog <<http://www.gpglidersusa.com/blog>>. Peszke S.C. links are <[www.facebook.com/gpgliders](http://www.facebook.com/gpgliders)> or <[www.twitter.com/gpgliders](http://www.twitter.com/gpgliders)>.

### GP 11 – *Pulse*

The simplest and cheapest model. Highlights:

- L/D near 40:1
- Fixed gear
- Flapless wing with dive brakes
- Tail ballast tank for tuning the CG
- Jan 2015 price – Eur 40,250

### GP 12 – *Flex*

- L/D low 40s
- Flaps and full span flaperon roll control
- Retractable landing gear
- Optional wing water ballast
- Optional electric self-launch motor

### GP 14 – *Velo*

- L/D mid-40s
- Improved wing and tailplane design over the GP-11 and 14
- Optional choice of a slim fuselage (2" less in width, 1" in height from the standard)
- Optional wing and fuselage water ballast
- Structure curing method allows custom colours other than white
- Optional electric self-launch motor

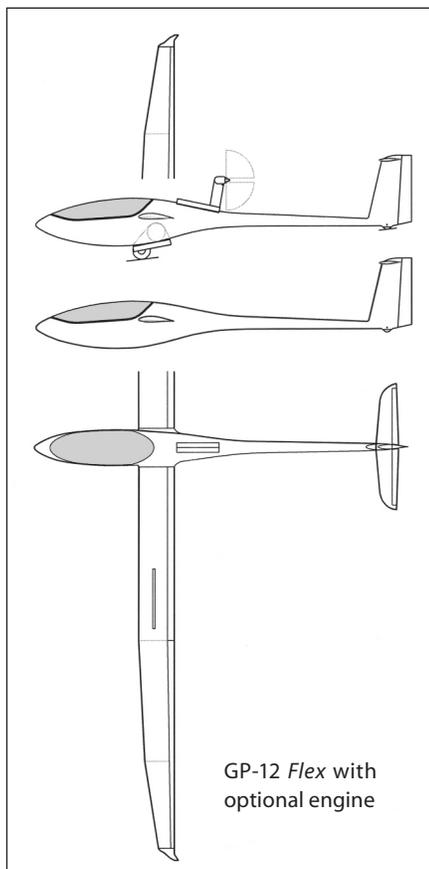
## Priorities

from page 2

ask yourself what SAC is doing for you, or if you wonder where the SAC annual membership fee goes that you are giving every year.

You will also see more details about the SAC programs, like the World Contest funding support program, the Youth Bursary program, the Club Marketing program, the Contest Host grant program and the new SAC Safety Improvement Grant. SAC-ACVV is committing \$40,000/year for three years in a new program for the purpose of enhancing safety in clubs. This money will come in the form of direct grants to all clubs, shared on a pro-rata basis with a minimum grant level of \$500 for our smallest clubs. The FT&SC will prepare a list of eligible expenditures under the program but it will include anything that enhances safety.

You must all read this year's safety report prepared by Dan Cook (SAC National Safety Officer and FT&SC chairman) to improve safety. Reading the previous year's safety reports will show you that the same errors repeat every year. Something has to be done by members and clubs to improve safety in Canada; start by putting in place at your club the National Safety Program and review it periodically. The NSP is available in the Document Vault under Safety and Training. ❖



Attempts have been made at this with procedures such as the Critical Assembly Check that is promoted by Tom Knauff. Before take-off we could also improve the pre-take-off check by more actively involving the wing runner. Instead of thinking of wing runners as working 'for' us in the launch, it's better to look at them as working 'with' us.

We have an increasing trend in our sport to use one-man rigging aids, wing dollies, etc. to have gliders rigged and moved alone. Pilots usually offer that then they are not a 'bother' to anyone. While there may be less 'bother', there continue to be cases of mis-rigged gliders, ground towing accidents, or obstruction of aircraft movement that can be directly attributed to these solo operations. We have to learn that enlisting the help of others is a move towards safety. Too often our pilot-in-command mentality leads to errors and subsequent finger pointing rather than safe outcomes.

Next we have to review how we interact with others. I am sure part of the appeal of gliding is that we don't have to interact directly with others. Our behaviour is what the aircraft does, and it directs our minds. Further, we expect that others will behave according to our logic, which is often not the case. For instance, I have witnessed a pilot using the Huth method of centering a thermal when others were present. This involves a tight turn for 270° and is not often expected in gaggles, where the simpler surge methods are more common. Later, the pilot's explanation was that the others would have anticipated his centering, and should have been prepared to make the same adjustment.

Another case is the standard circuit, designed to provide a margin to cope with variations in sink, wind, turbulence, obstructions, traffic etc, and provides time for humans to correctly judge changing conditions. Variations to the standard are of course encouraged as conditions change. However, I have seen many non-standard circuits flown that had nothing in particular to do with changing conditions. Further, the pilots involved all had some rationale about why their deviations were acceptable such as, 'no one else is in the circuit', or 'the other aircraft in the circuit will understand my actions', or 'I wanted to extend my soaring flight', and so on. The safer approach when interacting with others is not to behave according to internal, spur-of-the-moment thinking, but to follow the rules and behave predictably.

Glider pilots routinely make internally logical decisions that are based on incorrect criteria. As a group we value skill over safety margins. This is rooted in our belief that we will always operate with a high degree of skill. The truth is that our ability to perform in any given situation is highly variable. The result is we incorrectly set safety margins based on our best performances, rather than our poorest.

It gets worse. When humans are faced with unexpected conditions, they typically take two seconds to act. This should be a prime consideration when discussing safety margins. However, many pilots assume that they will react in the same time frame in emergencies as when they practised them in training. This is rarely the case. We get very few opportunities to train to do the correct thing under a variety of unexpected, stressful conditions – and training of that sort is usually quite a bit riskier than the normal variety. Link two or three such unexpected events close to the ground and one can see how incidents become accidents.

We can better cope with these issues by setting more specific standards for acceptable safety margins. These should be based primarily on human factors, equipment, and environmental limitations, rather than pilot skill or how they feel about themselves. If you look objectively at off-field landings from a safety margin rather than a skill perspective, you should realize that any landing circuit in a modern glider that starts below 800 feet will severely push the limits of how pilots can cope with changing conditions – regardless of their expertise.

Finally, we have to start changing the safety conversation. When I started flying there were many shades of gray when it came to safety. The attitude was that if you became a 'good' pilot, you could push the limits. However, the flaw in this thinking was knowing what constituted the 'limits'. These were seen as just personal choices. More of us should be willing to speak out against the foolishness of this kind of thinking.

#### Summary

- Since we are a stubborn lot, we must try to get agreement on what safety means to us. This I believe must be based on the right criteria that are firmly rooted in real human, aircraft, and environment considerations.
- The external world should be more important to us than our instruments and

flight computers. When we interact with others when flying our behaviour should be standardized and predictable rather than emanating from internal logic or personal goals.

- We should take advantage of opportunities to involve others in our procedures. Just because we are responsible for our flight as pilot-in-command, it does not mean that we cannot benefit from the help of others to promote safety.
- We must learn to value safety margins over skill. Personal performance varies greatly from one situation to the next. Our safety margins should be based on poor performance, not what we think we are capable of. Again, the unexpected usually requires those two seconds before you perform, regardless of your training. On a bad day those seconds may be critical.
- Finally, I think our individual preference to stubbornly stick to our own internal worldview causes us to make the same mistakes with our safety programs as we do with our flying. If we don't get a consensus on the safe behaviours we are promoting, we are less likely to implement effective safety programs. This consensus has to be built beyond the level of national committees. ❖

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#### about the author

*Paul started flying gliders in 1981 at York Soaring and began instructing on gliders in 1984. In 1985 he acquired a Private Pilot Licence. The ensuing years found him instructing, towing, completing his soaring Diamond Badge, and serving variously as the Safety Officer, CFI, and Chief Tow Pilot at York. He is a past member of the SAC Flight Training & Safety Committee, and has conducted numerous ground schools, flying camps, and instructor courses. To date he has accumulated 2000 hours and 6000 flights in gliders with about 1200 hours instructing. This has been complemented with another 500 hours power flying, mostly aerotowing.*

*Paul is the author of several books on flight instruction and instructor training, that are now available as e-books on the York website ([www.yorksoaring.com](http://www.yorksoaring.com)), along with a variety of on-line gliding related courses. He is also a builder of flight simulators that are now integrated into the flight training at York.*

*As with most pilots in Canada these efforts have been pure recreation. In his non-flying life, Paul teaches computer-related subjects at several community colleges in his area.*

albeit slowly. Among other safety improvement initiatives the group is working on safety requirements for international and World contests of all aerospots. It is hoped that their use in such contests will filter down into national and club operations. As such we expect that many of the requirements will be similar to those already in the SAC safety program. Hence for SAC-sanctioned contests, we will not have to do much extra to be in voluntary compliance. My opinion is that the Europeans feel SAC has been able to make a significant contribution to this work.

**National Safety Program status** This is a performance measurement tool for the success of the NSP and is measured by percentage of club participation. The NSP consists of annual safety reports (70%), club hazard/risk analysis (70%), safety audits (50%), and safety program manuals (25%). Although club safety reporting had improved dramatically last year due to the SAC Safety Officer's involvement, it has dropped off substantially this year without this position being filled. Incident reporting within Quebec region clubs has increased with improved safety cultures. The mostly-French clubs are using the French material for the training, adapted to Canadian rules and SAC material.

**FT&SC future work** Evaluating the Safety Training App by Dr. Kearns and the BGA video on winch launching on BGA website. Winch safety documentation reviews from work done by the Alberta Soaring Council and SOSA. Finishing the work started on the preparatory ground instruction materials. Many cross-country pilots are now flying with some method of locator in the event of a crash. GGC has recommended pilots fit some method of location in the event of a crash, be it ELT, PLB, SPOT, or *InReach*. Smart phone apps are becoming available to do similar functions and FT&SC will evaluate their effectiveness for cross-country and contest safety.

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

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✌ Plan a badge flight this spring ✌

SAC has eliminated the processing fee (\$15) for badge leg claims, the cost of the FAI certificate (\$10), and the Silver (\$50) and Gold (\$60) pins. We want to encourage more badge flying – eliminating these costs to pilots is part of our strategy.

Let's keep the Badge chairman busy this year. CFIs, get your newly-licensed pilots busy flying and sending in those claims.

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## magazines

**GLIDING AUSTRALIA** – the bimonthly journal of the Gliding Federation of Australia. <[www.soaring.org.au](http://www.soaring.org.au)>. International rates for on-line access.

**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\$96/172, 1/2 yrs airmail. Personal check or credit cards accepted <[subs@glidinginternational.com](mailto:subs@glidinginternational.com)>. Register on-line <[www.glidinginternational.com](http://www.glidinginternational.com)>.

**SAILPLANE & GLIDING** – the bimonthly journal of the BGA. £41.50/yr airmail, £25.75 surface. <[www.gliding.co.uk/sailplaneandgliding/subscriptions.htm](http://www.gliding.co.uk/sailplaneandgliding/subscriptions.htm)>.

**SOARING** – the monthly journal of the Soaring Society of America. Subscriptions, US\$52. Credit cards accepted. Box 2100, Hobbs, NM 88241-2100. <[feedback@ssa.org](mailto:feedback@ssa.org)>. (505) 392-1177.

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marcarnault@sympatico.ca

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