



free flight • vol libre

2/96
Apr/May



Liaison



I just returned from the AGM in Regina fully primed to tackle a new year of SAC activities. It was encouraging to see how a small club (Regina has about 30 members) organized the event so well. I want to thank Jim Thompson and his group for such an outstanding effort.

There is another small club that is also doing great things for SAC and its members. Randy Blackwell, Dave Mercer and their friends from Cold Lake are tackling another awesome task: the 1996 Nationals! To make the challenge more formidable, they are doing it in Red Deer, away from their home field. The organization is well prepared and promises to produce an event that all will remember. The 1996 Nationals will also determine the seeding list from which we will select the members of team SAC Canada for the 1997 World Soaring Championships to be held at Saint Auban sur Durance in France.

The 1996 season starts on a positive note as two new clubs — East Kootenay from British Columbia, and Wheatbelt from Sovereign, Saskatchewan are joining SAC. Welcome! This fares well relative to our membership objective of 1331 SAC members in 1996. I would like to remind all clubs that the office has new tools to help you in your recruiting effort: we have gliding micro-posters the size of a postcard that are a good vehicle to promote and advertise your club. MSC has used a similar item very successfully for a number of years. The second is a "cookbook" on club recruiting and promotion written by John Broomhall, the Alberta zone director. John has used these recipes to turn around clubs twice before. Under his presidency, the Edmonton club has been very successful in this regard.

Leaving the Board after eight years as director (one of these as SAC president) is Chris Eaves. Chris removed himself from the director-at-large nominee list in order to avoid a conflict of interest as he was elected president of the Aero Club of Canada. We wish Chris all the best as he takes on the daunting task of nursing this important organization back to health.

Finally, I want to welcome our new secretary, Raisa Vyriotes, who joined the office staff on March 4. Raisa reports to Jim, our executive director. Also starting his mandate following the AGM is the new Prairie zone director, Howard Loewen.

Until next issue, have a good, fun, and safe 1996 soaring season!

Deux notes importantes pour les membres francophones:

Un cours de formation pour aspirants instructeurs sera donné par Marc Lussier en mai. Le site choisi est Saint Dominique, the terrain de AVV Champlain. La formation se donnera sur deux fins de semaine de trois jours, celles des 18 et 25 mai respectivement. Veuillez contacter le bureau national pour réserver votre place!

Veuillez aussi prendre note que notre nouvelle secrétaire, Raisa parle français. Ce qui fait que tout le personnel du bureau national peut maintenant s'adresser à vous dans la langue officielle de votre choix. Raisa parle aussi le russe, sa langue maternelle.

Pierre Pepin president

free flight • vol libre

2/96 April/May

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

ISSN 0827 - 2557

12 ways to practise cross-country

4 what to do when soaring locally – *Maurie Bradney*

soaring New Zealand

6 sightseeing and flying the PW5 – *David Woodhouse*

drifting waves

8 lee waves are not always stationary – *Tom Bradbury*

1996 SAC AGM INSERT

1995 annual reports and the events of the 1996 AGM

en l'air et en français

15 a look at the soaring scene – *Jean Richard*



Cover

A beautifully restored LK-10, owned by Herrie ten Cate of SOSA, is preparing to launch at the International Vintage Sailplane Meet held at Elmira, NY in 1995. Herrie is looking for any photos and documentation on this ship. It flew in Kingston in the late 40s to early 90s. (see info "Misc" section on page 19)

photo: Gilles-André Séguin

DEPARTMENTS

5 **Letters & Opinions** — thanks for *free flight*, des points ou des positions (points or placing?), contest scoring needs change, a response to critique of SAC activities

10 **Training & Safety** — I blushes to tell you!, ça demande reflexion, radial tires on glider trailers

12 **Hangar Flying** — competition scoring by place standing, crash analysis, "flypast/survol" – a review of the national aviation museum collection on CD, K8 airworthiness directive, did you know?

17 **SAC Video Library** — current listing

12 ways to practise for cross-country when local soaring

Maurie Bradney, from *Australian Gliding*

QUITE OFTEN we find that a day has good soaring possibilities, but is unsuitable for cross-country. Some of the reasons can be: wind too strong, too short a soaring period, restrictions on the sailplane for club or other reasons, site not suitable. Rather than just milling about for an hour or so, some of the following items could be practised so that when cross-country is possible the pilot is prepared.

- 1 Work at centering all thermals rapidly. Use only a small number of methods and develop them to a high standard. Always use 35 degrees of bank or more. Practise using the turn direction you least prefer. After working the thermal, leave it and see if you can find it again lower down. Near the airfield is a very good place to practise picking up a thermal from low down. Take care when doing this not to interfere with normal circuit traffic.
- 2 On days which have an inversion, leave the thermal as soon as it weakens or becomes broken. This will probably be within 500 feet of the inversion.
- 3 Select clouds and fly to them. Note your successes and failures and try to develop recognition of the best working clouds.
- 4 If cloud streets develop, practise using them. Try this at different MacCready settings.
- 5 On blue days, lift will often street the same as it does when there are clouds. Usually it will be along the wind line, but on light wind days may be crosswind. Look for it and use it if it is there.
- 6 Practise flying a line and make a suitable allowance for drift. Learn to estimate the wind strength and direction. Use this to go as far as possible without thermalling.
- 7 Practise final glides. Remember: arrive at circuit height. You don't want the CFI to put an end to all your practise. Alternatively, make an arrangement with the duty instructor for you to practise a competition finish in an acceptable manner.
- 8 If other sailplanes are thermalling, practise joining them. Try not to frighten them or yourself.
- 9 Practise using the MacCready ring and estimating the strength of the next thermal. Try setting it too high over a run of three or four thermals and see the result.
- 10 Select a line and fly along it from one likely thermal source to another. Minor diversions may be necessary. This is a good one to try when the thermals are not going very high. Note your successes. This is also good to try with other sailplanes. See who can do it with the least height loss.
- 11 Look for waves. Check out every possible source. Note the appearance of the clouds where you have found waves. They will also occur on blue days. Visualize the method you used successfully on clouds and apply them in the blue.
- 12 Practise turnpoint photography on local features. It is easy, but does need a certain skill that will come with practise. Remember to get the results checked.

These are some skills to try rather than just a takeoff and landing. They needn't make the flight any less enjoyable, and may make it memorable. When you do come into land, make it a spot landing, just as if you were landing in a difficult field. ❖



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 a Canadian team for the biennial 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. A 3.5" disk copy of text in any common word processing format is welcome (Macintosh preferred, DOS is ok in ASCII text). All material is subject to editing to the space requirements and the quality standards of the magazine.

Prints in B&W or colour are required. No slides or negatives please.

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 SAC Zone Director whose name and address is listed in the magazine.

The contents of *free flight* may be reprinted; however, SAC requests that both the magazine and the author be given acknowledgement.

For change of address and subscriptions to non-SAC members (\$20 per year, US\$22 in USA, and US\$26 overseas - extended subscriptions available at cost savings), please contact the National Office, address below.

President	Pierre Pepin
Vice President	Harald Tilgner
Executive Director	Jim McCollum
Corporate Treasurer	Jim McCollum
Secretary	Raisa Vyrjotes

SAC National Office
111 - 1090 Ambleside Drive
Ottawa, ON K2B 8G7

(613) 829-0536 fax (613) 829-9497
email: bx271@freenet.carleton.ca

Deadline for contributions:

5 January, March
May, July
September, November

L'ASSOCIATION CANADIENNE DE VOL A VOILE

est une organisation à but non lucratif formée de personnes enthousiastes cherchant à développer et à promouvoir le vol à voile sous toutes ses formes sur une base nationale et internationale. L'association est membre de l'Aéro Club du Canada (ACC) représentant le Canada au sein de la Fédération Aéronautique Internationale (FAI), administration formée des aéro clubs nationaux responsables des sports aériens à l'échelle mondiale. Selon les normes de la FAI, l'ACC a délégué à l'Association Canadienne de Vol à Voile la supervision des activités de vol à voile telles que tentatives de records, sanctions des compétitions, délivrance des brevets de la FAI etc. ainsi que la sélection d'une équipe nationale pour les championnats mondiaux biennaux de vol à voile.

vol libre est le journal officiel de l'ACVV.

Les articles publiés dans *vol libre* sont des contributions dues à la gracieuseté d'individus ou de groupes enthousiastes du vol à voile. Le contenu des articles soumis est la responsabilité exclusive de leurs auteurs. Aucune compensation financière n'est offerte pour la fourniture d'un article. Chacun est invité à participer à la réalisation de la revue, soit par reportages, échanges d'opinions, activités dans le club, etc. Le texte peut être soumis sur disquette de format 3.5" sous n'importe quel format de traitement de texte bien que l'éditeur préfère le format Macintosh (DOS est acceptable). Les articles seront publiés selon l'espace disponible. Les textes et les photos seront soumis à la rédaction et, dépendant de leur intérêt, seront insérés dans la revue.

Les épreuves de photo en noir et blanc ou couleur sont requises; pas de diapositives ni de négatifs s'il vous plaît.

L'exactitude des articles publiés est la responsabilité des auteurs et ne saurait en aucun cas engager celle de la revue *vol libre*, ni celle de l'ACVV ni refléter leurs idées. Toute personne désirant faire des représentations sur un sujet précis auprès de l'ACVV devra s'adresser au directeur régional de l'ACVV dont le nom apparaît dans la revue.

Les articles de *vol libre* peuvent être reproduits librement, mais la mention du nom de la revue et de l'auteur serait grandement appréciée.

Pour changements d'adresse et abonnements aux non membres de l'ACVV (\$20 par an, EU\$22 dans les Etats Unis, et EU\$26 outre-mer) veuillez contacter le bureau national à l'adresse qui apparaît au bas de la page à gauche.

EDITOR

Tony Burton
Box 1916 Claresholm, AB T0L 0T0
tel & fax (403) 625-4563

Any service of Canada Post to above address. Commercial courier service, c/o "Claresholm Local Press".

COMMERCIAL ADVERTISING

National Office (613) 829-0536
email bx271@freenet.carleton.ca

Date limite:

5

janvier, mars
mai, juillet
septembre, novembre

Letters & Opinions

THANKS FOR FREE FLIGHT

Just a word of thanks for the great contribution you and Ursula have made with *free flight* over the years. For a diverse group such as in this sport, spread over the large area that is Canada, our magazine means a lot — especially for those of us who belong to small clubs or are isolated from the mainstream. The quality and reliability of *free flight* make it a first class publication, and I look forward to the arrival of each issue.

Paul Chalifour, Cranbrook, BC

The opinion du jour in "Letters" this time is contest scoring and all its perceived faults. The next letter is a rebirth of the concept of scoring by placing rather than points. The idea is actually a quarter of a century old, well before the time of most current pilots who are now contemplating contests as a means of broadening their soaring skills. In order to bring everyone up to speed on how this scoring could work, see the write-up in "Hangar Flying" on page 12.

Perhaps it would be worthwhile for the CAS and others to have a provincial contest or two scored both ways this year to see if this simple scoring system is worth revisiting.

The second letter on scoring is a serious critique on the specifics of the current points scoring formula by a pilot from Latvia who reads free flight. editor

DES POINTES OU DES POSITIONS?

Il y a peu de pilotes dans ce grand pays du Canada qui s'intéressent au championnat national de vol à voile. Cependant ceux qui participent désirent j'en suis sur, que le meilleur gagne.

Je n'ai jamais participé à un concours important mais j'admire la détermination et la persévérance de ceux qui participent. Ceci ne m'empêche pas d'avoir l'impression que le présent système où la somme des points cumulés par les participants ne rend pas justice à certains pilotes. Ce système qui permet de dévaluer des journées ne peut être juste. Il défavorise le pilote qui ne complète pas une journée. Evidemment il est impossible de contrer entièrement le facteur chance, c'est ce qui rend le sport du vol à voile si intéressant. Et probablement que le présent système souhaite favoriser le pilote qui complète son épreuve.

Présentement toutes les épreuves sont des courses de vitesse contre la montre. Celui qui est le plus rapide est présumément le meilleur. Lors des compétitions à Pendleton en 1995 si on regarde le classement sous

l'angle de la position journalière et non celui du cumul des points, l'on se rend compte que dans la classe Sport le pilote le plus performant est Tony Burton et non Alan Wood. Comme les règles définissent le jeu celui qui a le mieux fait dans les circonstances c'est Tony Burton avec deux premières places, deux deuxième places ainsi qu'une troisième et une cinquième place. Alors qu'Alan a réussi deux premières, une troisième et trois quatrième. Evidemment ceci est une évaluation subjective. Ce qui est recherché en fait c'est une façon de mesurer la compétence des pilotes sans facteurs subjectifs.

Soyez sans crainte je n'ai pas l'intention de proposer une nouvelle formulation du système de pointage, j'en suis incapable. Je propose cependant un nouveau point de vue. Tout en conservant le présent système de points qui détermine la position de chacun à chaque jour cessons le biais actuel à la fin de la compétition où la somme des points détermine le gagnant. Je propose que l'on cumule les positions journalières. Le plus petit nombre est le gagnant. Pour six jours de compétition six points est un score parfait. Et c'est celui qui a le mieux utilisé le système.

Voici ce que donnerait la classe Sport pour les quatre premières positions en 1995 à Pendleton.

CLASSE SPORT 1995

Pos	Nom	Jour	1	2	3	4	5	6	total
1	Tony Burton		3	1	2	5	2	1	14
2	Calvin Devries		2	5	1	2	3	2	15
3	Alan Wood		1	3	4	4	1	4	17
4	Hans Berg		5	2	3	3	3	6	22

Faites l'exercice pour les autres classes et vous serez surpris.

Il est peut-être encore temps pour Tony de réclamer les billets d'Air Canada auprès d'Alan! Bon vol!

Gilles-André Séguin

English summary ... I have never participated in an important contest but I admire the determination and perseverance of the participants. However, this doesn't stop me from having the idea that the present system — the sum of the points accumulated by the participants — doesn't give justice to certain pilots. A system that allows day devaluations can't be fair. It isn't fair to pilots who don't complete a day. It's impossible to counter the luck factor, but that's what makes the sport of soaring so interesting anyway. The present system seems to favour the pilot who completes his task.

At the present time all tasks are speed tasks. The one who is the fastest is presumably the best. At the competitions in ➔ p18

Soaring New Zealand

A little sightseeing and flight testing in the PW5

David Woodhouse
SOSA

PART OF MY WORK involves computers and I am a regular user of the Internet. I especially keep track of what is going on in the world of soaring by reading the newsgroup *rec.aviation.soaring*. During the fall, a group of comments were posted about the World Class winner, the PW5. The comments were mostly derogatory and also seemed to be contradictory. After checking the World Wide Web, I came to the conclusion that there was either one PW5 or none in North America. Since most of the commentary was originating in North America, I came to the conclusion that what I was reading was opinion based on little or no first hand knowledge.

Further "net surfing" brought me to the conclusion that the place to look at this glider was New Zealand. There were six there, and December and January are summer months in the southern hemisphere. I had collected a large pile of frequent flyer miles over the past year so, on the spur of the moment, I placed a call to United Airlines, did some quick calculations and booked a trip to Auckland.

I once again went to the Internet to post my trip intentions and a request for input and suggestions. I was overwhelmed at the response I got. Without having met or spoken to any of the people involved (other than through e-mail) my trip took shape with amazing speed. I do have to say that Ian and Kim Muga of the Wellington Gliding Club went far out of their way to make my stay comfortable, enjoyable and instructive. Thanks are also due to many others who provided shelter, transport, food, friendship and good advice throughout my trip.

Y'Puk My first stop was in a small town called Waipukarau, the site of this year's Central District Championships. This contest is similar to a regional or provincial contest. There were 40 gliders registered with entries varying from the venerable Ka6 through Discus, Ventus and LS-8. The contestants' experience level was equally wide, ranging from several first-timers to a seven time champion. I was struck by the level of interest and intensity displayed by the competitors. It never devolved into a "win at all costs" atmosphere and I was impressed with the level of cooperation and assistance given to newer, not necessarily younger, pilots both on the ground and in the air. The glider

frequency was constantly busy with useful and colourful commentary.

The weather briefing at the daily pilot's meeting was an absolute masterpiece. The common opinion was, not only did Bob Henderson provide an accurate review of the weather and how it would affect soaring for the next 5 to 7 hours, but it was easily understood. Bob did an outstanding job of translating "met speak".

The contest provided opportunities to fly in wave, ridge, thermal and convergence lift. On most days, you could count on using at least two forms of lift during the tasks. On one wave day, the Open/Racing class flew a 338 kilometre course while at the other end of the spectrum, the Sports class flew a 4 hour POST. The Club class was dominated by Ka6s but had three PW5s entered.

On one of the days, I was able to fly a Janus in the Sports class with Phil Gotlieb in the back seat to keep me out of trouble. During the 5 hour POST task, we flew for 4-1/4 hours, shot 11 turnpoints and covered 264 kilometres. Phil's local knowledge and flying skill coupled with my relatively strong stomach allowed us to win the day. Phil flew with a different person each contest day and still managed to place second in the class.

We all know what a high tech sport soaring is, but other unrelated technologies are starting to have an impact on flying as well. During one run down a convergence line, I heard a familiar sound, though not a normal one while flying, then listened as Phil suggested to his daughter that she "call her mother to give her a ride home". "Why? Because I am at 4000 feet over Waipawa!" Daughters seem to be the same in the southern hemisphere as they are in the north — I'll make it a policy to take my cellular phone with me when I fly, but only turn it on when I need it.

The airport is well situated with lots of large paddocks (fields) for landouts, a range of hills which provide wave or ridge lift depending on the direction and strength of the wind and a reliable sea breeze which causes convergence lines later in the day. When there is no contest, the airport is only open for flying Wednesday, Saturday and Sunday. The rest of the time the grass on

the runways is kept under control by sheep. Every entrance to the clubhouse is posted with a request that you "Check your footwear for effluent before entering".

On to windy Wellington At the end of the contest, I drove down to Paraparaumu with Trevor Helson. After depositing his DG-200 at the Wellington Gliding Club, I moved into the clubhouse for a few days of extremely interesting flying. The club is as close to a commercial operation as the law allows. They run seven days a week, offering open flying, instruction and "trial flights". The two critical posts of towpilot and instructor are currently filled by volunteers from the UK and the USA respectively. This arrangement allows people to build time and experience very quickly.

The club is located at the Paraparaumu airport which has a manned control tower until 6 pm daily. Flying alongside power traffic is not something I am used to. There is also an active skydiving club and a helicopter training centre on the field. The club has a very nice fleet which, as well as the PW5s, includes Blaniks, Ka6s, Libelles, a Twin Astir and a Janus A. These aircraft provide the club pilot with a great growth path and a wide variety of types to fly.

After a few checkrides, I was cleared to fly the PW5. Since this was the main reason for my visit to New Zealand, I felt pretty good about things at this point. I studied the pilot notes and the manual, then I sat in the glider and just got used to the look and feel of the craft. With one more quick briefing, off I went behind a Pawnee. The Pawnee is powerful, the PW5 is very light and we went up at something in excess of 1000 feet per minute.

You can't rush the takeoff. The nose/main wheel arrangement makes for a relatively noisy takeoff roll and the tendency is to try to lift off as soon as possible, but you have to be patient. On tow the craft is easy to control and I was able to trim it to fly virtually hands off.

At 3000 feet, the fun started. After clearing tow, I pulled up into a stall. With my weight (about 95 kilos) the PW5 mushes along but never really stalls. I did get it to stall using a slightly higher speed and a more abrupt pull up, but recovery was straight

ahead and normal in every respect. The controls are very light and well balanced, the roll rate was crisp, and it was very quiet in the cockpit. There was no thermal activity that day and I was not familiar enough with the area to head off into the hills to work the ridges, so I was unable to evaluate the way the ship climbs. (I have since flown in very light lift and I can say that this glider will stand up well against the Ka6 and the 1-26. At one time I was working some lift with a paraglider and pretty well held my own as we flew along a small hill.)

The landing was straightforward and the spoilers are very effective. As I was briefed, I made certain that I was pointing in the direction I wanted my rollout to continue. Once on the ground, the ship loses energy very rapidly and the nose wheel and main wheel make low speed maneuvering very difficult. The wheel brake really works!

I could go on and on about the PW5 but I will just say that it is a ship that allows a new solo student to hone his or her flying skills and prepare for a higher performance glider quickly and without risk. In my limited experience on the type, just over two hours, it seems to be without any obvious vices. I should also point out that of the six ships that were in the country, I looked at five and flew four. I noticed a bit of surface waviness on all the wings and the paint seems to have a tendency to stain. At first glance there is an impression that the canopy doesn't open up quite enough, but once you try to get in, there is no problem. The cockpit layout is very clean and logical with lots of room for even the larger pilot such as myself. The seat back and rudder pedals are both easily adjusted and unless you are a sumo wrestler or a pro basketball player, you should fit into this airplane quite nicely.

Two things I would like to see changed are the location of the canopy release and the trim control which requires downward pressure on a button while sliding the lever backward or forward. These are minor inconveniences in my estimation.

My stay at Wellington could only have been improved upon by better soaring conditions. I was made to feel like one of the regulars and had a wonderful time.

Plenty to do in the Bay of Plenty

It was my plan to head south to Omarama and fly at the site of last year's Worlds but it seemed to be raining on the South Island the whole time I was there, so I decided to go back up the island. My next stop was the Tauranga Gliding Club in Tauranga, a six and a half hour bus ride away. Situated on the Bay of Plenty, Tauranga has much to offer in the way of history, kiwi fruit (have you ever tried kiwi fruit wine?) and gliding. While I was there, a replica of Captain James Cook's ship, "Endeavour" made a visit to the port.

Within ten minutes of my arrival at the Tauranga club, I was in the back seat of a

pink, yes pink, K7. Having never flown the ship, never flown a tow from the back seat and flying out of a new airport, I thought I did fairly well. The next day brought high cloud and an opportunity to get another checkout. This time I was to do the check ride in a Puchacz, another new type for my log book.

At Tauranga, there was less concern that I prove my ability to fly but that I understand the required radio procedure for the control tower. Like the Wellington club, Tauranga shares the field with a power club, training facilities, and a couple of daily scheduled commercial flights. Since the field is in an urban area, the search for lift must be done with great care. Once high enough to venture away from the field to the south and west, the soaring opportunities really open up. Flying becomes very relaxed as everywhere you look, huge fields offer lift in the sun and easy landings when the day ends unexpectedly. I did get checked out for the PW5 here and had some fun flying around Mount Maunganui with a paraglider.

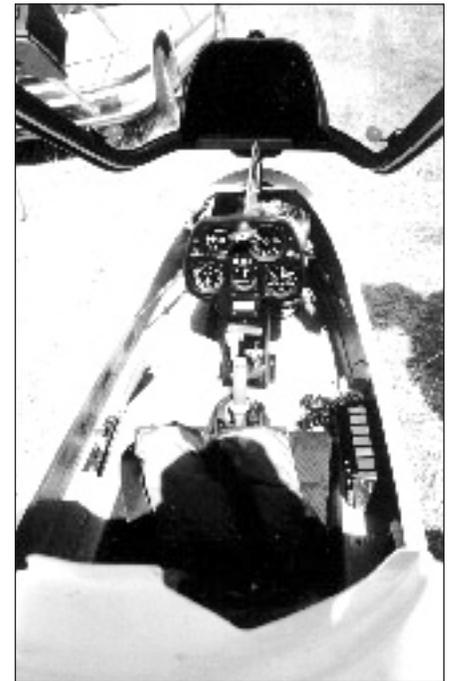
My attention got diverted from soaring to other things by John and Noeleen Borman who adopted me and included me in the Tauranga Flying Club's (a power flying club) participation in a fund raising effort called "Blues, Brews and Barbecues". Part of this activity involved moving a Cessna 152 on a flatbed truck 8 kilometres over city roads at 6 am to the site of the festivities and back again the next day at the same time. It all turned out to be a great deal of fun and the flying club made some money.

Dreary weather in Drury It was getting near the end of my vacation and I wanted to visit at least one more club. Matamata, the site of the Nationals the week after I was scheduled to leave was next on my list, but a Scout flying school had closed the airport to all other activities during my planned visit, so Drury and the Auckland Gliding Club became the closest and most convenient alternate.

Mother Nature was to prove uncooperative

for the last weekend of my stay. Saturday dawned overcast and cool and this weather persisted throughout the day. I did get a chance to meet some of the members and check out the fleet. Sunday was a little better and I got into a Krosno KR-03 (another new type) and had a quick checkflight.

I liked the KR-03, it is very stable and easy to fly, but I was unprepared for the rate of descent that results from a full spoiler approach. The soft ground and the good suspension system in this ship helped lessen the blow to my ego and my checkpilot's back. Unfortunately the rain came back as I sat on the line waiting to launch. It made me feel a little better to hear the angry whine of the Turbo Ventus approaching from downwind at a relatively low altitude after a launch no more than 20 minutes earlier. Nothing was staying up. → p9



Two views of the PW5 flying at the Auckland Gliding Club in Drury. David Woodhouse



Drifting Waves

Lee waves are generally essentially stationary systems through which the air travels, but there are exceptions which make wave soaring a skill which has to be learned.

Tom Bradbury
from Sailplane & Gliding

THE FIRST THEORIES of lee waves assumed that the undulation was set off by a mountain ridge lying more or less at right angles to the wind. The temperature profile most suitable for waves showed very stable air at low levels capped by a deeper layer of a less stable air aloft. The wind direction needed to be fairly constant while the wind speed increased with height. Wally Wallington soon noticed that the most common situation had a shallow unstable layer at the bottom, then the inversion and finally a deep layer of low stability aloft. Figure 1 illustrates the classic profiles of temperature and wind speed on the left and the distribution of lift on the right. The profile of wind speeds is an average taken from a large number of days with climbs of three kilometres or more.

Mathematical models In the days before computers were commonly available, mathematicians such as RS Scorer wrote a set of equations to calculate the forms of lee waves. These generally assumed that the atmosphere had reached a balanced state with the wave flow steady. This simplified the equations but even so they were extremely tedious to solve manually. It was many years before powerful computers became so common that experimenters were able to write more realistic equations. These can show how the wave form develops with time and may change dramatically over an hour or two.

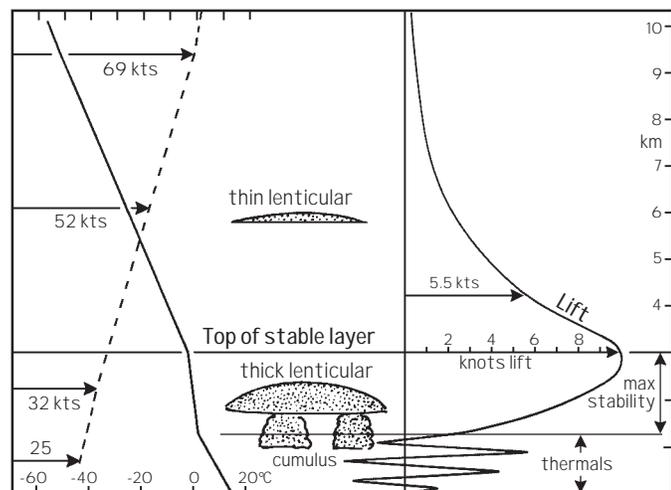


Figure 1 Profiles of temperature, wind speed, and lift in a lee wave.

Water waves Even the nonmathematical can see that wave flow changes with time. Atmospheric waves are often hard to see unless prominent clouds develop in the wave crests. Even then the changes are apt to be too slow to notice. Waves on water are easier to watch and can be quite instructive. A pleasant observation point is the bridge over a shallow river or stream, preferably near a village pub. The flow pattern often contains standing waves as well as semi permanent eddies.

One might suppose that the current of water would be steady enough for any lee wave pattern to persist indefinitely. In fact the waves downstream of a submerged obstruction tend to drift off station, collapse and then reform at their original position. A similar effect influences atmospheric waves. Waves in the atmosphere are less likely to be stable than water waves because there are more variables. In a steadily flowing river the waves show up at the discontinuity between dense water and rarefied air and both the water level and river speed do not change significantly. Atmospheric density discontinuities are far less and layers above and below experience changes of stability and velocity which alter the resonant wavelength. For example if the wind speed decreased steadily the wavelength would shorten and the wave amplitude increase.

This is shown in Figure 2. In the last example (D) the wavelength became too short and the system collapsed. In some circumstances the steepest wave and the strongest lift occurs in stage (C) just before the critical speed when the wave ceases. Big lee waves are usually steady.

Many pilots get their first wave soaring experience at a site near the mountains where there is at least one big ridge to trigger off a wave. On a good wave day the wave stays anchored to the ridge and extends high above the peaks. The ridge supplies the initial impulse and, if the atmosphere is tuned to resonate at a certain frequency, the

wave holds its position long enough to be called a "standing wave".

The availability of GPS has made it much easier to tell if a wave is stationary, particularly when the air is too dry for any upper cloud to form or too moist for any wave slots to reveal the ground.

Weak waves are more likely to drift

Waves tend to weaken if the depth of the stable layer decreases and if the wind speed changes through the deep layer associated with wave flow. The effect of these changes can be to broaden the tuning of the atmosphere so that one single wavelength is no longer dominant. Then oscillation may become possible at several wavelengths and the actual wave may seem to move about.

Some visible indications

Very thin lenticulars are often shown in text book illustrations of wave clouds but these elegant formations are often associated with very low amplitude waves. A deep lenticular is a good sign but a thin high lenticular may just mark the weak upper limits of a wave system.

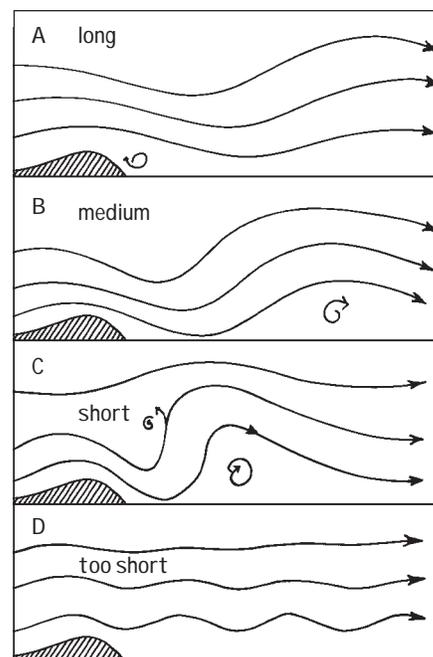


Figure 2 A decrease of wavelength moves the primary wave and alters the steepness and amplitude of the streamlines until the system collapses.

Cumulus and waves

It has long been known that cumulus may set off waves. This occurs chiefly when there is an increase of wind upwards. The air aloft travels faster than the cu which act like hills forcing the upper flow to rise and fall as it passes over the active clouds. The effect fades out when the cu loses its lift. If the thermal inside dies out the cu becomes passive and starts to drift with the wind. One can often see such cloud tops bent over by the stronger wind aloft. Bending is soon followed by dissolution of the cu top and collapse of the wave above. When there is a powerful wave aloft, produced by a distant upwind mountain, the wave pattern controls the location of the cu which then grow beneath regions of wave lift.

It can be difficult to tell whether the cu or the wave is the dominant factor. One may fly 100 kilometres or more in thermals and never realize that there is wave aloft.

Confusing wave alignment

Nearly all the well established large waves have wave bars aligned across the wind and more or less parallel to an upwind ridge. Occasionally the wave pattern is broken into zig-zag sections which combine to form diamond shaped gaps in the cloud. These are usually unstable patterns which have a short life; the associated waves tend to be rather weak and liable to drift away or collapse completely.

Now and then wave bars appear parallel to the wind as well as at right angles. On one such occasion, a nearer wave cloud was parallel to an upwind ridge and more or less at right angles to the wind. Further away,

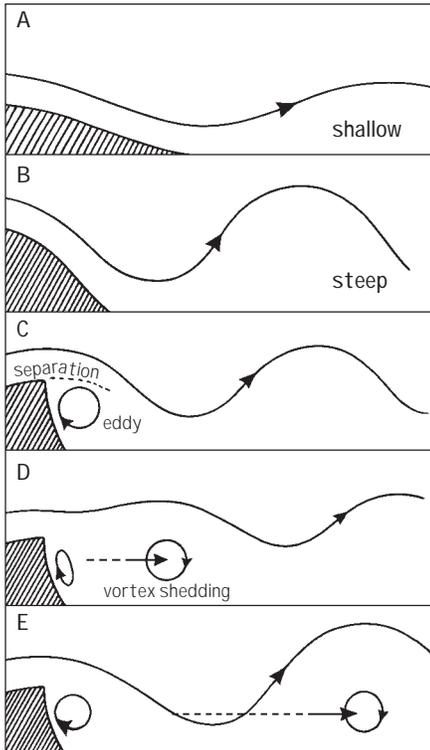


Figure 3 Steepening of the lee slope results in a lee eddy forming followed by vortex shedding which causes the wave to move.

however, there were four lenticular bars aligned almost parallel to the wind. I have not yet come across a satisfactory theory to explain why this happens. The pattern persisted for about 20 minutes before becoming degraded and drifting away downwind.

Vortex shedding

Many years ago J. Forchgott observed a wave pattern which drifted downwind and then reformed in its original location just to the lee of the generating ridge. Figure 3 shows how the changing steepness of the lee slope affects the wave position and amplitude. In diagram C the lee slope is too steep to be followed by the wave flow so it breaks away from the ground leaving a surface of separation and a lee eddy below the cliff. This rotating eddy (the vortex) altered the effective shape of the lee slope.

From time to time this vortex broke away and drifted downstream. The process was called vortex shedding. As a result the wave moved downstream in phase with the eddy until the drifting vortex decayed. Meanwhile a new vortex formed up against the lee slope restoring the original shape. The primary wave then redeveloped in its proper place. In effect, the wave jumped upwind.

Breakdown when thermals end

A different type of wave collapse can accompany the end of thermal activity in the evening. Figure 4, labelled "the domino effect", shows the changes with time. In A, thermals developing over an upwind hill produced semi-permanent cumuli marked waves numbered 1, 2 and 3. In B, the cu died out over the hills and wave 1 faded away resulting in the associated cu weakening and starting to drift downwind. C shows it closing up the original wave slot as 1 approached 2. In the final stage D waves 1 and 2 had drifted far enough to merge into wave 3 which then moved off itself. This was disconcerting because chasing wave 3 was fruitless and only led to a marginal final glide home.

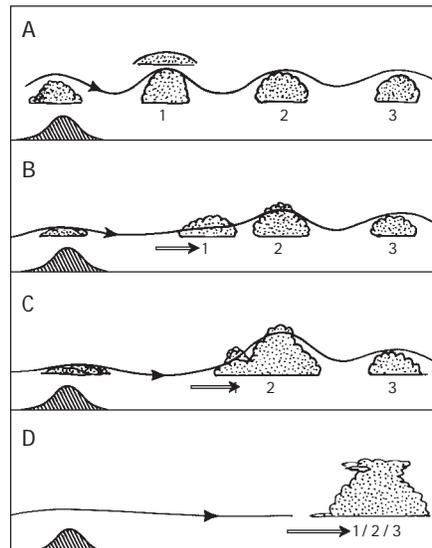


Figure 4 The domino effect — progressive collapse and drift away of waves when convection ends.

"Up" seems to be a very hot topic in New Zealand these days. At all the fields I visited, there are height restrictions. At Drury, for example, if you are able to get above 4500 feet, you need to get clearance from Auckland Tower before breaking that barrier. There are a large number of areas where gliders may not go. Gliders used for cross country work must have transponders and radios. Permission must be obtained for the most modest of excursions outside designated GFAs (Glider Flying Areas). The airways are under the control of a private company driven by a desire to make money.

The amount of unrestricted airspace in New Zealand is small and is likely to get much smaller before the end of this year. Sadly, there are a large number of pilots who feel that someone will represent their interests in this matter and are taking a passive role in the negotiations. I think that pilots in other parts of the world need to take notice of this trend and become active in their own country to prevent this type of limitation to our access to airspace.

Last September at my club, I noted with alarm the flight of a DC10 on final into Toronto International. This aircraft was more than 100 kilometres from the airport and passed under me and I was at 5000 feet agl! This sort of approach makes for a nice comfortable ride for the passengers, but what is the impact upon non-commercial, non-IFR traffic? As we soar through the sky in our glass slippers, we are invisible to radar. The colour, size and speed of our ships make us hard to see even if the commercial pilot is actively looking for local traffic. It is my fear that it will take a disaster to bring this issue into focus and then, it will be the gliding community that will be forced to change. Our ships will be loaded up with expensive electronics and we will be forced to stay in GFAs or below unworkable altitudes. Okay — there, I said it. Now I can put the soapbox away and get on with my story.

Next time ... Next day, it was off to Auckland and the "friendly skies". My overall impressions of New Zealand should be considered very limited. I went with one idea in mind and that was to fly the PW5. I didn't do any sightseeing except for that which was either inadvertent or from the cockpit of a sailplane. I didn't meet many "ordinary folks". I spent all my time with soaring pilots. Having stated those conditions, I can say that my trip was an unqualified success except for a couple of rainy days and I am saving up my frequent flyer miles for next season. Flying people down there are wonderful, friendly, generous and warm. I really made some friends while I travelled on the North Island. The Nationals in 1997 will be held at Omarama in the south and with a bit of luck I will be in the front seat of LM (the Janus A) again. Thanks again to all the great people who helped along the way. Cheers!

training & safety

3 blushes to tell you!

Mike Morgulis, SOSA

I'M WRITING TO TELL YOU ABOUT an experience I shared with a fellow pilot while attending the instructors course last year in Hawkesbury. As instructor candidates we flew with other candidates who were acting as our would-be students. They were also to act as a judgement checkpilot while the instructor was flying the plane. On one particular flight I was the instructor and my good friend, Dean Toplis, was my "student". We'd flown together before at the Air Sailing Club and we were both comfortable with the other's flying abilities.

The *lesson du jour* was stalls and slow flight. Our plane was none other than the L-13 Blanik ("Sputnik", as it came to be known) which we thought was good because the 2-33s take much work to stall, and the Sputnik flew similarly to our K-13s at Air Sailing. So up we went and I would demonstrate a stall and Dean would perform it and do the proper recovery. We tried gentle stalls, abrupt stalls, angle-of-attack stalls and mushing stalls. Over and over we heard Ian Oldaker's ominous voice through our patter, "Lower the nose, look at the airspeed indicator, look at the horizon and resume the normal glide attitude."

We were arriving near the circuit entry point when the bright light came on and I said "We should have stalled this in full landing configuration because that's when it's critical." Dean agreed and upon my instruction he raised the nose until the glider stalled. We didn't account for the change in the centre of pressure with full flaps, and when the nose dropped, it really dropped! You could hear the ooh's and aah's from the flightline. We started the maneuver at about

1100 feet and recovered to join downwind at about 900 feet. The landing was smooth and uneventful and I congratulated Dean for his flying. Then he said, "You know, Mike, maybe that wasn't the smartest thing in the world which we just did." It was about then that we saw Terry Southwood, the Assistant Course Director, sauntering over towards us. We removed our hats and braced for the onslaught, but Terry just looked at us and said, "Dean, Mike, I really like you guys, BUT.."

Terry was right on the money. We were cocky, overconfident and we also did something that we would never do with a real student. As an instructor I should have let the full-flap stall go to another flight and not performed a spin inducing maneuver below 2000 feet. Dean should have not done it and as my checkpilot should have voiced his concern at the time. Hindsight is usually 20/20 and we were seeing perfectly by then. We both felt pretty low after that. But for some it may seem like a small thing. To those people, and other more open-minded pilots, I offer some advice. It is only too easy to concentrate on a single task while ignoring the larger safety picture. For us it was a boneheaded maneuver, for others it might be a low save attempt over a completely unlandable field. Or maybe you think you can stretch that final glide and save time, or fit one more autorotation into the lesson. Our judgement was lacking and we lucked out.

We were prepared for a full classroom discussion at the next morning's briefing but it never came. If Terry or Ian had a dog house, they certainly didn't show it. We both commented to Terry that we learned a lot from the way he dressed us down and it was fair and constructive. I'm not sure that the ground is so forgiving when you screw up, and no matter what attitude you approach it, it's always there. ❖

courir plusieurs milles dans le calme presque absolu, mais la loi de la gravité existe même pour les plus fins (lire planeur).

Le soleil est couché depuis quelques temps et moi je me dirige vers le club, l'altimètre indique 1500 pieds alors que je m'approche pour prendre le circuit d'atterrissage. Je commence mes vérifications (CRAVVT), les ceintures (ok), roue (sortie et verrouillée), aérofrein (no way) ils sont bloqués. Là je commence à réfléchir, je suis à 1000 pieds, le planeur est plus que performant et malgré le fait que nous avons 4000 pieds et plus de terrain pour atterrir je sais que je vais défoncer, si je ne planifie pas en conséquence.

Le vent étant nul j'ai deux options de piste pour l'atterrissage, soit la 09 ou la 27 mais mon approche sur la 09 m'apparaît sans l'ombre d'un doute la meilleure, dû au fait que les obstacles naturels de l'environnement sont plus bas, pour une finale appropriée aérofreins bloqués.

Je descends toujours, et je tente toujours, à 500 pieds, d'actionner la manette mais rien ne se produit à l'exception du mécanisme qui débarre mais ça bloque et ils ne sortent toujours pas, ces maudits aérofreins. Un coup d'œil à notre environnement me dit que je devrais peut-être tenter ma chance pour les débloquent si je passe au-dessus d'un feu de camp qui se trouve juste en dessous de moi alors que je suis maintenant à 300 pieds, j'essaie mais, même résultat.

Je ne panique pas, je sais maintenant que je ne défoncerai pas la piste, car j'ai encore une porte de sortie, la glissade sur l'aile, outil indispensable que les instructeurs m'ont légué au début de mon apprentissage en 80-81 et que j'utilise régulièrement.

En bout de piste je glisse toujours et à 1500 pieds je place le planeur à 90 degrés boussole mais ma vitesse augmente à 60-65 nœuds dû à ce rétablissement et je force le planeur à toucher le sol afin de pouvoir utiliser le frein sur la roue pour diminuer ma course et puis le planeur roule lentement jusqu'à l'arrêt complet bien avant les limites du terrain non négociable.

Devinez quoi! Toujours assis dans l'habitacle, j'actionne la poignée et ça fonctionne parfaitement, l'explication réside dans le fait que les secousses normales occasionnées par l'atterrissage a provoqué le bris de la glace s'étant formé au cours de la montée, entre l'aérofrein et son lieu d'entreposage au niveau de l'extrados de l'aile.

Pourquoi ce phénomène naturel s'est-il produit? La réponse est fort simple, au décollage il y avait de l'eau au niveau de l'aile et plus particulièrement dans l'encavure du puits des aérofreins. La température ambiante à ce moment-là était proche de celle du point de congélation. Tout véli-vole sait que lorsque l'on monte en altitude, le gradient de refroidissement existe, l'air refroidi, ce qui a occasionné le gel et le blocage des aérofreins.

Ça demande réflexion

Jean-Guy Hélie, CVV Québec

PAR UN BEL APRÈS-MIDI de novembre, alors que dame nature dans sa grande bonté nous permettait de voler encore cet oiseau magnifique qu'est le Jantar, il m'est arrivé ceci. Pour vous placer dans le contexte, je dois vous dire ici qu'au retour d'une saison automnale extraordinaire à Baie St-Paul nous avons pensé que de rigger le Jantar St II, serait un geste normal, comme si la saison hivernale ne viendrait jamais. Mais la température de ce 12 novembre m'a fait réfléchir et vous ne pouvez pas savoir à quel point.

Il est environ 15:45 heures, il fait beau et le thermomètre indique 1 degré celsius sur le champ au CVVQ et je décide d'aller faire un vol dans le calme le plus absolu, qu'on peut imaginer. Je fais les vérifications pré-décollage (CIAVTLCV) puis du pouce je fais signe que je suis prêt à décoller à mon ami qui tient l'aile et c'est un départ fulgurant, derrière notre nouvelle acquisition le Piper Pawnee, quelle puissance, qui soit dit en passant qui nous a bien servi à Baie St-Paul.

Toujours est-il que je monte et je largue à 3500 agl, je dégage à droite et je me dirige tout en douceur à 40 nœuds vers la chaîne de montagne que sont les Laurentides. La finesse du Jantar m'a permis ainsi de par-

Maintenant songeons à ce qui pourrait se produire, si un pilote néglige, comme moi, ou oublie d'essayer les aéofreins, voire l'aile au complet dans la région des aéofreins et qu'il se retrouve dans l'onde disons à 18,000 pieds, comme cela s'est produit à Baie St-Paul cette année. Ajoutons ici un facteur important, admettons que ce même pilote entre à court d'oxygène, et je vais être un peu plus méchant en ajoutant que le *pauvre* type est assis aux commandes d'un Nimbus 3.

Bien sûr, il reste la vrille pour vous sortir du pétrain, mais au fait, est-ce que vous la pratiquez au moins une fois par année? Pensez-y, c'est une question de vie ou de mort. Moi, je veux continuer à voler. ❖

This story relates an incident in which the spoilers of a Jantar could not be opened following a wave flight. The cause was snow meltwater on the wings draining into the spoiler box and freezing at altitude.



Peter Mayman
from *Airflow*

THE AVERAGE GLIDER TRAILER is just a basic box on wheels that absorbs as little of the gliding budget as the owner can get away with. As most of them are used infrequently, it's tempting to accept a mediocre towing performance as being "good enough" and not worth the trouble of trying to improve it. I'm certainly not an expert in the black art of trailer dynamics, but I'd like to share with you a recent eye-opening experience that taught me what a difference tire selection can make.

I was returning from Adelaide towing a Standard Cirrus 75 in a single axle trailer that was built long ago for a Ka6. A friend, Stuart Smith, accompanied me to help assess the aircraft, which had been languishing in a hangar since 1985. Of course its trailer had also been sitting around for those ten years, out in the weather — metal rusting, tires perishing and wheel bearing grease drying out, as you'd expect.

My first misgivings about the trailer's handling arose before we left the city's suburbs that evening. It was grossly unstable in the rolling plane, and would begin to sway alarmingly about its longitudinal axis at the slightest bump in the road. Any attempt to achieve a heady 80 km/h triggered the roll spontaneously, and it would continue unabated until the speed was reduced to about 60 km/h. The Honda Prelude coupe was

dwarfed by this lurching juggernaut in a classic "tail-wags-dog" relationship. The tires were set to a firm 32 psi and there was a healthy 50 kg or so on the drawbar (pardon my imperial/metric combination), so we couldn't do much more to trim her out. The vintage suspension with its long thin leaf springs and afterthought booster coils looked precarious enough to be the cause of the instability.

When we stopped for the night, we debated over a few steins how long it would take to get home with a VNE of 43 knots. Our morning inspection revealed the true state of the trailer's tires, which we hadn't yet examined in daylight. The sun glinted off the steel belting in one ancient radial, while a reasonable facsimile of the Grand Canyon was opening up in the perished tread of its opposite number. The spare was not sufficiently better to be worth swapping on. We would be lucky to make it to the nearest tire store before the "big bang"!

At the next decent sized town we rolled up to a tire store after a very sedate trip. I relied on the expertise of the manager to choose the appropriate type of tire for this application, and he recommended a pair of cross-ply (bias) tires. This tallied with a dim memory from a car magazine article I read years ago which extolled the virtues of stiff strong sidewalls for supporting a heavily-loaded trailer.

Anyway, tires were in stock, the price was reasonable and the Bankcard was at hand, so they rolled out the trolley jack. When the hubs were exposed I asked the mechanic to check the bearings. Although there was no excessive free play, the inner ones operated in a grease-free environment. His technical assessment was that they were knackered, and that at least one (or more) would seize before we reached the border.

"Wonderful! Replace them all," I said, delighted at the prospect of not worrying about tires or wheel bearings for the next ten years. Well, I said something like that. As the hubs were the common variety, there was no problem getting new bearings, and the job proceeded with an air of competence.

Back on the road at last. Now comes the really good part! Even within the speed limits of the town I felt that the trailer was riding more solidly, and as we accelerated out onto the highway there simply wasn't anything happening back there. Through the former white-knuckle zone of 80 km/h with bated breath to 90, 100, 110 ... and still the trailer just sat there and trailed! We settled down to cruise at about 100, and began to analyze this amazing transformation. The evil-handling 'trailer from Hell' with a death wish at 80 was cruising smoothly and happily at 100 km/h or more. Even humps that would previously have thrown it into a frenzy at low speed were negotiated with no more than a shrug. Occasionally we reached 120 while passing the big 22-wheelers, but there was never any feeling of drama or instability.

(If you're not interested in reasons, the bottom line is that cross-ply tires are worth considering for trailers. You can now skip to some other article.)

Stuart and I have had a lifelong and abiding interest in cars, motorsport and the factors involved in keeping a vehicle firmly on the road when the laws of physics are trying to tempt it elsewhere. A reasonable appreciation of suspension and tires tends to accumulate through such an interest. We spent hours discussing the issue on the road, with Stuart's engineering background reinforcing the necessary theoretical principles.

The new wheel bearings were quickly dismissed, as the hubs had been spinning freely on the old ones without undue slop; there was no significant change there. It seems that the improvement was due solely to the tires, and mainly to the change from mismatched radials to matching cross-plys.

What we're looking at is the resistance, resilience and damping qualities of the whole suspension and tires combination. Perhaps the soft-walled radials upset the flexible leaf springs, and these two sets of tires might have performed less differently on a trailer with a more competent suspension. Maybe a dual-axle trailer would be quite happy with radials. Certainly the stiffness and load bearing strength of cross-ply walls appears to be an important factor. The supple qualities of radial ply tires which make them superior for the demands of cornering, braking and steering on a car may work to disadvantage on a trailer, which simply has to follow the path dictated by the towing vehicle and carry its load in a stable attitude.

My brother, a mechanical engineer who has worked for 20 years in motor vehicle development subsequently confirmed this logic. He tells me it's well recognized in the trade that cross-ply tires are superior to radials for trailers with a high polar moment of inertia. A loaded glider trailer is an extreme example of this. I also recall reading about how the suspension characteristics of modern cars had to be carefully redesigned and "tuned" for radial tires before they could safely change from the old cross-plys. How many glider trailers would have a "radial tuned" suspension? Another factor probably exacerbated our rolling tendency — the old radial tires were different brands and dissimilar in section. Although inflated to the same pressure, they probably had a different degree of sidewall flex on striking a bump. This would cause one side of the trailer to drop further and compress its spring more, resulting in a stronger rebound. With soft springs and poor damping a significant rolling motion would be initiated.

In conclusion, the choice of trailer tire has the potential to affect towing performance, especially if your suspension (like mine) needs all the help it can get. Just because radial tires are all the go for high performance cars, don't automatically assume that they must be the best choice for a heavy 25 foot trailer. Ask for expert advice! ❖

hangar flying

COMPETITION SCORING BY PLACE STANDING

The British worked out a very good placing scoring system during the 1970s. The guiding light was Jack Harrison.

The problem with 'simple' placing (1 point for 1st, 2 points for 2nd, etc with the smallest cumulative total the winner) is to determine the "tie criterion", that is, how close in speed or distance do you have to be to those immediately above or below you to be awarded the same placing score.

From what I recall, when the bugs had been worked out by several competitions scored by Harrison's placing system, it was as good if not better than points scoring. Indeed, it is better and less arbitrary in many ways.

Why is it not used? Simple. Pilots are crude animals when it comes to being awarded scores at the end of a competition day. They prefer 1000 points if they win and, say, 850 points if they do quite well. If they are last because they make "pig's ear" of it, they still like some distance points (say 300 or so), whereas on scoring by place the last pilot effectively gets zero (as in theory he should, he was beaten by everyone else on the day). This was not liked. Some people even said it was 'unfair'.

But what is 'fair' about points scoring in a competition? It is not about achieving, say, 500 kilometres for a Diamond. If you are last on a competition day, the fact that you may have flown 500 kilometres should be quite irrelevant in terms of scoring — the winner may have flown 1000 under the same conditions.

Competitions are about comparing pilot performance on a given day under similar conditions. Logic indicates that the winner should get top marks and the guy who did least well, no marks. That way you spread the scores out between the competitors. Isn't that the idea of having scores in the first place? Think of Formula 1 racing, even more fierce in the scoring cutoff.

In gliding we seem to think that a guy who flew the task very slowly or landed out deserves marks for an achievement in distance or speed, irrespective of how the other pilots flew that day. In principle this is right for badges, but wrong for competitions.

Take a speed task where pilots fly from 100 km/h (the winner) to 80 km/h (the poorest speed on the day), how do YOU score this in a 'fair' competition?

1000 points for the winner and 800 for the loser? And 900 points for the guy who flew 90 km/h? This is scoring by achievement,

not scoring by competition. Or 1000 points for the winner and 500 points for the guy who flew at 90 km/h? This is still scoring by competition and not by achievement.

Which is 'fairer'. Placing scores of 1 if you win and 5 if you do quite well do not have the same ring as "I got 850 points today" when you are quaffing beer in the bar.

You can certainly say that a second-order placing scoring system is at least as fair as points scoring, which will always be riddled with assumptions and potential anomalies. For example, how do you fairly score a slow finisher in a high performance sailplane against a guy in a lower performance sailplane who lands one field short of the finish? How do you proportion speed and distance points? And why award distance points at all if more than, say, 80 percent of glider finish? It's a good issue for discussion.

Ian Strachan

ian@ukiws.demon.co.uk

The placing scoring system Ian refers to is further described below. Tony

This is from memory, perhaps someone can find the original Sailplane & Gliding references. There were two or three variants.

The underlying logic is that, particularly in complex weather, a bad weather patch not far past the minimum scoring distance can distort results. For instance, most of the field may land 70 kilometres out while two or three pilots keep on into booming conditions and finish, getting about an 800 point advantage as a result.

Wallington's argument is that in the above case, if pilot A finishes and pilot B is downed early, the only statement that can be made with any confidence is that pilot A is better than pilot B (on that day at least) — one cannot state that pilot A is five times better than pilot B. Likewise, on speed tasks, some weather conditions result in large point spreads, others a low one. Good examples appeared in the days before windcapping when strong wind days (which open up the performance capabilities of different sailplanes) opened up the apparent performance spread between pilots.

Here's how one variation of the placing scoring works (joint credit goes to Wallington and Harrison):

The task setter sets a minimum scoring distance (Z) and the tie criteria for distance and speed (typically 1 km and 0.5 km/h). When the results are all in, each pilot scores 2 points for everyone he beats and 1 point for everyone he ties with. All pilots landing short of (Z) are scored like a single pilot

landing at (Z), thus giving an automatic devaluation of low distance days.

Now say that on a no-finishers day with Z = 70 and a 1 km tie criterion, and with distances handicapped, A flies 150 km, B flies 140 km, C flies 139 km, D flies 138 km, E thru H all fail to make 70 km, then:

- A beats B, C, D, and the group short of Z for 2 points each totalling 8 points.
- B ties C (1 pt), beats D (2 pts), and the short group (2 pts) for a total of 5 points.
- C ties with B and D (1 pt each), and beats the short lot for a total of 4 points.
- D ties with C and beats the short lot for 3. The lot that landed short of (Z) get zero.

I was the scorer at a BGA-rated Regional contest in 1971 using this system (it was used as an option). I later calculated the scores using the conventional points system for comparison — using a slide rule, remember them? The order of placing was much the same except for one group of three pilots, and the difference did indeed come from a day when we had no option but to set an out and return task into a strong wind.

In my humble opinion, the result on the Wallington/Harrison placing system was a fairer reflection on how well the people were flying that week. A number of critics of the system missed the point, believing the main reason for it being advocated was simplicity, and anything which allowed the scorer to go to bed before 1 am couldn't possibly be sophisticated enough to reflect what the pilots had achieved!

Defenders of the system maintained that not only was it ludicrous to kid ourselves that we could measure pilot performance on a given day to 0.1% (which is what 1000 points implies), but a place-based system was fairer since on anything but straight-forward racing days, only relative placings tell us anything about relative performance.

Richard Brisbourne

richard@bris.demon.co.uk

CRASH ANALYSIS

William Chilcott

from *Soaring*

WHEN I get to an accident scene, I do the accident reconstruction and forensic engineering for either the local law enforcement or an attorney for the near certain litigation. Aside from weather, there are four major areas of inquiry. The first area is design deficiency. If there is a design deficiency, then that deficiency will be in each aircraft of that model, regardless of when manufactured. Correcting that deficiency will require correction to the entire fleet.

The second area of concern is material deficiency. If a material deficiency occurs, then all aircraft using that lot or batch of material will have the defect and only those

aircraft using the defective material will require retrofit or modification to correct. It is frequently difficult to ascertain exactly which aircraft were or were not involved. At times, just to cover those unknown aircraft, the entire fleet may require retrofit or modification just to be sure all involved aircraft are, in fact, corrected.

The third major area of concern is workmanship. A workmanship defect may involve all of the aircraft the workman actually worked on. If the workman were improperly trained, it could be every aircraft that he worked on. If the workman was fatigued, high, or otherwise distracted, there may be any amount or degree of workmanship defect. This is the hardest of all of the defects to quantify and correct and which drives manufacturers up the wall.

This is why stringent quality control (QC) programs are in place for commercial and military aircraft manufacturers. The cost per aircraft of these QC programs is substantial. Most general aviation manufacturers do have QC programs but they are nowhere as stringent as the commercial/military manufacturers. As a rule of thumb, the smaller the manufacturer, the smaller and less sophisticated the QC program. By the time you get to the experimental aircraft manufacturer there is virtually no QC program. Frequently the builder may have absolutely no past experience or technical training. Experimental aircraft run the full gamut from some of the worst aircraft built to some of the best aircraft ever built.

When one looks at the entire accident picture as a pie, three small pieces are the design defects, material defects, and the workmanship defects. The older the aircraft and the more aircraft in the fleet, the more the problems have been corrected, so therefore the smaller the first three pieces of the pie would be. A new experimental aircraft may have the first three pieces of the pie much larger.

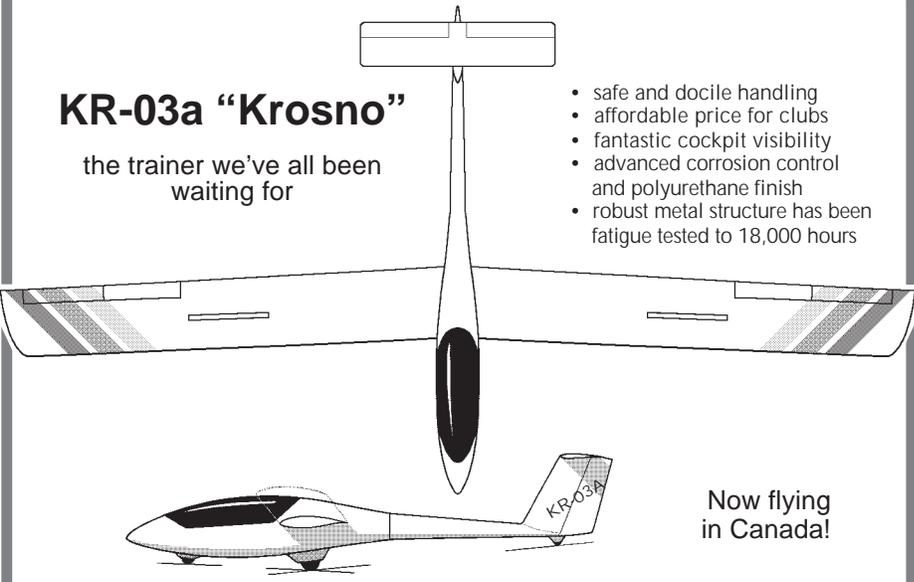
The missing huge piece of the pie is the human factors aspect. This large piece of the pie is the last major area of investigation at an accident. Human factors are the most difficult to deal with as the investigator frequently has the least objective material to study or examine. Sometimes the pilot is dead. If the pilot is not dead, you can rest assured that the pilot is doing everything possible to show it was the fault of one of the first three areas already discussed. Accepting responsibility for some sort of a pilot error is indeed rare. You can also be sure that the manufacturer is trying to show pilot error to be the problem.

There are many things which can induce pilot error. Many of them are quite insidious in that the propensity for the pilot error may not be carelessness or poor judgement, but subtleties the pilot may not even understand or know exist. The obvious stressors of fatigue are intuitively understood by most everyone. It is the more subtle stressors that are frequently not understood or even

KR-03a "Krosno"

the trainer we've all been waiting for

- safe and docile handling
- affordable price for clubs
- fantastic cockpit visibility
- advanced corrosion control and polyurethane finish
- robust metal structure has been fatigue tested to 18,000 hours



Ed Hollestelle, 2371 Dundas St. London ON N5V 1R4

(519) 455-3316 phone & fax

Now flying in Canada!



known. Such things as sunshine in the face, which can reduce visual acuity, reduce reaction times, and induce fatigue at a higher rate than flying away from the sun, are not considered by even many of the most seasoned pilots.

The ergonomics or man/machine relationships are frequently not considered by either the manufacturer or the pilot. An example of poor ergonomics is where the flap control lever and the spoiler/brake lever are co-located with nearly identical levers and with knobs which are identical. When the pilot reaches for a lever, he must visually verify that he has the correct lever. If the manufacturer (or now the pilot) would remove the nice round knob from the flap lever and install a cubical knob, then there would be no doubt about which lever was being activated from a tactile sense only. Remember, both of those levers are only used at a time when the pilot is required to be doing many things, both physically and mentally. That is a perfect set of circumstances to induce error, even by a good pilot. This is the very set of reasons that there are gear-up landings.

Other distractions, such as another glider in the pattern near you, contribute to unpractised flying requirements which force near instantaneous correct decisions which are never identical to the last potential pattern conflict.

People generally don't understand that they are remarkably different from the next pilot, not only in obvious height, weight, reach, and experience aspects, but in visual and audio acuity, blood sugar, hemoglobin, concentration level and duration abilities,

anticipatory and non-anticipatory responses (this is why some people jump and others don't when they are surprised). There are many other differences.

You can actively control many human factors aspects. There are also many factors over which you have no control. It is the entire composite which makes up the pilot. Knowing and understanding the nature of the human beast, and more specifically your own human beast, can make you a better pilot. In those areas that you may be weak, such as poor reaction time, you may be able to compensate for in other ways. It really is worth finding out what your reaction time is. It is worth finding out what your low pulse rate responses are as opposed to your high pulse rate responses.

The more you know and understand yourself, the less likely you will be called upon to use your high pulse rate responses. Learning about yourself is something that can be done year round, not just the day before a contest or wave camp. Only you can do it. I don't want to have to try and reconstruct you after the fact while I'm doing your accident reconstruction. If you have questions or wish to discuss this further, I may be contacted at (916) 587-2332 or fax (916) 587-1111.

Chilcott is a pilot and multiple aircraft owner and a professional engineer with a PhD in engineering. He owns the Marine Testing Company which does accident reconstruction on small boats, experimental aircraft, and motorcycles. Chilcott teaches accident reconstruction and accident recreation to senior law enforcement officers in California and Florida.

"FLYPAST / SURVOL"

The CD Collection of the National Aviation Museum

The museum is in Ottawa, but this CD brings you as close as possible to it without actually being there — in many ways it's better. The experience starts with an introductory page which changes, after some music, to a main menu page. Don't get too impatient; make one pick at a time and wait for the result. I made the mistake of picking several things before the first pick had time to happen and the result was a bit confusing.

The main menu gives you a choice of searching for aircraft by name, or viewing a scrapbook of aircraft. From either the scrapbook or the search method you are led to a main page for the 110 aircraft which exists in the museum collection.

The scrapbook allows you to page through each aircraft in the museum collection. By clicking on the corner of a page, the page appears to turn and a new set of four photographs appears. Clicking on a photograph presents a whole screen image of that aircraft. Clicking on the title under the photograph takes you to the main page for that aircraft. Very slick! From the main page for each aircraft you can access four or five colour pictures of it, four small pages of explanatory text, and in many cases (but not all cases) a movie clip and a sound clip are also available. The text pages cover *Introduction*, *More Information*, *Museum Example*, and *Specifications*. The search method of looking for aircraft allows you to search categories of *Aircraft*, *Engine*, *Manufacturer*, *Time Period (7)*, or *Use*.

The graphics are detailed and of great quality, the movie clips are good and the sound is excellent! Actually the sound is one of the great parts of this CD. One can hear a 1300 horsepower Hawker Hurricane XII on a low pass with all cylinders of its Rolls

Royce Merlin V12 making their distinctive roar. I found this quite thrilling and I'm one of those who do not know these sounds well. This would surely bring back memories for people who are more familiar with the sounds.

The movie clip I liked best was a taxi and takeoff of a Grumman G-21A Goose. This aircraft was flown by the RCMP for 48 years from 1946 until 1994 mostly in Western Canada. The description of the history of this Goose is typical of the information that is found on each aircraft. It will keep you browsing for a long time — I probably saw only a third of the information after about four hours of looking.

There are several other branches you can take from the main menu. These are *The Museum*, *Walkway of Time*, *Flight Plan*, and *Selected Sources*.

- *The Museum* is further subdivided into History, Information, Library, Behind the Scenes, RCAF Hall of Tribute, and Boutique. I did not explore all of these areas fully, but in one area I found a movie with sound discussing the restoration of the original Royal Aircraft Factory BE-2c built in 1914.
- *Walkway of Time* seems to lead one through the development of aviation, accompanied by such things as a sound clip of Mabel Bell describing the day the Silver Dart first flew.
- *Flight Plan* identifies fourteen aviation museums in Canada. Each name contains (by clicking on it of course) a description of the museum, its location, hours, and a list of its collection.
- *Selected Sources* contains eight pages of books and seventeen pages of films which can be ordered from the National Film Board.

For more information phone 1-800-463-2038 (Canada only) or 613-993-2010. The CD ROM is distributed by the NFB, 1-800-

267-7710. Ask for "Flypast/Survol", a CD ROM about the National Aviation Museum.

The CD ROM contains all the same information in French also (either language is selected during installation). There is a technical support line to call if you have any trouble operating the CD.

Minimum IBM or clone: 386 with 8 MB of RAM, CD drive, Windows 3.1, 5 MB free on drive.

Minimum Macintosh: 68030 CPU, 8 MB RAM, CD drive, System 7.01, 3 MB free on hard drive.

Faster CD drives and CPUs, good audio and colour monitors are recommended.

review by **Al Hoar**, Cu Nim

K8 AIRWORTHINESS DIRECTIVE

The German LBA has recently issued this AD (Schleicher 96-005) which applies to all K8s. It is a six part inspection of several areas of the structure and controls for damage, wear, or corrosion. Inspections are to be repeated at each annual and the first one no later than 30 April 1996.

Schleicher Technical Note No. 24 of 4, December 95 becomes part of this AD and may be obtained from Alexander Schleicher GmbH & Co, Huhnrain 1, D-36163 Poppenhausen, Germany.

DID YOU KNOW?

Did you know? 30 July 1961 was the day the longest recorded glider flight landed after 71:05 hours in the air. The endurance flight was in a Pratt-Read with pilots Geza Vass and Guy Davis at the controls. The steady northeast trade winds on the Koolau Range of Oahu, Hawaii allowed the ridge soaring record to be set.

Eric Newsome

Great club and cross-country ship
Type approved in Canada
Outlasts fibreglass
Great value

L33 Solo
Easy to fly

For all-metal quality, nothing beats a Blanik!
Telephone (509) 884-8305 • Fax (509) 884-9198
Box 1124, Wenatchee, WA, USA 98807-1124

contact **BLANIK AMERICA, INC.** for a competitive quote

L23 Super Blanik

Type approved
Superb cockpit visibility
Proven all weather durability
Over **50** L23s flying in North America!

En l'air et en français

Jean Richard, CVVO

TANNÉS des longs articles techniques traitant de l'influence de la pleine lune sur le sens de rotation des thermiques? Fatigués de voir que les Kiwis et les Kangourous tiennent plus de place que nous dans notre magazine vélivole? Confiants que la situation en terre canadienne a suffisamment évolué pour qu'on puisse écrire en français sans risquer d'abîmer les prothèses dentaires de nos confrères anglophones? Convaincus de la sincérité de notre président et de notre rédacteur en chef lorsqu'ils affirment que les "articles from Quebecers in French" seront publiés?

J'ai pris le risque. J'ai imaginé une petite chronique vivante et en français sur le monde et la vie vélivole au Québec. Cette chronique ne survivra que si vous y participez, tant comme lecteur que comme auteur. Vos réactions, vos commentaires sont indispensables. Le contenu? Des informations sur nos activités et celles de nos clubs, des anecdotes, des expériences à partager, des éléments d'analyse, de débat... Le contenant? Des articles courts, directs, des capsules, des clips écrits, mais pas trop de longues dissertations... Le ton? En juste équilibre entre le sérieux et l'humeur, un brin provocateur au besoin, c'est stimulant, mais jamais arrogant, jamais médisant.

La revanche des berceaux

En matière de climat, de topographie et d'aérodrome, le Québec n'a rien à envier au reste du Canada, les Rocheuses mise à part. Des pans complets de territoire, et non des moins prometteurs, n'ont jamais vu l'ombre d'un planeur. Pourtant, avec 25% de la population canadienne, le Québec ne représente qu'environ 12% de sa population vélivole. La situation est plus inquiétante qu'on ne le croit. Alors, vélivole québécois, faites l'amour... en planeur, pas la guerre! Comme on disait dans l'évangile — "Volez et multipliez-vous!" Comme le disaient les curés du haut de la chaire — "Faites votre devoir!"

L'influence culturelle

Votre club ressemble-t-il à ce qui suit — une taille qui rétrécit d'année en année, une moyenne d'âge très élevée (qui frôle les 99 ans) et un dynamisme inversement proportionnel à la moyenne d'âge? Votre conseil d'administration a-t-il tendance à tout compliquer alors qu'il pourrait tout simplifier? Peut-être souffre-t-il du syndrome de la fonction publique? S'il vit à l'ombre d'une capitale d'état, il a peut-être subi l'influence culturelle de sa population de fonctionnaires.

Des poules, des cochons et des vaches

Dans tout Québécois il y a un fermier qui sommeille. Deux aéro-clubs montréalais ont choisi de s'installer dans la plaine agricole de la vallée du St-Laurent, tantôt au nord du fleuve, tantôt au sud. Les montagnes n'étaient pourtant pas si loin. Parole de météorologue — l'aérodrome de la plaine est bien calme si on la compare à celle de la montagne. Parole de vélivole — voler en plaine est presque ennuyeux quand on a connu la montagne, si modeste soit-elle. Souhaitons que le prochain accouchement d'un aéro-club se fasse en montagne.

2001, silence on treuille

Rien de plus aberrant que de voir un treuil rouiller au fond d'un hangar sous prétexte que l'avion remorqueur, c'est plus facile. C'est pourtant ce qui se passe dans un club du Québec. Paresse ou manque de vision? Les deux! Le treuil, c'est une solution d'avenir, parallèlement au motoplaneur. Ceux qui fouinent sur Internet ces jours-ci ont dû remarquer l'intérêt suscité par le treuil, en particulier le treuil électrique.

Venant surtout d'Allemagne, les motoplaneurs resteront l'apanage des biens nantis. Pour les clubs plus modestes, le treuil c'est l'avenir. Ses avantages: l'économie, l'impact sur l'environnement (nos banlieues et leurs habitants chatouilleux envahissent dangereusement les abords de nos aérodromes), la souplesse (possibilité d'opérer à des endroits inaccessibles à l'avion remorqueur), la formation du personnel (un treuilleur est plus rapidement et plus économiquement formé qu'un pilote remorqueur).

Talent en veilleuse

Imaginez un prof à la retraite, discipliné, minutieux, vélivole expérimenté, et qui aime enseigner à qui veut apprendre. Une véritable perle dans une équipe de moniteurs me direz-vous! Exact! Imaginez un club où on préfère le laxisme à la discipline, où on craint les effets de la rigueur sur les élèves, et où les profs à la retraite sont encouragés à se retirer de l'équipe des moniteurs. Imaginez un club où la qualité des tables à pique-nique passe avant celle de l'instruction et où un moniteur ayant un potentiel élevé reçoit un trophée pour ses talents... d'ébéniste. Vous croyez que j'invente? J'ai vu ça quelque part.

Usine ou école?

Plusieurs aéro-clubs emploient la méthode industrielle pour former leurs pilotes. On foute un moniteur de service de neuf heures jusqu'à la tombée du jour, et on lui demande de former des élèves à la chaîne. Quand enfin tombe le jour, vous avez, à la place du moniteur, un abruti qui ne veut plus rien savoir de ses élèves, mais qui n'ose pas le dire. Et vous avez des élèves qui n'ont pas reçu toute l'attention nécessaire qui se sentent perdus. Certains disparaissent dans la brume et plus personne ne s'en inquiète.

J'ai eu la chance dans le passé de pratiquer l'enseignement personnalisé, c'est à dire

d'avoir des élèves que je suivais de près et avec qui je volais plus souvent. Rien de comparable avec la méthode industrielle. C'est beaucoup plus exigeant, mais combien plus motivant, valorisant, et surtout, efficace!

Les clubs qui veulent vraiment améliorer la qualité de leur enseignement et diminuer le nombre d'abandons auraient intérêt à adopter la formule "un élève, un instructeur". Dans certains milieux, on appelle ça la lutte au "décrochage scolaire".

Tours de planeur à vendre

On prétend vouloir recruter de nouveaux membres, mais on n'est pas toujours prêt à mettre l'effort au bon endroit et encore moins à se remettre en question lorsque les résultats de l'effort ne se font pas sentir. Un copain du MSC me faisait un jour remarquer que les fameux vols d'initiation (les badauds du dimanche après-midi, à qui on donne le statut de membre d'un jour, histoire de ne pas avoir l'air de se livrer à des opérations commerciales) n'étaient souvent rien d'autre qu'un prétexte pour voler gratuitement les meilleurs biplaces du club (car on réserve les meilleurs pour les visiteurs et les poubelles pour les élèves).

Trois ans plus tard, je lui donne raison, et les statistiques aussi. Un club québécois a vu ses effectifs réguliers diminuer d'année en année, et ça depuis plus de dix ans. Pendant ce temps, le nombre de membres d'un jour n'a cessé d'augmenter pour atteindre des sommets en 1995, soit un membre régulier pour dix membres d'un jour.

Un ours polaire ou l'imagination au congélateur

Les projections budgétaires de l'ACVV vont nous coûter un ours polaire (\$2) de plus. C'est bien peu, mais c'est trop. C'est trop parce qu'on choisit la voie facile, celle qui évite de réchauffer ses méninges pour faillir jaillir de nouvelles idées.

Notre président nous a sermonés sur le fait que certains membres jouissaient des services de l'association sans payer leur quote-part. Il a raison. Aussi, il devrait exiger des clubs une cotisation pour tous les membres qui s'y sont inscrits, y compris les membres d'un jour, puisque ce sont des membres (autrement, les règlements leur interdiraient de voler dans nos machines, à moins de le faire presque gratuitement). Mais pourquoi l'association n'a-t-elle pas prévu une diversité de classes de membres qui convienne aux besoins des clubs? Exemple: une cotisation pouvant atteindre \$5 par membre d'un jour serait non seulement légitime, mais équitable, et permettrait d'éviter une hausse indésirable.

Drab et cheap

Intéressant l'article de Bob Carlson à la page 5 du numéro 1/96. Et non sans un fond de vérité. C'est vrai que nos clubs font parfois pépères, que nous hésitons beaucoup à investir dans la modernisation de nos installations et de notre équipement. ➔ p16

C'est vrai que la moyenne d'âge est élevée et qu'un peu plus de jeunesse ne nous ferait pas tort. C'est vrai que notre image de "ligue du vieux poêle" n'est pas des plus recherchées, mais je ne crois pas qu'il soit nécessaire de peindre nos planeurs en vert et orange fluo ni même de porter nos casquettes avec la palette sur la nuque pour attirer des nouveaux membres ou afficher notre joie de vivre. Hey! Man! T'sé veux dire! Le vol à voile n'est pas très compatible avec les modes trop éphémères. Aussi, il vaut mieux ne pas trop miser sur les consommateurs de modes.

Des partis politiques

Très intéressante également la suggestion de Svein Hubinette à propos de la démocratie et des élections du conseil d'administration de l'ACVV. Ce qui vaut pour l'association vaut aussi pour les aéro-clubs. Dans bien des clubs, les élections du conseil se font avec la plus grande improvisation, souvent lors du party de fin de saison. La démocratie en prend pour son rhume. Tant pis si vous n'avez pu assister au party: vous avez perdu votre droit de vote.

Une bonne recette pour améliorer la démocratie et le dynamisme au sein d'un aéroclub — des équipes de travail (s'apparentant un peu à nos partis politiques), un programme et une orientation connus des membres, des candidats connus avant la date d'élection et des élections par scrutin universel.

Compétition, encore et encore

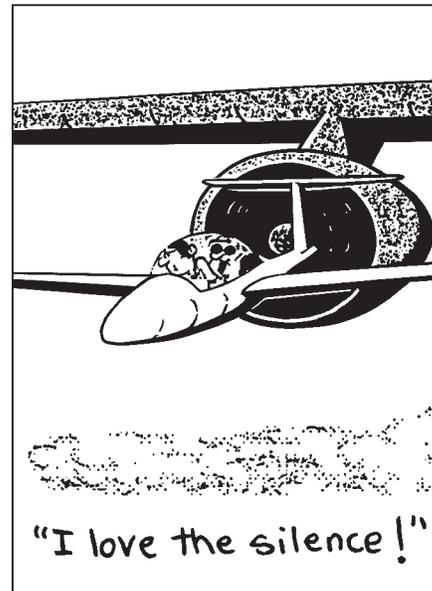
Illusion ou réalité? En lisant notre magazine, on a l'impression que la compétition occupe un peu trop d'espace, accapare un peu trop d'énergie, au détriment peut-être de certaines priorités. Incidemment, nous avons les mêmes priorités qu'au ministère de l'Éducation — la lutte au décrochage. La qualité de la formation, c'est notre plus grande faiblesse, une cause bien identifiable du haut taux de roulement des nouveaux membres.

En Europe, un pays de la taille du Québec peut facilement compter entre 2000 et 4000 vélivoles. Avec à peine 200, nous sommes en plein tiers-monde. Il nous faut de nouveaux membres, et de toute urgence. Ces nouveaux membres, il faut les former. Si on draine les ressources vers la compétition, qui formera ces nouveaux membres? Il faut aussi revoir nos méthodes de formation.

Le problème est-il exclusif au Québec? Le déclin du vol à voile ne se vit-il qu'en français? Les carences de formation n'existent-elles qu'à l'intérieur de nos frontières? Nous n'avons pas grand chose à lire dans notre magazine venant du Flight Training & Safety committee.

La formation des nouveaux instructeurs francophones est dans une impasse. Une solution pourtant — la formation outre-frontières. Il semble y avoir des ressources

pour envoyer des compétiteurs à Fayence, en France. Pourquoi n'y en aurait-il pas pour aider nos instructeurs francophones à se perfectionner dans ce même pays? Certains centres français sont en mesure d'organiser des stages de perfectionnement pour les vélivoles étrangers. Si seulement notre association manifestait le même empressement à notre égard qu'à celui de la compétition! ❖



AMO 155-93

Renaissance Aeronautics Associates is pleased to announce the appointment of

ED HOLLESTELLE, Jr

MANAGER – Training and Engineering Development

bringing to the RAA team his years of accomplishment and international experience in sailplane composite repair.

RAA provides complete inspection, maintenance, repair, modification, and refinishing to all aircraft types. We can provide repair design, STAs, metal to metal and advanced composite structural modification or glider repair. Contact RAA for your personal requirements or for your club fleet maintenance needs.

ADVANCED COMPOSITES TRAINING

RAA will soon be opening an international facility for training on the design, manufacture, maintenance, repair, and modification of advanced composite structures. On-site residency programs, for as little as \$55/day, include accommodation, meals, and recreational activities! Call for details.

Wilson J. Boynton, CET, president
RAA Bldg #90, Centralia Airport, Huron Park, ON N0M 1Y0
tel 1-800-817-5545 or (519) 228-7114, fax (519) 228-7015

SAC Video Library

Ted Froelich

2552 Cleroux Crescent
Gloucester, ON K1W 1B5

(613) 824-6503 p&fax
– call first if faxing –

102375.1616@compuserve.com

Video tapes are available to clubs and members from the SAC tape library. To rent a tape for three weeks or so will cost you the phone call to the librarian and the return postage. To get a copy of any of the films listed below, send \$6 for tape and postage (copyrights might exist on some tapes). Any income from this will be used to acquire new tapes. The films are 30 minutes on average and can be divided into three categories:

- Professionally made presentations of the delights of soaring from the USA, UK, France and Canada.
- Canadian club-made videos.
- Educational films, most supplied by Transport Canada for power instruction.

Professional films

- 1 *Running on Empty (USA)* 22 min
The world's best soaring pilots compete in Arizona. Narrated by Cliff Robertson.
- 2 *Free Flight (UK)*
Derek Piggott risks his neck flying a reproduction of the world's first glider. Hans-Werner Grosse tells the designer how he likes his latest ASW. The joys and frustrations of soaring in the UK.
- 3 *Pure Flight (USA)* 30 min
Cliff Robertson tells power pilots about soaring. Good shots from Vermont and Colorado.
- 4 *Soaring (USA)* 20 min
A history of soaring, ending with Region 5 contest in 1988.
- 5 *Soaring in harmony with the wind (USA)* 13.5 min
Excellent ridge soaring shots from Stowe.
- 6 *Delta Fox (France)*
Silent (music only) dream flight over Alps.
- 7 *Riding the Mountain Wave* 27 min
Produced by CBC Edmonton, featuring the 1982 Thanksgiving Cowley wave camp. Great scenery.

Club videos

- 1 *SAC 50th anniversary (eng or fr)* 15 min
Soaring from Hope to Halifax.
- 2 *GGC and Pendleton's 50th Anniversary*
Tiger Moth gathering (there were 90 of them at Pendleton once), giving rides and tows. Glider rides, aerobatics, speeches, & fun.

- 3 *Base Borden Soaring Group*
Winch soaring, well filmed and edited.
- 4 *Chasing Phantoms, Hope BC* 8 min
Good filmed slide presentation with musical background and some breathtaking aerobatics.
- 5 *Winnipeg Gliding Club* 29 min
A well done essay on late spring soaring as shown on TV, some interesting amateur shots at the field, a TV news report on a fatal mid-air at that field.
- 6 *1982 Nationals at SOSA* 27 min
High quality documentary by Molson with some beer commercials thrown in.
- 7 *Bluenose Gliding Club* 90 min
 - a The Harris Hill Soaring Museum
 - b The quiet challenge
 - c A motorglider visit from Florida
 - d Sailors of the sky
- 8 *1989 Flying Week at Bluenose*
A document of a year's activities at Stanley, NS and a day's visit to St. Raymond, PQ.
- 9 *Alberta Soaring Council*
 - a TV interview with Tony Burton and Ursula Wiese 32 min
 - b Building the AV-36 11 min
 - c Alberta soaring in the 50s 26 min

Good interview, answering many layman's questions about soaring in general and is useful in introducing the public to soaring. The next two items are classics. They tell about the construction of the Fauvel AV-36 "flying wing" gliders by the "Tenardee" club members in Calgary in the early 50s, and the flying activities in Southern Alberta that led to the discovery of the wave at Cowley. Ursula edited this material from old home movies by A.W. (Bill) Riddell, one of the AV-36 builders, who does an informative "voice-over". Considering the origin of the material, the quality is fairly good.



'96 Coming Events

- 23 June - 4 July **1996 Canadian Nationals**, Red Deer, AB. Contest organizer: Randy Blackwell (403) 594-2171.
- 6-28 July **5th Invermere Summer Camp**, hosted by VSA, BC's premier soaring event. \$75/wk or \$15/day camping charge for airport user charge, tie downs and towplane ferrying. Hans Baeggli (604) 434-2125 (H), (604) 231-3078 (W).
- 14 - 20 July **SAC Western Instructors School**, Prince Albert (Birch Hills), SK. Will fly the K7 and Blanik employing winch and aerotow. Course director: Terry Southwood (403) 255-4667.
- 27 Jul - 5 Aug **Cowley Summer Camp**, this is the best soaring holiday in Canada. Contact: Tony Burton (403) 625-4563.
- 26 - 30 Aug **CAS Beginners XC clinic**, SOSA. Call Fred Hunkeler (905) 335-1246, or e-mail fred.hunkeler@drew.tor.hookup.net
- 31 Aug - 2 Sep **SOSA Dust Bowl**, Call Fred Hunkeler (905) 335-1246, or e-mail: fred.hunkeler@drew.tor.hookup.net
- 2 April **Toronto Glider Pilot Ground School**, Tues eves 7-10 pm for eight weeks. Contact Ulf Boehlau at (905) 884-3166 for registration.
- 11 May **Ontario Soaring Society Annual General Meeting**, location to be announced, Ken Withrow (416) 537-8791.
- 18 - 20 May **Ontario Provincial Contest**, location tba. Call Jörg Stieber (519) 684-7372 (H).
- 24-26, 31 May-2 June **SAC French Instructors School**, CVV Champlain. Course director: Marc Lussier (514) 634-0078.
- 3 - 7 June **CAS Advanced XC clinic**, SOSA. Call Jörg (519) 684-7372 (H), 662-2844 (W).

Available soon, being transferred from film:
10 *SOSA in Brantford in the early 60s.*
11 *Soaring at GGC in the early 70s.*

Educational videos

- 1 *To be a Pilot (TC)* 21 min
Overconfident student prangs the club's Cessna 150 in a crosswind landing but is given a second chance.
- 2 *The Wrong Stuff (TC)* 51 min
For too complacent airline pilots.
- 3 *Ian Oldaker et al (SAC)* 7h 45 min
 - a Dangers on tow – Ian Oldaker
 - b Airspace use – Kathy Fletcher of TC
 - c Stall prevention on final – ?
 - d How to join gliders in a thermal – Ian
 - e Stress overload – Ian
 - f Dehydration – Dr. Hanson of TC
 - g Post-solo training – ?
 - i The important first flying lesson – Ian

Eight very interesting lectures presented at a towpilots' and instructors' seminar. Worth seeing in spite of poor camera work. Some audio got lost during mike transfer and some introductions, unfortunately.

- 4 *Collision Avoidance in Gliders (SAC)*
How to prevent accidents when entering a gaggle.
- 5 *Why Airplanes Crash (NOVA)*
- 6 *Better Communication for Better Safety (TC)* 26 min
- 7 *Safety by Stress Management (TC)* 40 min
- 8 *Accidents and Pilot Planning (TC)* 24 min
- 9 *When in Doubt (TC)*
All about ice on the wings, not bugs.

Pendleton in 1995 if one watches the classes from the perspective of daily position and not from the accumulation of points, one can see that in the Sports class the pilot with the best performance is Tony Burton and not Alan Wood. Tony had two first places, two seconds, one third and one fifth, while Alan achieved two firsts, one third and three fourths. Do the same exercise for the other classes and you will be surprised.

I don't intend to propose a new formulation of the point system, I'm not able to, but I propose a new point of view. I propose that one adds the daily positions. The smallest number is the winner. For six competition days, six points are a perfect score. Using this system, the top four in the Sports class are scored as in the table (above). Perhaps there's still time for Tony to reclaim the Air Canada tickets from Alan.

CONTEST SCORING NEEDS CHANGE

I must say that I took pleasure in reading John Bisscheroux's comments ("Scoring rules out of hand") in the 2/94 issue of *free flight*. Modern sailplanes appear almost every year, while the current FAI scoring formula has been in place for twenty without significant change. It is high time a better scoring formula for contests were created.

Perhaps no other item of the FAI Sporting Code is as great a point of issue as the scoring system used at gliding competitions. I will attempt to show you an example of how this is so. The points given for speed tasks in World contests are calculated by the formula below which is found in Annex A of the Sporting Code:

$$P = F \cdot P_{\max} \left[\frac{d/D (1 - 2n/3N)}{\text{dist part}} + \frac{2n/N (v/V - 2/3)}{\text{speed part}} \right]$$

- where F = day factor
- P_{\max} = maximum points available
- d = marking distance of pilot
- D = length of task
- v = pilot's speed
- V = best speed of the day
- n = number of pilots exceeding 2/3 of V
- N = number of launched competitors on the day

The formula also includes a low speed limit of 2/3V below which a pilot does not receive speed points. Now let me draw your attention to some features of this formula considering the following situations (assuming the day factor is 1.0 and P_{\max} is 1000):

Situation 1 – All pilots complete the task ($n/N = 1$):
Pilot A is the winner and gets $P_{\max} = 1000$. Pilot B has completed the task at 80% of the winning speed. He gets 600 points.

Situation 2 – 30% of the pilots finish the task ($n/N = 0.3$):
Pilot A is the winner again and gets 1000 points. Pilot B, again with 80% of the winners speed, now gets 880 points or 280 more than in Situation 1 above.

Where have these 280 points come from? It is evident that they are a "gift" from those who have not completed the task, because when everyone finishes one would have to fly at 0.94V to earn 880 points. So pilot B, without any improvement in his own flying has come closer to the winner. The consequences show in the following situation.

Situation 3 – After four competition days the competition is over. Three tasks were flown at a 30% completion rate ($n/N = 0.3$). Pilot A won all these tasks, and Pilot B also showed identical results in all three, 0.8V. On the last day all pilots finished, while Pilots A and B reversed their flying speeds (B won and A achieved 0.8V). Given this scenario, who would you logically expect to be the contest winner? Pilot A, of course; he won three tasks and finished one at 80% of B's speed, while Pilot B won only one task and finished

	Speed and points				score
	Day 1 $n/N=.3$	Day 2 $n/N=.3$	Day 3 $n/N=.3$	Day 4 $n/N=1$	
pilot A	V_{\max} 1000	V_{\max} 1000	V_{\max} 1000	$.8V_{\max}$ 600	3600
pilot B	$.8V_{\max}$ 880	$.8V_{\max}$ 880	$.8V_{\max}$ 880	V_{\max} 1000	3640

three at 80% of A's speed. However, look at the table of daily scores — Pilot B is the winner! Suppose that on Day 4 there were "only" 88% finishers, $n/N = 0.88$ (perhaps 2 to 4 pilots make some mistake out on course) — now Pilot A would

earn 648 points and is the champion.

Now para 22.2.1 of Annex A of the Sporting Code states, "Each competitor shall be given points based on his performance." According to this requirement the scoring formula shall avoid any outside factors or limits which exert an influence upon any pilot's scoring results, however we see the contrary effect:

- 1 the formula contains the factor (n/N) which has no effect on the winner's score but increases the points earned by everyone else;
- 2 the 2/3V limit on earning speed points is in fact a penalty to slow pilots.

Who could argue that the speed formula as it exists is in harmony with the stated Sporting Code requirement? We see nothing like this in the scoring formula for distance tasks ($P = F \cdot P_{\max} d/D$) where the sole criteria for the points scored by a pilot is the distance he has flown. I believe that the sole criteria for scoring speed tasks should also be the speed achieved by the competitor without any limitation imposed by the performance of other competitors.

An unexpected change of flying conditions which may influence the sporting results is taken into account by the day factor which reduces the scores of *all* competitors by the same percentage, thus giving no advantage to anyone. I fully agree that the scoring formula for speed tasks should take into account the number of finishers, but only as a factor which reduces P_{\max} .

Vytautas Sriubas
Gliding Federation of Lithuania

RESPONSE TO CRITIQUE OF SAC'S ACTIVITIES

This is in reply to Svein Hubinette's letter in the Feb/Mar *free flight* in which he requests that SAC be more active in representing the interests of glider pilots with Transport Canada.

What Svein should realize is that the association has only two paid persons in Ottawa looking after a host of items concerning gliding club members across the country. Heads of committees are all unpaid volunteers.

The difference between the Soaring Association and such bodies as COPA, RAAC, and the EAA Canadian Council is numbers of members. Because of their large memberships, these organizations have significant influence on the policies of Transport Canada. They also have more funds available and can afford paid staff to look after various items, although they also depend as we do on unpaid volunteers.

In answer to Svein's Internet source for gliding information, he should be given the opportunity to set up a committee to implement this proposal. The information on page 22 of the last issue of *free flight* shows what some noble volunteers are doing on behalf of SAC members. SAC is not 'they', it is 'we'.

I feel that the present structure for zone representation is a fair one, although some communications between clubs in a zone would be desirable before the deadline for sending in the name of a nominee. I agree with the practise used in many organizations that the elected directors should choose their president.

Bob Gairns

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 the national office.

Box 1916, Claresholm, AB T0L 0T0
tel/fax (403) 625-4563

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

single seat

1-23 Std. CF-ZBR, excellent condition, encl custom trailer. Something special, priced to sell. Don Sutherland (604) 530-6335.

Skylark 2, excellent condition, recovered in 1987, electric vario, chute, encl trailer, current c of a. \$5500 obo. Fred Lukianow (519) 681-0533.

Skylark 3, excellent cond, new paint, encl trailer (needs some work). \$6000 or best offer. George Vich (519) 748-9750 (H).

Pioneer II, C-GLUV, 35/1. Fun to fly, excellent shape, all rigging aids, nice enclosed trailer. \$7000 obo. Ron McCullough (613) 547-7802.

HP-11A, 70 h, 720 chan radio, O2, Security 150 chute, Schreder trailer. \$9500. Horst Dahlem (306) 955-0179.

HP-14, 450h TT, good condition, single piece canopy, filled wings, TE vario, chute, new Imron paint. US\$9000. Keith Pritchard, (519) 570-9437 (H), (519) 571-1434 (B), kpritchard@sstech.on.ca.

Ka6CR, C-GJUA, fully instrumented, radio, wood trailer. Estate sale, price negotiable. Adam Martin (519) 354-6041.

Monerai, C-FEUQ, \$3500. Trailer \$1600, instruments negotiable. Struan Vaughan (403) 362-5837.

Phoebus B, C-FOKA, 1014 h, vg cond, never damaged, Cambridge vario, O2, tail dolly, gear warning, excellent encl trailer, delivery available. \$17,500 (604) 344-6620, 1-800-268-SOAR.

1-35, #38, 650 h, yellow, aileron/flap interconnect, radio, O2, new canopy and cover, Varicalc 3 audio/flight comp, metal trailer, complete history and docs. \$20,000 Don Wood (604) 658-8288, fax (604) 658-5538.

SZD-55-1, C-FTVS, brand new, fully instrumented with latest or with basic instruments. Licensed and ready to fly. New *Trailcraft* clamshell trailer. Ed Hollestelle (519) 455-3316 W, (519) 461-1464 H.

DG 202/17, 564h, excellent condition, Sage vario, M-Nav computer, Terra 720 radio, Security 250 chute, O2, Komet trailer. \$US32,000 firm. Francisco Diaz, (514) 355-6081 evenings.

PIK20E-II, C-FIGW, 490h, engine 150h, Varicalc vario/comp, Becker 720, Bohlh compass, Security 150 chute, solo rigger, factory trailer, expensive extras. \$US 42,000 Len Gelfand (613) 749-5101.

two place

Lark IS28B2, C-GVLI, 1400 h. Basic instruments, Cambridge vario & back seat repeater, Alpha 100 radio, Varicalc flight computer, g-meters, professionally built open trailer. Available immediately. \$US19,500 obo. Contact Winnipeg Gliding Club. e-mail: wgc-info@lark.magic.mb.ca or leave message at (204) 837-8128 (24 hrs).

miscellaneous

Wanted - Photographs and documentation of LK-10A training glider C-FZAJ (see this cover), and sister ship C-FZAK, which were based in Kingston in the late 40s to early 90s. Call Herrie ten Cate (416) 205-2646, fax (416) 205-3339, e-mail: htencate@toronto.cbc.ca

Wanted - **Winch** in working condition. Contact Paul Chalifour, (604) 426-7322

Winch, Gehrlein, Chev V8 engine, Trailer format, wire included. Al Sunley (403) 464-7948.

Barograph JMF MkII 30,000 ft barograph, large 14 hour drum, calibration incl. \$350. Pneumatic switches for netto on/off etc. \$15. John Firth (613) 731-6997.

'M' Nav final glide computer, with 3-1/4" vario. As new condition. Adjustable for any polar. \$1499. **Radio**, KX99 handheld, like new with many accessories/extras. A Jackson, days (403) 720-0262, eves (403) 246-7919.

PIK-20B parts, factory trailer \$2000, new spare canopy and frame, left wing, tail and other parts. Willi Terpin (604) 365-8378.

Used final glide computer/audio vario, several available at good prices. Peschges VP3E and Zander SR-820, \$1495 each. Ed Hollestelle (519) 455-3316 W, (519) 461-1464 H.

Bubble canopy, smoke gray tint, free blown to these dimensions: 85" long, 24" at widest, 14" greatest depth. Blunt ends, distortion free, 1/4" starting thickness. Not trimmed from form (flange in place). \$300 Jim Cook (204) 489-6929.

Wanted - **O2 mask** for A14A regulator, bailout bottle and mike preferred but will consider mask alone if in good condition. Paul (604) 426-7322.

Crew for Nats wanted, Ventus. Expenses covered. Andrew Jackson (403) 720-0262 (W), 246-7919(H).

Parachute, "Para Cushion" with 26' Slo-Po canopy, \$750. Struan Vaughan (403) 362-5837.

Solaire Canada

Ed Hollestelle (519) 455-3316 p & fx

LX-20 the new FAI standard for stand-alone GPS data recorders \$1995

ATR720A 760 chan VHF with mounting tray and wiring harness \$1695

SHM1010 Boom mike and wiring (as installed by most glider manufacturers) \$150

LX-4000E S-RAM final glide computer or connects to any GPS (with NMEA output) or connects to LX-20 data recorder \$2795

LX-5000 the ultimate GPS/final glide computer system with large backlit graphic display and FAI data recorder \$5995

LX-400 3 demo units, 2-1/4" panel mount GPS with Canadian database \$1295

Blanik dealer in Canada Pemberton Soaring Centre

L-33 Solo - test flights available
L-23 Super Blanik • Spare parts

Rudolf Rozsypalek

Box 725 Pemberton, BC V0N 2L0
(604) 894-5727 fax (604) 894-5776

magazines

SOARING — the monthly journal of the Soaring Society of America. Subscriptions \$US43 second class. Credit cards accepted. Box E, Hobbs, NM 88241-7504. (505) 392-1177, fax (505) 392-8154. e-mail: 74521,116@CompuServe.com

NEW ZEALAND GLIDING KIWI — the bi-monthly journal of the New Zealand Gliding Association. Editor, John Roake. \$US32/year (seamail). Private Bag, Tauranga, NZ. Internet: john@roake.gen.nz

SAILPLANE & GLIDING — the only authoritative British magazine devoted entirely to gliding. Bi-monthly. BGA, Kimberley House, Vaughan Way, Leicester, LE1 4SG, England. £16.50 per annum. fax 01 16 251-5939.

AUSTRALIAN GLIDING — monthly journal of the Gliding Federation of Australia. \$US34.80 surface mail, airmail extra. Payable on an Australian bank, int. money order, Bankcard, Visa, Mastercard. Box 1650, GPO, Adelaide, South Australia 5001. fax (08) 410-4711. e-mail: AGEditor@gfa.on.net

Come and soar with the bald eagles!

PEMBERTON SOARING CENTRE



Operating daily April to October in Pemberton, BC

- excellent mountain scenery with thermals to 12,500 ft
- camp at the airport, B&B, or stay in Whistler
- area offers a wide variety of summer activities

Glider rentals: L-13 Blanik, L-33 Solo

Instruction: glider pilot courses or book a number of lessons

For more information, ph (604) 894-5727, fax (604) 894-5776
e-mail: jwatson@mountain-inter.net

MARITIME ZONE

BLUENOSE SOARING CLUB
Ron Van Houten
17 John Brenton Drive
Dartmouth, NS B2X 2V5
(902) 434-1032

QUEBEC ZONE

AERO CLUB DES OUTARDES
Gérard Savey
16 Placae Valmont
Loraine, PQ J6Z 3X8
(514) 621-4891

ASSOCIATION DE VOL A
VOILE CHAMPLAIN
Claude Gosselin
30 des Orties
Laprairie, PQ J5R 5J3
(514) 444-3450

CLUB DE VOL A VOILE
DE QUEBEC
Jean-Guy Hélie
CP 9276
Ste-Foy, PQ G1Y 4B1
(418) 875-2005

MONTREAL SOARING
COUNCIL
Martin Hickey
5082 Bourassa
Pierrefonds, PQ H8Z 2K4
(514) 471-3138
(613) 632-5438 (airfield)

CLUB DE VOL A VOILE
MONT VALIN
3434 Ch. Ste Famille
Chicoutimi, PQ G7H 5B1

ONTARIO ZONE

AIR SAILING CLUB
Christopher D. Manning
417 Lakeshore Road East
Oakville, ON L6J 1K1
(905) 849-4596

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

BASE BORDEN SOARING
Box 286
Borden, ON L0M 1C0

BEAVER VALLEY SOARING
Doug Munro
187 Chatham Avenue
Toronto, ON M4J 1K8
(416) 466-1046

BONNECHERE SOARING
Iver Theilmann
7 Hoffman Avenue
Petawawa, ON K8H 2J4
(613) 687-6836

CENTRAL ONTARIO
SOARING ASSOCIATION
Keith McKenzie
21 Princess Street
Markham, ON L3P 1K4
(905) 294-2148 H
(416) 490-7156 B

ERIN SOARING SOCIETY
Box 36060, 9025 Torbram Rd
Bramalea, ON L6S 6A3

GATINEAU GLIDING CLUB
Rick Officer
1085 St. Jovite Ridge
Orleans, ON K1C 1Y6
(613) 824-1174

GUELPH GLIDING &
SOARING ASSOCIATION
G. Ritchie (519) 763-7150
259 Cole Road
Guelph, ON N1G 3K1

RIDEAU GLIDING CLUB
Box 307
(519) 285-2379
Kingston, ON K7L 4W2

LONDON SOARING SOCIETY
Brian Keron
RR 2,
Thamesford, ON N0M 2M

RIDEAU VALLEY
SOARING SCHOOL
Box 1164 (served by machine)
Manotick, ON K4M 1A9
(613) 489-2691

SOSA GLIDING CLUB
Pat O'Donnell
74 Lincoln Avenue
Brantford, ON N3T 4S9
(519) 753-9136

TORONTO SOARING CLUB
Stephen Foster
10 Blyth Street
Richmond Hill, ON L4E 2X7
(905) 773-4147

WINDSOR GLIDING CLUB
Eric Durance
785 Bartlett Drive
Windsor, ON N9G 1V3

YORK SOARING ASSOCIATION
10 Courtwood Place
North York, ON M2K 1Z9

PRAIRIE ZONE

GRAVELBOURG GLIDING
& SOARING CLUB
Mark Jalbert, Box 213
Lafleche, SK S0H 2K0
(306) 472-5668

PRINCE ALBERT GLIDING
& SOARING CLUB
Keith Andrews
219 Scissons Court
Saskatoon, SK S7S 1B7
(306) 249-1859 H
(306) 933-7498 B

REGINA GLIDING &
SOARING CLUB
Bryan Florence, Box 4093
Regina, SK S4P 3W5
(306) 536-4119 or 545-3366

SASKATOON SOARING CLUB
John Toles
45 Churchill Court
Saskatoon, SK S7K 3W9
(306) 652-7909

WESTMAN SOARING CLUB
2615 Rosser Avenue
Brandon, MB R7B 0G1

WHEATBELT SOARING CLUB
Douglas Cameron
Box 101
Sovereign, SK S0L 3A0
(306) 882-3738

WINNIPEG GLIDING CLUB
Susan or Mike Maskell
489 Lodge Avenue
Winnipeg, MB R3J 0S5
(204) 831-8746

SWAN VALLEY SOARING ASSN
Sam Namaka
Box 1827
Swan River, MB R0L 1Z0
(204) 734-3404

ALBERTA ZONE

CENTRAL ALBERTA GLIDING CLUB
Jerry Mulder
4309 Grandview Boulevard
Red Deer, AB T4N 3E7
(403) 343-6924

COLD LAKE SOARING CLUB
Randy Blackwell
Box 2108
Medley, AB T0A 2M0
(403) 594-2171

CU NIM GLIDING CLUB
Keith Hay
7 Scenic Glen Gate NW
Calgary, AB T3L 1K5
(403) 239-5179

EDMONTON SOARING CLUB
John Broomhall
1040 - 107 Street
Edmonton, AB T6J 6H2
(403) 438-3268

GRANDE PRAIRIE
SOARING SOCIETY
Walter Mueller
10317 - 82 Avenue
Grande Prairie, AB T8W 2A6
(403) 539-6991

PACIFIC ZONE

ALBERNI VALLEY
SOARING ASSN
Doug Moore
RR3 Site 310 C6
Port Alberni, BC V9Y 7L7
(604) 723-9385

ASTRA
Christine Timm
9280 - 168 Street
Surrey, BC V4N 3G3
(604) 589-0653 H
(604) 574-4141 B
(604) 574-4907 F (school term)
(604) 581-7456 F (summer only)

BULKLEY VALLEY SOARING
Ted Schmidt
Box 474
Smithers, BC V0J 2N0
(604) 847-3585
(604) 847-2231

EAST KOOTENAY SOARING CLUB
Mike Cook
509 - 5 Avenue
Kimberly, BC V1A 2S8
(604) 427-5471 H
(604) 427-5563 F

VANCOUVER SOARING ASSN
Ray Richards
2336 Marine Drive
West Vancouver, BC V7V 1K8
(604) 926-6354 H&F

return address:

Soaring Association of Canada
Suite 111 – 1090 Ambleside Drive
Ottawa, Ontario K2B 8G7

