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free flight · vol libre

Pierre Pepin PRIORITIES

One last time!

AND THIS TIME it is to say good-bye, thank all of those who helped me during those 10 years I spent on the SAC board. I would like to specially thank Gordon Bruce, one of our past presidents who "recruited" me in the first place and allowed me to live this fabulous experience, and Jim McCollum without whom I could not have survived.

The times have changed a great deal and the challenges ahead are significant. I will speak to the two I feel strongly about:

- We need to have each club involved in a "continuous training" program. In too many clubs, the training effectively stops after the licence if not after the solo. This situation may explain why our safety record does not improve and why we are using so much energy training people who leave the sport after two or three years.

- We need to focus on cross-country, to bring a majority of our members to that level. Cross-country is what this sport is all about. It gives you the focus, the challenges, and the spirit that will keep you in the sport until the day you are too old to fly. Training is just the means to get to that end. Cross-country means practice and means improving your skills on a continuous basis.

While I will be "retired" by the time you read this, I plan to keep involved with SAC, accomplishing specific mandates from time to time. SAC can certainly use more volunteers.

Well, that's it. It's a wrap!

Une dernière fois!

Et cette page sera faite de remerciements pour tous ceux qui m'ont aidé durant ces dix dernières années passées au conseil d'administration de l'ACVV. Plus particulièrement, je veux remercier Gordon Bruce, un ancien président, qui m'a «recruté» et m'a permis de vivre cette expérience enrichissante, et Jim McCollum qui m'a aidé à survivre toute ces années.

Beaucoup de choses ont changées en dix ans et les opportunités pour l'excellence seront légion. Je veux brièvement élaborer sur deux qui me semblent cruciales.

- Chaque club devra avoir un programme de formation continue. Hélas, trop souvent, l'encadrement se termine lors de l'obtention du brevet quand ce n'est pas après le solo. Ceci peut expliquer pourquoi notre performance au chapitre de la sécurité stagne depuis plusieurs années et pourquoi nombres de nos membres nous quittent au bout de deux ou trois ans.

- L'emphase devra être mis sur le vol-voyage qui est l'essence même de ce sport. La pratique du vol voyage offre les défis et les objectifs qui feront que vous serez un vélivole jusqu'au jour où vous serez trop vieux pour voler. C'est un exercice exigeant qui exige une amélioration des performances de façon continue.

Au moment où vous lirez ces lignes, mon successeur sera déjà en fonction. Bien que «retiré» du conseil d'administration, je compte rester actif au niveau de l'ACVV et d'exécuter de façon ponctuelle divers mandat. L'organisation a vraiment un grand besoin de plus de volontariat.

Voilà, c'est fait, le rideau est tombé.

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

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Cover
Montreal Soaring Council action at Hawkesbury – John Bisscheroux in his DG-202, Yankee Whiskey.
photo: Stan Doda

A soaring promotion that worked!

Ulli Werneburg
Gatineau Gliding Club

MY FIRST EXPOSURE TO GLIDING came on a rather dull day in grade school in Germany — the teacher announced at the morning break that instead of our class in German grammar that day, we would be visited by members of the local gliding club who would show us a film about gliding and give us a little talk about it. You can imagine how my imagination was fired up — what right thinking 10 year old wouldn't trade grammar lessons for a film about gliding?

Sure enough, a couple of hours later some young men showed up with a home movie projector and showed us the film — a pretty amateurish colour effort. Amateurish or not, I found it unbelievably fascinating. It actually had shots of gliders being winch launched, gliders landing, and marvellous shots from the cockpit. This was followed by a short talk about gliding and the local club. I was impressed — a whole new world had been opened up to me, a world which has captured and retained my attention ever since. Consequently, when Ron Walker of my home club, the Gatineau Gliding Club, approached me late last winter about helping out with making presentations about gliding at local high schools, I quickly agreed. Here was a chance to give back to gliding some of what those German glider pilots had given me so many years ago.

The whole effort was really the brain child of Jim McCollum and membership chairman Ron Walker. They had decided that a good avenue for spreading the word about gliding in the Ottawa area would be to approach the local high schools for time in their adult evening courses. Sure enough, they got positive responses from both the Public and the Catholic systems. Now they had to put together some kind of course outline, one that would be interesting yet not too challenging for a broad cross-section of students. GGC CFI Roger Hildesheim volunteered to help out. In the end they came up with a great mix of educational and entertaining material, mainly composed of PowerPoint presentations on all aspects of gliding and great videos from the SAC video library.

We published the following sales pitch in each of the school board's continuing education calendars:

Title: Introduction to Soaring

Course Description: Since ancient times humans have dreamed of soaring like eagles. Today's sailplane pilot, using the natural forces of the atmosphere, can fly higher, faster and further than any bird. In the Ottawa area, flights of hundreds of kilometres and several hours are common. This workshop introduces the art and the science of modern day soaring. Soaring pilots range in age from 14 to over 80 and all ages will enjoy this workshop.

Course Objectives: This course introduces the theory of flight and soaring principles so participants will understand how an airplane can fly for hours without an engine. Participants will experience a soaring flight through a photo essay and video. An outline of the ground school and flight training programs are provided, along with an overview of the facilities available at the local soaring clubs.

We also included a short profile on SAC and soaring in Canada. The course takes three to four hours and we presented it in one night at one school, and over two nights at another school. We think the one night approach was better for students and teacher. So, what were the results?

I think, for a first time effort, they were very encouraging. We were able to attract a total of 18 students, each paying the course fee of $30. One interesting feature was that the students came from all walks of life, from people working at home to scientists and engineers to full-time students. While their backgrounds were quite different, they all left with a new-found enthusiasm for soaring and a promise to come out to the club when the season got started. In the end, we were successful in spreading the word about soaring within the local community, we actually made some money which we contributed to ⇨ **p22**

The
SOARING ASSOCIATION of CANADA

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

free flight is the official journal of SAC.

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

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

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

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Deadline for contributions:

5th **January, March**
May, July
September, November

L'ASSOCIATION CANADIENNE DE VOL À VOILE

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

vol libre est le journal officiel de l'ACVV.

Les articles publiés dans *vol libre* proviennent d'individus ou de groupes de vélivoles bienveillants. Leur contenu n'engage que leurs auteurs. Aucune rémunération n'est versée pour ces articles. Tous sont invités à participer à la réalisation du magazine, soit par des reportages, des échanges d'idées, des nouvelles des clubs, des photos pertinentes, etc. L'idéal est de soumettre ces articles par courrier électronique, bien que d'autres moyens soient acceptés. Ils seront publiés selon l'espace disponible, leur intérêt et leur respect des normes de qualité du magazine.

Des photos, des fichiers .jpg ou .tif haute définition et niveaux de gris peuvent servir d'illustrations. Les photos vous seront retournées sur demande.

vol libre 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 *vol libre* peuvent être reproduits librement, mais le nom du magazine et celui de l'auteur doivent être mentionnés.

Pour signaler un changement d'adresse ou s'abonner, contacter le bureau national à l'adresse à la gauche. Les tarifs au Canada sont de 26$, 47$ ou 65$ pour 1, 2 ou 3 ans, et de 26$US, 47$US ou 65$US à l'extérieur.

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looking for opinions

Should we hold a Canadian Nationals in Uvalde?

Jörg Stieber (Sporting committee) and **Dave Springford** (CAS)

RECENTLY THERE HAS BEEN a lot of discussion on the SAC Roundtable about holding the Canadian Nationals in Uvalde, Texas. We will try to summarize the discussion from the Roundtable and present the pros and cons of the idea. The idea of holding the Nationals in Uvalde has been kicked about by competitors during the Nationals for many years. Uvalde is known for its consistently good weather and holding a contest there almost guarantees ten out of ten flying days. The idea of holding the Nationals in Uvalde came up again during the Canadian Advanced Soaring AGM in July in Pendleton. Subsequently, some pilots who attended the US 18m Nationals in Uvalde in August 2000 put out feelers with the local organizers. Uvalde is a pretty busy place but there is a slot available in conjunction with the US Open Class contest in 2002. The SSA was asked to reserve this slot for the Canadian Nationals. Some of you may say, this is jumping the gun and we should have waited for SAC's blessing. We want to commend these pilots for their initiative because cancelling is a lot easier than trying to organize a contest at the last minute.

There were suggestions made during the Roundtable discussion that decisions are being made behind the scenes without the knowledge of, or input from, those affected and that if the whistle hadn't been blown the discussion never would have taken place. We want to assure everyone that there is no sinister plot to hijack the Nationals. As it turned out, someone who was not part of the project found out about the idea and people assumed that there must obviously be a hidden agenda of some kind.

The approach that the CAS executive took after the AGM was to discuss the concept with members of the Sporting committee. Both groups agreed it was an idea worth considering and CAS started a study to determine the feasibility of the concept. To date we have determined that Uvalde is available for 2002, that towplanes and infrastructure will be in place for the US Open Class at the same time, and that the entry fee including ten tows would be around US$500. Our next step was to contact current competitors (ie. all those who flew in the last five Nationals) with the information we had gathered and determine if there was enough support from within this group to consider holding the Nationals in Uvalde. At this point, the Sporting committee would make the proposal to the SAC Board. The current status of the project is to contact potential pilots and see if there is enough interest.

A number of pilots have spoken out strongly against holding the Canadian Nationals in the USA. The recently conducted CAS e-group poll indicated a low level of support for Uvalde. However, due to the anonymous nature and limited scope of the poll it is impossible to tell how representative the result is. For these reasons we ask pilots to respond to the questionnaire at the end of this article. This will allow a valid assessment of the opinions of the pilots who are affected.

A number of objections against holding the Canadian Nationals in the USA have been made. We see the following as the most significant that need careful consideration:

- *No involvement of local clubs and local novice pilots.*

The loss of the "club connection" is a serious concern, no doubt. But, we are currently talking about holding the 2002 Nationals in Uvalde, not all future Nationals. We don't feel that holding the occasional contest in the USA will have a dramatic impact on the participation of new pilots.

- *Cost might be prohibitive for some contestants.*

The cost to fly in Uvalde will be higher than flying the Nationals at your home ⇨ **p22**

GPS flight recorder tests

Jörg Stieber, SOSA

Jörg had the opportunity to test four flight recorders: the Cambridge Model 20, Volkslogger, Filser Colibri, and the Bonnière/CAS recorder. All the units were used without interfacing to a flight computer.

Cambridge Model 20

The basic unit is very compact and comes with an integrated antenna which requires the unit to be mounted in such a way that it can "see" the sky. (If this is not desired or possible, one can use the Model 25 which has an input for a remote antenna instead.) The unit has power inputs for battery and for a wall charger type power supply for convenient use when not in the glider. It has telephone jack output ports for the Nav Display and for interfacing the unit to the flight computer. Theoretically it can be interfaced to a number of flight computers but certain features are only available when used in conjunction with a Cambridge L-Nav. It can also be interfaced to a palm top computer but there still seem to be bugs in the software.

The 12 channel receiver locks onto satellites very quickly and is very stable in turns. During the 1999 Nationals I lost power for a moment about two kilometres from the finish line. By the time I crossed the finish line the recorder was back on and recorded a good finish.

Without the Nav Display, which is also the in-flight user interface, the flight recorder (FR) has to be set up before the flight using a personal computer. Once installed in the glider, it will flash a green light to indicate that it is receiving a position fix. The actual position recording begins when the glider reaches a certain speed and ends when the glider has stopped moving for some time. This is a useful feature which prevents the memory filling up with useless data while the glider sits on the grid. The recorder adjusts its fix interval rate automatically which means it records at a leisurely pace when on course and speeds up the rate when close to a turnpoint/startpoint. This feature allows it to make efficient use of its data storage capacity and still gets the data where it counts.

There is no problem when the memory is full, the recorder just over-writes the oldest data in its memory.

I would consider the Navigation Display a must when using the Cambridge recorder. In addition to the regular nav info such as distance and bearing to the selected waypoint and track of the glider, it provides a multitude of other information such as frequencies and elevation of airports, wind direction and speed (calculated from thermal drift), number of satellites received, etc. Its 4 button + "go" user interface is very intuitive and well documented. The left/right arrows cycle through the screens, the up/down arrows cycle through the options on the individual screens, the go button makes the selection. The flow diagram documenting all screens is on a single sheet of paper which can easily be carried in the cockpit.

The navigation to turnpoints is very simple and a beep marks the first recorded point in the observation zone (OZ). Unlike the Colibri and the Volkslogger, the Cambridge only recognizes cylindrical OZs (beer can), not FAI sectors. This is not a problem in competitions, since cylindrical zones are the norm there. However, on a badge flight a beep from the FR does not guarantee a position fix in the appropriate FAI sector and the pilot has to ensure by proper navigation that he in fact entered the sector.

Since I didn't want to experiment during the Nationals, I never used the task feature of the recorder. I just entered the next turnpoint and followed the nav instructions. One very handy feature is the possibility to set a standby waypoint. With the push of a button the pilot can toggle between the active waypoint and the standby. This is very useful when approaching a turnpoint. With the next turnpoint in standby it is easy to plan the outbound leg before reaching the turn. Once the turn is reached there is only one button to push for the next turnpoint to become active. Being able to monitor a standby waypoint is also very useful in situations where

Cambridge Data Recorder

The basic unit is compact and sturdy but lacks any user interface

Cambridge Navigation Display

In addition to the regular navigation info such as distance and bearing to the selected waypoint, the Nav Display provides a multitude of other information.

it is important to keep track of a landing field or airport while continuing on course — just in case things turn sour. None of the other flight data recorders I tried have a comparable feature.

The Cambridge model 20/25 system is very flexible in terms of how it can be mounted in the cockpit. The possibilities range from attaching it to a camera mount, using the Cambridge suction cup bracket that holds the recorder and the Navigation Display, or installing the display in the panel and the recorder either under the glare shield or behind the seat using the remote antenna.

Software The DOS based PC software has the usual functions for uploading turnpoint files, pilot info and tasks into the recorder, downloading log files as well as flight analysis. The DOS environment makes the menus and settings a bit cumbersome to use. However, with a bit of practice one will easily overcome this. Unlike most other flight data recorders, Cambridge records and downloads a proprietary file format which can be converted into IGC format after the download. Some people say the Cambridge format is even more tamper proof than the IGC format.

The flight analysis part of the software is excellent. It allows the data to be displayed in a variety of units of measurement and a good mix between metric and Imperial (distance in km, speed in km/h, lift in knots and altitude in feet). There are two main views, the overhead view which shows positions of turnpoints and track of the glider in a coordinate grid, and a vertical or barogram view which shows altitude over time with the turnpoints achieved. Both views have easy to use zoom features for detailed analysis. Data points are marked in green when altitude was gained and in blue when the glider descended.

The feature that sets the Cambridge software apart is the ability to run "maggot races". In a maggot race the FR files of a number of pilots who flew the same task run simultaneously. They can be displayed in both views, either in elapsed mode which starts them all at the same time, or in real time mode which puts them in the sequence they actually started. In the overhead view the gliders are displayed as different coloured flags with the foot print of the flag pole representing the position and its length representing the altitude. At the 2000 Nationals we had great fun watching maggot races over a beer at the end of the day.

The software can be downloaded including sample files at no charge from the Cambridge website. However, it will only display flights from other recorders if a Cambridge log file is present which is dated within 20 days of the flight to be displayed. This clever feature allows the owner of a Cambridge FR to display non-Cambridge files along with his own, but it prevents the use of the software by somebody who doesn't have ready access to Cambridge files. The purpose of this restriction is to prevent people from using the Cambridge software with other makes of FRs. The Cambridge system is widely used in North America, particularly in the USA. One of the Cambridge people is an active contest pilot who is usually present at higher level US contests. Somebody using the Cambridge system has a good chance of getting help from contest organizers and fellow pilots in case he has hardware/software problems. With other less well known systems one has to be far more self-sufficient.

Volkslo gger

The Volkslogger's black anodized aluminum housing is about the size and shape of a turnpoint camera. It is designed to fit into a standard camera mount.

In my opinion the Cambridge flight recorder offers the best features among the recorders I tried. However, it is also the most expensive system. Furthermore the choice of the GPS navigation/flight data recorder system is strongly connected to the choice of flight computer. It makes little sense to try to match a Cambridge flight data recorder to a flight computer of a different make.

Volkslogger

As the name suggests, the Volkslogger is a basic no-frills flight recorder. Its price is roughly half of the Cambridge package including Nav display. Sized and shaped equivalent to a small turnpoint camera, it fits perfectly in a camera mount. The antenna is mounted on top of the sturdy black anodized aluminum housing. The supplied mounting screw (camera type but a different thread!) fits in any of the three positions at the bottom of the recorder to fit a range of camera mounts. It comes complete with cables for power supply, interfacing to the flight computer as well as connecting to a standard serial port for downloading. A separate AC power supply for downloading is also included.

The user interface consists of three buttons and a large two line LCD display. The menu structure and three button interface are definitely not intuitive and does require practice and patience. When hooked up to a PC/laptop for data downloading or uploading of turnpoint/task info, the display tells the recorder's side of the story which is useful for troubleshooting.

In addition to TPs, the recorder's database accepts checkpoints and landing fields. An emergency function will return the five nearest landing fields. However, there is no function to isolate turnpoints from landing fields and checkpoints in the database which makes in-flight turnpoint selection somewhat cumbersome. There is no on/off switch. The FR starts recording as soon as it is connected to power, although with the latest firmware the IGC file will not start unless the glider is in motion. Unlike the Filser and Cambridge recorders, the Volkslogger will stop recording when the memory is used up. There is a low memory warning with an audio beep if less than 8 hours of memory capacity are left. The pilot then has the option of increasing the recording interval in flight to extend the remaining recording time. I found the repetition of the warning every few minutes annoying. It cannot be turned off.

Since the recorder creates a new file every time it's turned on, a power interruption in flight would result in a new file being started. It is recommended that a capacitor be

installed in the power supply line as a buffer to filter out the "flicker" when switching batteries. Declaring a task also starts a new file with the declaration information in the file header. Consequently, there is no need for the OO to enter a lock code. Entering and declaring tasks via the three button interface is possible but requires concentration and shouldn't be done in the air. The recorder accepts cylinders (beer can) and sectors with adjustable radii for turnpoints as well as start and finish lines. An audio signal indicates when a turnpoint OZ is reached. The FR switches automatically to a one second fix interval in the OZ or when the event marker is activated.

Installation and Compatibility In its most basic installation the Volkslogger only has to be connected to 12V power in order to function as a flight recorder and basic GPS navigation instrument. It has to be placed where its integrated antenna can see the sky. Since Garrecht, the manufacturer, does not sell flight computers, it is designed to work with a number of different systems. The Volkslogger has been proven to work well with Borgelt computers, ILEC SN 10 and WinPilot. Connecting the Volkslogger to WinPilot (runs on palm top computers) and using a Borgelt B50 for variometer input is probably the most economical solution for a complete GPS flight computer and recorder system. My only reservation would be the tendency to fly "heads down" to interpret the complex information being displayed on the small screen of the palm top computer.

Software The Achilles heel of the Volkslogger is its software. The DOS version is all right for uploading and downloading data. Creating turnpoint files and tasks is a bit cumbersome but workable. There is a function to import turnpoint files in ASCII format; unfortunately, the format of the ASCII file is not documented in the otherwise comprehensive (English) manual. Fortunately, John Leibacher's Worldwide Turnpoint Exchange *<http://acro.harvard.edu/SSA/JL/TP>* offers turnpoint data in Volkslogger format. The waypoint information is limited to a six character identifier, coordinates and a flag indicating if it is a landing field or an airport. Other recorder formats (ie. Cambridge, Filser) support additional useful information such as turnpoint number, description of the feature, elevation, radio frequency, etc.

Filser Colibri
The smallest FR on the market.

A significant shortcoming is that there is no provision for turnpoint numbers; landing fields, checkpoints and turnpoints are all mixed together and sorted alphabetically in the FR's database. The only way to overcome this is to manually incorporate turnpoint numbers in the six character identifier and use a different prefix (L) for landing fields.

The analysis part of the software will show the track with the declared turnpoints and a tiny barogram on the same screen. It is impossible to display turnpoints or tasks that were not in the original declaration. In my opinion it is best to use the VL software only for upload and download functions and to use other software such as Strepla or Coutraci to analyze the flight.

In addition to the DOS software, my Volkslogger also came with Windows software which seems to work only on the German version of Windows. From July 2000 the Volkslogger will be shipped with an OEM (scaled down) version of Strepla which can be upgraded to full Strepla at a reasonable cost. Strepla is regarded as the leading software for flight data analysis and flight planning.

Filser Colibri
The Colibri (Hummingbird), which is the smallest flight data recorder on the market, is about the size of a pack of cigarettes. It is priced a bit higher than the Volkslogger. The separate antenna, which is small and can be secured with Velcro, allows the main unit to be placed anywhere in the cockpit. On the flip side there is the antenna wire in addition to the power/data cable to contend with which can make temporary installations cumbersome.

The Colibri features mounting holes for upright or sideways mounting. The unit I tried had a tendency to lose satellite lock in tight turns. The reason could be either the Colibri's GPS engine (most modern GPS units use 12 channel engines) or a less-than-ideal antenna placement. The seven button user interface is fairly straightforward and includes an event marker. The two line display is fairly small and fades when it heats up. According to Solaire Canada, later units have an improved display. In addition to the large memory for flight data the Colibri's database can store up to 600 turnpoints, 100 tasks and an amazing 4500 airports. There is no need to worry about remaining memory capacity before takeoff since the Colibri simply starts overwriting older flights when the data memory becomes full.

Although its data output is in standard NMEA format, the Colibri obviously works best when connected to a Filser computer. (Filser has since come out with a low cost flight computer with integrated IGC approved FR.)

Software The DOS-based software utilizes standard function keys and is easy to work with. It has several nice features such as a function to show all turnpoints of the task enlarged on one screen which allows for quick verification. Another nice feature is the ability to re-fly the task at varying speeds while a readout on the sidebar shows the achieved average lift for thermals and the achieved effective L/D for glides between thermals. Task information can be entered after the flight.

Bonnière Flight Data Recorder
This recorder does not quite fit into this review because it cannot be certified by the IGC. However, since many Canadian pilots may end up flying in contests with one of these clever little boxes, I decided to include it here.

A few years ago, when flight recorders gained in popularity, it became clear that competitions accepting FR as well as camera evidence would be burdened with cumbersome rules and procedures. In order to take full advantage of the capabilities these new electronic gadgets offered, we had to go away from cameras entirely. The problem was the cost of IGC-approved recorders which were $2000 Cdn and up at the time. To facilitate the transition (if funding for the cost of the material could be found), Nick Bonnière offered to build simple and inexpensive recorders with the capability to record the

NMEA output from handheld GPS units. This seemed the ideal solution to the problem of making recorders affordable to all participants in a contest. CAS came forward with the funding and, with Nick donating his labour to design and assemble the units as well as to write the software, twenty recorders were built at a cost of about $50 per unit, and cameras could be dropped from the rules. CAS makes the recorders available to contestants for the cost of film. As more pilots acquire IGC flight recorders, CAS is selling off surplus recorders at the cost of a simple camera.

Installation and Compatibility The Bonnière recorder works with nearly all handheld GPS units (there were problems with Trimble and Eagle units). It is equipped with four different connectors to accommodate a variety of input and output configurations. Power can be supplied either directly or through the GPS hook-up. The most common installation includes one cable for power and one cable for input from the GPS unit. Since there is no read-out or antenna, the unit can be placed wherever it is convenient, for example in the luggage compartment. It records as soon as power and data are supplied. A flashing LED indicates when the unit is powered (red) and when it receives a valid GPS signal (green).

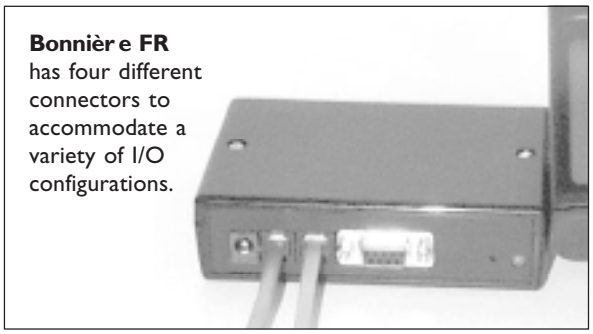
The recorder has enough capacity for one long flight. It's a good idea to clear the memory before every flight. This can be done after downloading, using a software command, or by pushing a recessed, well protected button on the back of the unit. This erase button allows contest officials to ensure there are no data present in the logger prior to launch.

The Bonnière recorder cannot be approved by the IGC because the connection between GPS and recorder is not secure by nature of its design. However, it is acceptable in Canadian contests including the Nationals and the Sporting committee is currently looking into the feasibility of using it for some badge documentation.

Software Initially, Nick provided DOS software with the following features:

- PC/laptop communication, upload/download
- Conversion of the log data to IGC format
- Flight validation and graphic display of log trace/ altitude trace.

The DOS software is simple but very functional and can be downloaded from Nick's website in seconds and it is free. Nick has now developed Windows-based software as well which he is also making available at no cost from *<www.magma.ca/~bonnfutt/Varicalc/NMEArecorder/>*. I want to take this opportunity to thank Nick for this outstanding support of competitive soaring in Canada. ❖



Bonnière FR has four different connectors to accommodate a variety of I/O configurations.

	Cambridge Model 20	Volkslogger	Filser Colibri	Bonnière / CAS
IGC approved	Yes - engine sensor incl.	Yes - engine sensor incl.	Yes - engine sensor incl.	Useable only for Canadian and perhaps US contests
Nav display	No display/user interface in basic unit. The add-on Nav Display unit has clear 4 line display.	Integrated large 2 line display adjustable contrast	Integrated small display, can be difficult to read when unit hot	N/A use the display of the GPS unit feeding the recorder
Flight computer interface	Yes	Yes	Yes	N/A
Event marker	Yes	Yes	Yes	No
Antenna	Integrated, or separate with Model 25 (US$70)	Integrated	Separate	N/A
GPS "engine"	12 channel	12 channel	11 channel	N/A
Dimensions (mm)	120 x 68 x 51	100 x 60 x 55	58 x 98 x 35	115 x 76 x 32
Weight (grams)	360	300	220	>100
Current draw (mA)	150	120	100	Very low + GPS
Memory	120 hrs recording time automatic variable rate	150 hrs recording time automatic variable rate 500 waypoints, 25 tasks	104 hrs logging time manual variable rate 600 waypoints, 100 tasks, 4500 airports	depends on speed of the GPS used – enough for one flight after which memory erasure recommended.
Software	Very good	DOS – needs improvement, Strepla has good reputation	Good	Basic but functional
Mounting	Very flexible	Camera mount	Difficult	Anywhere
Website [*www...*	*cambridge-aero.com/*	*segelflug.de/firmen/gcs*	*filser-electronic.de*	*magma.ca/~bonnfutt/ Varicalc/NMEArecorder/*
Price	Model 20 US$1090 Model 25 US$1090 + $70	$1325 Cdn shipping and taxes incl.	$1295 Cdn	$150 Cdn (availability limited)

Just 10 kilometres more

John Toles, Regina Soaring

I ALWAYS ENJOY reading about unusual landouts, so I feel I owe everyone a story. There is no great lesson to be learned here, except that there are two kinds of cross-country pilots — those who have an interesting landout story to share, and those who will. Landing out is a fact of life for soaring pilots. I probably hold the unofficial club record for the most. Although each presents its own challenges and a need for planning, most are routine on the wide open prairies of Saskatchewan. Occasionally, however, a flight provides a little extra excitement and a story that won't go away. It also helps keep alive the memory of a long time aviator, club member, and friend, Alfred (Tet) Walston who passed away last year.

Tet was the source of many great flying stories himself, having served in the RAF as a Spitfire reconnaissance pilot during the war. He continued his love for flying as a member of the Saskatoon Soaring Club until moving to the coast a few years back.

July 7, 1989. A group of Saskatoon members are enjoying a cross-country camp hosted by the Regina club at their home field near Strawberry Lakes. Mike Apps, who had recently completed a 1000+ kilometre flight from Edmonton to Winnipeg, is the guest instructor. We brought along the club Phoebus and a Blanik. The forecast looked good for a cross-country flight, so a task was set that would allow all to participate with Mike acting as the leader of the pack. He was in the Regina Grob, introducing one of their members to cross-country. I took the Blanik, with Tet along for his first cross-country experience in a glider. A Cirrus, ASW, and Jantar were also involved. A Blanik trying to keep up with glass ships? Why not!

Overdevelopment was a probability later in the day, so a rather modest course was set, a triangle of about 100 kilometres to the east with turnpoints at Wolseley and Montmartre. After a briefing, we were in the air by 1400. Release at 3900 feet, climb to 6000, assemble with the other gliders. So far, so good. Keep a sharp lookout — none of us is really experienced at sharing a thermal with more than one or two gliders. With everyone launched and ready, Mike reported he was starting on course, and that best-speed-to-fly between thermals was 90 knots.

Right! Now 90 knots in fibreglass is a slight nose down attitude and a comfortable rate of sink. At 90 knots with two in a Blanik, you are looking at a lot of ground! Seventy-five felt comfortable as we watched the rest of the field cruise past and become much smaller very quickly. As they were disappearing in the distance, a voice came on the radio suggesting that this was a good thermal, and time to get some altitude. It took about five minutes for Tet and I to reach the thermal, and we joined at a much lower altitude. Amazingly, with flaps out and a steep bank angle we were hitting 8 knots vertical, and flying a much smaller circle than the others. By the time they left, we were only about 1000 feet lower. This time, however, by the time we completed the climb and headed back on course, the rest of the field had disappeared to the east. Oh well! Who needs them anyway! It provided us with an excellent opportunity to share navigation and flying techniques and to plan for ourselves. My cross-country philosophy has always been to "get high and stay high". It may not win contests, but it usually gets me home and reduces the pucker factor considerably.

We can hear the others talking as they are rounding the first turnpoint. We are getting close, and with one more thermal, make the turn at 9800 feet. This is easy! We report our location, and the discussion turns to altering the task. The advice from Mike is to continue to Montmartre and stay on course. What are they talking about? What's the problem?

The second leg is the shortest to the south but angling back to the west. After about ten kilometres, we realize that we are gliding, but there isn't any cu ahead, and we have had no lift since Wolseley. Also the sky is darkening to the west. At 7500 feet it is time to assess the situation. If things were getting bad, why would the others continue? We discuss three choices: continue like the others, head back to the lift north of us and work our way back along the same course we covered, or take the shortest distance home. To continue with no more lift guarantees a landout. Not a big deal, but the Blanik is not the most fun to put on a trailer. At 7000 feet we are about 25 kilometres directly east of the field. The sky is really starting to overcast. Now at 6800, we have 4000 feet of height to use and still arrive with a safe circuit altitude. A quick calculation indicates that we should be able to fly at 60 knots. It's really starting to look black in the west.

The radio indicates that the Grob has made it back and is about to land, but is warning about gusty winds with a cell approaching the field. A few minutes later, there is another report of a glider choosing to avoid the cell over the field and land on the dry lake bed a few kilometres away. We are halfway there, but not making the ground speed expected.

What are we flying over? What had been cultivated fields most of the flight have become poplar bluffs and hills, with only a few open fields. We are directly east of the field, and following a road. At least it was a road. Now it looks more like a trail. We are now at 4000. Time to start looking for suitable fields and prepare for an outlanding if necessary. There is a rolling summer fallow field along the north side of the trail. Could be used, but small, sloping, and would make for a muddy retrieve if it rains. Best to keep following the trail and look for something better. We also note a clearing with two houses that look occupied. Now 1500 feet above the ground, and still no glider field in sight — just lots of trees and brush. What's happening to our trail? Instead of continuing west, it turns south and winds through the brush into a clearing. It looks like some sheds and cattle pens with ⇨ **p23**

The geriatric pilot

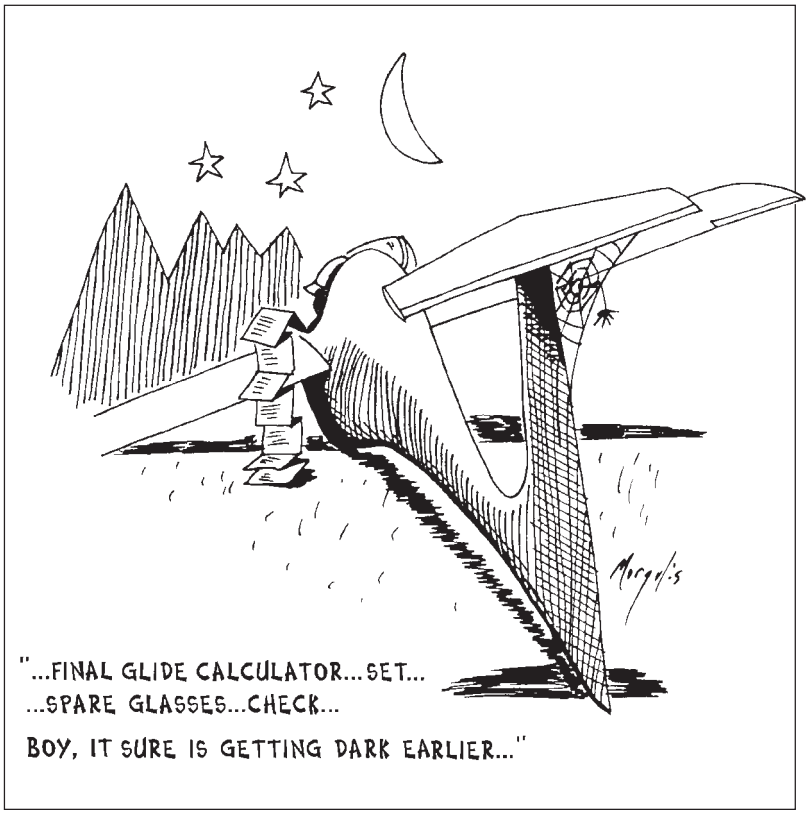
Sergio Colacevich, *from WestWind*

GERIATRICITY, WHAT AN AFFLICTION! Everybody everywhere from Australia to Sweden reports the same trend: glider pilots as a group are becoming older. Not only are they older, they are becoming less numerous. There simply isn't the influx of young people to replenish the number of pilots that retire, and to lower the age of the group.

There are reasons for this which are mostly economic — our sport has become so expensive. En mass, young people are going to hang gliding, paragliding, or microlighting. All these activities are less complicated, less regulated, and most of all, so much cheaper. Where is the young guy that may afford the capital and the recurring expenses of gliding? I myself started gliding when I was almost forty. I was introduced to gliding when I was twenty, but it was for me far above my financial capabilities.

There is a positive aspect to this: ours is an activity that may be continued until we become so decrepit that flying is easier than walking. Even if we begin at forty, we have 20, 30 or, in some cases, 40 years of flying ahead of us. And the increase in age does not go against proficiency — we continuously improve our skills until our weakened eyes can barely see the clouds outside the cockpit.

However, flying with an older body involves behavioral changes. There are things that we do at a younger age that we cannot afford to do as venerable old men. I experience this myself. There are people more experienced than me on this but I think I can share some of what I have learned in these few past years of decreasing youth. Hopefully, people transitioning from juvenile to ancient will benefit from my findings. I could have benefited myself if somebody told me ahead of time.



One may think that decreasing stamina and reflexes would be the primary causes of concern when aging, but it is not so in our sport: we sit there the whole time with little movement; and there is no need for prompt reaction time in soaring except for a short time when landing. No, the drawback is not there — it is in our loss of mental presence to the world.

When I was younger, I did not need a checklist. I was always well aware of everything. I knew for certain that the canopy was closed and latched, the air brakes had been tested, the tail dolly removed, radio checked, all ready to go, etc. I knew very well when to give the thumbs up, who was piloting the towplane, who was lifting my wing, where the good clouds were, where the other gliders were. I could see well in all directions, my field of vision unhampered by eyeglass frames. I knew everything at once and had no doubts.

Slowly, that has changed. Without my checklist I may forget to turn on the oxygen, to place the battery, to check the radio, to carry the telephone or the water or the map or the glasses or ... or, or, or. It doesn't happen that often mind you, but once a month is enough to spoil that day and because of the sense of constant worry, all the other days. What will I forget next time? My head?

So at a certain point I found out that the checklist is a tremendously useful invention. Even if I think I am okay, I still go through the checklist. The checklist is great not only because every now and then it actually detects something that was forgotten, but more importantly because of the sense of completeness and well-being due to full confidence — if I make it through the checklist, I know that everything is okay and I can go and fly with no worries.

Of course, one has to read the checklist not only with the eyes but with the mind: I already surprised myself going through the checklist reciting all the items and still missing something that was clearly written in there ... will it ever end?

Another drawback that younger people do not have is those little physical ailments. The older pilot assembles the wings the way it had been done many times before — and finds him/herself limping all day long with a hand on his/her back. Or one muscle of the arm becomes painful, and we have difficulty in operating the airbrakes. Or one leg becomes sciatically challenged, so that all our turns to the left are fine, to the right are pitiful.

There is a remedy here, and it consists in being careful when making abrupt movements or lifting anything from the wing to the trailer hatch to our wing wheel. When reaching inside the trailer from the front port, be careful not to extend ourselves in a stretched-out ⇨ **p21**

Surviving control system failures

Richard Johnson, *from Sailplane & Gliding*

CONTROL SYSTEM FAILURES are rare, but they can happen and they deserve careful thought. Some are relatively benign; others can be quite deadly. My purpose in this article is to suggest methods for avoiding a deadly crash should one of the worst types of control system failures happen to you. In many instances these suggested survival techniques apply to powered airplanes as well as gliders.

Rudder control failure If rudder control is lost, perhaps due to a broken cable or a disconnected pushrod, the results are usually quite survivable, although a crash or groundloop of some kind might not be avoidable. With the typical cable actuated rudder control system, each pedal is usually held forward by a relatively strong spring. If a cable breaks, that pedal will move to its fully forward position and no longer be of any use. The remaining cable and spring-loaded pedal will then move either partially or fully forward, depending on airspeed and the strength of the spring.

If your rudder pedals are equipped with stirrups, you can counter the spring effect simply by pulling the rudder pedal aft with your toes, thus considerably easing the resulting control problem. Alternatively, if your rudder cables are exposed in the cockpit area you may be able to pull the good cable aft far enough to counter the unwanted force of the rudder pedal return spring.

Otherwise you'll be forced to fly the rest of the flight in a slip. That should not be very dangerous providing you keep up your flying speed. Most aircraft steer fairly well with ailerons alone. However, a groundlooped landing is likely, so give yourself plenty of room for that! Also, be aware that flying in a slip will result in a higher than normal sink rate that needs to be planned for.

Elevator control failure Loss of elevator control is much more dangerous, and can easily lead to a fatal crash. In the event that the elevator control system was not connected at takeoff, it is usually best to abort the takeoff immediately. However, if too much altitude is gained before the disconnect is detected, it might be best to continue to higher altitudes where more time and a better solution might be available. Don't just sit there and wait for a crash; be determined to survive even if your aircraft does not! If your aircraft has a separate elevator trim system, it might function despite the elevator control being disconnected. This may not help with many sailplanes because their trim is achieved through a spring that is connected to an elevator control pushrod or cable in the cockpit area.

If your aircraft has wing flaps, deflecting them downward increases the effective wing-to-tail incidence (decalage) angle, and that might give you some pitch control. Airbrakes also often have some effect on pitch. Each aircraft is different, so experiment with all of your controls and learn their responses before you find yourself in an emergency. With powered aircraft the throttle often has a large effect on pitch.

If you find that the aircraft starts developing a pitch oscillation, you'll need to stop or at least moderate this or you will likely impact the ground in a deadly steep nose down attitude. An uncontrolled pitch oscillation usually consists of a series of increasingly violent nose-up pitches followed by increasingly severe dives. If left uncontrolled, there is little chance that ground impact will be made in other than a steep nose-down attitude. You need to avoid that by any means possible! Use your ailerons to bank when the nose starts to climb too high. Don't just sit there and assume that you can do nothing.

If for some reason the aircraft enters an uncontrollable dive, use the ailerons to roll inverted. That should reverse the dive to a nose up maneuver, although uncomfortable and inverted. Some time will be gained, and that will allow you to sort things out, even if only to jettison the canopy and make a parachute escape.

Aileron control failure An aileron control system failure usually consists of a disconnection of one aileron, with the other unaffected. Some aircraft are quite controllable in that configuration by using the connected aileron alone; others may tend to roll uncontrollably despite full opposite aileron being applied. In level flight the free aileron usually tends to float up (unload) with its trailing edge above its normal position, and that creates an unwanted rolling moment toward the free aileron. Often this can be countered simply by moving the control stick in the opposing direction. If the rolling problem persists and the aircraft has wing flaps that are coupled with the ailerons, the flaps should be moved to their full up position. That will allow the good aileron to achieve larger countering roll deflection angles.

All of the many aircraft that I can remember flying, both airplanes and gliders, have positive wing dihedral, like free-flight models. This means that the rudder can be used to slip the aircraft and create a significant rolling moment in the direction opposite to the slip. Right rudder creates a left slip and a right rolling moment. When rudder is applied to produce a slip, it effectively increases the leading wing's angle of attack, thereby creating a rolling moment in the direction to which the rudder was applied. Also, the air load on the vertical tail fin will usually add to the counter-sideslip rolling moments, thus creating additional positive effective dihedral.

Flying in a slip will increase the drag and sink rate, but otherwise the aircraft should be relatively controllable. However, the landing will likely be a bit awkward. Allow room for a groundloop because when landing in a heavy slip it will be difficult to avoid.

Should all of the above fail to stop the aircraft from rolling, there is still hope for a successful parachute escape. As the aircraft rolls inverted, push the control stick for-

ward to push out of the dive, and both regain altitude and reduce airspeed. Unless you practise aerobatics, this will be an unnatural maneuver. However, it will buy time and make it easier to first jettison the canopy, then release the belts and bail out.

Wing flap control failure If flaps are extended and the flap control system on one side fails, the air loads on the failed flap will normally cause it to retract. Obviously, the still extended flap on the other side will then act like an aileron and cause the aircraft to roll markedly. Depending on the relative sizes of the flap and aileron control systems, and the flap deflection angle, it may be possible to maintain lateral control with the ailerons alone. Even then it would be prudent to gradually retract the still connected flap to continue the rest of the flight in a symmetrical condition. A large amount of down aileron on one wing can easily lead to a wingtip stall and a spin.

If sufficient altitude and airspeed are available, the still-attached flap should be retracted to solve the roll problem. However, if airspeed and altitude are too low to safely retract the remaining flap and the ailerons alone are not sufficient to counter the flap induced roll, then you should consider applying rudder to create a counter-roll sideslip. However, that can be dangerous, and can easily lead to an out-of-control spin, so be very careful if you have to resort to a slip to prevent an out-of-control roll at low airspeeds!

Airbrake control failure An airbrake control system failure probably will consist of either one or both wing mounted airbrakes failing either to deploy or retract. If this happens, your ability to control your sink rate is quite limited. However, that should not lead to an injurious crash if you recognize the problem quickly and plan and execute your descent properly. Do glance at each wing anytime that you suspect that your aircraft might have a configuration problem. It may be better to make a controlled landing in trees than to crash through wire fences; and the tree landing is always preferable to losing control and spinning into the ground.

Should the failure be a single airbrake failing to close the problem can be very serious. The extended airbrake will cause that wing to create less lift than the other, but the ailerons will likely be able to compensate for that. If not, and if altitude and airspeed permit opening the other airbrake, then a symmetrical wing configuration is restored and normal flight (with a high sink rate) is possible.

If you find you must fly with only one airbrake extended, be careful to maintain extra airspeed when in that hazardous configuration. The combination of the one airbrake extended and its nearby aileron being deflected downward to compensate for the wing's reduction in lift creates an aerodynamically dangerous wing lift distribution that can lead to the wingtip stalling. A little too slow and a stall-spin can easily develop.

If both airbrakes fail to deploy, then a slipping and/or S-turning landing approach will almost certainly be needed. If your normal runway is not long enough to permit a safe airbrakes-closed landing, do not land there! Choose an alternate, longer runway or large cultivated field. Going through a fence with a sailplane should definitely be avoided, because often one or more of the wire strands will break through the canopy and cause grievous injuries to the occupants. Some countries require that their sailplane canopies be provided with a stout metal wire deflector to protect the occupants from that kind of injury.

A plowed field or a high crop landing invariably results in a very short landing roll. However, if such a landing is made at other than low speed, a nose-over (to an inverted attitude!) or a severe groundloop will likely occur. Practise the airbrakes-closed landing techniques with an instructor on your home field, if you are not already proficient at it.

Suggested flight training It is a good plan to experiment with control system effects, in whatever air-craft you fly. But do so only at a safe altitude, and consider having a qualified flight instructor aboard.

- Try controlling and maneuvering the aircraft while:
  not touching the rudder pedals,
  not touching the aileron control,
  not touching the elevator control.
- Fly with half and then with full rudder applied, noting the effects of rudder deflections on the roll and stall characteristics.
- With half and then with full aileron applied, can you control roll with the rudder alone?
- Without moving the elevator control, determine the effects of:
  flap deflections,
  airbrake extensions,
  rudder deflections,
  elevator trim deflections,
  landing gear extension,
  throttle settings.
- Trimmed at nominal level flight airspeed, bring the nose up to near stall, and then release the stick. If the aircraft is stable in pitch (almost all are), the aircraft will normally begin a pitch oscillation consisting of a series of dives and zooms. Without applying any force to the elevator, use aileron and rudder to eliminate the dives and zooms.
- Fly a landing pattern without airbrakes, relying solely on sideslips and perhaps S-turns.

Summary The above suggestions are the author's opinions. They are intended to provide ideas for pilots to think about, and hopefully will lead to plans to cope with various possible control system failures. Another purpose is to try to convince pilots that they should not think that it is their destiny to crash and die should they somehow have a serious control system failure in flight.

If all else fails, a pilot should by all means possible avoid a wings-level nose-down crash. Use the ailerons, if you can, to take the initial impact on a wing as much as possible, thereby deflecting and lessening the severity of the nose impact. When faced with an unavoidable nose impact, one should assume a fetal position with knees as far back as possible, and arms wrapped around the lower legs. It may seem unnatural not to take the nose impact with one's feet, but the fuselage structure is usually much stronger than a pilot's legs!

Also, be aware that if a major flight control system surface becomes disconnected, the critical flutter speeds are likely to be significantly reduced. So if you can, avoid flying at high airspeeds. ❖

Why can't we get a handle on this thing?

Mike Meier ©

IF I WERE TO ASK YOU to characterize the view that the "uninformed public" has of hang gliding, how might you respond? You might say that they think of it as a "death sport" or, at the very least, an "unreasonably unsafe activity". You might say that they think hang glider pilots are thrill-seekers who recklessly disregard the inherent risks in what they do. You might say that they are under the mistaken impression that hang gliders are fragile, unstable flying contraptions blown about by the winds that are only partially and inadequately under the control of the occupant.

The venue is hang gliding, but this article has powerful thoughts about the decision making process in safe flying.

If confronted by this attitude in a spectator, how would you respond? You might say that in the early days of the sport, it was true that hang gliders were dangerous, and pilots behaved in an unsafe manner. You might point out that in recent years, however, the quality of the equipment, the quality of training, and the level of maturity of the pilots have all improved immeasurably. You might point to the fine aerodynamic qualities of today's hang gliders, the rigorous certification programs in place for gliders, instructors, and pilots, and you might give examples of the respectable occupations of many hang glider pilots; doctors, lawyers, computer programmers. You might make the claim that hang gliding today is one of the safer forms of aviation, and is no more risky than many other action-oriented sports.

Later on, you might wonder, *"Why is it, after all these years, that the public still doesn't understand? Why can't we educate them about what hang gliding is really like, and how safe and reasonable it really is?"* So now let me ask you another question. What if they are right? What if they're right and we're wrong? And what if I can prove it to you?

Let's take a look. First of all, you have to admit that year after year we continue to kill ourselves at a pretty depressing rate. Anybody who's been around this sport for very long has probably lost at least one friend or acquaintance to a fatal hang gliding accident. It's true that we have seemingly made some improvement in the overall numbers in the last 25 years; between 1974 and 1979 we averaged 31 fatalities a year [in the USA]. Since 1982 we've averaged about 10 per year. In the last six or eight years, we may have dropped that to seven per year. However, our numbers are also down a lot, so my guess is that the fatality rate hasn't changed much, and almost certainly hasn't improved in the last ten years. I'd guess it's about 1/1000 per year, which is what I guessed it was ten years ago.

So the question is why? The equipment gets better and more hi-tech every year, we know more about teaching than ever, we've got chutes, and the rockets to deploy them, full-face Kevlar helmets, wheels, and radios for emergency rescue. We are all about twenty years older, and commensurately wiser and more conservative. How come we're not safer?

I've been asking myself variations on this question for as long as I can remember. Three years ago I had an accident, and in thinking about that accident I thought that maybe I had stumbled onto some little insight into the answer that I'll share with you.

Here's the story. We were out doing some production test flying at Marshall Peak in San Bernardino. We were landing on top, which we do whenever conditions are not too rowdy, because it vastly enhances efficiency. I've logged about 100 top landings a year at Marshall for the last fifteen years. Even so, I know for a fact that at the time I was not complacent. In two weeks, I was due to leave on a three week family vacation abroad, and I was thinking, *"You damn well better not get yourself hurt before your trip or your wife is going to kill you."* I wasn't anxious, the conditions were only moderate, I'd made lots of successful landings with more difficult gliders in more challenging conditions. I hadn't had an unsuccessful landing attempt in longer than I could remember, and I was relaxed yet focussed. My intent was simply to fly a perfect approach ... such intent is always a good idea when top landing at Marshall; the landing is challenging and a sloppy approach can quickly get you into trouble. I knew exactly where I wanted to be at every point in the approach — position, heading, altitude and airspeed. I executed the approach exactly as I wanted to.

You top land at Marshall half crosswind, gliding up the back side of the hill. You come in hot because the gradient can be extreme and there's often some degree of turbulence. The time interval, from 40 mph dive through round out to flare, is very short. I was halfway through this interval, past the point where one is normally rocked by whatever turbulence is present, when both my left wing and the nose dropped suddenly and severely. I went immediately to full opposite roll control, and managed to get the wings and nose just level when the basetube hit. Having turned 90 degrees, I was travelling mostly downwind, at a ground speed of probably 30 mph. The right downtube collapsed immediately, and the right side of my face and body hit the ground hard.

Very briefly, I thought I might die. Within a minute, I knew I was mostly okay. In the end, I got away with a slightly sprained ankle and a moderate case of whiplash. I had three weeks to think about the accident while I bounced around the rutted dirt roads of East Africa, trying in vain to keep my head balanced directly over my spine to moderate the pain.

The thing was, at the time of the landing, I never considered that I was anywhere near "pushing the envelope". I've done dozens of landings at Marshall where I *did* feel that way. All during the previous two summers I'd been top landing there in much stronger conditions. I had

never had a crash. Thinking about it, I couldn't even remember the last time I had broken a downtube. I tried in vain to think of a clue that I had missed which might have suggested that this was going to be a dangerous landing. Finally, I was left with only one conclusion. What happened to me was nothing more or less than exactly what the potential result was, during *any* of the times I had landed under similar or more challenging circumstances. That was a dangerous landing because of what could have (and did) happen. The corollary, of course, is that all the other landings I had done, on more challenging gliders, were also dangerous — in fact they were more dangerous. And they were so in spite of the fact that no bad results ensued in any of those landings.

Suddenly I felt like I was beginning to understand something that I hadn't previously understood. Here's how I think it works. *The overriding determinant of pilot safety is the quality of pilot decision making.* Skill level, experience, quality of equipment — all those things are *not* determinants. All that those things do is determine one's upper limits. More skill gives you a higher limit, as does more experience or better equipment. But safety is *not* a function of how high your limits are, but rather of how well you stay within those limits. And that is determined by one thing — the quality of the decisions you make.

And how good do those decisions have to be? Simply put, they have to be just about perfect. Consider the type of decisions you have to make when you fly. Do I fly today? Do I start my launch run at this time, in this thermal cycle? Do I have room to turn back at the hill in this thermal? Can I continue to follow this thermal back as the wind increases and still make it back over the ridge? Each time you face such decisions, there is a level of uncertainty about how the conditions will unfold. If you make the "go" decision when you're 99% sure you can make it, you'll be wrong on average once every 100 decisions. At 99.9%, you'll still be wrong once every thousand decisions. You probably make 50 important decisions for every hour of airtime, so a 1000 decisions comes every 20 hours, or about once or twice a year for the average pilot.

So, to be safe, you have to operate at a more than 99.9% certainty. But in reality, 99.9% is virtually impossible to distinguish from 100%, so for all intents and purposes, you have to be 100% sure to be safe.

Now I think we can begin to understand the problem. First consider this — we all have a strong incentive to make the "go" decision. It means I launch now, relieve my impatience to get airborne and avoid the annoyance of pilots waiting behind me, instead of waiting for the next cycle because the wind is a little cross and the glider doesn't feel quite balanced. It means I turn back in this thermal, and climb out above launch and stay up, instead of taking the conservative choice and risking sinking below the top and maybe losing it all the way to the landing zone. It means I choose to fly today, even though conditions are beyond my previous experience, rather than face listening to the "there I was" stories of my friends in the LZ at the end of the day, knowing that I could have flown but didn't, and knowing that they did and were rewarded with enjoyable soaring flights.

So the incentive is there to choose "go". The only thing we have to counter this incentive is a healthy respect for the possible dangers of failure, and our ability to evaluate our prospects for success. And here's where we get caught by a mathematical trap. Let's say I'm making my decisions at the 99% level, and so are all my friends. Out of every 100 decisions, 99 do not result in any negative consequence. Even if they're bad decisions, nothing bad happens. Since nothing bad happens, I think they're *good* decisions. And this applies not just to my decisions, but to my friends' decisions as well, which I observe. They must be good decisions — they worked out, didn't they? The next natural consequence of this is that I lower my decision threshold a little. Now I'm making decisions at the 98% level, and still they're working out. The longer this goes on, the more I'm being reinforced for making bad decisions, and the more likely I am to make them.

Eventually, the statistics catch up with me, and my descending threshold collides with the increasing number of opportunities I've created through bad decisions. Something goes wrong; I blow a launch, or a landing, or get blown over the back, or hit the hill on the downwind side of a thermal. If I'm lucky it's a $50 downtube or a $200 leading edge. If I'm unlucky, I'm dead.

If we can agree at this point that making 100% decisions is the only safe way to fly, it then becomes interesting to consider, as an aside, what the sport of hang gliding would look like if we all operated this way. Pilots would choose to fly in milder, safer weather conditions. They would operate much more comfortably within their skill and experience limitations. They would choose to fly more docile, more stable, easier to fly gliders. Landings would be gentle, and under control. Hang glider manufacturers would sell two downtubes and one keel for every glider they build (the ones that come on the glider) instead of three or four replacement sets like they do now. There would be far, far fewer accidents. (As it is now, there are about 200 per year reported to USHGA.) There wouldn't be any fatalities, except maybe for one every couple of years if a pilot happened to die of a heart attack while flying (it's happened once so far that I can remember).

Since this isn't anything like what the sport does look like, we might conclude that hang gliding, as it is presently practised, is an unreasonably unsafe activity practised by people who lack a proper and reasonable regard for their personal safety. In other words, we might conclude that the "uninformed public" has been right about hang gliding all along.

If you don't like that conclusion, I'm pretty sure you're not going to like any of the coming ones either. But let's first ask this question: if we wanted to address this problem of bad decisions being reinforced because they look like good decisions, how would we do it? The answer is, we need to become more critically analytical of *all* of our flying decisions, both before and after the fact. We need to find a way to identify those bad decisions that didn't result in anything bad actually happening.

Let's take an example. You're thermalling at your local site on a somewhat windy day. The thermals weaken with altitude, and the wind grows stronger. You need to make sure you can always glide back to the front of the ridge after drifting back with a thermal you've been climbing in. You make a decision ahead of time ⇨ **p20**

A quick review of pilot decision-making

Can't remember the important points? Here are some worth remembering when you are preparing for and on your flight.

Aircraft Is it airworthy? Who signed off the DI? Is the radio working? Yes, some clubs allow their trainers and tugs to fly NORDO when radios are fitted, because someone forgot to charge the battery overnight.

Pilot Are you ready for the intended flight? You have protection from the sun... *but* no peaked hat such as a large brimmed hat (dare I say Tilly?) or baseball cap should be used in the cockpit. These are okay on the ground during those long summer days though. A map for not getting lost, and food and water (most important) if on an extended flight.

Never let the glider take you somewhere that your brain didn't get to five minutes earlier.

Checklists These are our VITAL action lists such as CISTRSCO and SWAFTS. Start over if interrupted. And other pilots, *don't distract* those who are preparing for flight. If you, an instructor, see someone taking for ever on the pre-flight check, question their ability to go over the pre-landing checks also ade-quately.

Flight plan Have one — yes, it *is* a requirement that you notify someone of your intended cross-country task, or to file a flight plan. But also have a plan for improving your flying abilities, such as increasing your average climb rate (keeping a good lookout in the meantime) or checking what the glider will really do on a long glide back to the club. Locating suitable fields close to the club for an unplanned off-field landing is an excellent idea. We continue to have accidents from pilots trying to reach the club airfield when too low.

Judgement You continue to make decisions throughout your flying days. How about trying to improve here by learning from the mistakes of others? Training and practice of course are the other means of improving our judgement. That dual checkflight at the season's start is an opportunity to learn more from the instructor.

Navigation How about taking a good look at the maps before takeoff? How often do you only take out the map once airborne!? Take it home and study it at leisure after a flight; what alternate routes could you have taken, what ground features did you miss?

Out Always have a way out of a narrow mountain valley, and keep well in mind the winds (lift and sink sources) and likely wind changes during the day. Avoid being resigned to continue a flight when your SITUATION suggests your safest OPTION is to go back to a safer location.

Proficiency Be proficient on the sailplane you are flying, or get more dual instruction on a suitable type.

Rules Don't be anti-authority! Always follow the rules, others depend on us to do things correctly.

Suddenly Something happens that is a major distraction. FIRST, maintain control of the glider, then quickly go into the SOAR mode: What is the SITUATION? Assess OPTIONS, then ACT on the best and safest one, finally as you continue to fly the glider under control, REPEAT the process by assessing the now changing situation.

Takeoff Remember the OPTION item at the end of the pre-takeoff checklist? Have an emergency plan in mind. This is a conscious decision for actions to take in case of a pre-mature interruption of the launch, whether by tow or winch. What to do if the tug or winch quits at very low height, or at an intermediate or higher height, etc.

Vision Make absolutely sure you can see out of all areas of the canopy; your hat must not obscure any of your peripheral or direct vision above and to the sides. The canopy *must* be clean. Remember flying behind the tug towards the sun!? Any scratch or dirt is dynamite.

Weight and Balance Need any more be said? It is imperative that the glider is loaded correctly, and that in particular all lightweight pilots know the requirements (and changes of response between solo and dual) to take ballast with them. Also this ballast *must* be securely fastened; it must not be able to move under reduced-g or negative-g maneuvers.

X-Winds Know your glider's and your own limitations and do not accept that you must use the runway in use if you judge it is marginal. Catching wings and ground loops that could have been avoided have caused too many accidents.

You Know your own abilities and limitations. Are you okay for the flight; health, mental preparedness (calmness)? There is a tendency that all should be aware of, "Programmed Mind Phenomenon", which is a tendency to continue as programmed. This has caught out even top competition pilots! Things change and alternate actions are sometimes needed. Don't continue on blindly because this is what you planned earlier on! Keep your ears and eyes wide open, use all incoming information, and admit that height is lower and an outlanding is needed before it is too late for adequate circuit planning.

Zero accident rate This is an idealized goal. SAC's long-range goal is to reduce gliding accidents by a factor of four compared to past averages. This leads to our slogan:

SAFETY TIMES FOUR. All actions at all our clubs should be geared towards a four-fold increase in our safety, or in other words, an accident reduction rate of four times. Think about it! This requires a real concerted effort on all of us to make this kind of improvement. HOWEVER, if we are to get lower than general aviation in this country, this is the number we need to aim at!

Ian Oldaker,
Chairman, Flight Training & Safety Committee
Based on Transport Canada's TP 8753

Visibility markings on gliders fail sight test

Trials to test the visibility of contrasting Day-Glo paint markings on the nose and wing leading edges have been carried out in the UK under the supervision of Dr. Tony Head, Human Factors Group, College of Aeronautics, Cranfield University, with the support of the British Gliding Association.

"Conspicuity" tests were carried out with two Grob 109 motorgliders, one with markings. One motorglider flew a constant heading while the other approached from various headings, with the crews recording when sightings were made and the distances taken from GPS data. Crews were switched and tests repeated in a fully randomized manner.

Mean detection differences in sighting the marked and unmarked gliders were not statistically significant. The mean detection distance for all trials was 2.54 nm which, at a ground speed of 70 knots for each aircraft, represents a time to collision of 65 seconds for a head-on course. On two of the closest detection distances, time to collision would be 21 and 25 seconds. On one head-on run, no sighting was made at all. The danger of a pilot failing to maintain a good lookout for only 30 seconds is obvious.

There is evidence that breaking up the outline of an aircraft by painting it in different colours or by adding stripes, etc. effectively camouflages it, making it more difficult to detect. Thus there is good reason to preserve the clean outline of an aircraft by keeping it in one colour.

Keep looking around. There's always something you've missed.

While there is a need to evaluate other visibility aids, collision avoidance requires the best possible lookout at all times — even then, a target may pass by completely undetected.

from Sailplane & Gliding

You start with a bag full of luck and an empty bag of experience. The trick is to fill the experience bag before you empty the bag of luck.

A real premature termination of tow

I read Andrew Roos' article *Handling a PTT* in the 06/00 *free flight* with great interest and reflected upon a PTT incident which happened to me a month ago. I was flying dual in a K-13 out of a small airfield draped over the top of a hill in Wales. It had been raining for a week and the airfield was wet and muddy. This was to have been my second flight of the day. The takeoff would be challenging as the glider would become airborne as it crested the hill and it would then become necessary to "fly downhill" as the towplane continued its takeoff on the 1200 foot runway. The airfield sits 600 feet above the nearby village and valley floor. Local fields are small and ringed with impenetrable hedges.

I received a comprehensive site briefing when I first arrived at the field. By comprehensive, I mean literally walking each runway with the CFI and discussing departures and arrivals, circuits, topography etc. Takeoffs there are, naturally, all downhill. The good news is that in the event of a rope break much above the far fence you can generally reach the valley.

On the flight in question I performed my pre-flight checks twice, first the Canadian CISTRSC-O and then my instructor and I reviewed the BGA version which adds a "Ballast" component and the last part is understatedly termed "Eventualities". Twice I confirmed that in the event of a rope break I would retain control, below 150 feet land ahead in the fields below; above 150 feet head for the valley. We signaled "all-out" and off we went. The glider lifted off and I concentrated on staying behind the descending towplane. Moments later, midfield, at an altitude of about ten feet — you guessed it — *bang*, and I saw the towrope snaking off to one side. $#&?@!*, how did I manage to break the rope? I chided myself for a millisecond. Training then took over: keep flying the aircraft, get rid of the towrope — by then I was landing and looking at a small electric fence not all that far away. A firm application of forward stick planted the nose skid firmly on the ground and we stopped quickly.

As it turned out, because of the wet surface, the towplane was not accelerating to the pilot's satisfaction and he released me at his decision point. Much better to be let go midfield at ten feet than at the fence at fifty. We landed safely without much drama but my analysis of the event pointed out that while I had twice considered rope breaks, mentally I was landing beyond the airfield. I had not considered and rehearsed actions at very low altitude over the airfield. This introduced a "what-the-hell-was-that" delay in my decision making, the potential results of which are obvious. What I learned from this event is echoed in Roos' article, namely the requirement for a separate element of the options considerations. Mine now reads:

"In the event of a low-level rope break with sufficient runway remaining I will immediately release the towrope, deploy full airbrakes, and land straight ahead."

May I suggest that we consider adding this circumstance to the training syllabus giving options such as low-level, below 300 feet, over 300 feet.

Yves Bastien, MSC

Hangar flying

SparrowHawk 155 lb sailplane nearing production

A new ultralight sailplane is in development and the first one is expected to be out of the mold and test flying this spring. The designer is Greg Cole of Bend, Oregon. The SparrowHawk is a 32:1 lightweight sailplane whose design is optimized for mid-range performance rather than max L/D. Construction is almost all carbon fibre pre-preg cloth formed in molds and high temperature cured.

The primary design goal was "value" rather than lowest cost, value being defined as:

- docile flight characteristics with low landing speed.
- pleasant, responsive flight with slow thermalling speeds to use even weak lift.
- better than 20:1 at 70 knots for reasonable XC performance, even in wind.
- strong, durable, high quality construction.
- lightweight for very easy rigging and handling, launching with low-powered towplane/ small car or winch/ or even bungee, and classification as an ultralight glider.

If these goals are achieved, it will be a unique sailplane with no other approaching its performance and weight.

Modern airfoils allow the moderate performance goal to be met by a relatively small span glider, 11.1 metres in this case! The wing is of standard sandwich construction but using pre-impregnated carbon fibre cloth with high temp curing epoxy rather than the usual wet lay-up, room temp curing epoxy. The pre-preg cloth layers are laid into position in the mold, held by a vacuum bag, and cured at 270°F. The primary benefit in using this method over wet lay-up is about half the weight for the same strength. This is made possible because: hi-temp/strength resin is used, minimum resin weight is used as it has been machine-applied into the cloth, and denser cloth can be used yielding a higher fibre/resin ratio.

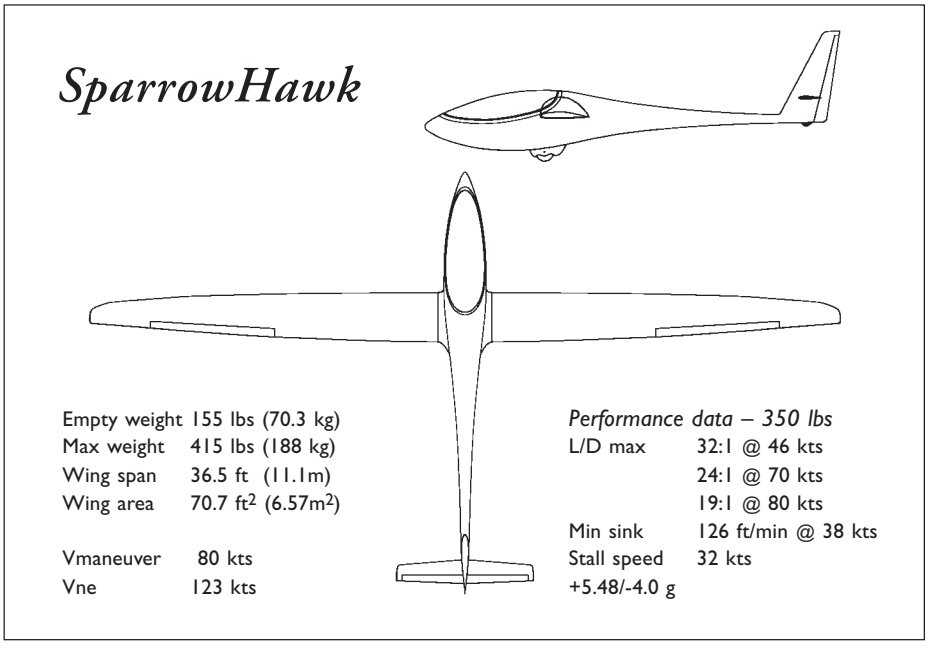
A secondary benefit is ease of use as lay-up can proceed in an unhurried way (mistakes can be corrected easily), and yet the hi-temp cure speeds reuse of the molds.

Structural testing will be critical to ensure safe margins while staying within the 155 lb ultralight definition. Each part of the glider must have the correct strength: areas too weak will be beefed up — areas too strong will be lightened. These mods are easily achieved by changing the cloth lay-up "formula" in the mold.

Flight testing will include the usual elements: general handling, stall/spin behaviour, flutter modes, glide path and landing control, and launch behaviour including car and aerotow. Of course, results of soaring flight tests are of particular interest: how well will it climb, how much wind will it handle, will it be able to exploit the "microlift" reported by proponents of ultralight soaring?

Actually being able to meet the weight limit of the ultralight category (FAR Part 103) is an important design goal. If it does it can be sold fully assembled without certification, registration is not required, and a pilot's licence is not required (although it would be a dummy who would try to fly without formal soaring training). If the weight cannot be met, it can still be supplied in the Experimental category like the *Russia* or it could be certified, and it is still certainly useable to fly for FAI ultralight class records which have a 220 kg gross weight limit. For more information, go to:
<*www.windward-performance.com*> and
<*cole@transport.com*>

from *WestWind*



Why is an aircraft cabin called a cockpit?

The term cockpit has been with us since at least the 1500s, although how it came to be used as the term for an aircraft cabin is something of a mystery (back then, it only had meaning as the place where cock fights were held). By 1635 the word was being used for the similarly-shaped lowest seating area in a theatre, and in the seventeenth century a London theatre was named The Cockpit. By 1706 the Navy had adopted the word: on a man o' war the name was given to a section on the after part of the "orlop" deck, below the waterline, used as quarters for junior officers and for treating the wounded during battle.

According to some sources, the room in the lower deck for the crew of a yacht or motor boat is still called a cockpit, as well as the area from which a vessel is steered. A watchman in the highest position is called a cock, and a hollow or cavity in any vessel is called a pit. The dictionary adds that a "cock" or "cockboat" is a small shallow boat — which sounds as if it might derive from its similarity in shape to a cockleshell.

It's unlikely that the term cockpit, as we use it today, derived from the French — even if the first animals aloft were a cock, a sheep and a duck, in a Montgolfier balloon at Versailles on 19 September 1783. The first horseman to reach the animals once they landed was Pilâtre de Rozier, who less than a month later became the first human being to ascend, and giving us the term "pilot". Another origin for cockpit would be the French word "coque" (shell or hull) which we still use in monocoque ("mono" from the Greek for single) from the construction.

But it's likely that the term is merely a carry over from the days yachtsmen used the term to describe an enclosed cabin on board ship. Sometimes the simplest answer is the most likely.

courtesy of **ArcaMax Trivia**

Vice-Admiral Harry DeWolf

Harry DeWolf died in Ottawa in December at age 97. He was the most highly decorated Canadian naval officer of WWII and was responsible for what historians regard as one of the most daring rescues of the war of torpedoed survivors off the French coast.

DeWolf was one of the first directors of the newly-organized SAC in 1946. He actively encouraged gliding as a recreational activity within the service. In the SAC 1948-49 Yearbook he wrote, "As many senior officers still retain the conviction that a man with experience in sailboating is potentially a better seaman than one without, and in light of the Navy's active interest in aviation, the argument [for support for the gliding movement] held water and a limited amount of support was obtained."

DeWolf was the officer responsible for having the famous three war-prize Grunau Babies and the Mü-13 brought to Canada on a Navy ship for the National Research Council for "flight testing".

A club was established at the Dartmouth Air Station with two US military surplus TG-3A gliders, but flew mostly at Greenwood, NS. Another Grunau Baby was at Dartmouth and was being built up from the remains of two machines obtained in Austria. Much of the rebuilding was done on HMC Warrior and Magnificent, and the presence of glider components on the two carriers aroused considerable interest and some speculation as to launching and retrieving technique at sea. However, the reason for their presence was simply because that's where the volunteer repair labour was!

NZ soaring promo video ready

You may recall the article reprinted in 3/2000 *free flight*, written by John Roake, outlining the worldwide decline in soaring membership. As a consequence the IGC has produced, via his office, *"Soaring – Your Sport for the New Millennium"*, a beautifully crafted 15 minute video on the sport to provide clubs with professional promotional material to support local membership and public exposure to the sport. With a new voice-over, it has been re-edited from the film used to produce the two very popular 1995 New Zealand videos, *Windborn* and *Champions of the Wave*.

The storyline introduces you to soaring by having a newcomer to gliding, an attractive young girl, experience her first flight and then go on to her first solo. It then takes you on to the further opportunities offered for either recreational or competition flying.

All of this takes place in the most spectacular scenery that you could imagine for flying, over green fields to the snow-covered Southern Alps, which presents the sport in a most attractive way. The video concludes with an exhortation to make it your sport and has space on the sleeve for contact details for your local club, etc.

The video is intended to be given away as a promotional tool to anyone that is considered a worthwhile prospect or for publicity purposes that any club wishes to use it for. The video costs US$2.90 each plus shipping and the minimum order of 135 comes to about $700 Cdn. It is available directly from John Roake, at <*gk@roake.gen.nz*>. Smaller clubs may consider pooling an order if the minimum order is a bit high for one alone.

On freezing the Sporting Code

There's been a bit of discussion lately on the FAI e-group arising from further proposals to be put before the next IGC meeting for more changes to the Sporting Code. Opinion settled into two camps: stop the incessant changes by freezing the Code for a few years except for correction of errors or omissions, or allow democracy to prevail since the IGC delegates can judge if proposed changes are unnecessary or not. Two major changes have added complexity to the Code in recent years:

- the introduction of GPS recorders and the attendant need to control FR security and define a new set of evidence requirements.
- the introduction of new tasks.

In time, we *might* see cameras phased out of the Code. Come that day, the Code will make a big jump in simplicity, but there is *no* appetite to remove camera/baro evidence until FRs get as cheap and simple to use as cameras and camera use withers.

It's true, the Code can't be swallowed whole any more and this has increased the confusion for the poor badge pilot — one best deals with the Code in bites as described by Walter on page 24. This frustration is expressed by a writer to the FAI e-group who said, "Two things bother me about the seemingly endless series of Code changes:

1 It's just too much trouble, especially for beginners, to try to understand the Code in the first place, and then to try to keep up with perpetual changes. If you really want to take the fun and participation out of badge and record flying, just keep moving the Code targets.

2 The free waypoints, remote starts and finishes and the zig-zag courses all contribute to devaluing badges and records. And all this at the same time that sailplane performance continues to improve. Imagine what the early Diamond pilots must think of today's badge flights. You can run the performance handicap numbers yourself and figure what a 500 is really worth these days compared to the original requirements in 1950–'60 gliders. A few months ago, I saw a fairly new soaring pilot complete a Diamond distance [ridge] flight in a contemporary glider using a remote start/finish and a zig-zag course... The pilot said later that the flight felt "sort of like cheating", and promised to do 500 "the real way" someday... I felt sorry for the above pilot to have done the Diamond distance and to have mainly felt embarrassment."

Badge flying really can't be judged in absolute terms either historically or geographically, it must be looked at relatively — the Dutch pilot looks at his performance against his mates, not Texans. Nevertheless, there is some truth to the above, I don't think the top distance badge should be "easy". How about a higher level of badge less than the relatively rare diploma flights? More yet added to the Code, you can't win.

Tony Burton

Why can't we get ... from page 15

that you will always get back to the ridge above some minimum altitude above the ridge top, say 800 feet. You monitor your drift, and the glide angle back to the ridge, and leave the thermal when you think you need to in order to make your goal. If you come back in at 1000 feet agl, you made a good decision. If you come back in at 400 feet, you made a bad decision. The bad decision didn't cost you, because you built in a good margin, but it's important that you *do* recognize that it was a bad decision. Without having gone through both the before and after analysis of the decision (setting the 800 foot limit, observing the 400 foot result), you would never be aware of the existence of a bad decision, or of the need to improve your decision making process.

This was one of the main ideas behind the Safe Pilot award. The idea wasn't to say that if you never crashed hard enough to need a doctor, you were a safe pilot. The idea was to get pilots thinking about the quality of their decisions. Not just, *"Did I get hurt on that flight?"* but *"Could I have got hurt on that flight?"* During the first couple of years of the Safe Pilot award program, I got a few calls and letters from pilots who would tell me about an incident they'd had, and ask for my opinion as to whether it should be cause for them to restart their count of consecutive safe flights. I would give them my opinion, but always point out that in the end it didn't matter — what was important was that they were actively thinking about how dangerous the incident had really been, ie. what was the actual quality of their decision making.

Looking back on it now, I would say that the criteria for a "safe flight" (any flight which didn't involve an injury indicating the need for treatment by a licensed medical professional) was too lenient. Today I would say it shouldn't count as a safe flight if, for example, you broke a downtube. A few years ago we had a short-lived controversy over "dangerous bars". The idea was that manufacturers were making dangerous control bars, because when smaller pilots with smaller bones crashed, their bones broke before the downtubes did. (Today, most of the complaints I hear are from the other side, pilots who would rather have stronger downtubes even if their bones break before the downtubes, because they're tired of buying $65 downtubes, which they're doing with some regularity.) I have a different suggestion for both of these problems. Why don't we just stop crashing?

Of course, I know why. The first reason is we don't even recognize it as "crashing". I continually hear from pilots who say they broke a downtube "on landing". (I even hear from pilots who tell me — with a straight face, I swear — that they broke a keel, or a leading edge "on landing".) The second reason is we don't think it's possible to fly without breaking downtubes from time to time. I mean after all, sometimes you're coming in to land and the wind switches, or that thermal breaks off, or you're trying to squeak it into that small field, and you just can't help flaring with a wing down, sticking the leading edge, groundlooping, slamming the nose (whaack!) and breaking a downtube.

We regularly observe our fellow pilots breaking downtubes, which also reinforces our perception that this is "normal". I'm going to go out on a limb here, I'm going to say that if you've broken more than one downtube in the last five years of flying, you're doing something seriously and fundamentally wrong. Either you're flying too hot a glider for your skills, or you're flying in too challenging conditions, or at too difficult a flying site.

Now let's ask one more thing. If hang glider pilots stopped dying, and if hang glider landing areas stopped resounding with the sound of whaaaack! every second or third landing (in other words, if hang gliding started looking like fun, instead of looking both terrifying and deadly), do you think maybe the public perception of the sport might change? Not that more of them would want to do it, but do you think maybe they'd stop thinking *we* were crazy for doing it?

Maybe they would. And maybe they'd be right. ❖

the geriatric pilot

from page 11

position, etc. Take care of ourselves — it helps our flying and it makes it safer. Of course, if one has some illness that could unknowingly be carried, remember that with the ailing and almost disabled body of ours, perhaps we are better off considering that today it is not really the best one we can fly on, and maybe we can just take a rest day.

And what about if something happens in flight? Years ago I could jump out of anything as if charged by a spring. Today I find difficulty in entering and exiting my car, let alone the cockpit. In a day that the flying is not so exciting, why not spend ten minutes in trying to get out the glider, paying attention to the little things that adversely affect the ejection like the oxygen tubes, the radio boom, water bag, the camera. Do we remember where the canopy ejection knob is? Are we prepared to jump out if we need to? Could we do it as well at 1.5g? The problem with acquiring more wisdom is that we think things over much more than we were used to. As boys we were doing things by instinct — we had trouble with methodical, organized things. As really mature people we are organized and methodical but we lack quick presence of mind.

I saw a TV program where they were showing just this kind of peculiar behavioral difference. Two groups, one made of teenagers, and one made of people older-than-me were compared. The test consisted in executing a number of tasks generated by a computer, many of which had to be accomplished contemporarily. You could see the people at work in front of the monitor, and how they were coping with the tasks. The teenagers were enjoying the game, did not worry about their mistakes, and they were doing fine. The quite mature people were trying to do everything right, concerned with errors and unfinished tasks, and they were in shambles.

In particular, one of the tasks was to follow a mark that was going slowly back and forth from left to right. The mark had to be hit so as to reverse its direction before arriving at one of the stops at either end. But this had to be done while other tasks were going on. The kids had no difficulties performing the other tasks and hitting the mark just before it arrived at the stop. The non-kids were unduly worrying and confused by the mark. It was comical to see them in front of the monitor, trying to accomplish other tasks and contemporarily following the inexorable movement of the mark. You could see from the movement of their heads that they were looking at the mark over and over, taking away the concentration from the other tasks, and in the end failing to hit the mark after worrying so much about it.

Shall we throw away our worries, and become careless and happy-going in order to recoup the brilliant promptness of youth? Well, maybe not, and we would not be very good at it anyway. It is probably better to follow our natural disposition and to make the best use of our acquired maturity. The best thing may be to recognize our limitations and take advantage of our strong points. So, do not count much on improvisation — rely on organization instead. We may think ahead about possible situations and try to solve them in our mind ahead of time, so that we are prepared when and if they really happen. Have checklists and follow them. Organize our cockpits so that we do not have trouble in emergencies. Organize ourselves so that we know what to do in every circumstance. Follow the rules more closely than before — we have become better at that now. And choose the right time to retire, perhaps listening to the advice of our good friends.

I realize that the concept of old age is very relative and nobody is really old when young at heart, and we soaring pilots all have young hearts. Nobody likes to consider themselves as old, so practically I am writing this article for nobody. But we can admit that one day (a far away day for us of course) we will become old, that this is a law of nature which we cannot escape. After all, we know that old people exist, we see many of them around. Therefore, this article is of interest to everybody. My dear old friends ... oops, I mean my dear friends, I hope that all kinds of lift will be with you always, and that you can wisely, rationally make good use of it in an organized way. ❖

Book Review – Tony Burton

EXPLORING THE MONSTER

by Robert Whelan

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This book is for you if you have any interest at all in wave flight and its history. In 1933, quite by accident, Wolf Hirth discovered mountain waves in Germany while soaring in the lee of the Riesengebirge [mountains]. After giving a brief history of the early days, the author jumps into the meat of the book with the post-war discovery and use of the awesome Sierra Wave which sets up in California's Owens Valley in the lee of the Sierra Nevadas.

By the late 40s, a group of soaring pilots in the Southern California Soaring Association were regularly getting to 30,000+ feet exploring the monster which, at that time, was quite unknown to the general aviation community and even to many practising meteorologists. They discovered that this wave could produce 2500+ ft/min lift as well as violent rotor capable of producing ±15g accelerations.

Scepticism from the experts about the claims of these SCSA "recreational" pilots prompted the beginnings of the famous Sierra Wave Project of 1951–52. This project grew with the interest and support of the USAF and the supply of two Navy Pratt-Read sailplanes that were specially modified and instrumented for the project by the SCSA group.

Whelan writes extensively of the flying lives of the major characters on the project: Bob Symons, John Robinson, Victor Saudek, Dr. Werner Klemperer, Dr. Joachim Kuettner, Larry Edgar and others. The conduct of the project itself is fascinating, and the book contains a wealth of photographs (many previously unpublished) which puts the reader right into the action. A photo of Symons wave soaring his P-38 *Lightning* with props stopped was arresting!

The book also relates the more noteworthy altitude and distance record flights that were flown at the time using wave, and of striking interest is the remarkable story of the events surrounding Larry Edgar's flight in which the Pratt-Read was literally ripped apart in rotor and he found himself out in midair with the nose of the glider caught in his boots.

"Exploring the Monster" is an altogether good read and I recommend it. ❖

Uvalde Nationals?

from page 5

club, but it will be similar to the cost of travelling to either the east or west. The entry and tow fees will be about $500 US for ten days. Compare this to the standard $250 Canadian entry fee, plus $30 per tow for ten days. Hotels are about $40 US per night. In total it will probably cost $500-1000 more to fly in Uvalde than in Canada.

- *Liability implications for SAC.*

This will have to be investigated, but it is not an insurmountable problem.

- *A Nationals in Uvalde is intended to replace competitions in Western Canada.*

Uvalde will not replace western sites. Western contests will still be held in the same ratio as they are now. We see this as an opportunity for eastern and western pilots to compete together in good conditions. A Uvalde competition might actually encourage more western pilots to compete than an Ontario site would.

We see as less significant:

- *Distance* It is about the same distance to Uvalde for both eastern and western pilots, and it is about the same distance as driving from Ontario to Alberta or vice versa. But in the case of Uvalde there is a very high probability of good racing weather.

- *A major sponsor might be opposed*

We don't currently have major sponsors (although we are working on it), but they may like the international exposure.

- *Canadian Nationals should be in Canada*

This is a nice sentiment, but most pilots attend the Nationals for *fun* and sitting at the airport in the rain is not fun. Racing for ten days in Uvalde will be fun. It also gives pilots an opportunity to combine flying the Nationals with flying in an exotic location. Usually, these two things are mutually exclusive since if you want to fly the Nationals all your vacation time is used and you don't have time left to fly elsewhere.

Considering these points we ask that pilots fill in the following questionnaire and send via e-mail or surface mail to CAS.

Questionnaire

- Name
- Are you a current contest pilot?
- When did you last compete at the Nationals?
- If you are not a current contest pilot, do you intend to fly a National contest in the next few years?
- If you are a western pilot, will you drive to eastern Canada to attend a competition in the next few years?
- If you are an eastern pilot, will you drive to western Canada to attend a competition in the next few years?
- Would you attend the Nationals in Uvalde in 2002?

Send to: 669 Milford Dr, Kingston ON K7M 6J1, e-mail: <*springford-d@rmc.ca*> ❖

a soaring promotion ...

from page 4

SAC, and we gained at least three new members for our club. So, was it worthwhile? You bet. What did we learn? For one thing, we realized that we should have approached the school boards a little bit earlier to ensure that we got a high quality picture in with the course description. We were able to do that for only one course and that one was much better attended than the other. We also learned that it's important to obtain a proper mix of entertainment and technical stuff — too much of the latter caused some eyelids to droop, particularly during a lecture given on the evening of a busy work day.

On the whole, it was a very positive and rewarding effort. I know that the people who attended the courses will from now on look at a nice summer sky and think about gliding at least as much as of ice cream castles in the air. And I guess that's what it's all about. ❖

The PowerPoint presentation referred to in Ulli's discussion above is available to interested clubs from the SAC office. ed

Just 10 km more

from page 10

the outline of a race track. It's open enough to land in if needed. Back to the west, the weather looks worse. Where the field should be is a wall of nasty looking cloud. Time to get on the ground. No suitable fields ahead. At 1200 feet, it is best to go back. The grassed clearing was level, firm, and open enough for a landing. We have time to select the best approach and landing area, have a really good look on downwind, make a radio call, then over the trees, turn final, and safely down in the infield. Tet hasn't been saying much, but is making up for it now! There is a sense of relief, but also bewilderment. Where are we and what do we do now? Relax Tet, let's get the glider turned into the wind and tied down while we can. We are just finishing as the rain hits.

We decide that Tet will stay with the glider while I walk to the house and phone for a retrieve. The yard looked close from the air, but seems a lot farther when walking in the rain. Along the road is a sign reading "CTK Community Pasture". Must be the manager's house we flew over. Hope he's home!

My knock at the door was answered by a large, shirtless gentleman who was quite surprised to have a visitor. He also told me there was no phone in the house. Well, what about the other house across the yard. Is there a phone there? "No phone", was the reply with a smile, and jokingly added, "if we need to talk we just build a fire and send a few smoke signals". This seemed a little strange, but I explained the situation with the forced landing, and the urgency of finding a phone. It was an hour since I had radioed our intent to land out, and I was getting a little concerned. He invited me to hop in his truck, and then stopped at the other house to pick up his brother.

I was also getting concerned after driving for 20 minutes with no buildings in sight! He finally turned north, pulled into a driveway, and stopped at a large, modern looking building. When I read the sign "Band Office" I finally clued in. After a brief discussion and a few laughs, we determined that I had landed on the pow-wow grounds of the Carry the Kettle (CTK) Indian Reserve. The office had the only telephone.

Although we landed less than ten kilometres from the glider field, the only road in was from the north, and with the heavy rain the retrieve crew elected to go around by the highway, then stay on the gravel roads. The trip took a little over an hour. In the meantime, I was anxious to get back and let Tet know all was in order. Also, the locals wanted to see the glider.

The phone call eased concern at the field, and with the weather clearing, the towplane made a pass over to confirm our location and help explain to the retrieve crew how to find us. We had lots of help getting the glider on the trailer, and after many thanks, handshakes, and a few dollars for gas for the truck, we were on our way for the hour long trip back to the airfield.

The next morning, I talked one of the towpilots into flying me over the area to take some pictures. It was also a hot topic at the day's briefing. We then learned why the others had elected to continue south to Montmartre and follow the highway back. As one of the Regina pilots stated, "Nobody around here flies over that area to the east. It's a reserve, and mostly hills and bush. I thought you knew that!" I now include a grid road map with my cross-country kit. It clearly shows the roads and the reserves.

Tet had another tale to add to his repertoire, and we both gained valuable cross-country experience. I get reminded of the story at most hangar talk sessions. It rates right up there with Keith's 300 kilometre flight and landout in southern Saskatchewan. The only problem was, his crew was expecting him to fly east along the Yellowhead Highway, and when he phoned from near Estevan, they heard Esterhazy, some 200 kilometres to the northeast. But that's another story. ❖

Discovery Channel does soaring

There is going to be a soaring episode on the *Flight Path* series on Discovery Channel. The program was to air this spring but is still not set at this time. Monitor *www.exn.ca* for the *Flight Path* series schedule (the 19 March is on homebuilding and ultralight evolution).

SAC news

Pioneer fund donors – 2000

Thanks to the following donors to the Pioneer Fund this year. The total donations for the year is $8152, up almost 30% from 1999.

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Snell, Robert
Soellig, Karl
Stachow, Klaus
Staufert, Dean
Sunley, Al
Thiele, Wolfgang
Trent, Peter
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Weir, Walter
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Badge work made easy

It's time again to renew the Official Observer list for all SAC clubs. This is done every three years in order to keep my list of active OOs current and correct. The Senior OO (or CFI) of each club *must* mail or e-mail to me a list of the active Official Observers in their club before *any* 2001 FAI flight claims are made. Claims signed by unlisted OOs will not be processed.

Thinking about doing some badge legs this summer? Why not have a look at the Sporting Code to find out what you have to do. Believe me, it's not safe to ask your Official Observer. Find out for yourself — it's not that hard to do. The Sporting Code was completely rewritten in 1999 and updated as of 1 October 2000 by Ross Macintyre of the UK and our own Tony Burton. It's much easier to understand than it was in the olden days, when I was a boy.

The new Sporting Code can be downloaded from <*www.fai.org/sporting_code/sc3.html*>. There is a choice of formats, pdf or Word. The Code is designed to be printed and read using the pdf file. The Word version uses a more universal font and has some pagination differences and is available mainly to allow users to translate the file as required.

If you decide on the pdf format, the file you download is *sc03-us.zip*. When unzipped you have ten files but you only need the big one, just over 122KB, named *SC3-Ltr-AL1-2000.pdf*. It's 44 pages long but you don't need the whole thing. However, what you do need you should print, so that you can easily work back and forth through the pages you require. First print out Chapter 2, FAI BADGES which is only two pages. Then you will also need Chapter 1, GENERAL RULES and DEFINITIONS which is six pages long and Chapter 4, VERIFICATION REQUIREMENTS and METHODS which is another 12 pages.

Now read the two pages of Chapter 2 and refer to Chapter 1 for definitions of the terms used. Only go to Chapter 4 when a reference directs you there.

See how easy that is? Do it! And then get out there this summer and fly your badge legs, fill in the claim form you can download from <*http://www.sac.ca/page12.htm*> and have your achievements recorded for posterity in the Canadian FAI Soaring Register.

Questions? E-mail me, <*waltweir@inforamp.net*>, or check out the *OO & Pilot Guide*, Annex C to FAI Sporting Code, which was contributed to and edited by Tony and is also available at <*http://www.sac.ca/page12.htm*>.

SAC Badge and badge leg statistics 1991 – 2000

	91	92	93	94	95	96	97	98	99	**00**	5 yr avg	% of avg
1000 km	0	0	1	1	0	2	0	0	0	**1**	0.6	167%
Diamond	1	1	3	1	2	4	1	0	3	**2**	2.0	100%
Gold	12	5	1	2	4	6	3	2	4	**5**	4.0	120%
Silver	18	11	3	11	12	16	8	17	17	**7**	13.0	54%
C Badges	59	28	44	55	42	39	30	34	33	**15**	30.2	50%
Badge legs	125	65	45	87	93	91	79	87	79	**67**	80.6	83%

You can see from the chart that year 2000 was not very good for badges. It was even worse than 1992 for C badges. I hope that this decline is a reflection of the poor weather in the east and not the general trend of our sport.

Note that the old Edition 7 of the *SAC Record & Badge Flying Guide* is now obsolete and should be discarded.

Walter Weir

New club contact page

The club contact data opposite has been reformatted with an emphasis on web data. Please check closely for changes or errors.

Coming Events

10 March **SAC AGM** Details on page 26, info updated on SAC website.

7 April **CAS Winter Soaring Seminar** La cité golf club, Hawkesbury ON. A one day seminar covering cross-country soaring techniques for novice and advanced pilots. If you want to start flying cross-country for fun or FAI badges, this is a day you cannot miss. Visit the Events section of the CAS website for more details <*www.sac.ca/cas*>.

le 7 avril **CAS conférence de vol à voile** Club de golf La cité, Hawkesbury, ON. Une conférence d'un jour couvrant des techniques de vol à voile à grandes distances pour les débutants et les pilotes avancés. Si vous voulez commencer voler à grandes distances pour le plaisir ou pour les insignes FAI, c'est une journée à ne pas manquer. Visitez la section Events du website CAS pour plus de détails <www.sac.ca/cas>.

3-8 June **Eastern Instructors Course** MSC in Hawkesbury, ON. For info and applications contact Tom Coulson (519) 651-2779 <*tcoulson@istar.ca*>.

17-23 June **Western Instructors Course** Chipman, AB. If interested, call Terry Southwood, (403) 225-4667.

27 Jun - 6 July **Cdn National Soaring Championships**, Rockton, ON. Practice days are 25-26 June and the contest runs from 27 June. CD Larry Springford.

SAC Clubs

Atlantic Zone

BLUENOSE SOARING CLUB
Pat Tye (902) 864-7736
club (902) 632-2088
www.chebucto.ns.ca/Recreation/BSC/

Quebec Zone

AERO CLUB DES OUTARDES
Gérard Savey (514) 621-4891

AVV CHAMPLAIN
Sylvain Bourque (514) 771-0500
www.echomtl.com/avvc/

CVV QUEBEC
Bruno Bégin (418) 337-4905
www.cvvq.net

MONTREAL SOARING COUNCIL
Peter Trent (514) 739-6182
airfield (613) 632-5438
www.flymsc.org

Ontario Zone

AIR SAILING CLUB
Oscar Boesch (416) 769-4000

ARTHUR GLIDING CLUB
10 Courtwood Place
North York, ON M2K 1Z9

BASE BORDEN SOARING
Ray Leiska (705) 424-2432 H
(705) 424-1200 x 2479 B

BEAVER VALLEY SOARING
Doug Munro (416) 466-1046
http://www/interlog.com/~kwithrow/beaver.html

BONNECHERE SOARING
Iver Theilmann (613) 687-6836

CENTRAL ONTARIO SOARING ASSN
Bob Leger (905) 668-5111 H
(416) 973-8534 B

ERIN SOARING SOCIETY
www.erinsoaring.com

GATINEAU GLIDING CLUB
Andrew Robinson (613) 226-7616
www.gatineauglidingclub.ca

GREAT LAKES GLIDING
Richard (416) 391-2900 (H)
Longhurst (416) 391-3100 X 4400 (B)
www.greatlakesgliding.com

GUELPH GLIDING & SOARING ASSN
Paul Nelson (519) 821-0153 (H)
www.thinkage.on.ca/~GG&SA/

LONDON SOARING SOCIETY
Sue & Chris Eaves (519) 268-8973
www.lonet.ca/res/mkeast/soar.htm

RIDEAU VALLEY SOARING
club phone (613) 489-2691
www.cyberus.ca/~rvss/

SOSA GLIDING CLUB
Pat O'Donnell (519) 753-9136
www.sosaglidingclub.com

TORONTO SOARING CLUB
Alex Foster (905) 773-4147
www.home.istar.ca/~boblepp/

YORK SOARING ASSOCIATION
(519) 848-3621 airfield
(416) 250-6871 info
www.YorkSoaring.com

Prairie Zone

PRINCE ALBERT GLIDING & SOARING
Keith Andrews (306) 249-1859 H
www.soar.sk.ca/pagsc/

REGINA GLIDING & SOARING CLUB
Jim Thompson (306) 789-1535 H
(306) 791-2534 W
www.soar.regina.sk.ca

SASKATOON SOARING CLUB
Brian Galka (306) 652-7966 H
(306) 956-7200 B
www.ssc.soar.sk.ca

WINNIPEG GLIDING CLUB
Susan & Mike Maskell (204) 831-8746
www.wgc.mb.ca

SWAN VALLEY SOARING ASSOCIATION
Brian Tigg (204) 734-5771

Alberta Zone

ALBERTA SOARING COUNCIL
Tony Burton (403) 625-4563
www.soaring.ab.ca

CENTRAL ALBERTA SOARING CLUB
John Mulder (403) 739-4449 H
(403) 216-4051 B

COLD LAKE SOARING CLUB
Box 5108, Stn Forces
Cold Lake, AB T9M 2C3
(780) 594-SOAR
www.jetnet.ab.ca/clsc

CU NIM GLIDING CLUB
Al Hoar (403) 288-7205 H
(403) 569-4311 B
www.soaring.ab.ca/free-flt/cunim

EDMONTON GLIDING CENTRE
(Air Cadets) Jason Acker
1203 - 11307 99 Avenue
Edmonton, AB T5K 0H2

EDMONTON SOARING CLUB
John Broomhall (780) 438-3268
www.freenet.edmonton.ab.ca/soar/

GRANDE PRAIRIE SOARING SOCIETY
Walter Mueller (780) 539-6991
www.soaring.ab.ca/free-flt/gpss/home

Pacific Zone

ALBERNI VALLEY SOARING ASSN
Doug Moore (250) 723-9385

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CANADIAN ROCKIES SOARING CLUB
Don Miller (250) 342-3201
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ews@soartherockies.com

PEMBERTON SOARING
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www.mountain-inter.net/soaring/

SILVER STAR SOARING ASSN
John Urbas (250) 542-0529
www.members.home.net/soar/

VANCOUVER SOARING ASSN
David Clair (604) 739-4265 H
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Bob MacPherson
Mike Morgulis

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The following badge legs were recorded in the Canadian Soaring Register during the period 7 Nov to 3 Dec, 2000.

GOLD BADGE

293	Jean Provencher	Quebec

SILVER BADGE

933	James Snow	Vancouver
934	Pierre Beaulieu	Quebec

***DIAMOND ALTITUDE** (5000 m gain)*

Robert Katz	Montreal	5110 m	PIK-20D	Lake Placid, NY

***GOLD ALTITUDE** (3000 m gain)*

Robert Katz	Montreal	5110 m	PIK-20D	Lake Placid, NY

***SILVER DISTANCE** (50 km flight)*

James Snow	Vancouver	50.1 km	PW-5	Invermere, BC
Pierre Beaulieu	Quebec	71.2 km	Pilatus B-4	St. Raymond, QC

***SILVER DURATION** (5 hour flight)*

André Lepage	Quebec	6:45 h	LS-7	St. Auban, France
Alain Boulaine	Outardes	5:10 h	Blanik L33	Bromont, QC

***SILVER ALTITUDE** (1000 m gain)*

André Lepage	Quebec	1800 m	LS-7	St. Auban, France
Jean-Guy Drolet	Quebec	1300 m	Pilatus B-4	St. Raymond

***C BADGE** (1 hour flight)*

2657	Richard Snow	Vancouver	1:07 h	Blanik L13	Hope, BC
2658	Nicolas van der Heyden	Outardes	1:00 h	Blanik L13	Bromont, QC
2659	André Verville	Quebec	1:02 h	Blanik L13	St. Raymond, QC

SAC badge statistics and some direction on badge paperwork made easy are on page 24.

SAC AGM

LA RÉUNION ANNUELLE DE L'ACVV

10 MARCH 2001, WINNIPEG

Ramada Marlborough Hotel
331 Smith Street, Winnipeg, MB R3B 2G9
< www.ramada.ca/winnmarl >

reservations: (800) 667-7666

AGM rate is $69+tax, single or double
$69 et taux le chambre

Activities

Friday

7:30 – 10:00	President's reception

Saturday

8:30–9:30 am	Annual General Meeting
9:30–11:30	TC seminar – Pilot Decision-making
11:30–1:00	lunch
1:00–5:00	Pilot Decision-making
7:30 on	Wine and Cheese with the Winnipeg Gliding Club

Note that this AGM has been scaled back in size and activities this year with no Sunday AGM meeting or Saturday banquet. Contact: Howard Loewen, (204) 489-1148, <*holoewen@home.com*>

Trading Post

Personal ads are a free service to SAC members (please give me the name of your club). $10 per insertion for nonmembers.
Send ad to editor, not to SAC office.
(Address at bottom of page 5 masthead)

Ad will run 3 times unless you renew. Please tell me if your item has been sold sooner. Maximum ad length is 6 lines and subject to some editing as necessary.

single seat

Tern, CF-BWA, 195h, basic instruments, enclosed trailer. $5000 obo, Walter Mueller (780) 539-6991 or Karl at <*ksoellig@agt.net*>

1-23H-15. Ser #68, built in 1964. 2500h, standard panel, open trailer is included. Good shape with a blue & white paint scheme. Asking US$10,500. Rob Harling, (416) 923-3080 W, (416) 425-6627 H, e-mail <*harnai@pathcom.com*>.

HP-14T, C-FAXH, 1400 h, good condition, full ilec SB8, Delcom radio, ELT, chute, A8A O_2 system with two bottles, Scott mask with mic, new hydraulic disc brake, very complete, easy towing trailer with new tires. For photos see <*www.soaridaho.com/Schreder/HP-14/C-FAXH*> Asking US$12,000. Mike Thompson (604) 534-8863, <*thompson_foundry@telus.net*>.

Std Jantar 1a, C-GXTS, 540h, all ADs done, no damage, basic instruments, ATR 720A transcvr, boom mike, two total energy varios with audio, trailer and ground handling gear, wing & canopy covers, solar charger, turnpoint camera, chute. $28,000. Al Sunley (780) 464-7948, <*alsunley@freenet.edmonton.ab.ca*>.

RS-15, C-GPUB, 2000h. Record and contest winning *Echo Echo* going for a *Russia*. Honest almost-Cirrus performance, Hollestelle winglets add much climb improvement. Cambridge & Filser varios, O_2, chute, encl trailer, misc RS-15 plans & odds & ends. $17,500. Tony Burton (403) 625-4563, <*free-flt@agt.net*>.

LS-4, C-GTGO, best kept LS-4 in country, winner of five Cdn titles, built '84, approx 1200h, all ADs, no damage, never left outside, 4a landing gear mod, Peschges computer, Dittel FSG 50 radio, Komet trailer. US$29,950. Jörg Stieber, (519) 662-2840 ext 224, fax (519) 662-2421, <*joerg@odg.com*>

SZD-55-1, C-FCYF, 433 h, completely refinished with Simtec Prestec. It has a light green tinted Mecaplex canopy, custom interior and this glider looks better than new. Asking US$35,000 plus trailer and instruments. Ed Hollestelle, (519) 461-1464.

two seat

2-22, C-FAZG, 2000 h, 1970. Hangared, new fabric in 1993. Basic instruments. Club aircraft, BSI. Sturdy trainer, trailer available. Erik Hagberg, evenings (613) 584-4636 <*Fitz@magma.ca*>

2-22E, C-FACS, 2093 h, ex-Air Cadet glider. Well maintained with open trailer, partners lost interest, $8000, Open to offers, contact Bernie Boehnke, (250) 765-8154, <*berniehpb@hotmail.com*>

Krosno - wanted, in good condition for MSC. Contact Roly Niklaus at (514) 685-2739 or George Couser at (450) 655-1801 or <*george.couser@sympatico.ca*>

magazines

SOARING — the monthly journal of the Soaring Society of America. Subscriptions, US$43, price includes postage. Credit cards accepted. Box E, Hobbs, NM 88241-2100. <*info@ssa.org*>. (505) 392-1177, fax (505) 392-8154.

NEW ZEALAND GLIDING KIWI — the monthly journal of the New Zealand Gliding Association. US$33/year (seamail). Private Bag, Tauranga, NZ. <*gk@roake.gen.nz*>

SAILPLANE & GLIDING — the only authoritative British magazine devoted entirely to gliding. Bimonthly. British Gliding Association, Kimberley House, Vaughan Way, Leicester, LE1 4SE, UK. US$43 per year airmail, US$33 surface, <*beverley@gliding.co.uk*>

AUSTRALIAN GLIDING / SKYSAILOR — monthly journal of the Gliding and the Hang Gliding Federations of Australia. $A94.80 airmail. Pay by Bankcard, Visa, MC. Gliding Federation of Australia, 130 Wirraway Road, Essendon Airport, Victoria 3041, SA. fax: (03) 9379-5519. <*AdminOfficer@gfa.org.au*>

MOTORGLIDING INTERNATIONAL — bimonthly jointly published by the Soaring Society of America and the British Gliding Association. US$34 per annum, (505) 392-8154. <*info@ssa.org*>

VOL À VOILE — une publication bimestrielle éditée par Aviasport. 300 F les 6 numéros. Tel 01 49 29 44 22 <*info@volavoile.com*>

misc

Glider trailer, suitable for 15m or Std class. Interior dimension - 26' long. Aluminum tube style, designed and built by SST. $3000 obo. Larry Springford (519) 396-8059, <*larry_springford@hotmail.com*>.

HP-18, unfinished kit or repairable damaged ship wanted. Chris (519) 578-8044.

LD200, electronic vario, audio, dual damping, no capacity req'd. $450. Gilles Séguin, (450) 377-5737 <*dgseguin@rocler.qc.ca*>.

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XU Aviation Glider repairs in all materials. Chris Eaves <*xu-aviation@sympatico.ca*>. (519) 452-7999, fax (519) 452-0075.

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Flying High Parachute sales, repairs, repacking, custom containers. Al MacDonald (403) 687-2225. <*www.flyinghigh.net*>

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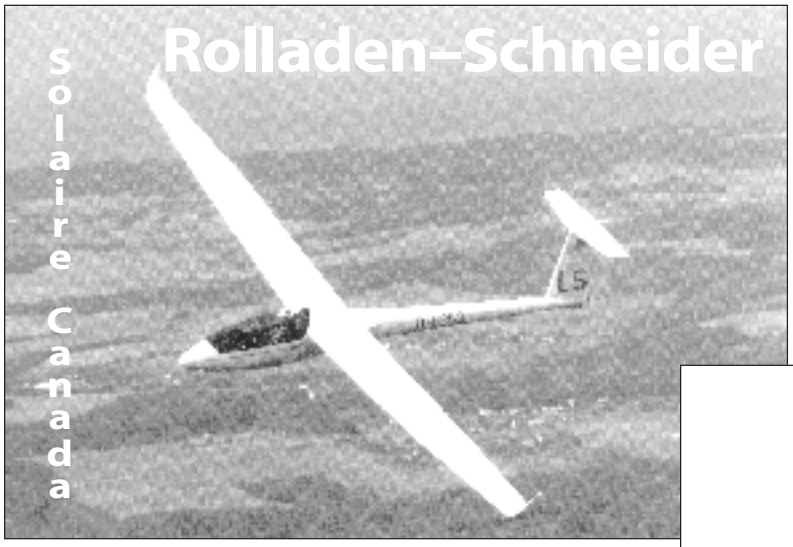

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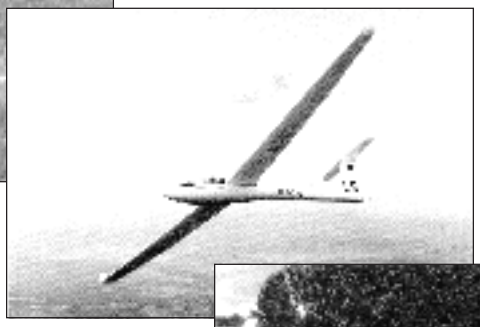

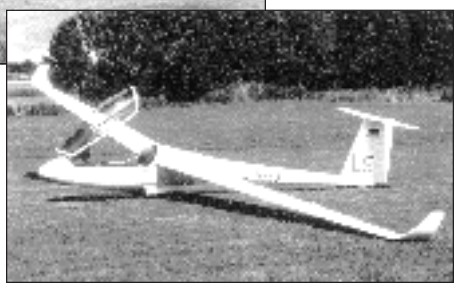

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