6/93
Dec/Jan

free flight · vol libre

POTPOURRI

YES! It's "Don't forget time". The clubs must remember to record total flights for all club and private gliders at the end of the year and have the information available to fill out the stats forms mailed out by Randy Saueracker. Randy and/or your Zone Director will be contacting those clubs which are late with their returns. Thank you in advance for your prompt response in returning these statistics.

Harold Eley, our Trophy and Claims Chairman, will also be expecting claims from all pilots who have made worthy flights and may be eligible for any of the SAC trophies. So pilots, get busy.

Richard Longhurst, our Insurance Chairman, reports that damage claims are very high and it's very likely that there will be some upward adjustments to premiums in the coming year. Somehow we must break the chain of BAD decisions and lack of forethought in handling our gliders. I sometimes wonder if being TOO optimistic is part of the problem. If we acted as if we were not insured, would we fly and handle our gliders with more care?

Continuing with insurance information, we have a very good "out of country" policy to cover injuries and hospital care due to gliding accidents, but so far there have been very few premiums sold. Those pilots going south this winter please remember to obtain your coverage through the SAC policy. All clubs were sent brochures and application forms this spring.

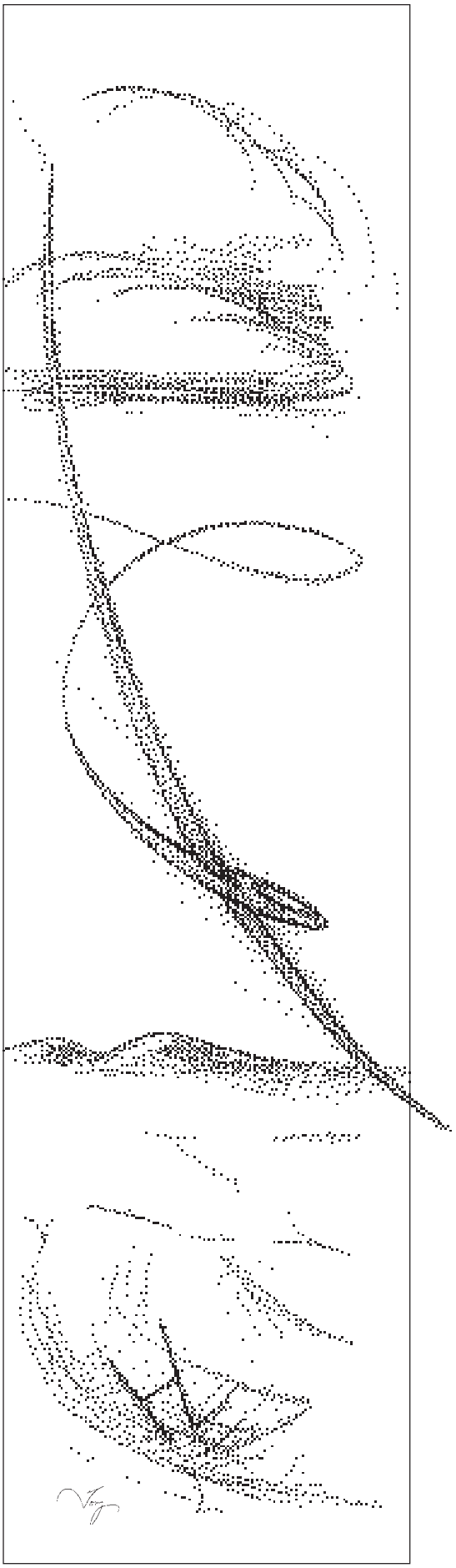
Everyone will have received by now their 1994 membership cards and Pioneer Trust Fund donation card and letter. Donations ARE tax deductible. As a further thought, how about considering SAC trusts in your will or as a memorium, before it is too late? Remember the membership cards are NOT a receipt for 1994 dues which have not been paid yet. They are sent out early to save postage and to assist those members who attend out of country contests early in the year. If you don't join SAC in 1994 we request that your card be destroyed.

A review of our financial status indicates that at the present time we may either have a small deficit or a small profit at the end of the year. Joan has been active this year in measures to increase the efficiency of our Office operations including reducing long distance telephone, printing and postage expenses without reducing service to members, and the Board cancelled their October meeting scheduled for Vancouver. However, with the present trend in interest rates and membership numbers, it appears that if we wish to maintain our present service to the members, it will be necessary to increase next year's membership fees somewhat.

Again, I wish to thank all those who contributed in any way to their club, provincial organization, or SAC. Volunteers are keeping our organizations alive and healthy and we cannot exist without them. Those who complain that this hasn't been provided or that hasn't been done, REMEMBER, some VOLUNTEER has to do it — how about YOU?

Again, please remember the Pioneer Trust Fund in your charitable donations. Best wishes for a merry festive season and happy soaring in 1994.

Al Sunley



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Trademark pending Marque de commerce en instance

6/93 Dec/Jan

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

ISSN 0827 – 2557

DEPARTMENTS

Cover For your reading enjoyment in the next issue — one of the best retrieve adventures of the year. A Blanik is being derigged after landing on a large sand bar on the north side of the Fraser River a bit upstream from the Hope BC airfield. photo by Kalli Brinkhaus

Canadian Advanced Soaring Association News

Ed Hollestelle

We all should set goals for ourselves every year and try our best to accomplish them. So I did exactly that this spring. However, the weather, though somewhat better than our almost washed out 1992 soaring season, did not permit me to fulfill any of them. A weather pattern shaping up on the continent in which a record flight could possibly be made did not happen very often. By the time the system came close, unexpected things would happen to change its course or disturb it. This was also the case during our 1993 Nationals at Swift Current. A most unusual weather pattern caused cold temperatures, high humidity, bad visibility and low cloudbase during this meet.

The Nationals turnout was very good, mainly due to the added Sports Class (although some other people, including the organizers, called it a handicapped "Open Class"). This shows there really is a lot of interest in cross–country competition flying and I encourage the new class if the facilities allow it. But it should be done in such a way that it does not influence the scores of the other classes. I would also point out that competition at this level offers an opportunity for qualified pilots to learn a whole lot in a very short time, and if they have a ship that can compete in one of the championship classes, I would encourage them to do so rather than flying the Sports Class. There are also the provincial competitions geared to more relaxed flying and to prepare for the more serious national championships.

Apart from the weather, I think we are experiencing the effects of our economic downturn in Canada. Not only is the SAC general membership down, it also shows in the fact that many individuals did not want to risk taking the extra time off to participate in certain soaring events. Either that or they lost their jobs and simply did not have the money ... The self–employed amongst our ranks possibly could not justify spending the extra money or taking the time off. I hope this is the case rather than a lack of enthusiasm.

CASA had its first annual general meeting during the Nationals at Swift Current and the board members were voted in for another term. Sue Eaves, who does an excellent job producing our newsletter, also volunteered for another year.

Our contest kit is now complete and is available for the organizers of any soaring competition in Canada. It contains just about everything one would need to run a competition, except the manpower. We are planning for beginners as well as advanced cross–country clinics for the 1994 season. If the interest is there, we will try once more to get a team of our top pilots together to go to Uvalde to sharpen their skills.

Now that the dates have been set for the 1994 Nationals at SOSA next summer, we will be setting the dates for the clinics soon, so people can make their plans accordingly. We will be working together with SAC on building the World Team fund and are actively looking for corporate sponsors. We will continue to promote cross–country soaring at all levels and we are counting on your continued support. If you would like to read about cross–country soaring stories in more detail and help us meet our goals, you should send us your $25 membership fee now. Mail it to:

CASA, c/o Richard Longhurst
1446 Don Mills Road, Suite 100
Don Mills, Ontario M3B 3N6

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 ok in ASCII). All material is subject to editing to the space requirements and the quality standards of the magazine.

Prints in B&W or colour are acceptable. No slides please. Negatives can be used if accompanied by a print.

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 given 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$28 overseas), please contact the National Office, address below.

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 contri-butions 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 photos en noir et blanc ou couleur sont acceptables. Les négatifs sont utilisables si accompagnés d'épreuves. Nous ne pouvons malheureusement pas utiliser de diapositives.

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 apparait 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$28 outre–mer) veuillez contacter le bureau national à l'adresse qui apparait au bas de la page à gauche.

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National Office (613) 739-1063

Date limite:

5 janvier, mars
mai, juillet
septembre, novembre

LOOKING FOR LIFT

Tom Bradbury
from *Sailplane & Gliding*

Some research with powered aircraft suggests that in a field of cumulus cloud only about 10% of the cloudy air contains useful lift. When there is a lot of moderate sized cumulus, one can expect at least half the clouds to have little or no lift under them when you arrive. Here are some suggestions for first cross–country pilots looking for lift under cumulus.

The ideal cumulus is distressingly rare. Most pilots know what it should look like:

It has a flat level base, a crisply–defined bubbly top with no hairy bits or fuzzy patches and a cross–section rather like an equilateral triangle. It is neither too tall nor too flat. It is evenly distributed like trees in a well–kept orchard. To get these ideal cumulus requires a moderate depth of instability, air which is relatively dry, and a wind field with little vertical shear.

Life of a cumulus Judging by the radio chatter some pilots have an exaggerated idea of how long a thermal lasts. One pilot will call a partner from many miles away to give the location of a thermal. Most thermals will usually have changed or died out long before the partner gets there. But with luck another may grow in the vicinity to support the laggardly pilot. It is well to be aware of the life span of cumulus; one can get badly out of phase by sticking too long in a weak thermal, planning to step across to a better looking cloud after gaining a little more height. By the time you at last make the move the next cloud has grown tired of waiting and has shut up shop.

Cu often look better from the side
If you look back at the feeble cloud you have just left it may appear much better now. Perhaps it had a new injection of thermals since you left it. Many cu look much better from the side than from below. Some apparently well–formed clouds look fine from a distance; when you arrive below them they turn out to be badly decayed. However, if your last cloud had lost all its lift before you left it will usually be dissolving into shreds when you look back.

Figure 1 shows sketches of cumulus arranged in order of their persistence. Note: LCL stands for Lifted Condensation Level, the level at which air carried up from near the surface starts to form cloud. The term is used to distinguish it from condensation levels due to the lifting of air which started from much higher up. For example, altocumulus form when medium level air is lifted above a different condensation level.

Sketch A: It is common for the ephemeral puffs or wisps of white which appear just above a strong inversion to disperse in under a minute. By the time you have spotted them the thermal is almost finished. With luck there will be another one along soon. However, if the puff formed just below the inversion (where the air is usually more moist) it often marks a new thermal which lasts just long enough to give a climb.

Sketch B: Tall narrow cumulus nearly always have a brief life. These "rocket clouds" shoot up in five minutes or less and dissolve two minutes later. The proper name for these towers is "castellanus"; I think rocket is a more entertaining description.

Sketch C: Cumulus with a roughly triangular shape have a moderate lifetime; many seem to survive ten or fifteen minutes but they may be revived by fresh thermals. When this happens you can watch them start to decay and then rebuild in a different shape.

Sketch D: Cumulus which form a line will often consist of several turrets side by side and these may last a half an hour or more, especially if they have formed over a line of hills with sunny slopes.

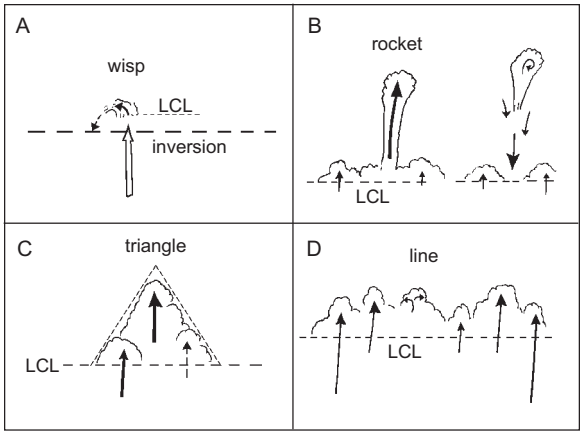


Figure 1 Four examples of cumulus clouds with different lifetimes

What controls the life span?

The lift time depends on:
- The mass of air in the cloud and the number of thermals which continue to refresh it. The bigger a cloud grows the longer it takes to dissolve but it may become almost inert for the last part of its life.
- How dry the surrounding air is. Evaporation is slower in moist air so the cumuli take longer to evaporate. In contrast cu which penetrate into very dry air (often found above an inversion) disperse very quickly.

In the morning there is seldom a large reservoir of warm air wait-

ing to form thermals. As a result clouds may only receive one or two thermals. The poor little cumulus is starved of energy and soon decays.

In the afternoon cumulus clouds are usually fed by many more thermals so their lifetime is longer. Time lapse films show these cumulus are maintained by several new surges of lift. Any one thermal has a short life but the general effect is to produce a moderate–sized cloud with a lifetime of 15 to 30 minutes.

Figure 2 shows a quarter of an hour in the life of a cumulus:

A is at minute1, a few seconds after the puff forms. If you are nearby this is the cloud to aim for because the thermal is usually fresh and vigorous.

B is at minute 3; a second thermal has shot up to produce another little cu alongside. It usually appears on the upwind side.

C at minute 6 shows the second thermal becoming dominant and making a taller cloud.

D at minute 9 shows this taller turret curling over in the wind aloft and perhaps forming a short lived hook. Meanwhile a new thermal has produced another cell, sometimes with a small step between the two bases.

E at minute 12 shows the beginning signs of degeneration. Hooklets, spiky prongs and fuzzy edges are usually signs of the dry wind aloft twisting the cloud top over and evaporating the bubbly domes into spikes or hairy bits.

F is the last stage before the cloud disappears. All sign of cu has gone leaving a wispy mess with only sink under it.

Long lived clouds

A cunim large enough to produce a substantial shower can grow to maturity within half an hour, and (if no fresh supplies arrive) collapse into shreds soon afterwards. Monster cunim which develop into “supercells” no longer depend on a stream of individual thermals. These clouds form in a type of wind shear which separates the warm moist updraft from cold rain–bearing downdrafts. The lift becomes a continuous process like a steeply sloping conveyor belt. Near the top the conveyor belt becomes almost vertical. At the top it turns horizontal as it encounters a much stronger wind which blows the air away as a long anvil cloud. The strong wind seems to act like an extractor fan carrying the air away instead of letting it fall back as sink. (But there are still areas of ferocious sink elsewhere!) As a result these monsters have a lifetime of many hours; they can persist through the night and keep going even if the storm moves over the sea or other large areas of water.

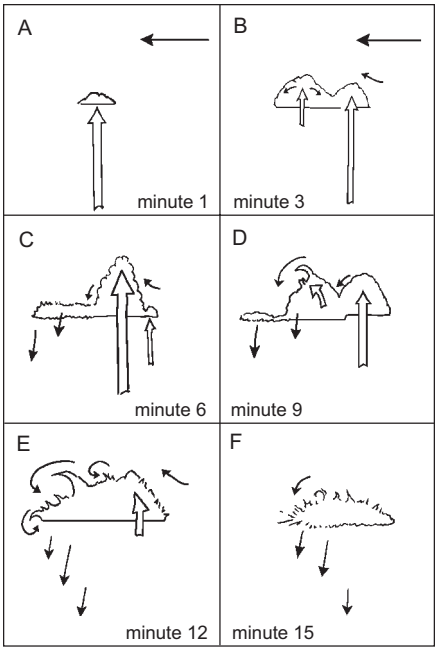


Figure 2 The life cycle of a small to medium sized cumulus cloud

Regions of lift Small cumulus, whose radius is not much more than the radius of the thermal feeding them, nearly always have the lift almost directly under the cloud, or slightly to one side. Even in a fresh breeze thermals do not tilt very much unless the lift has become very weak. But they do move at about the speed of the low level wind. As a result, the path of a glider circling in drifting lift is often far from vertical.

When looking for lift low down, it is usually best to try upwind of the small cu. This is not necessarily because the thermal slopes downwind but because even little cu are often maintained by a series of thermals. These tend to break away from a favoured region as a series of narrow plumes which follow one another up. As they go higher the plumes may amalgamate into a broader thermal and form a vortex ring “bubble” at the head of the rising column.

The latest plume is usually furthest upwind; it works very low down (but is usually desperately narrow). Earlier plumes broaden out but they soon become detached from the surface. Thus by flying into wind there is a chance of running into a younger plume lower down. If you fly downwind from a lost thermal the next plume is likely to be above your level. Figure 3 illustrates some possibilities:

A shows lift under the sunny side of a cloud. Much of the ground is shaded and if the cloud is very slow moving, the shaded ground tends to cool off and inhibit thermals. The best lift is then most likely on the sunny side.

B is an example of the effect of wind shear. The arrows on the left show windspeed increasing with height. When this happens almost all the new thermals start on the up–shear side. The cloud reaches its greatest height near the middle and from then on decays so that the down–shear side has collapsing cloud and much sink. One can often find the best lift by circling half in sunshine and half under cloud on the up–shear side. This is good if the route lies downwind because one comes to lift first. Going upwind one first meets sink on the lee side and then has to fly under a large area of cloud before finding lift.

C illustrates the problem when the shear is reversed. Now the best lift has moved to the shady side and the sunny side has the sink. If the two effects are both weak the cloud may not have a “best” side to approach.

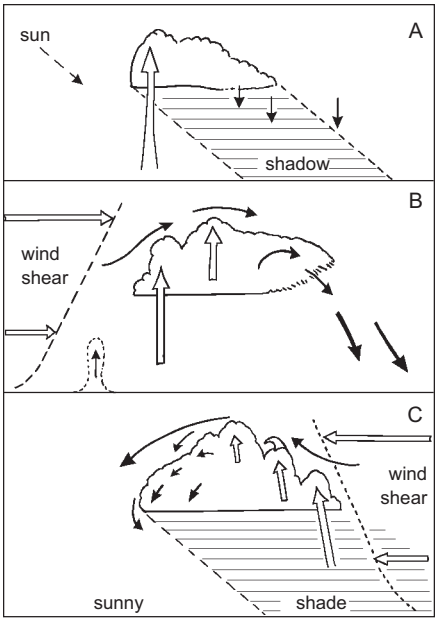


Figure 3 Regions of lift depending on sunny side and up–shear sides of a cloud

Figure 4 is an enlarged version of 3B. The appearance of tilted towers of cumulus show which way the wind aloft is sheared. The cloud has the newest lift on the left; mature thermals produce the main turret near the middle. On the right an earlier thermal has just peaked. Here lift only exists at the summit; there is none low down. Finally the oldest bit of cloud enters the downturn and dissolves in sink.

Lift under larger clouds

When clouds grow larger it is increasingly difficult to locate the lift. The level base maintains its appearance for several minutes after a good thermal has drawn up its tail; then it may not be obvious where the next active thermal will enter.

Steps, tendrils and whiskers

Figure 5 shows four indications:

A is an occasion when a large long–lived cumulus has approached the inert stage and only gives weak lift, but a brand new thermal rises off much warmer ground close by. If this new thermal starts off with a big excess of temperature and also carries a large mass of

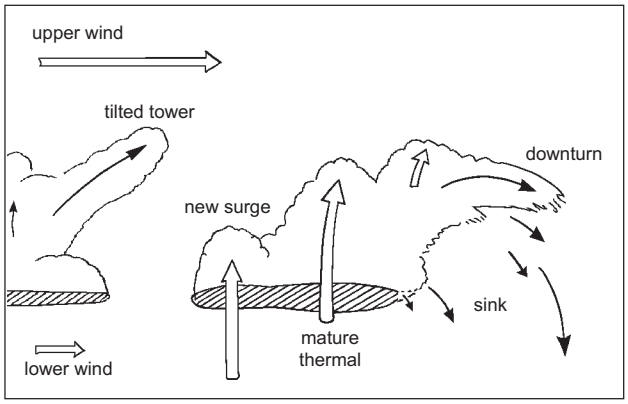


Figure 4 An example of lift in the presence of wind shear

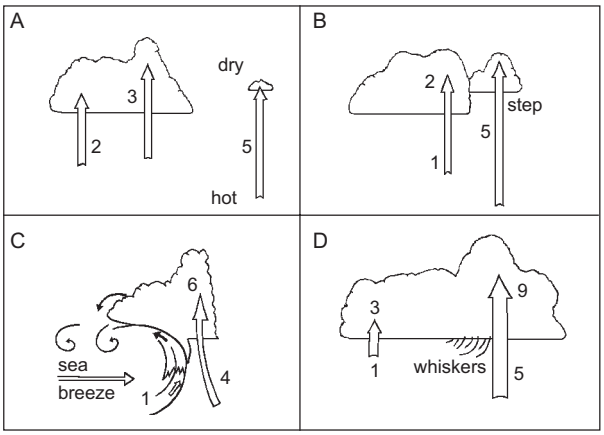


Figure 5 Cloud steps, tendrils, and whiskers

air it does not cool down so quickly as the smaller thermals. As a result it has a higher LCL. Such clouds mark where the best lift occurs and are often worth trying. The figures beside the arrows suggest the lift strength in knots. They are comparative rather than absolute values.

B shows a similar effect where the new cloud joins the old and feeble one. There is a step in the cloudbase with weak lift under the lower section and strong lift under the high base.

C shows a different kind of step caused by a sea breeze front. The damp sea air has a much lower LCL than the dry land air. When it meets the front the sea air rises rather slowly and eventually turns back seawards into a turbulent region. At the boundary one finds tendrils of cloud. The lift is usually very close to the tendrils on the landward side. It is unusual to see a continuous line of tendrils; they are more often found in patches.

D illustrates whiskers. These are effectively the kind of tendril formed when there is no contrast of air. Whiskers develop close to the region where strong lift is entering the cloudbase. They are often hard to see from low down but one may spot them when looking slantwise at the cloudbase. They show up best when silhouetted against a brighter cloud in the distance.

Thunderstorms and heavy showers may develop quite long and straggly whiskers. These can be seen to grow at a slanting angle. It may be that the gust front ahead of a shower has triggered off a new surge of lift by undercutting moister air. It can also be due to moister air from part of an old cloud which had recently evaporated due to prolonged sink. This moist patch is then drawn into the inflow of the new thermal. Whatever the reason whiskers are nearly always a good sign of lift. If the whiskers grow thick and long and seem to be turning into a full sized beard it may be wise to keep out of cloud unless you are determined to fly in a cunim.

"Rocket" clouds and doughnut rings

I call them rocket clouds because they go shooting up far above all their companions and either disappear in a line of shreds or vanish as a little puff. In either case the air comes falling back producing an area of strong sink; the sink can be so strong that it punches a hole in the original cloud. Then one may see a doughnut cloud forming a ring with a hole in it. One does not usually see this shape until very close under the cloud. What seems from a mile away to be a well shaped cloud will show no centre when the pilot is much closer.

Rocket clouds form when the energy increases upwards. The narrow rocket is easily evaporated when it shoots up into the dry air. To be successful, clouds need to surround themselves with a group of companions. These keep the growing cloud in a moist environment for the first part of its ascent and prevent premature evaporation. It is seldom worth flying directly under a rocket cloud; by the time you have reached it the lift has long gone and only sink remains. Adjacent clouds may get a boost when the sink spreads out near the ground and sets off fresh thermals.

A feature of isolated rocket clouds is their lack of a firm base. The base degenerates shortly after the rocket lifts off. This is a sign that there is a lot more energy available well above cloudbase than low down. Lift is quite weak when the rocket sets off but becomes very strong higher up. Acceleration is rapid but the cloud is often too narrow to circle in, even if you catch it at the start. I believe that rocket clouds mean that the lift will be patchy, short–lived and difficult to use (especially in the morning).

A summary of some general rules

• Most small and medium sized cu have a short active lift so one needs to have an alternative cloud in mind for times when the original choice proves dud.

• Lift is more likely on the sunny side of a large cumulus.

• Lift is often found on the windward side of cumuli, especially if there is an increase of windspeed with height. This shear almost always produces lift at the up–shear side and sink at the down–shear end. Time lapse films show that in strong winds these clouds have a rolling motion, rising on the windward side and descending on the lee side.

• If the up–shear side is also the sunny side there is an even better chance of finding the lift entering there.

• If the sun is on one side and the wind shear is on the opposite side the odds seem to favour the up–shear side. Lift then works best on the cloudy side but it may have a zig–zag pattern distorting the lift.

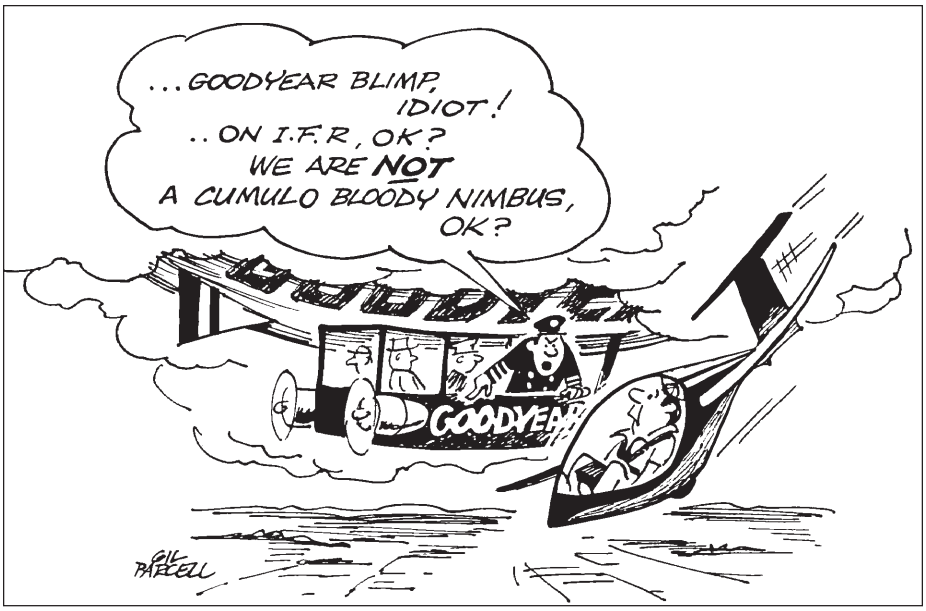
• Shower clouds tend to produce a gust front blowing out ahead. The gust front triggers off new thermals so the cloud moves partly by setting off new areas of lift in front of it. As the cloud shadow arrives new thermals may be triggered off. This seems to work even if the cloud is not large enough to give a shower. Pilots tacking up and down a ridge often find they can at last get away when the shadow of a big cloud arrives.

• No set of rules can cover all the possibilities; one may find lift in unexpected places. The flanks of a big cumulus line sometimes give weak lift in clear air. This seems to occur when the cloud is growing; if the cloud line is near your track it is a splendid bonus.

• Try to "follow the energy" by flying under as many good looking cu as possible without making a major diversion. Flying straight down the track marked on a map may look shorter but turn out much slower if you meet heavy sink out in the blue between cloud lines.

• Lift is not confined to well established cu, it may surge up under you in unexpected places such as gaps in a cloud line which are about to be filled in by new thermals.

Finally Do not be impatient to set off for Silver distance the moment thermals start. Morning cumulus are often short lived and difficult to work. By mid afternoon cumulus nearly always have a higher base and longer life. The thermals are larger and easier to work. Many pilots have found themselves down in a field within 20 miles through starting too soon. •



OFF–FIELD LANDINGS

Tony Burton

Ian Oldaker
Chairman, Flight Training & Safety Committee

"What does a student have to look forward to, having completed their training to licence standard?"

One of the first answers to come to mind is cross–country flying, and with that in mind a program to implement the required type of training is to be set in motion by the Flight Training & Safety Committee. The training for field landings will be done most efficiently within the clubs, and it is hoped that many experienced instructors will jump in with both feet, as it were, to encourage young pilots to extend their horizons, and to become enthusiastic cross–country pilots.

Even if you aren't interested in this type of flying, the training is well worthwhile, as it gives pilots added competence and confidence in hand-ling unusual flight situations, such as arriving back at the club with insuf-ficient height to make a standard circuit. This has occurred in the past too often. We hope that this type of flying training will become more routine within clubs in the coming months and years, and that having read and understood the article you will be more at ease with the idea of breaking the ties to the club field.

THE FIRST OFF–FIELD LANDING is truly a memorable event. When the lift runs out and the pilot has to select a field never seen before, then plan a circuit and land, there seems so much to do; the downwind check, SWAFTS, then am I in the right place to start a circuit, have I really inspected that field, where is the wind, am I flying fast enough, and is it clear on the approach? So many questions that seem so automatic at the club, but which now take on so much more importance that it seems there is little time as you inevitably descend.

The circuit is started, the downwind leg goes well enough, and I choose the angle technique to judge when to turn onto base leg. But on base leg I seem high and too close. Add in more brakes and extend the circuit, but I don't want to go too far downwind! Height great, the turn onto final goes well, good speed, and now the ground seems to come up fast. Hold off, does look a bit rough on the ground below, wings nice and level... touchdown!

Wow, the glider stops rapidly in the soft field and it settles onto the nose skid... noisy on the dirt. Then ... silence. I made it! Open the canopy, let the heart slow down. Deep breath ... and listen to the silence, nobody around ... Hey, that feels gooood! It's quite a sensation that will stay with you for many years.

FIELD LANDINGS

When venturing out from the club on a first cross–country flight some pilots are reluctant to depart because they have for so long flown within gliding range of the club. This is understandable, but the simple expedient of learning from an instructor how to choose the right sort of field to land in, and to plan a suitable circuit, will go a long way to making the departure easier.

One of the most difficult skills to learn is this ability to select a suitable field from the air and to plan and fly a safe circuit into it. On a cross–country flight you should of course always be able to land safely in a field, hence you should never fly over unsuitable terrain unless you have sufficient height to reach a good landing area. Bad luck does not enter into the equation when landing in a field. If you damage the glider because you did not notice the slope or that the crop was very tall, this was not bad luck, but an error on your part when you failed to notice the problem and act in time. Keep this philosophy in mind, it may be a tough one, but it is true!

When out on a flight, those fields down there look huge if you are from the prairies, or small in other parts of the country, but in any case as you lose height you suddenly realize that you are going to have to land in a few minutes! Imagine you are out of easy gliding range of the club, and below there are not too many fields, or so it seems, and the adrenaline starts to pump.

One of the difficulties of selecting a suitable field is that you will not be able to see the details on the ground clearly until you are too low to make a sensible or safe change of field possible. In other words, a pilot has to have a basic knowledge of the types of crops and ground or topography underneath, and to remember that a good approach into a poor field is much better than a poor approach into a good one. The following sections describe the important aspects of selecting fields and planning circuits for an off–field landing.

HEIGHTS FOR DECISION–MAKING

When starting cross–country flying, the following heights are suitable for most low time pilots. As you gain experience you will be

working to lower heights, however, remember that the sooner you make the decision to land the better. At the beginning stages it's unwise to try to catch a thermal low down because you'll most likely drift away from your chosen field and you will be putting your glider and yourself at an increased risk. It's not worth it!

The following sections discuss the heights for decisions needed to adequately plan for an off–field landing. The criteria for selecting fields are also given in the next sections. They are summarized in a briefing card at the end of this article for you to copy and laminate if you wish to carry it in the glider.

2000 feet Starting at a height of about 2000 feet above ground level (agl), if the lift is failing and the flight looks like ending soon, start by locating suitable looking areas for a landing. A good rule of thumb here for a typical early cross–country glider you will likely be flying is that it will cover approximately 4 miles for every 1000 feet height loss. You will need another 1000 feet for the circuit and landing, hence from 2000 feet agl your radius of action is about four miles. However, remember that you can cover more ground by flying downwind.

1500 feet As you descend you will be able to see more details in the fields, and by about 1500 feet you should have chosen two or three suitable looking fields.

Consider the surroundings. Are there streams that can indicate sloping ground, power lines to avoid, and obstacles around the fields such as tall obstructions which would create turbulence on the approach? If you can detect a slope to the ground, it is probably too steep to land on! Now get a good idea of the wind direction from ground clues such as smoke and the surface of water that you can see. Make a note of the sun's position relative to the wind; you will need this information later as you fly the circuit. Imagine an approach into each field, and using the "SOAR" technique of decision making, choose the option with the safest and best outcome.

1200 to 1000 feet By 1200 to 1000 feet you will have made your choice of field. It should be at least 2000 feet long for your first off–field landings, and choose a diagonal if it is more into wind. Indecision here can really cut into the time needed to get ready and to start the circuit. So don't delay in making this decision, as you will need to be planning the circuit in detail and starting the pre–landing SWAFTS check list.

1000 feet By 1000 feet agl you will make a commitment to land and at 800 feet you will commence the downwind leg of the circuit. So from now on forget all lift and concentrate on the landing. Position yourself to the side of the field well upwind, and make an effort to visualize the circuit that you will be flying. There is a double tendency here to fly too close to the field and to plan a circuit pattern sized according to the size of the chosen field. If it is small, the circuit will be small! And vice versa. If you get too close to the field, not only can you not see it well but you will be making the circuit very tight; the turns will need to be steeper than normal and you may find yourself too high and with little space to widen the circuit to use up this height.

So plan to fly a comfortable pattern, based on a typical pattern at your club. The last height check that you need to make is when opposite the aiming point on the field, chosen earlier. The altimeter may well not be a useful instrument now, particularly if the pressure has changed during the flight and the ground is at a different elevation than at your club.

Although simple arithmetic should allow you to subtract the map's heights from the altimeter reading to get your height above ground, mistakes are easily made in the air! You will have to rely more on your height judgement, by referring to ground features, particularly for the last few hundred feet of your descent. Try to avoid using the altimeter from now on.

500 feet Aim to be opposite the aiming point at about 500 feet above the terrain, and from there use your preferred method of judging when to turn onto base leg. At this point you will increase speed for the approach, remembering that in a modern sailplane excessive speed could make you overshoot. Give yourself adequate height over obstacles, and once you are safely over them and above the landing area, you may use full airbrake to touch down early. Aim to make a fully held–off landing so as to achieve a "low–energy" landing (this is discussed elsewhere in the manual). If you have flaps and you are landing in a crop, retract the flaps, and keep the wings as level as possible to avoid a ground loop from catching a wing tip in the crop.

WIND DIRECTION
This could change during the flight and is vital to know. Drift over the ground can help you detect the wind direction, if smoke or water can't be seen. Cloud shadows help too, but remember that the wind direction close to the ground could be different than at cloud height. It usually blows along valleys for example, and is affected locally by large bodies of water or a storm cloud. Plan your approach essentially into wind.

SIZE OF FIELD
The size should be as large as possible, of course, with a long into-wind dimension. Available length can often be related to concession lines, but in some areas close to towns, the fields can be quite small. A good guide is the spacing of power poles where a field at least five pole spacings long is a bare minimum. This should be increased considerably if there are hazards such as trees which have to be crossed on the approach. And remember that an into-wind diagonal across a field can be used to increase the landing run; you don't have to land parallel to the edge!

The size of the field that is needed for a successful landing also will depend on the slope of the ground, the skill of the pilot, the approach hazards, the surface of the ground and the wind strength. If you have a good wheel brake you could use it effectively by flying onto the ground early rather than doing a fully held–off landing. If you are prone to choose a field with good undershoot and overshoot areas, this probably means you cannot guarantee you can land in the field of your choice; you should not even be flying cross–country at this stage. It would be better to practise spot landings from odd directions and into different parts of your home field instead.

SLOPE OF THE FIELD
A great influence on the upcoming landing is the slope of the proposed field, as this will materially affect the length of the landing run.

One of the best ways to evaluate the slope is to look at the field from each side, and to look for telltale signs such as wet areas or hollows which have been avoided by the farmers due to the low–lying land. This requires time, and the above decision heights are designed to allow for this type of inspection.

Any downslope will increase the landing run considerably, in fact you may not be able to land and to stop when going down even a moderate slope. Therefore never plan to land downhill. Landing across a slope is feasible, but take care to avoid touching the uphill wing on the ground and going off down the slope after touchdown. If you have to land on a slope, landing up the slope is preferable even with a tailwind. However, extra speed will be needed, and be aware of the need to rotate the glider through a larger angle than normal to avoid a heavy landing.

APPROACH HAZARDS
Fields are always bordered by some form of hazard, whether it is a low fence or a high bunch of trees. Some are almost invisible, such as electric fences within the outer boundary of the field, or hydro poles along a treed or bushy boundary. Others are very visible, and these can present their own hazards.

Having found the hazard, aim to cross at a safe height, remembering that tall objects such as trees or buildings create turbulence so extra speed will be needed to maintain good control on the approach. A good rule of thumb to use for the effect of an obstruction is to consider that the length of field lost will be ten times the height at which you cross the edge of the field. Hence you will cover over 1000 feet for a typical 100 foot height of crossing the field boundary.

TYPE OF FIELD AND ITS SURFACE
Fields vary in their suitability with the time of year and time since they were worked. For example a field that looks smooth but has not been worked recently could hide gopher holes whereas these would be absent in a freshly harrowed field. Some field types are preferred, and will vary from one area of the country to another. Discuss these with other pilots in the club, and look at fields on your way to the club to keep up to date on crop progress and harvesting practises.

Among the best types of field are freshly harrowed fields, followed by plowed and summer fallow fields. However land parallel to the plowed rows. It is a bit rough to land across the furrows! Stubble is next best, followed by grass. However, grass can vary greatly, depending on how recently the field was sown and/or cut for hay, for example. If it is used for strip grazing be careful to look for the telltale signs of slight colour variations along a line which would indicate an electric fence.

A field with a new crop in it may appear green from a low angle but will look more brown from on top. The surface may be quite soft. Other crops such as corn are not suitable for a landing though they would be better than an adjoining bush area.

As for animals, there are not many occasions that you will have to land in a field containing animals, unless you are in a very sparse area for landable fields such as the Maritimes. Animals vary in their reactions to a glider, with cows not caring much except they are curious after you land. You may need to keep them clear of the glider. Horses tend to get excited and can gallop in random directions. Sheep will congregate in groups and usually will stay clear. In general, try to avoid sharing a field with animals.

In all cases of what sort of field to choose, the best teacher is you — look at fields close to your club and after landing go over to them and compare your airborne assessment with the ground view. They may be quite different at first, but after a bit of practise you should be able to assess a field quite satisfactorily.

SUMMARY – AND THE FARMER

Don't forget that you are landing on someone else's property. Your objective should be to cause a minimum of damage to the field and its crop, and then to contact the owner as soon as you can. Explain that you had to make an unplanned or emergency landing, and make arrangements to retrieve the glider, again making an effort to minimize any damage to crops. You may wish to photograph the farmer with the glider and send him a copy later, so ask him to sign your landing card — this will at least provide you with his name and address. Make sure he is happy with how you will remove the glider from the field. If he demands some damage compensation you should exchange with him details of the liability insurance you carry. Finally, as you leave the farmer's field with your glider, ensure that any gates are left adequately secured. •

FIELD LANDING BRIEFING CARD

2000 feet agl If a landing appears probable, fly towards a suitable area that is flat and free of obstructions. Fly downwind to cover more ground.

By 1500 feet

Pick an area with two or three potentially suitable fields. Consider the following:

- does the ground slope? If it appears to do so, it is too steep to land on.
- are there tall obstructions and other hazards, or hills to create turbulence on the approach?
- how does the surface wind line up with these fields, and are they long enough?

By 1200 to 1000 feet

Select the field considering these points:

- *Surface wind* Determine the wind direction from smoke, water patterns or the glider's drift. Plan to land essentially into wind, on the diagonal if necessary.
- *Length of field* Relate to concession roads and power pole spacings, or know the topography of the area. Choose a field at least 2000 feet long with low obstructions on the approach.
- *Obstructions* should be minimal since they reduce the effective field length by ten times the height at which you will clear them. Tall obstructions and hills create turbulence.
- *Slope of field* Any visible slope is reason to reject the field for a downhill landing. Look for slope by examining the surroundings and the selected field from each side.

Field type and surface

Fields are suitable in this order:

Summer fallow or harrowed	(plowed is acceptable when landing parallel to the furrows);
Stubble	recently cropped if possible;
Grass	but be careful of strip grazing indicated by slight colour differences showing electric fences;
New crops	appear brownish from above but green from a low angle;
Tall crops	such as corn are not suitable though slightly better than bush areas.
Animals	should be avoided if possible; keep well clear of animals if landing in a field with them.

At 1000 feet

Committed to land. No more thermalling. Start pre-landing SWAFTS checklist and move towards start of circuit. Have the aiming point selected and the circuit pattern fully worked out.

By 800 feet

Start of the downwind leg. Avoid flying too close to the field, use previously chosen circuit in mind. Aim to be opposite the aiming point at 500 to 600 feet above ground. Adjust to the previously chosen approach speed and retrim glider for this speed. Plan to cross any obstructions with adequate clearance and keep wings level, especially when landing in a crop. Reduce speed in the air as much as possible when landing on a rough field. Retract flaps if needed, to avoid damage.

After landing, secure wing tip to prevent wind damage by blowing over, secure canopy and take cameras and barograph with you to telephone for retrieve. Notify the farm owner of your unplanned landing and ask for permission to retrieve the glider; plan for minimal damage to the crop by the glider or trailer. Obtain owner's signature on landing form even if you are not attempting a badge leg. You will then have an address to send a thank you note plus a photograph — good public relations goes a long way!

A ROUGH OUTLANDING

George Szukala

George "Moose" Szukala
Cold Lake Soaring Club

THERE COMES A TIME in every glider pilot's life to go forth boldly in search of new challenges. These challenges are taken for reasons that are self evident and to obtain something that most people believe to be very valuable — experience.

However, life, at times, has a peculiar way of allowing us to gain experience. We are often given the final exam before any formal classes have been taken.

Our final exam came on 29 July 1993, during the 21st Cowley summer camp. Myself and another CFB Cold Lake gliding instructor, "Bull" Ilcan, decided to try to ridge soar on the west face of the Livingstone Range. This range, on the west side of the Cowley valley, is known to many glider pilots in Canada as a Mecca for tremendous soaring flights. The previous day, we had ridge soared the east side of the range with considerable success and much rejoicing after, but the wind shifted overnight 180 degrees and a decision was made to try the west side. As this was to be Bull's second ridge flight, a briefing and review of lessons learned from yesterday's flight were carried out. A briefing was also conducted with the towpilot to inform him of what was to take place and where we wanted to release.

With all necessary preparations completed, we proceeded to strap on our glider. Thanks to my many friends at Cowley, I shoe–horned myself into the back seat of the Lark and with water bottle in hand, we were rolling down the turf before you could say "BURNERS – BURNERS – GO" (as in afterburners).

A 4000 foot tow to the south end of the Livingstones put us over the smaller hills just north of Frank Slide (a natural disaster where 94 million tons of Turtle Mountain broke off and buried part of the town of Frank in 1903). The winds were strong and gusty from the west, steadying at the surface around 20 knots, while the upper winds must have been gusting over 30 as the tow was particularly rough; so much so that I took over for awhile so my friend could rest his arm.

We released after reaching 8000 feet (4000 agl) on the west side of the range in strong mechanical turbulence. After a few minutes we hit strong lift directly over the crest tracking north. Upper cloud cover forced us to stop our ascent at 10,500 as we passed over Centre Peak (at 8364 feet, the highest point of the range). We maintained a northerly track and an altitude of between 10,000 and 10,500 feet flying directly over the crest until we reached the gap in the range where the Oldman River runs through. Deciding to press on, we began to cross the gap and lose altitude, arriving on the other side at 7500, approximately 500 feet above the ridge. As we flew over the crest, the lift returned and after several laps along this ridge, we were back up to 9000 feet. Some discussion ensued and it was agreed that we would try to get back up to 10,000 feet before crossing back over the gap to proceed south.

Go get a coffee and hang on to your armrests, folks, 'cause it's all downhill from here — literally! Another 15 minutes on the ridge only yielded a 500 feet gain, so we turned around and headed south from 9500 feet. Progress was slow as we bucked a stiff headwind. Reaching the other side with 7300 feet, it quickly became apparent that this was going to be a battle. Flying 3–400 feet above the rocks, we joined the Livingstone Range at the arrow in the lower right corner of the photo above. Flying west over the crest we continued along the ridge towards the "star", at which point we hit strong mechanical turbulence in the lee of a westerly spur directly ahead of us. The turbulence was so strong that we ran out of altitude, airspeed and options in a heartbeat; a description which has been used by many a glider pilot, I dare say. At this point I said to my partner in crime, "I have control", placing the Lark into a steep descending right turn to regain airspeed and pull us away from the rocks which were getting far too familiar with my butt. Up 'til now, Bull had been flying the glider since release and I'd been back–seat driving with verbal directions like, "don't hit that mountain."

It quickly became apparent that we were going to land out — when and where was the question. I don't know how Bull felt up front, but I suspect that he was somewhat relieved that I'd taken over flying duties. Panic never really set in though — I had reached "a heightened sense of situational awareness", or the ability to know where I, and every other molecule in the universe was at this instant.

So we found ourselves down on the west side of the Livingstone Range tracking southwest. A brief survey of the situation gave us the following conclusions:

- Can't fly east due to foothills approaching the main range and turbulence in that area.
- Can't fly west because of densely forested hills, narrow roads which looked abandoned and no fields (unless you're in a helicopter — I wishing I had my trusty Jet Ranger at this point).

George Szukala

- Can't fly north because of hills, no roads or fields.

Flying in the only direction that seemed possible — south — I headed for the Crowsnest Pass some 28 kilometres away, secretly knowing I'd never make it as the wind was right on our nose at 20–25 knots. We were down to 7000 feet (2000 agl), and by some small miracle, we hit pockets of lift in the turbulence as I set negative flaps and began to dolphin fly, gaining a 100 feet here and there. I thought to myself that I might make it to Coleman in the Pass by tomorrow if I keep this up.

Bull is being very helpful throughout this phase, calling out potential fields, securing objects in the cockpit, calling checklist items and hanging on to the hand-held radio. No radio calls were attempted as we were below the ridge line from Cowley.

The dolphin flying wasn't paying off and we were lower still when a cut line in the trees finally came into view just off the nose and next to some kind of oil or gas facility. There was no time or altitude to overfly the area as it was still some distance away. Assessing the area from about four to five kilometres back, I could see it would be a straight–in approach to an uphill slope, with a 'useable' surface 200 feet wide and about 500 feet long. This area came at the end of a steep downhill descent, past some tall trees, a flare stack and a creek, and terminated in trees, a steep slope down and a wellhead in the centre which we didn't wish to hit. Not what you'd call your standard approach back at Cold Lake!

The photo above looks back at the approach from the north down over the trees, past the stack and other trees at the bottom. The photo below shows the final approach as flown, with the glider in its final resting place. The road on the right was not seen on approach, as it was shadowed by the trees at right and the sun shining directly on the nose, making forward visibility difficult.

Touchdown was made, deliberately nose high, left wing low, with full spoiler, flaps, gear and 60–65 knots at the bottom of the slope. I applied heavy braking to slow the glider, snagging the left tip on some bushes or the ground,

George Szukala

recovered, then snagged the right tip on the upslope to the road, which resulted in a 90 degree groundloop to the right. During the groundloop, the glider became airborne briefly to a height of about two feet due to a wind gust. The glider then dropped straight down, wings level, with no further movement.

With some brief verbal exchanges of, "are you OK? I'm OK", the canopy was opened with great haste and Bull shot out of the cockpit like a race horse yelling something about no post–crash fire (he must have been reviewing his CF–18 checklist). I slowly unstrapped and got out to survey the damage, which on initial assessment didn't look too bad. I had effectively removed both fibreglass wingtip caps, wrinkled a few nose panels and the tail cone, and punched a small hole in the underside of the right wing which nicked the spar. At this point, a feeling of remorse came over me for having damaged the glider. Although I was relieved at having landed on the spot I'd chosen, I couldn't get over how angry I was at damaging the Lark, no matter how minor it appeared.

Bull ran over to give me a big hug because he felt he needed to. I asked Bull to put me back down and inquired again if he had any injuries, and he said that his back hurt. Both my knees and right elbow began to ache as I sent Bull down to the gas plant to find a phone.

Walking over to the cockpit, I pulled out the radio and tried to call Cowley — no luck. Dialling in 121.5, I tried two calls with similar success. Feeling a little abandoned by now, I switched off the radio and sat down beside the glider to rub my knees and wait for Bull.

Several minutes had passed by when I heard Bull yelling down the road that someone would be at the site in five minutes. He had found a two–way company radio which was linked to the main plant and, fortunately for us, it was in a building which wasn't locked. A grey pick–up soon pulled up to the gate and a rather tall chap called Wendall got out. After we had exchanged pleasantries and explanations, he agreed to give us a ride into town. He said that we had landed on company property next to a natural gas dehydration plant about 19 kilometres north of Coleman. I said that we would be back later that day to pick up the Lark, so Wendall left the gate unlocked for us. Lady Luck was smiling on us a little because he mentioned that if we had called a few minutes later, he would have left for the day. That would have left us with the prospect of spending a night in the mountains dressed in shorts, T–shirts, and runners, and armed only with a water bottle to fight off the grizzlies.

On being dropped off at the bakery in Blairmore, another community in the Pass, we bid farewell and offered to take Wendall for a flight if he could make it out to Cowley. He smiled graciously and said he'd look at the work schedule, probably thinking that it would be a cold day in Hell before he got into a motorless aircraft with a couple of lunatics who just crashed in the mountains.

Entering the bakery, we asked if we could use their washroom and make a local phone call, in that order. By now I discovered that I didn't have the little Cowley info sheet that is handed out to everyone at the beginning of the camp. No matter I thought, I'll just phone directory assistance for the airfield number and we'll be set. I started feeling more depressed as the nice lady at Alberta Government Telephones said she had no listing for the Cowley airfield or the Alberta Sewing Council. "No, no, ma'am, that's Alberta *Soaring* Council." Well, she didn't have a listing for them either. At this point, I had visions of the boys sitting around the campfire with a bottle of Big Rock *Traditional Ale* in one hand and a needle and thread in the other. Those sewing council guys really now how to live it up!

It's a good thing the military teaches us to be flexible, because we're on plan Tango at this point. We're out the door in a heartbeat after getting directions to the local RCMP shop. Arriving at the town jail, we start off with a long explanation of who we are and what we've done; asking for a ride to the airfield along the way. The nice staff sergeant says that shift change is coming up, so she'll see what can be done in about 15 minutes. Bull and I settle back on the bench to watch the tail end of a domestic dispute with two women involved with a trucker ... and we think we've got troubles! Shortly after shift change, a constable comes up to the counter and says the free ride is ready. We hop in the car and are soon off for Cowley, discussing everything from radio relay procedures to capital punishment along the way. He drops us off and we bid him thanks, offering to take him flying later in the week ... and you know the rest of this conversation too.

A crowd starts to move our way at the airfield as we head for our tents to look for the other Cold Lake dudes. Once we've collected the boys and a few Cowley regulars for the retrieve party, we head off down the highway with my rusty Dodge in the lead, pulling the famous Cold Lake Scud missile launcher (AKA the Lark trailer).

It was getting quite dark and cool in the mountains when we arrived back at the site. A friend was riding shotgun with me, and I remember hearing his jaw slam on the floor when he first saw the glider nestled on the hillside. Everyone piled out of the vehicles and Bull starts to explain how we ended up here. After some photo work for posterity and documentation, the disassembly started. All things went off without a hitch, with everyone contributing to the effort. Many thanks again!

I remember that at one point during all this, standing off by myself and contemplating what had happened, Dave Fowlow (one of the Cowley regulars and Cu Nim deputy instructor) walked over to me and started to rub my shoulders. I guess he thought I was some kind of giant good luck charm and some of it would rub off, but all I remember is looking at him sadly and mumbling something about hating to damage company aircraft. In hindsight, I consider myself to be truly fortunate in having met so many wonderful folks throughout the Cowley camps.

The rest of the retrieve was uneventful, except for driving around Crowsnest Pass until 11 pm looking for a place to eat. Thank goodness for Chinese restaurants. I think I still owe a few dinners.

The next day, Bull and I checked into the Pincher Creek hospital for a once–over. I'm happy to report that we only suffered some bruises and strained muscles, but the ego damage is incalculable.

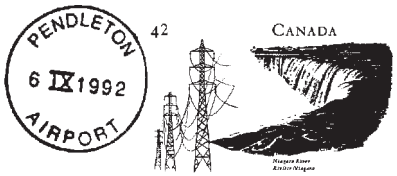
So, what are the lessons learned from this escapade? Well, if you lined up ten pilots who flew this same mission, you'd get ten different answers. The lessons may be endless; however, here are a few:

1 Don't panic.
2 Become proficient in spot landings with different wind conditions and aircraft configurations.
3 Wear a hat and carry a water bottle when flying in hot weather. If you're dehydrated, you won't think clearly no matter how much adrenaline is pumping.
4 Know your limits and that of your aircraft.
5 Carry all necessary information when you fly away from the field and get a briefing from one of the experienced folks on any new area you wish to explore.
6 Don't rely on your radio.
7 Be prepared to spend a night out.
8 Carry a first aid kit; however, if you get good at No. 2, you won't need it.
9 Good friends are priceless.
10 Believe in something. Believe in yourself and keep flying.

If, after reading this, you've learned something, then I'm glad. If you didn't learn something, but at least I got you to smile, then I'm glad also, for I've fulfilled my purpose. •

50 YEARS

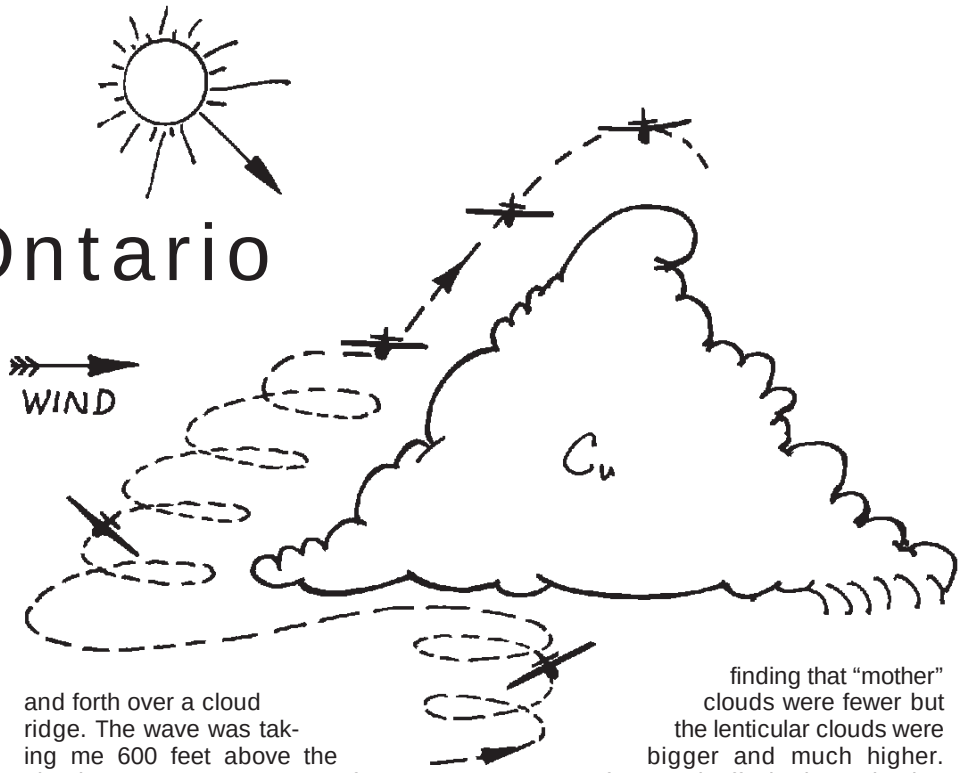
Aircraft Glider ASK-13
Registration C-FBQN
Pilot Taber Bucknell



FOR THE AVIATION STAMP COLLECTOR

The Gatineau Gliding Club still has unique souvenir envelopes for sale arising from the 50th anniversary of GGC and the Pendleton airport in 1992. Two different envelopes were carried in a Tiger Moth and an ASK–13 and given a one day only Pendleton Airport postmark. They are $2 each plus $0.50 for postage (proceeds go to GGC). Contact Nelson Bentley, 3044 Otterson Drive, Ottawa, ON K1V 7B6.

Flying a wave in southern Ontario



Mirek Stehlik
York Soaring Association

THE MORNING of Sunday, 6 September didn't look very promising for soaring: the sky was blanketed with dense high cloud. "I'll have to be satisfied with power flying today", I thought while dialing the weather office. To my surprise, our weatherman insisted that high cloud was moving out and fair weather clouds should cover our afternoon skies. In an hour, my son Richard and I were on the way to York Soaring, hoping the weatherman was right.

At noon, the sky was still looking "iffy", but a few fair–weather clouds at 2000 agl looked promising. My L–Spatz 55 was airborne at 13:20. At 1100 feet I released as we flew through good lift and began climbing to cloudbase at 2200 feet. Rough, narrow thermals with a lot of drift followed. I was questioning my sanity — do I really need this flight after 105 flying hours during this great summer?

I joined my son Richard in the 1–34 and a Twin Grob eight kilometres southwest of York. There was more drift than my Spatz is comfortable with, so I was working feverishly upwind towards Arthur. The cloudbase was now at 3300 feet. Now upwind, I felt more comfortable. There were a few struggling gliders below me. At 14:30, five kilometres northwest of Arthur, I left the cloudbase at 3400 feet into the blue. The cloud I just left was slightly wedged from the upwind side. When in the blue, a few hundred feet west (upwind) of the cloud, I still felt some lift. Not much, but a steady 1 m/sec. Well, I took it! The L–Spatz climbed beside the cloud in medium banked circles. I was now at 4000 feet! How far is this going to go? The lift seemed to be fairly wide and steady. I changed my climbing pattern to zig–zagging near the side of the nicely developed cumulus. At the same time, I caught a glimpse of lenticular clouds forming farther west. By now, all cloud tops were below me. I have always dreamed of being on top of clouds in a glider — it was great!

I realized that I was in a wave and guiding my Spatz — my pride and joy — back and forth over a cloud ridge. The wave was taking me 600 feet above the cloud tops. I was now at 5750 feet, enjoying every second. While on the top of the wave, I ventured above neighbouring clouds, found only zero sink, and had to come back to "my" wave again in order to stay aloft. I enjoyed wave flying for half an hour, observing other clouds and the formation of lenticular–like clouds above them. The Spatz was whistling "his" familiar song while I busily recorded heights on the edge of a map so I didn't forget how high I was.

I was excited with the scenery, this flying experience, and felt a great sense of accomplishment. I watched the drifting ground below me through blue holes, and tried to decide whether or not to go down. The Spatz and I spent the next 30 minutes descending through clear channels between clouds and re–connected lift under a 3600 foot cloudbase again. I was overwhelmed by my recent adventure. By now I had been up for more than two hours. Altocumulus clouds were now more frequent. I was sorry I didn't have a radio to let the other fellows know about my experience.

To find out whether I could repeat the climb to the top of the clouds again, I looked for a suitable cloud. I located one, but finding a wave was not easy. I eventually connected to the wave and climbed past 4000 feet agl in a few minutes. At this time, nature interfered. Forming clouds were boxing me in, and in order to stay clear of the cloud, I had to leave the wave with a good 400 feet to go to the top of the towering cumulus. A quick look at my watch and a narrowing gap between clouds brought me back to reality. I descended quickly below the cloudbase again. From now on, I was finding that "mother" clouds were fewer but the lenticular clouds were bigger and much higher. Before I took off, I had promised to land at a certain time to make supper. I was down to 1300 feet when I saw a Std. Austria and a fibreglass ship high above me. Well, I still had a few minutes left, so I climbed past the Blanik, left a couple of plastics below, and quickly approached cloudbase in 3 m/sec lift. It looked to me that the Austria beside the cloud was climbing in the wave. I silently wished the pilot good luck and, sad that I could not continue, thermalled out a few hundred feet above the cloudbase. I felt the wave once more but it was time to land.

On the ground, everybody was scrambling. Tows to 4000 and 6000 feet were made to catch the wave! Will they? A few cumulus clouds, "wearing" lenticular clouds above, had their tops polished off by strong wave action. At this time, most of the "mother" clouds were disintegrating or already gone, leaving the altocumulus clouds aloft alone.

Someone radioed in from 8000 feet. I could see several gliders high up at the lenticular cloudbase. I shared my experience of the wave with my son and other pilots. My face was still glowing (matching my red cap, one observer said) with the excitement of the recent flight lasting 4 hours and 6 minutes. While puting away my friendly Spatz, which has shared longer flights with me than this one — scratchy days, long cross–country ventures, and enjoyed outclimbing many younger and modern ships — we both agreed that this was one of the best times we ever had together. I hope we will re–live this flight again sometime in the future, and I wish every glider pilot the same experience at least once in their lifetime. •

A Thermal Wave over the western Prairies

Hal Werneburg
Cu Nim Gliding Club

THE FOLLOWING IS AN ACCOUNT OF a soaring flight utilizing a type of lift which is known to glider pilots as "Thermal Wave" or "Cumulus Wave". This type of lift is not often encountered during soaring flights in convective conditions and if found it is usually quite weak, normally in the range of 1–3 knots judging from personal experiences and accounts from other soaring pilots.

The encounter occurred during a competition cross–country flight from Claresholm, Alberta while I was taking part in the Western Canada Soaring Competitions in late June of 1989. My sailplane was a 15m Ventus B and on this day I had been flying mostly in the eastern sector of the competition area. Claresholm is located 120 km south of Calgary on the western margin of the Great Plains. About 20 km to the west rise the first foothills of the Rocky Mountains with higher mountain ranges, including the Continental Divide, approximately 75 km further west. To the east stretch the basically flat prairies with land elevations generally around 3400 feet over which most of my flying on this day took place.

The weather pattern during the afternoon showed a light northerly surface flow over western Alberta, probably associated with a weak low pressure centre situated over northern Montana, about 400 km to the south. Far to the west a maritime cold front was advancing across British Columbia and this front was forecast to reach the contest area not before the late evening. Cloud cover during the afternoon ranged from almost totally clear in the Lethbridge region to the south, to scattered cumulus in the centre part of the competition area and broken, towering cumulus reported around Calgary to the north.

The flight had proceeded quite well in good soaring conditions for several hours when I approached a vigorous looking cumulus cloud while on a westerly heading near the town of Vulcan, which is located in flat farm country about 90 km southeast of Calgary and about 65 km northeast of Claresholm. I reached the eastern edge of the cloud at an altitude of about 6000 feet msl and proceeded to circle under this cloud at a good rate of climb of 6–8 knots until I neared cloudbase at approximately 9000 feet. I then pointed the sailplane west, accelerated to 100 knots and prepared to leave this thermal on my way to the next cloud.

As I neared the western edge of the cloud, turbulence began to shake the aircraft and I felt a strong surge of lift pushing the glider higher. I immediately pulled the nose up in order to slow down and while the sailplane was arcing upwards in strong lift I left the grey cloud canopy behind me and emerged from the dark cloud shadow into bright sunshine. At this moment the lift, which would normally at this point diminish or even turn into sink, became extremely smooth and increased to a very strong 10–12 knots.

I at once made a 90 degree turn to the right in order to put myself parallel with the western edge of this cloud and in a few moments found myself rising above the base of the cloud while remaining well clear of cloud in brilliant sunshine. The lift remained strong and smooth and by flying back and forth along the west wall of this cloud considerable altitude was gained. The method I used was to treat the somewhat eastward sloping west wall of this cloud like a mountain ridge and by making repeated passes along the cloud wall I was able to maintain position in the strong lift area while staying safely in front of the cloud mass. The top of the cloud was passed quickly at about 12,000 feet while still enjoying a rate of climb of 6–8 knots. Finally, after gaining height for a little while longer, the rate of climb had dropped to 4 knots and I decided to leave the lift area on a southwesterly heading.

From this altitude in excess of 15,000 feet the view was breathtaking with a few pure white cumulus clouds scattered below me over the farm fields and an ominous looking row of black cumulonimbus cloud lined up in the northwestern sky ready to pounce on me. Luckily the thunderstorms remained at a safe distance throughout my flight, allowing me to enjoy the flying to the fullest.

I estimated the wind conditions at this altitude to be about 30–40 knots from the southwest, but despite overflying several other promising looking cumulus I could not find any other occurrences of thermal waves. Eventually I descended back into the convection layer and finished the flight at Claresholm airport without any difficulty.

When I later checked weather data for this day, I found that my estimate of upper wind speeds and directions had been fairly accurate. The charts showed the following:

surface (3400 ft)	045° @ 5 kts
850 mb (4600 ft)	025° @ 10 kts
700 mb (10,000 ft)	190° @ 25 kts
500 mb (18,000 ft)	200° @ 30 kts
250 mb (33,000 ft)	190° @ 80 kts

Above the 250 mb level a jet stream located just west of the flight area was blowing from 190 degrees at 100 knots.

This type of lift is relatively rarely found and exploited by glider pilots although I have had a few occasions before where I was lucky enough to be able to utilize weak thermal wave during soaring flights. The phenomenon is certainly known to many soaring pilots and is also well described in several books on soaring meteorology. The most interesting features of this flight of course were the strength of the lift encountered and the altitude to which it reached. Normally these strong conditions are only experienced in stationary waves generated in the lee of mountain ridges. Although I stopped my climb before then, I estimate that the updraft over this cloud reached and perhaps exceeded 20,000 feet. Strong horizontal and vertical wind shear between 850 mb and 700 mb combined with a vigorous convection column growing into this shear likely were the underlying causes of this amazing wave action. The cloud itself showed no signs of any wave flow — it was just a regular looking, well developed cumulus cloud with no apparent lenticular wave cloud features such as a smooth upper surface.

I hope this short account will encourage other soaring pilots to look for and exploit unusual sources of lift during their flights and gain a deeper understanding of the dynamics and beauty of the atmosphere around us.

I would like to thank Mr. Ted Rhodes, in charge of the Weather Research Station at the University of Calgary, for providing the meteorological data and helping interpret the weather charts. •

hangar flying

STICK IN THE MIDDLE FOR GOOD TAKEOFFS

Tom Knauff
from *Soaring Pilot*

Aircraft are designed to fly with the control stick near the middle of the full fore and aft position. The aft position is determined by how far the control stick needs to come back to allow a normal, tail low landing.

With the control stick in the middle, the angle of attack of the wing is near its cruising speed. In a glider, this position approximates the position during the aerotow. If the pilot holds the control stick near this middle position (actually about a centimetre aft of the mid position) before the towplane begins to tow, the glider will simply make a perfect takeoff.

The next time you make an aerotow, try this technique. Move the control stick full forward then full aft to locate the limits of travel, then place the stick at the midpoint. Move the stick about a centimetre aft of this, and proceed with the tow. If the glider is a tail dragger, the tail will lift off, and the glider will lift off as soon as airspeed is sufficient. If the glider is a nose skidder, the nose will come up, and the glider will also lift off as soon as airspeed is sufficient.

Once the glider lifts off, a very slight forward motion of the stick will be required to prevent the glider from gaining too much altitude while the towplane continues to accelerate to its takeoff speed.

By setting the control stick just aft of the mid position, the pilot is setting the eventual angle of attack of the wing. The wing generates lift by having a proper angle of attack and a sufficient airflow over its surface. With the angle of attack set, the pilot simply waits for the towplane to provide enough airflow for an adequate amount of lift to be produced for the glider to fly.

Compare this technique with the commonly taught full stick forward at the beginning of the tow. This technique originated with gliders like the 2–33 that have a tow release mechanism set too low, so if the towplane accelerates too quickly the nose of the glider is jerked up and the tail bangs down hard against the ground.

If the pilot holds the stick full forward, when should it be brought back? How far should it be brought back? At what rate should it be brought back? It is impossible for the inexperienced pilot to guess when and what to do. The poor pilot ends up with the stick too far forward or too far back at the moment the airspeed is adequate for flight, and the result can be a series of PIOs on takeoff.

Holding the stick just aft of the mid position works perfectly and it works for all aircraft. The next time you fly your Cessna, Super Cub, DC–3, C5A, or whatever, try it. You will be impressed how easy takeoffs can be.

I recently had the opportunity to fly a DC–10 simulator at the United Airlines training centre in Denver. I immediately grabbed one of the famous glider pilots who is also an airline captain and expressed my desire to try this takeoff procedure. He had told me previously he had never heard of this technique. Also, a second glider pilot/retired airline captain and the flight simulator instructor were listening to the conversation.

The consensus was the DC–10 would simply roll off the end of the runway at a high speed. So I sat in the seat and placed the control stick in the neutral position. To be fair, the DC–10's horizontal stabilizer is moved to adjust the trim, and we had a discussion as to what setting was "neutral". The travel of the trim went from an indicated –2 to 14.5. The first takeoff, we set the trim at 7, and at full power the DC–10 accelerated, rotated early, and took off — climbing at too low an airspeed. We then set the trim at the midpoint of the full available range, and the aircraft took off much more acceptably.

I was not able to get an answer to my question of how the aircraft would respond if the trim was set in the true neutral position. I was especially interested in how close the airspeeds would be compared to what is used with various takeoff weights.

PW–5 PROGRESS REPORT

Oran Nicks
from *SOARING*

On June 21 and 22, the chairman of the World Class Management Group, Piero Morelli, and I visited Warsaw for discussions with the PW–5 Team and the factory which will produce the glider in Poland. This visit provided a review of the status and plans for this project.

A second prototype had been built and was being prepared for thorough static testing. Dynamic tests had been completed and increases in the torsional stiffness of the wing and fuselage had been made.

Three more gliders are being built with two more expected, for a total of seven to be completed before the end of the year. Certification is expected before the March 1994 deadline.

Documentation for the manufacturing is being completed and the latest computer aided design is being used. It is expected that technical information for other manufacturers may be available in this form.

Changes recommended by the IGC prototype jury have been incorporated in the second prototype and are expected in the production phase. These changes will result in improvements in the tail skid shock absorber, the canopy jettison system, the tow release location, wheel brake operation, reduction in stalling speed, improved rearward vision, and aerodynamic wheel fairing.

The PW–5 Team has been very responsive to considering the suggested changes and incorporating improvements in the production design. The university team has excellent professionals assigned to pursue the many tasks. The PZL–Swidnik factory has allocated a large manufacturing facility which has been used to produce composite parts, including rotor blades for helicopters. Molds were being made for production, and equipment such as large autoclaves suitable for curing wing and fuselage assemblies were available.

The Swidnick factory officials are enthusiastic about producing the World Class glider and indicated a willingness to produce molds, tooling, components, or otherwise arrange to support manufacturing in other countries upon request. All officials strongly support the commitment of the PW–5 team. We were very impressed with the dedication and confidence exhibited by the Polish organizations.

The next major milestone will be certification to JAR–22 standards *(estimated at mid–Dec)*, followed by an IGC review to ensure that all World Class requirements have been met. This process is due to be completed by March '94.

(The NZ Gliding Kiwi reports that the PW-5 is getting excellent reviews in Europe, is described as a delight to fly, and pilots have already flown 500 km triangles in this honest 33:1 ship. Six are now flying and the factory has received over 100 orders. Series production is slated to begin in January 1994 with an estimated run of 50 units, increasing to 100 in 1995. The price is expected to be in the range of $20,000 US.)

RACING ... WHERE ARE ALL THE PILOTS?

The total recent participation in FAI class competitions in the USA has plunged to only 25% of the highest year of 1985. In an analysis by Carl Herold published in the Seattle Gliding Council newsletter, *Towline*, he finds that many pilots have moved into the new handicapped Sports Class which is gaining popularity in both regional and national competitions. As of the latest (1992) data, the non–FAI classes (1–26, Sports, and Seniors) are now essentially equal in activity to the FAI classes (15m, Standard, and Open).

The Sports Class pilots in 1993 represented over 31% of all the racers on the seeding list. The trend line in FAI class participation is decreasing rapidly from 1123 pilots in 1985 to 278 in 1992, a reduction to 25% in seven years! The Sports Class has become home for the more sporting racing pilots looking for fun, recreation, race for shorter periods of time, race closer to home, with less arduous tasking, and hoping to compete without purchasing a new glider every so often.

Carl notes that the causes and indicators are the reduced number of sailplane sales (it used to be 300+ new gliders per year, now it's less than 100), and the inexorable loss of instructors and training soaring sites. With the economic, lifestyle, legal, family values, and other changes, he predicts that the large numbers of competitive soaring pilots has passed, and states that there is little doubt that the sport would be in greater difficulty without the development of the Sports Class and a resurgence in the 1–26 Class.

Carl is in the process of writing a book on handicapping, including a considerable amount of research and historical racing data, for the US and world soaring sites. He has been studying and applying handicapping since 1962.

CAUSE OF 1991 DUSTER FATALITY

On 23 June 1991, a home–built Duster, C–GAJS, crashed on final approach to a landing when one flap jammed open. The pilot was unable to control the resultant steep turn and did not survive the impact. Onsite examination of the glider revealed that the right spoiler was closed and the left spoiler was jammed open by being forced laterally outboard against the wing trailing edge.

On rigging, a flap control shaft in the wing is required to couple with its mate in the fuselage. If the shafts are not properly aligned when the wing is lifted to the fuselage, the bumping of the wing control shaft causes significant lateral forces on the wing rib where the shaft bearing is attached. Over time, this caused cracks in this rib which allowed the shaft bearings to shift towards the wing tip.

On this flight, the increase in the lateral play allowed the spoiler shaft to disengage at the right wing root which caused the shaft to be pushed towards the left wing which in turn jammed the left spoiler. The asymmetrical opening of the spoiler caused the glider to enter a left turn which could not be corrected by the primary controls.

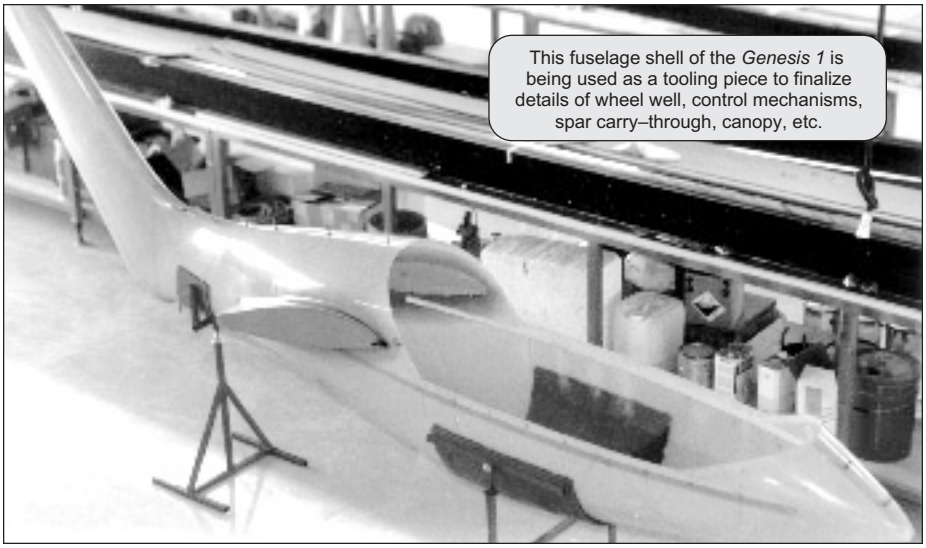
A review of the aircraft construction drawings showed that no reinforcement was included to allow the ribs supporting the spoiler outboard bearings to absorb lateral bumping during wing rigging.

from the Transportation Safety Board
3/93 Aviation Safety Reflections

VINTAGE MEET IN '95

An invitational international vintage sailplane meet will take place at Harris Hill, NY 16–25 July 1995. The organizing committee encourages owners of Canadian vintage and classic sailplanes to mail in an application as soon as possible as there is a maximum entry of only 50 ships. A form can be faxed or mailed from our *free flight* address.

A vintage sailplane is one *designed* before 1958. Only a few classic sailplanes can be accommodated (*built* at least 25 years ago; 1–23, 1–26, and 2–22's excepted as there are so many of them). This promises to be a most colourful and interesting soaring event.



This fuselage shell of the *Genesis 1* is being used as a tooling piece to finalize details of wheel well, control mechanisms, spar carry–through, canopy, etc.

NEW STANDARD CLASS SAILPLANE KIT PROGRESSING

A new Marion Ohio company, Group Genesis, is well along the way towards completing their Standard Class kit sailplane, the *Genesis 1,* and their goal of creating a reasonably priced kit with competition level performance.

The design team has an impressive list of credits in composite construction, design and aerodynamics, including Roy Bailets who worked on the Voyager around the world aircraft, Jim Marske, well known in ultralight sailplane design, and John Roncz, an expert in airfoil design and aerodynamic software who has designed mission–specific custom airfoils for 21 aircraft including the Voyager, Beech's 'Starship', and the Pond Racer.

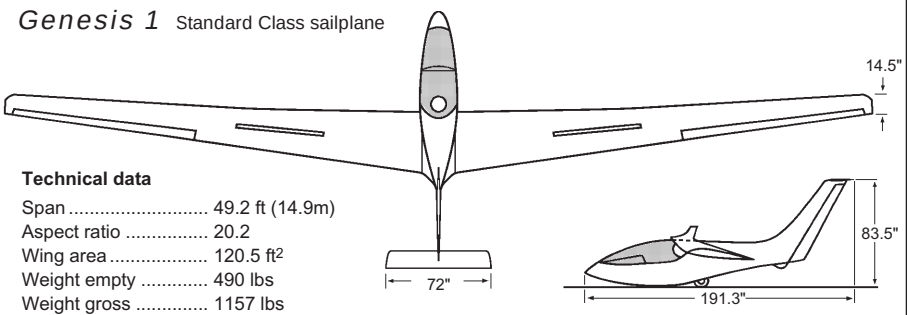
The Genesis 1 has been optimized in every aerodynamic parameter through computer aided analysis to refine dynamic airflows and pressure contours. The ship uses a completely new series of airfoils. The wing employs a progressive transition among four discrete airfoils and a complex mix of forward sweep, taper, and twist. This design was probably not possible without enormous expense prior to the maturation of "electronic wind tunnel" software.

In a conversation with *free flight*, Jim Marske stated that the Genesis 1 originated from a tailless design of his. In its evolution from there it gained a small horizontal stabilizer for better pitch control of the high aspect ratio wing. The new airfoil went through about 100 design iterations on the computer to maintain a high maximum lift coefficient which is usually a trade–off on reflex trailing edge airfoils.

As of late November, the ship is about two thirds complete. The fuselage is well along with controls being installed, and the wing skins are being mated. The Genesis team plans to have the ship ready for its first flight sometime in January '94.

The Genesis 1 will be supplied as a complete kit, including a very detailed step–by–step construction manual and basic instrumentation. Kits are scheduled to ship in the second half of 1994 and only after exhaustive flight performance of the prototype. The kit price has been established at $21,900 for the first ten orders with an anticipated rise to $25,900 thereafter. A $1000 refundable and secure deposit reserves a delivery position, and depositors will be able to review actual flight performance data before confirming their order. For further information, contact the Genesis Group at (614) 387-WING.

Genesis 1 Standard Class sailplane



Technical data

Span	49.2 ft (14.9m)
Aspect ratio	20.2
Wing area	120.5 ft²
Weight empty	490 lbs
Weight gross	1157 lbs
Wing loading	5.5-9.6 psf

Calculated performance

L/D max	43.2 @ 65 kts
L/D @ 100 kts	29.5
Vstall @ 5.5 psf	37 kts
Vmax rough air	115 kts
Vne	150 kts

Features: Structure employs oven cured high temp prepreg composites. Kevlar reinforced cockpit structure, carbon spars, water ballast, ballistic parachute recovery system, automatic control hookups, large cockpit for 6'4" 250 lb pilots, projected build time of 300 hours, optional factory trailer.

SAC affairs

NATIONAL OFFICE UPDATE

I would ask that all clubs purge their files of outdated forms. Using forms that are not current may result in delays in processing. The Head Office will be pleased to send the most recent forms to any club that request them.

You will see more info in the club listings normally on the back page (contact name and phone numbers listed for some clubs). If your club doesn't have the same type of listing it's because the completed club official form with the contact person has not been submitted. Do so now so that all clubs have similar listings; and please keep them updated!

We are winding down the membership year and the new program is working well. Some things have changed however, for example member numbers are no longer being used and membership cards will reflect that change. As far as we know all instructor and official observer numbers are up to date, however, if there is an error please contact the office.

Over the year many clubs have submitted their members on forms other than the one I requested. This leads to confusion and wasted time in trying to sort out SAC Club Members from Social Club Members. By using the format requested it is a simple matter to tick off renewing members and add new members to the end of the list. Corrections are also easier to make if they are crossed out on the form and written beside or over top. It is preferable that changes be made in red ink if possible, particularly if it is a second or third submission of the same form.

The German *"Bildkalender"* should arrive by the second or third week of November. We have ordered only 150 and orders will be filled on a first come first served basis. I intend to mail out all back orders as soon as I have the calendars in the office. The SSA calendar is now available and there are only 80 this year. If you want either of the calendars I would suggest that you get your order in now.

The new Glider lapel pin is now available for Christmas and we also have the new Student T–shirt which is quite eye catching. The pin is an attractive white enamelled gold metal with a strong clasp. The "Soaring Stuff" insert in this issue shows what it looks like.

Pierre Pepin is working on a catalogue of SAC supplies. If the cost is not prohibitive, I am hoping to send a copy to each club as soon as it is available. As membership fees and sales are the two major revenue sources to SAC, I would like to encourage all SAC members to support SAC by buying their supplies through the Head Office.

As this is the last issue before Christmas I wish you all the best of the season. Merry Christmas and a very happy new year.

Safe soaring,
Joan McCagg

TC REVIEWING TOWPILOT MINIMUM QUALIFICATIONS

Transport Canada is revieving the current minimum requirements for pilots seeking a towpilot endorsement to their licence. Clubs are requested to re–read these requirements and send in comments or suggestions to Ian Oldaker so that a consolidated SAC position may be forwarded to TC for their consideration.

TAXMAN BREATHING DOWN NECKS OF CLUBS SOON

Large non–profit organizations are going to have to file a new and complicated form with Revenue Canada later this year or early in 1994. (SAC itself will be exempt since as a registered charitable organization it has already made some form of disclosure.) Among those who will have to file are golf and curling clubs, many social clubs, political parties and a host of other organizations created for non–profit aims. This change was proposed at the end of 1991 and legislation was passed by Parliament last spring.

(The most likely affect on our sport will be to large gliding clubs which have either more than $10,000 a year in investment income or more than $200,000 in assets. The form to fill out, the T–1044, has just been made available at your local tax office along with an accompanying guide. Clubs who might exceed the above criteria should get the form and guide to see exactly what is required.) It appears the government's decision to require non–profit organizations to report is an indirect way to gather information that may lead to stricter controls of them under the Income Tax Act in the future.

Arthur Drache
from *The Financial Post*, 13-15 November

Coming Events

12 Jan **Toronto Glider Pilot Ground School**, Winter session, Weds evenings 7–10 pm for 10 weeks. Contact school at (416) 395-3160 for registration info, or Ulf Boehlau at (905) 884-3166.

9 Feb **Bramalea Glider Pilot Ground School**, winter session Weds evenings 7:30–10:30 for 12 weeks. Terry Miller Recreation Centre, Bramalea. Registration on first night. For info call Bill Tom, Erin Soaring Society (905) 853-1787.

4-6 Mar **SAC AGM & awards banquet**, Montreal

5-14 Jul **Canadian National Soaring Competition**, SOSA. Contest manager will be Ed Hollestelle, (519) 461-1464 (H), (519) 455-3316 (W).

25-29 Jul **MSC Soaring Contest** for sport & club sailplanes. Contact Gilles Séguin (514) 377-5737.

WEATHER BBS TO COST

After months of prototype R&D, the Bulletin Board System (BBS) from the Atmospheric Environment Service is now operational for personal computer access to weather information. As mentioned in the article "Rolling Your Own" (*free flight,* Jun/Jul 93), the service will be administered by the various regional divisions of AES.

Unfortunately, for modem linkup to a database already funded by your tax dollars, a rate schedule has been adopted that is outrageous. They want $150 just to set up an account and $96/hr for dial–up access with a 1/2 hour monthly minimum. This rate schedule was established assuming use by commercial clients with no consideration of the recreational pilot community. There is some willingness on the part of Ontario region (others are likely to be the same) to re–examine this exclusionary pricing policy provided there is a sufficient number of soaring pilots (and other sport aviation groups?) to warrant such consideration.

If we want to see affordable public access, then we must make our voices heard. If you are interested in using the system to obtain the latest charts, near real–time satellite images, etc, please answer the questions below, sign, and send it to me by mail or fax:

Steven Foster 10 Blyth Street
Richmond Hill, ON L4E 2X7
fax (905) 773-9573

(Since this space is small, duplicating info on full sheet of paper would be more legible. ed)

1 How many times per week would you use the BBS during the flying season? .....

2 Would you be willing to pay something for the service? .....

3 If you would pay something, what would be your annual maximum? .....

4 In what province are you living? .....

COMMENTS .....

.....

.....

Signature .....

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Airspace
position to be filled

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Whitby, ON L1P 1E6
(416) 668-9976 (H)

FAI Records
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(204) 453-6642 (H)

Flt Training & Safety
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(416) 877-1581 (H)
Mbrs: Mike Apps
Ken Brewin
Geo. Eckschmiedt
Fred Kisil
Paul Moggach
Richard Vine
Harold Yardy

Free Flight
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Mbr: Dr. W. Delaney

Meteorology
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PRODUCT REVIEW – the LD-100 VARIO

RATING A NEW BASIC VARIOMETER

Michael Steckner
York Soaring

What is the fastest way to spend money, other than buying a new sailplane? Buying instruments for your sailplane. The last several years have seen tremendous advances in sailplane instrument technology: flight computers, GPS, electronic barographs and heads up display, just to mention of few from the lengthening list of available goodies. I suspect that this rapid proliferation of new and exciting products is largely due to the various manufacturers attempting to capitalize on the latest advances that technology can provide. No doubt the profit margins are better too!

I personally find the technological advances to be fascinating but as a part owner of a Ka6CR with a Winter mechanical, a Soaring Aids electric vario, and a limited budget, I had always hoped that some "high tech" would trickle down into the basic instrumentation market to meet the needs of people like myself. Recently a Canadian (Peter Masak, High Performance Engineering) has entered the variometer market with a brand new instrument, the LD-100, based on the latest pressure transducer technology. I became quite anxious to try one after some other members of my club purchased one and reported success. The LD-100 is advertised as a basic altitude derivative vario with one second response rate; as quick as any of the premium variometers on the market, but at a fraction of the cost. I'm happy to say that after a couple of months of use I am convinced that my money was well spent.

The LD-100 vario is built in both the 80 mm and 57 mm sizes and is available in either a ±5 m/s or ±10 knot scale. The LD-100 is slightly longer than a standard sensitive altimeter, weighs approximately 0.3 kg and is constructed with a strong plastic casing. It has an attractive, easy to read, red = sink, green = lift front panel which is devoid of any switches or knobs, other than the mechanical zero adjust. The needle, which swings through a circular arc of slightly less than 270°, is well damped against mechanical jarring in the vertical direction. The power requirements are 9–14 volts (20 mA @ 9 V), permitting use of the radio battery and main power switch. An audio attachment will be manufactured, but was not available at the time of writing. The modular design is appropriate for those who do not want to spend extra money for an audio unit they do not need or want. The units are warranted for two years and are calibrated before shipping.

Attention to detail is of key importance during installation. Since the vario is fast, any leaks in the plumbing will wreck havoc with the signal. Even if the seal is perfect, problems can still occur if two or more varios share the same TE probe. If the capacity between the TE probe and each vario is different, the various resonances may interact and disturb all vario readouts. Once all the plumbing imperfections had been removed from our system, my partner and I were delighted by the fast and smooth response. It is impressive to see how quickly it reacts to real bumps while thermalling. The valuable extra information gained from a fast vario certainly helps centre thermals more quickly and find the hot spots in disorganized thermals.

In summary, the LD-100 is a "basic" variometer only in name. It is a fast, inexpensive, high quality vario which is suitable in any sector of the market. Even though it is a brand new design, it has already won two major contests (US 1993 15 metre Nationals, US 1993 Open Class Nationals).

There should be no duty assessed on this or any other variometer. Canada Customs initially decided that my LD-100 was a "meteorological appliance" and charged duty, even though the package was clearly and correctly marked. This was successfully appealed.

ADVICE FOR GLIDERS WITH FUSELAGE MOUNTED TE PROBES

Unfortunately my Ka6CR did not have the tail mount for a TE probe (the best location for a TE probe), so I installed a Reichmann fuselage probe (Eastern Sailplane) in the nose of my glider about one foot ahead of the canopy. As a result, the tube length between the TE probe and vario was much shorter than typically found in gliders with a tail mounted TE probe. Not only is a tail mounted TE probe better, the added tubing provides some measure of gust filtering. The twitchy vario readings caused by gusts can be removed with a commercial gust filter or a home–made filter constructed with a fuel filter capacity and cigarette filter restrictor. Do not use a large fuel filter or else the extra capacity will create stick thermals as the air expands during a pullup. A few iterations will be required to find the appropriate amount of cigarette filter. No matter what vario you have, attention to installation details can improve your instrumentation performance. Do not underestimate the havoc gusts can play on a high quality vario.

A PLEA TO ALL ELECTRIC VARIOMETER MANUFACTURERS

I have a phobia concerning dead batteries. I always worry that I will leave the vario on and drain the battery. Why don't the variometer manufacturers build timing circuitry into the vario such that 12 hours after the unit is turned on it automatically shuts off? I cannot begin to count the number of times I have jumped into a club glider only to be greeted by a dead vario. In fact, why not wire all the electrics in this fashion? •

FAI badges

Walter Weir 24 Holliday Drive
Whitby, ON L1P 1E6 (416) 668-9976 H

The following Badges and Badge legs were recorded in the Canadian Soaring Register during the period 3 September to 3 November 1993.

GOLD BADGE

267	Rick Dawe	Edmonton			

SILVER BADGE

844	Edward Pedskalny	–			

DIAMOND GOAL

	Rick Dawe	Edmonton	302.3 km	Jantar	Chipman, AB

GOLD DISTANCE

	Rick Dawe	Edmonton	302.3 km	Jantar	Chipman, AB

GOLD ALTITUDE

	Colin Campin	Vancouver	3270 m	Grob 102	Hope, BC

SILVER DISTANCE

	William O'Brien	Champlain	72.0 km	Jantar Std	St Raymond, PQ
	Edward Pedskalny	–	61.9 km	Grob 102	Minden, NV

SILVER ALTITUDE

	Edward Pedskalny	–	1710 m	Grob 102	Minden, NV
	Colin Campin	Vancouver	3270 m	Grob 102	Hope, BC

SILVER DURATION

	Timothy Johnson	SOSA	5:08h	1–26	Rockton, ON
	Tracie Wark	York	5:02h	1–26	Arthur East, ON
	Edward Pedskalny	–	5:13h	Grob 102	Minden, NV
	Colin Campin	Vancouver	5:26h	Grob 102	Hope, BC

C BADGE

2389	Marc Gohier	Montreal	1:28h	1–26	Hawkesbury, ON
2390	Timothy Johnson	SOSA	5:08h	1–26	Rockton, ON
2391	Nelson Bentley	Gatineau	1:16h	1–36	Pendleton, ON
2392	Raymond Leiska	Borden	1:30h	2–33	Borden, ON
2393	Alan Mills	Borden	1:27h	2–33	Borden, ON
2394	Douglas Scott	Erin	1:01h	1–26	Grand Valley, ON
2395	Peter Vados	SOSA	1:07h	2–33	Rockton, ON
2396	Edward Pedskalny	–	Silver C - did not apply for C		
2397	Colin Campin	Vancouver	5:26h	Grob 102	Hope, BC
2398	Tim Daniel	Vancouver	1:24h	Blanik L–23	Hope, BC
2399	Gabriela Sgaga	Borden	1:19h	2–33	Borden, ON
2400	John Bowles	Montreal	1:19h	1–26	Hawkesbury, ON

So far this year only one Silver badge has been earned by a Canadian. He is Ed Pedskalny, 61, of Porquis Junction, Ontario. Porquis Junction is 320 kilometres north of North Bay or 740 kilometres north of Toronto! There's no gliding club there — Ed gives Air Cadets familiarization rides in 2–33's and has accumulated about 100 hours that way. In September, Ed visited Minden, Nevada, checked out in a Grob 102 with "Soar Minden" and much to their dismay, earned his entire Silver badge in one flight. He says he did just what was told to him in *"Joy of Soaring"*. Just to prove it wasn't a fluke he did it again the next day. Well done, Ed.

CLUB LOSES OUT ON RODEN TROPHY!

That's what could occur if you don't send in your club stats, and the *second* best run club in the country will win instead. SAC's statistician, Randy Saueracker, has done a good job of arm–twisting to prepare a pretty complete report on SAC clubs the past two years, but he shouldn't have to — armtwist late clubs, that is. Now that the season is done, club executives are urged to promptly submit their annual flight stats to the National Office or to Randy directly (address on page 19).

PS Have you heard any of your newer club members complaining that they haven't seen an issue of *free flight?* Tell them to make sure that your club treasurer or secretary has sent their membership fees and name into the SAC Office. The odd club executive is holding onto that money as if it would actually earn the club some bank interest!

Kevin Bennett enjoys a spectacular flight in his Ventus over the Kananaskis Range south of Banff early this summer. The ridgetops are near 10,000 feet in this area.

1993 ACCIDENTS

29 Aug	Bluenose, K7, C–FOZA. Hard landing on runway in crosswind and wind gradient conditions. Minor fuselage and undercarriage damage.
31 Aug	MSC, Glider trailer. Severe windstorm, local small twister rolled two glider trailers and two house trailers. Minor claim on one glider trailer.
4 Sept	SOSA, ASW–24, C–FPMV. Off–field hard landing. No accident details.
3 Oct	Vancouver, Grob 102, C–GVSV. Stall/spin event into local mountain. Glider destroyed. No injury to pilot.

1994 SSA Soaring
Calendar photo

From across the United States and overseas, here is a wide range of soaring photographs for everybody to enjoy. A vintage Minimoa in flight over France to the high tech beauty of the Stemme S10 ... this calendar contains something for all soaring enthusiasts.

The popular 11 x 14 inch format is packed with colour. *Price – $15*
Order yours now from the SAC Office – purchase one for a friend.

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L'ASSOCIATION CANADIENNE de VOL à VOILE
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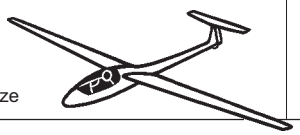
SOARING STUFF / ARTICLES DE L'AIR

nov 1993

prices include postage and GST • la livraison et TPS sont inclus dans les prix

		Price Prix	Size Taille	Qty. Qté	Amount Total	TAX	
	1 Bee-shirt • black on yellow specify size – S, M, L, XL	12.00				✔	T–shirt "Abeilles" • noir sur jaune précisez la taille – P, M, G, XG
	2 SAC T– shirt navy with gold and white crest specify size – S, M, L, XL	12.00				✔	ACVV T–shirt bleu marin avec un écusson or et blanc précisez la taille – P, M, G, XG
❄	3 SAC student T-shirt • various colours specify size – S, M, L, XL	15.00				✔	ACVV T–shirt de l'élève • couleurs diverses précisez la taille – P, M, G, XG
	4 SAC golf shirt • navy specify size – S, M, L, XL	25.00				✔	ACVV Chemise de golf • bleue marine précisez la taille – P, M, G, XG
	5 SAC sweat shirt • navy specify size – S, M, L, XL	25.00				✔	ACVV sweat shirt • bleu marin précisez la taille – P, M, G, XG
	6 SAC hooded sweat shirt • navy specify size – S, M, L, XL	35.00				✔	ACVV Sweat shirt à capuchon • bleu marin précisez la taille – P, M, G, XG
	7 Beanie • white with blue gliders	10.00				✔	Chapeau • blanc avec des planeurs bleus
	8 Tie • blue with white gliders	20.00				✔	Cravate • bleue avec des planeurs blancs
	9 Decal "I'D RATHER BEE SOARING"	.75				✔	Auto collant "I'D RATHER BEE SOARING"
	10 Sunshade (sun protector for your car windshield; glider design)	6.00				✔	Sunshade (para–soleil en carton pour votre voiture; dessin d'un planeur)
❄	11 '94 SSA calendar	15.00				✔	'94 calendrier de SSA
❄	12 '94 German "Bildkalender"	29.00				✔	'94 calendrier allemand
	13 Tost rings (4 for $100)	28.00				✔	Anneau de remorquage Tost (4 pour $100)
	Books from international authors						*Livres des auteurs internationaux*
❄	20 *SOARING CROSS–COUNTRY – ed. 2* Helmut Reichmann	58.00					*SOARING CROSS–COUNTRY – ed. 2* Helmut Reichmann
	21 *FLYING SAILPLANES* • Helmut Reichmann	48.00					*FLYING SAILPLANES* • Helmut Reichmann
	22 *WINGS LIKE EAGLES* • Paul Schweizer	55.00					*WINGS LIKE EAGLES* • Paul Schweizer
	23 *TRYING THEIR WINGS* • Lloyd M. Bungey (BC gliding from 1920 – 80s)	15.00					*TRYING THEIR WINGS* • Lloyd M. Bungey (vol à voile Colombie Britannique 1920–80)
	24 *GLIDING SAFETY* • Derek Piggott	35.00					*GLIDING SAFETY* • Derek Piggott
❄	25 *AWARE* • Gagnon et al (weather manual)	25.00					*AWARE* • Gagnon et al (manuel de la météo) anglais
	SAC crests and pins						*Ecussons et epingles de l'ACVV*
	30 Crest "SAC•ACVV", embroidered	3.50				✔	Ecusson "SAC•ACVV", brodé
	31 "SAC" lapel pin	5.00				✔	Epingle "SAC"
❄	32 Lapel pin • Glider actual size	10.00				✔	Epingle • Planeur



continued on other side — voir au verso

❄ changes to last flyer

		Price Prix	Size Taille	Qty. Qté	Amount Total	TAX	
	prices include postage and GST • la livraison et TPS sont inclus dans les prix						
Manuals and flying aids							*Manuels et accessoires de vol*
40	Glider pilot logbook (box of 66 $435)	10.00				✔	Carnet de vol pour pilote de planeur (boîte de 66 pour $435)
41	Student progress book (24 for $60)	3.50				✔	Carnet de vol d'entraînement de l'élève pilote (français) (24 pour $60)
42	Soaring instruction manual rev. Jan 80	5.00					Manuel d'instructions de vol à voile rev. jan 80 (français)
43	Air instruction notes (for instructors) (12 for $30)	4.00					Instructions en vol – notes (pour instructeurs) (français) (12 pour $30)
44	SAC guide "Badge and Record Procedcures" • edition 6	5.00				✔	ACVV guide des procédures pour FAI certificats et insignes (édition 6 • anglais)
45	CISTRSC (green) / SWAFT (red) cockpit checklist (12 for $12)	1.50				✔	CISTRSC (vert) / SWAFT (rouge) liste de vérification (12 pour $12)
FAI supplies • certificates, badges (complete list on back page of *free flight*)							*Articles FAI • certificats / insignes* (voir aussi revue *vol libre)*
1	FAI 'A' badge, silver plate pin	5.00				✔	Insigne FAI 'A', plaqué argent
2	FAI 'B' badge, silver plate pin	5.00				✔	Insigne FAI 'B', plaqué argent
3	SAC Bronze badge, pin (available from your club) (12 for $55)	6.00				✔	Insigne ACVV bronze (disponible au club) (12 pour $55)
4	FAI 'C' badge, cloth, 3" dia.	4.50				✔	Insigne FAI 'C', écusson de tissu
5	FAI Silver badge, cloth, 3" dia.	4.50				✔	Insigne FAI argent, écusson de tissu
6	FAI Gold badge, cloth, 3" dia.	4.50				✔	Insigne FAI or, écusson de tissu
7	FAI Flight Declaration form /sheet (available from your club)	0.15				✔	Formulaire de déclaration de vol de la FAI /feuille (disponible au club)

Total _____

8% Tax _____

Total _____

Please enclose payment with order. Prices include postage and GST. *Ontario residents,* add 8% sales tax for items having a ✔ in the "Tax" column. Do not forget to indicate the size you want for shirts.

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1–26C, C–FRSD, 1965, no damage, 2200h, condition 7/10 inside & out, always hangared. $7,000. CVVQ c/o Claude Rousseau (418) 875-4395.

Monerai, C–FEUQ, very good condition, basic instruments, Cambridge audio vario, netto, TE, panel mount TR–720 radio. Encl steel trailer. $7200. Struan Vaughan (403) 362-5837.

RS–15, C–GPKH – estate sale – trailer, instruments, chute. Contact Ed Holestelle (519) 455-3316 (B), or Chris Eaves (519) 452-1240 (B)

ASW–15b, with basic instruments, alum trailer. Needs repairs due to lack of maintenance and the spar AD (have all the materials for the AD). $5000. Robert Smolka, (613) 596-6826 evenings

ASTIR CS, C-FIUR, formerly N-127SS, 545 h, never damaged, excellent condition, Ball vario with audio netto/cruise, 720 chan hand-held radio, aluminum enclosed trailer. Marc Gallanter (416) 848-7900 or (613) 224-3255 any time.

ASW–20, C–GRKX, Cobra trailer, final glide computer, Dittel radio, $42,000. For details phone Chris Eaves, (519) 268-8973 (H), (519) 452-1240 (W).

Ventus B/Turbo, C–FMVA, with 15/16.6/17.6m wingtips, Masak winglets, Ventus C wing root fairing mod, Westerboer computer, Dittel radio, O2, tow–out gear, Komet trailer. All in excellent condition. Ed Hollestelle (519) 455-3316 (W), 461-1464 (H).

USED SAILPLANES WANTED FROM CLUBS & PILOTS

If you are considering selling, call *FREE FLIGHT* immediately, don't wait for the magazine to appear! The sailplane market is tight, and the editor regularly gets calls to see if anything has become available.

TOWPLANE

L–19, 2000h TTSN, remanufactured in 1975, always hangared, clean, 8/10 condition inside & out, no damage, mogas STC, Continental 0-470-II-B, 700h SMOH by Continental (good cylinders). Sale includes a stripped, run–out 0-470-II (running in aircraft when removed). $55,000. CVVQ c/o Claude Rousseau (418) 875-4395.

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Quoted prices for a single ad. Discounts for multiple insertions. Many other fractional page sizes available. Contact the National Office for full information on rates and sizes.

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Grob 103, 950h, all ADs done, standard instruments front and rear, fittings for trailer (trailer available separately. Alberta Soaring Council, (403) 625-4563.

MISCELLANEOUS

Trailer, steel tube frame, galv. steel cover, good condition. Internal dimensions: 28' x 3' wide x 4' high, (5'-2" for fin). Tows well. $2000 or offer. Bob Gairns (514) 691-4754 (Montreal).

Varicalc Vario, final glide, speed–to–fly, averager, clock. One season old. $700. Gilles Séguin (514) 377-5737 evenings.

Rico Vario, with netto, like new, $350. Carol King (514) 672-9220 (H), (514) 289-4154 (B).

Parachutes, three Cu Nim club military chutes, $250 each. Dave Fowlow (403) 289-9477 (H).

Winglets, kit for HP–18 or HP–16/RS–15 without the aileron counterweights. Lowers thermalling speed by 5 knots, improved roll rate and other benefits. Kit contains molded fibreglass skins and materials to custom fit to your ship. $500. Ed Hollestelle (519) 455-3316 (B), (519) 461-1464 (H).

Turn coordinator, 12/14V, 3–1/8", like new, $200. Andrew Jackson (403) 435-4425.

Video quest Does anyone have a copy of the Walt Disney film, *"The Boy Who Flew With the Condors",* circa 1970? Will pay for full tape and shipping cost. Mike Maskell (204) 831-8746 collect.

MAGAZINES

SOARING — the journal of the Soaring Society of America. International subscriptions $US35 second class. Box E, Hobbs, NM 88241 (505) 392-1177.

SOARING PILOT — bimonthly soaring news, views, and safety features from Knauff & Grove Publishers. $US20, add $8 for foreign postage. RR#1, Box 414 Julian, PA 16844 USA.

NEW ZEALAND GLIDING KIWI — the official publication for the 1995 World Gliding Championships at Omarama and the bi–monthly journal of the N.Z. Gliding Association. Editor, John Roake. $US25/year. N.Z. Gliding Kiwi, Private Bag, Tauranga, N.Z.

SAILPLANE & GLIDING — the only authoritative British magazine devoted entirely to gliding. 52 pp, bi-monthly, and plenty of colour. Cdn. agent: T.R. Beasley, Box 169, L'Orignal, ON K0B 1K0 or to BGA, Kimberley House, Vaughan Way, Leicester, LE1 4SG, England. £15.50 per annum (US$30) or US$40 air.

AUSTRALIAN GLIDING — the journal of the Gliding Federation of Australia. Published monthly. $A40.50 surface mail, $A55 airmail per annum. Payable on an Australian bank, international money order, Visa, Mastercard. (No US$ personal checks.) Box 1650, GPO, Adelaide, South Australia 5001.

HOLLESTELLE NEW "SOLAIRE" DEALER IN CANADA

Ed Hollestelle is now operating *Solaire Canada* as an independent Canadian company and will be the Canadian distributor for all the products that are carried by *Solaire USA* out of Hilton Head Island, SC (see ad on back page).

The SZD–55 is nearing type approval in Canada. Ed is negotiating a price reduction on the ship, and should be able to cut about $6000 from the current price. Contact him for details.

There will be an extensive line–up of soaring material available in Canada, which avoids cross–border and custom problems associated with US purchases and warranties. The products available include instruments, radios, varios, computers, GPS, parachutes and glider trailers. A Gaines–built aluminum/fibreglass enclosed trailer for 15 metre ships and a special trailer for the 13 m World Class glider, both attractively priced, will also be available.

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XU Aviation Ltd. Repairs in wood, metal and composites. C. Eaves (519) 452-1240 (B), 268-8973 (H).

INSTRUMENTS & OTHER STUFF

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Variometer / Calculator. Versatile pressure transducer and microprocessor based vario and final glide calculator. Canadian designed and produced. Skytronics, 45 Carmichael Court, Kanata ON K2K 1K1. (613) 820-3751 or 592-0657.

Firmal Electronics. Cambridge variometers, L Nav and S Nav now both available with Global Positioning System (GPS) option. You need never be lost again! Write for list or phone John Firth, 542 Coronation Avenue, Ottawa K1G 0M4 (613) 731-6997.

MZ Supplies. CONFOR foam, Becker radios, most German soaring instruments. 1450 Goth Ave, Gloucester, ON K1T 1E4 tel/fax (613) 523-2581.

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SZD–55–1, Jantar, Jantar 3, Puchacz, Puchatek. For Polish gliders, contact Josef Repsch, (403) 488-4446, fax 488-7925.

Schempp-Hirth. Nimbus, Janus, Ventus, Discus. Al Schreiter, 3298 Lonefeather Cres, Mississauga, ON L4Y 3G5 (416) 625-0400 (H), 597-1999 (B).

Schleicher. ASK-21, 23, ASW-22, 24, ASH-25. Ulli Werneburg, 1450 Goth Avenue, Gloucester, ON K1T 1E4 (613) 523-2581.

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