free flight • vol libre

3/93
Jun/Jul

POTPOURRI

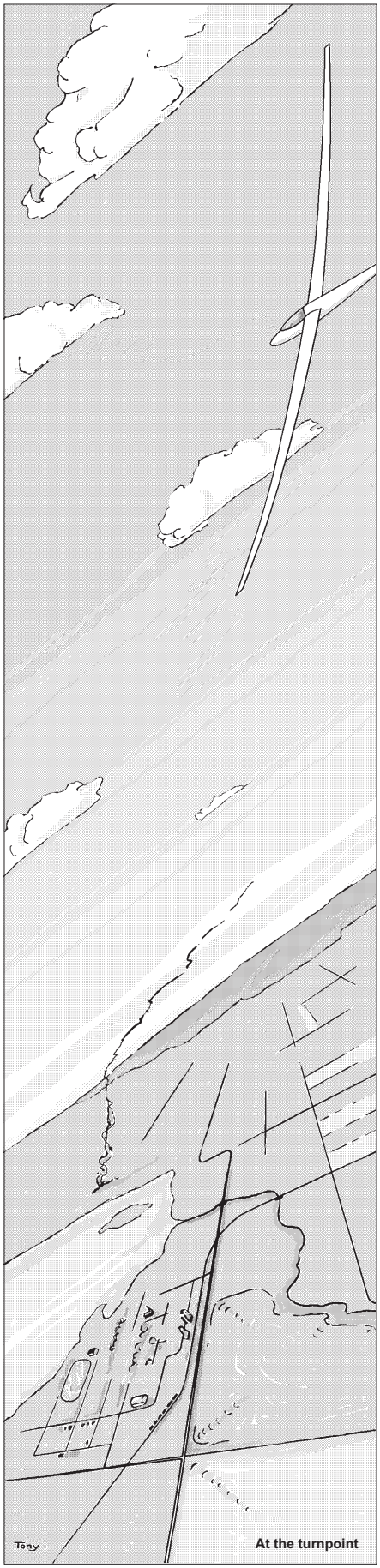
Deepest sympathies are extended to the family of Gunther Geyer–Doersch. Gunther, a very long time and much respected member of SAC, passed away on 10 May on losing a siege with cancer. His absence will be much regretted in the soaring community.

A lively discussion (argument, tirade) took place at our last club meeting on the issue of attracting new members. The club president claims that we old f---s (beg your pardon, senior members) are the cause of new people not joining the club. He claims that we form an elite clique that coolly shoulders away any attempt by newcomers to join our happy little circle. The president claims people will not join if they are not having FUN, and we older members stop them from having any FUN because of all the rules and restrictions we put in their way — they can't do this, and they mustn't do that, and they have to abide by those, and they can't have FUN under those conditions. To stay they must have FUN, not just during the few minutes they are flying, but also during the hours they are at the club waiting to fly (or waiting after flying to do their duties — oops, mustn't use that, it's not a FUN word). The president maintains that statistics prove him out, that the average age of the club member is increasing, indicating that we are not attracting young people. I didn't want to spoil his argument by pointing out that if we kept every member which ever wished to join, the statistics would indicate the same thing, but we would have a humongus sized club. He has encouraged some club volunteers to attend a seminar, called Alberta Host, being provided by the Alberta Department of Tourism, to foster better relations with visitors. Dave also put pressure on me to attend — is he trying to tell me that I'm an old f---t?

Anyhow-w-w what are your thoughts on the reasons for our dropping membership. Our club president has given his and heard others from club members. His are now in print — how about yours? We can't discuss them, we can't adopt them, and we are not liable to increase membership unless we do implement some, or many, ideas to interest new people and keep existing members happy. Let's see them.

Please fly safely.

Al Sunley



At the turnpoint

free flight • vol libre

Trademark pending Marque de commerce en instance

3/93 Jun/Jul

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

ISSN 0827 – 2557

Note to .pdf file viewers: *This file is a reconstruction of the original issue. It contains minor variations in layout and perhaps an error or two when compared with the hard copy.*

Cover

Here's another in the series of glider types that Jack Humphries collected at York Soaring a few years ago. This is an L–Spatz, designed by Egon Scheibe in the early 50s. It has wood/fabric wings and a steel tube/fabric fuselage. Span – 15m, max L/D – 29 at 40 kts, empty weight about 350 lbs (160 kg).

GUEST EDITORIAL – "Chapter 549"

Jack Greenlaw
from *Canadian Aviation News*

The technical side of aviation in Canada is regulated through massively complex rules, gathered together in a tome known as the Airworthiness Manual, and administered by the Director of Airworthiness. The manual is broken down into chapters. Each chapter is directed towards a specific segment of aviation, ranging from the smallest single engine air vehicle to the largest of the commercial fleet. The regulations which pertain to the amateur builder and his/her aircraft are contained in "Chapter 549" of this manual. It is probably safe to say that many who have heard of '549' fail to appreciate what a thoughtful, practical and worthwhile document this really is. It has evolved over the years through the cooperation of the industry and Transport Canada Aviation Group (TCAG). It was introduced in 1956, through the leadership of the late Keith Hopkinson who, at that time, was President of the Ultralight Aircraft Association — which was the forerunner of the EMC and today has become our Recreational Aircraft Association Canada (RAAC) — and the late Dick Berg of TCAG, Ontario Region. Without the foresight, sincerity and hard work of these two gentlemen and their respective associates, Chapter 549 would not be the success it is today. The current version of the chapter, about three years old, is the result of an extensive review to bring it up to date, carried out by Gerry Germain and Glenn Lockhard of TCAG Airworthiness Branch in Ottawa.

The objective spirit and entrepreneurial enterprise of the aviation-minded public continues to carry on from the days of Alexander Graham Bell and the Wright Brothers. By the mid-fifties, there were many airborne examples of private enterprise projects, from homebuilt gliders to little, high speed, low level racing aircraft. The surplus equipment of WWII, combined with experience gained in aircraft plants producing tens of thousands of modern (for those days) aircraft, were providing the incentive for experimenters worldwide to try something new. The result today is a thriving industry built around factory prepared kits, original design "one off" aircraft, plans-built aircraft, and major reconstruction of classics and rare vintage aircraft — mainly being done by amateurs (myself included).

To meet the needs of this developing industry in the fifties, TCAG accepted that the rules within the amateur building chapter would have to be clearly different from those which controlled the commercial aviation world. The objective therefore was to maintain the central theme of safety while giving the amateur builder freedom to express himself/herself, in matters of design and equipment application — such as the use of automobile powerplants. Basic to the success of the whole amateur aircraft movement is the absolute acceptance and adherence to the use of "standard aircraft practises".

Given the present day range of electronics, navigation equipment, powerplants, materials and other technical attributes available — and being legally used by the modern amateur builder because of Chapter 549 — much of the credit has to be given to those pioneers of this chapter, originating in the fifties.

A close look at Chapter 549, and the range of activity of construction and maintenance it makes possible for the recreational flyer, prompts the question, "If all of these things are possible for amateur builders, why can't I apply the same kind of rules to the certified aircraft that I own and use strictly for recreation?" That is the question that the RAA has been raising for several years now.

As a practical illustration of what this means, the same amateur builder that can legally design, create, build an aircraft from raw materials, a kit or a plan, unless licensed as an AME, cannot accept the responsibility for the airworthiness of his/her own certified aircraft. To add further complexity to the situation, the same amateur builder can take full advantage of such state of-the-art developments as Loran, GPS, multiple function instruments, electronics, etc. and still be responsible for their impact on his/her aircraft. Conversely, he or she must have the signature of a licensed person to legally affect the identical (usually) upgrades to his/her own certified aircraft. This isn't a quarrel with the AME community, rather it is a question of the validity of current regulations. The real and important matter here is a clearly

continued on page 18

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.

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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.

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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.

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

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letters & opinions

TECHNOLOGY AND COMPETITION NOT A PROBLEM

I would like to comment on the letters by Ian Grant and Len Gelfand in the last issue.

Ian Grant's worries about allowing Global Positioning System (GPS) navigation equipment be used during FAI sanctioned gliding competitions seem overstated. For instance, the FAI rules have never forbidden the use of electronic navigation aids during badge or record flights, but I have heard only of a few instances of such aids being used during record attempts despite the many advantages that Ian claims for GPS and similar devices.

It is not obvious what advantage there is for a glider pilot to be able to consult a very precise lat/long position readout in flight. Clouds and thermals hardly slay fixed in place and thus GPS cannot be any help in interpreting or using the weather as such. Locating hard-to-find landing fields in otherwise unlandable areas is one possible use, but glider pilots rarely encounter such fierce terrain even during contests. Besides, who would really depend solely on GPS to blindly glide to a small field in the middle of a forest? Simply staring at a nav display in the cockpit to avoid getting lost seems to be more of a disadvantage than looking outside and staying alert for visual clues to the weather and so on.

On the other hand, there are definite advantages to using GPS and a data logging device to record and verify a pilot's flight performance. Trials have proven that GPS data can replace often controversial turnpoint photography, and the old rule that worried about the pilot sneaking out to the first turn point before the start is no longer needed. Providing a continuous record of a sailplane's position during a flight is the surest check against a pilot entering restricted airspace which is a significant problem in countries with a more crowded airspace situation than Canadian pilots enjoy. In addition to competition use, a combination GPS/electronic barograph can provide the ultimate in post-flight analysis and interpretation for any pilot interested in improving his or her performance through study of the track flown and thermals used.

As far as the cost argument goes, a GPS/data logger combination is available at a fraction of the cost of the "distance flown" computers already in use by many contest pilots and about which the FAI rules are quite silent. Electronic barograph devices have been more than cost competitive with the better traditional instruments for some time now.

A long time ago, there may have been a "rich man" advantage to be had by supplying one's own radio direction finding team to follow you around the course and help out if you got lost. Thus the old "no navigation assistance" rule. However, GPS and Loran signals are equally available to all and exploitable at low cost so why ignore the potential benefits to be had simply to be seen to sidestepping technology. This is one case where comparatively low cost technology can be our friend.

I find Len Gelfand's statement to the effect that "competition has been more harmful than helpful in getting more people into our sport (gliding)" rather surprising (letters & opinions — *free flight* 2/93). Only by taking a very narrow view of the cost/benefit ratio of modern gliders compared to those of the fifties can such an opinion be supported.

By way of explanation, I would recall two fellow club members who some years ago owned a homebuilt Miller Tern. Now the Tern, although perhaps a worthy aircraft in its day, must surely be the epitome of the low-tech, presumably low-cost, approach to soaring. What I remember most about the aircraft though was the amount of time and work that went into maintaining and fixing that particular Tern. Spring, summer and fall, I watched my friends tinker instead of fly. The thing was a bear to derig, of course, so it sat exposed to the elements six months of the year which didn't help. Then one day, the two partners sold the Tern and acquired a Standard Astir, one of the more modest fibreglass ships around. By the end of their first season they were sold: as one of them put it "I still can't believe it, all you do is put it together and fly, no more tinkering!"

Now I have no reason to dispute Len's point that there is little if any technology transfer from the race track to the car in the average family's driveway. However, I would submit that modern composite construction sailplanes would not exist if it had not been for sailplane competition. This includes gliders such as the Standard Astir which have probably never seen much competition use, but instead have provided hours of safe, enjoyable flying to club pilots. Note that most of the World class sailplane entries employ composite construction techniques and aerodynamic features that appear to have been largely, if not entirely, developed for competition sailplanes. Even the classic Ka6 design, much beloved by gliding traditionalists, was prompted by a competition glider design exercise.

The pursuit of low cost gliding should not blind us to the other side of the cost/benefit equation. A return to the Ka6/K7 era with fragile gliders requiring lots of ongoing maintenance will not necessarily pay the expected benefits of increased participation in the sport once after-purchase costs and time requirements are figured in. (In fact, the amount of skilled labour in a Ka6 wing would probably make the Ka6 unaffordable to produce today.)

Lacking any other obvious impetus for sailplane designers to pursue composite construction and advanced aerodynamics, perhaps glider pilots owe a larger vote of thanks to the gliding competition community for the existence of today's modern sailplane than Len seems willing to acknowledge.

Jim Oke
Winnipeg Gliding Club

cont. on page 19

CUMULO–NIMBUS CLOUDS

Part 1 Details of the average temperate cu–nim

Tom Bradbury
from *Sailplane & Gliding*

CUMULO-NIMBUS clouds can produce some of the most violent effects of the atmosphere with thunderstorms, cloudbursts, tornadoes, downbursts and fierce squalls. These clouds vary greatly in size and destructiveness; some produce nothing more than a brisk shower of rain. This is a description of some of the smaller and less dangerous cu-nim found in unstable polar air over the UK. A description of the more ferocious storm clouds which is more likely to occur in tropical air will appear in the next issue.

Conditions for cu-nim development

Cu-nim usually develop when the air is unstable to heights well above the freezing level. In order to produce rain the cloud top nearly always has to rise above the freezing level. At sub-zero temperatures it contains both water droplets and ice crystals. The vapour pressure over ice is less than over water and, when they are mixed, the ice crystals grow at the expense of water droplets. This forms snow which melts into rain when it falls below the freezing level.

Some warm clouds can give a shower

This mixture of ice and water is not always essential for a shower; some big cumuli produce showers even though the temperature at the top is above zero. This is thought to be due to coalescence when large, faster falling drops collide with and grow by collecting the smaller droplets in their path. This takes rather a long time and is not so efficient as the ice/water process.

Where the energy comes from

The energy available depends on the amount of latent heat released by condensation. This in turn depends on the amount of water vapour held in the air. The warmer the air the more water vapour it can hold and the greater the energy released when clouds form. Figure 1 shows a simplified tephigram. Pressure lines range from 1000 mb (usually near sea level) to 150 mb which is about 45,000 feet. The temperatures are shown from 30°C on the right to -80°C on the left.

Three types of airmass are represented:

- arctic air, much the coldest, appears on the left; the shaded area shows the energy released when cumuli form in this very frigid air. The amount is relatively small which is why one rarely finds thunderstorms in high latitudes.
- the middle is polar air. The shaded area shows these clouds can release quite a lot of energy when the air moves into temperate regions like the UK.
- on the right is tropical air which has an enormous amount of energy available. This only reaches the UK in summer.

The highest cu-nim grow in tropical air

Figure 1 shows that the top of the shaded area is usually low in arctic air (about 18,000 feet in this diagram) and high in tropical air. In polar air the energy often reaches as high as 35,000 feet. In very moist tropical air the positive energy has been found to extend above 45,000 feet. In fact, tropical cu-nim may rise so fast that the tops overshoot this level and go very much higher than shown here; a few radar measurements showed tops to 58,000 feet. The size and ferocity of cu-nim is closely connected to the energy available, and the height to which the cloud grows.

Stages in the growth of a cu-nim over land

Forecasts of cu-nim are largely based on the latest upper air soundings made at some upwind station. When these are plotted on a tephigram and modified to take into account the surface heating and the dew point, one can find the condensation level (effectively the cloudbase) and the possible cloud top. The cloud is assumed to grow to the top of the shaded area; a vigorous cloud will over shoot this level and the final top may be several thousand feet higher.

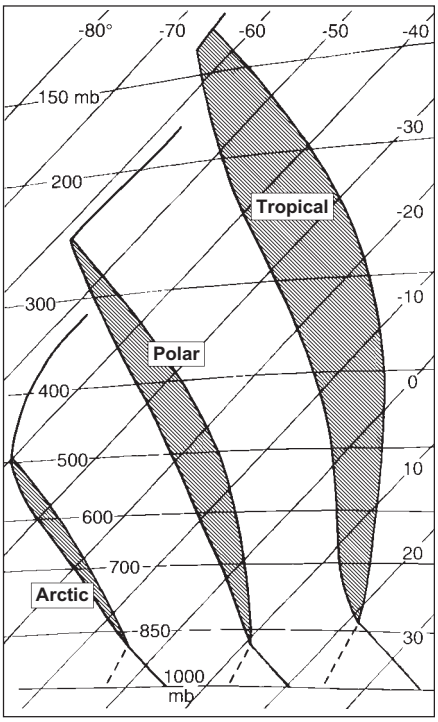


Figure 1 How the amount of energy varies between arctic and tropic air.

The first clouds rarely go shooting up to the theoretical maximum in one bound; it normally takes several hours before tops reach their full height. Figure 2 shows the process.

A The first cumuli are both small and numerous. Each little cloud is an independent feature. As its top rises it draws in some of the surrounding air and, if this is relatively dry, the little cloud tower starts to evaporate. Evaporation cools it and the cloud soon decays. Tall thin clouds usually have a short life. The wider the base of cloud the longer it persists.

B The next stage is for a number of cumuli to combine, forming a clump. The outer clouds still suffer from erosion as they rise but the inner cells are protected by the relatively warm and moist surroundings. This group of clouds can now start to grow much higher and wider. The lifetime of the group is much longer than that of a single cell. The main mass of cloud grows taller as its base expands and the in flow of air increases.

C The third stage is well formed cu-nim complete with anvil. Now the cloud dominates its surroundings. Subsidence all round suppresses all the lesser cumuli which were too slow in forming their own groups.

Small new clouds seldom grow once cu-nim are established

At this stage it is difficult for a small cloud to grow fast enough to overcome the general intercloud subsidence. To succeed it needs a wide sunny area well away from the sink from adjacent cu-nim; it also helps if the outflows from distant showers collide to form a surge of lift. In a typical failed attempt, a growing cloud will become overshadowed by a fully developed cu-nim which is up-sun. This delays the rise for the first cloud tower, a fatal delay because the lift is then too weak to stop the stronger winds aloft blowing the top sideways before the tower is fully established. The cloudbase may not be broad enough either; a wide base often indicates a large

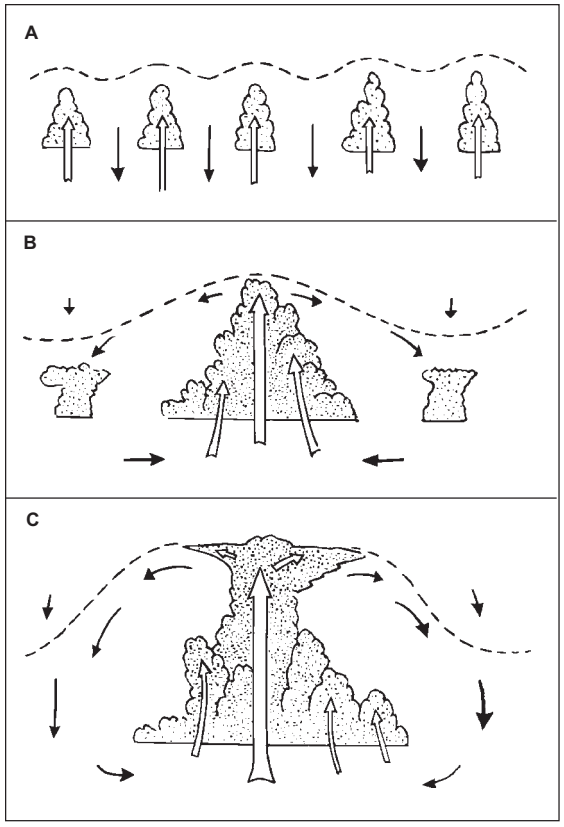


Figure 2 Stages in the development of cu-nim.

inflow of rising air, big enough to keep the summit rising fast. With too narrow a base a cloud runs out of energy.

Using the edge of cu-nim to go around them

It is sometimes possible to fly along the leading edge of a line of cu-nim clouds using the lift which develops above a squall line. To do this one may need to tuck in under the overhanging anvil cloud (Figure 3A). This brings you uncomfortably close to the main shower area. This is sometimes a region where the cloud base is higher and there are many miles of smooth strong lift (A). The snag is that a new shower cloud can develop between you and the clear air to the right producing a zone of very rough air on the escape route (B).

Figure 3B shows a different version when the cu-nim line has not produced a parallel squall line. Then the lift will not be continuous. Instead one may find a zone of big cu which form well ahead of the main cu-nim belt. In time these outriders (C) grow into cu-nim themselves, but until they do one can use them to get away from the advancing storm. This is a more comfortable way of getting round the end of a cu-nim line.

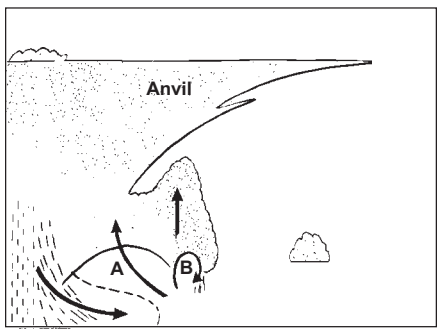


Figure 3A Region of smooth lift in A just ahead of cu-nim line. B marks possible turbulent zone.

Isolated small cu-nim may develop lift on the upwind side

Some small cu-nim may grow from the upwind end and rain out at the downwind end. With such clouds the best route is via the developing end. This kind of cu-nim can be found in England, especially where the wind comes in from the sea and cu-nim grow as the clouds move inland. If you decide to explore such a cloud it is useful to know which is the way out to younger clouds upwind. Determined pilots who stick with their original cloud to the bitter end may find it reaches the lightning stage. Moving upwind when the climb gets rough may give you almost as much height with far less effort.

Lift, rain and sink

If you get into the core of the lift, conditions are often very smooth and only the visibly moving needle of the altimeter shows how strong the lift has become. Even in small cu-nim the rate of climb may be well over 20 knots. (It is far stronger in tropical monsters.) Near the top of the lift the air usually becomes very rough and it can be hard work to stay upright. The tops of many clouds are a region where the rising column turns over and forms turbulent eddies.

Some cu-nim develop when there is little vertical wind shear. When such clouds start to precipitate the rain falls straight back into the column of lift. After a short pause the heavy rain produces a downrush of chilled air. For a time up and down currents can exist close together. Presently the cooling and precipitation loading becomes so great that it kills all lift; the sink spreads through the cloud and becomes very strong. The cloud then starts to fall to bits.

Figure 4 illustrates the stages. One may be climbing up in the strong lift of a fresh developing cell only to find part of the circle takes you into rain. This sounds extremely noisy. For a few turns one may continue to climb in this half quiet, half noisy environment. This is a good time to open out the turn in the quiet sector and make for a less stressful region. Staying close to the rain shaft is apt to end in a big loss of height when the rain produces widespread sink.

Lightning

The risk of lightning is an even better reason for getting clear at this stage. Laboratory experiments show that collisions between ice particles and soft hail in the presence of supercooled water result in charge separation. In a cu-nim the updraft brings up liquid water which is supercooled above the freezing level. The downdraft carries ice crystals formed aloft. Turbulent mixing of ice and supercooled water in the shear zone gives the ice particles time to grow into soft hail (3 mm particles were found in this zone during aircraft traverses). Thus the optimum conditions for charge generation by ice particle collisions exist in this zone.

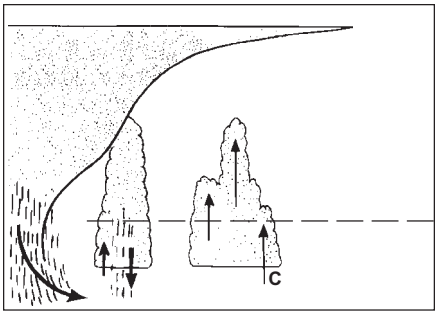


Figure 3B Large cu clear of the cu-nim line.

Charge separation

The up and down currents also provide a means of separating the differently charged particles and building up a great potential difference within the cloud. Some researchers found a big negative charge built up at levels where the temperature was -10°C: the positive charge grew at the -20°C level. Although cu-nim vary widely, it seems that if you climb above the freezing level into the region where columns of lift and sink come

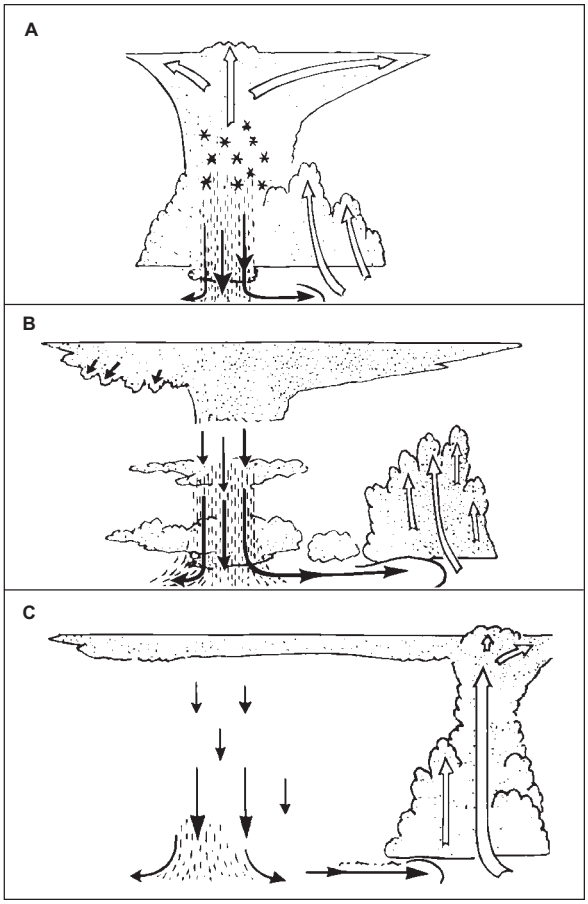


Figure 4 Growth and decay of one cu-nim followed by triggering of a new one by the downdraft outflow.

close together you may be getting close to the source of lightning.

Dangers of lightning

All metal aircraft keep their occupants fairly well protected from the effect of lightning strikes. Holes may be burned through the metal, particularly near sharp corners on rudders, tailplanes or wingtips, but the crew are unhurt. Composite and wooden gliders are at much greater risk. Although a number of pilots have had very painful shocks, most have survived the episode. Some aircraft measurements showed a gradient of 100,000 volts/metre near the centres of charge. This is quite enough to give a very painful discharge in the cockpit, even if no full sized lightning flash occurs. A direct hit from lightning may be catastrophic for a wooden glider.

Damage in cu-nim

Some thirty years ago cu-nim climbs were quite popular. Many pilots reached Gold height and some gained Diamonds. In 1960 Gordon Rondell set up a UK height record of just over 29,000 feet. There was one fatality and a number of gliders were damaged. Derek Piggott wrote that one in five gliders had some damage after climbing above 15,000 feet in cu-nim. This may have been due more to hail than lightning. Since then most pilots found wave soaring gives a less stressful way of achieving their Diamond climbs.

Hail

Rain drops freeze to form soft hail when they are carried high above the freezing level. This hail falls down below the freezing level and picks up a layer of water. If it then gets into strong lift again it can go up high and do another lap. During this the water freezes to make a second skin of ice. Some hailstones grow many layers of ice this way before finally falling to the ground. The process works best when the lift and sink are kept separate by a wind shear which bends the column of lift.

Wind shear and large hail

Cu-nim which grow in a strong vertical wind shear often produce the largest hail. Some very severe storms which grew in conditions of strong shear produced hailstones of 7 cm diameter over England. Such huge stones are rarely formed but much smaller stones can do great damage to the leading edge of wings. Heavy metal aircraft have been badly dented by hail and a light aircraft (lucky not flying at the time) had much of the fabric stripped from its wings.

Icing

The droplets of water in a cloud do not freeze as soon as they are cooled below zero. Many can remain liquid in temperatures of -20°C and some do not freeze till it reaches -40°C. Supercooled droplets are not stable and if you fly into them they turn to ice and stick fast. At temperatures only just below zero only part of the drop freezes on impact, freezing releases latent heat and so some of the water remains liquid and flows back over wings and tailplanes. Here it may freeze along the hinge lines and ice up the controls.

If you are going up in strong lift there seems to be a delay between passing the freezing level and picking up ice. Severe ice seems to occur when the lift is lost and you are left blundering about near the cloud top. Cloud tops are usually turbulent and the rapid control movements needed to keep level seem to delay control icing. However, when you emerge into smooth air there is a risk that controls may freeze up then.

Differences between ancient and modern sailplanes

Most modern sailplanes with their accurately profiled wings suffer a serious drop in performance when they are iced up. A covering of ice which would hardly trouble an old Skylark will reduce the glide ratio of a Libelle to something approaching an ancient Dagling. Skylarks would carry quite thick layers of ice on the wings without sinking rapidly. When the ice finally thawed there would be rather startling swish and crunch sounds as thin sheets of ice several feet across slid off the wings and bumped into the tailplanes.

Sink between showers

One snag of flying on a cu-nim day is that the sink persists long after the shower cloud has departed. One can sometimes see the rain left behind by the evaporating cloud; it may show up as a bright curtain at low levels or as a rainbow under an insignificant scrap of stratus. Large areas of invisible sink left behind

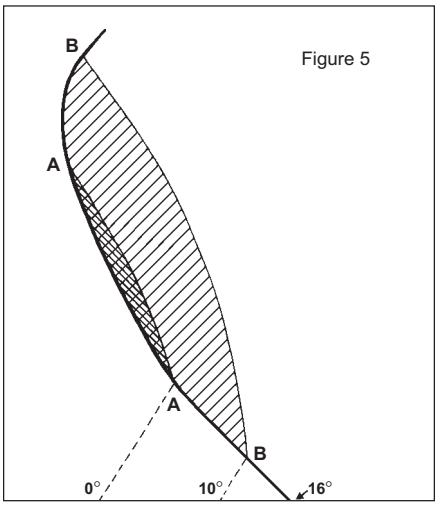


Figure 5

Raising the dewpoint increases the energy.

after the shower has gone make it hard to pick a good route to any usable cloud. Even when the sink has ended, wet ground delays and sometimes prevents new thermals from forming. It can take more than an hour before any thermals grow large enough to be us able. The tiny scraps of white cloud which may form only show where embryo thermals had been, not where they are.

Descent of air, downbursts and gust fronts

When sink hits the ground it spreads out sideways forming a gust front which may trigger off new cu-nim. In hot conditions, when the cloudbase is much higher than we usually meet in the UK, the sink can become extremely powerful. It is then termed a downburst or microburst. The microburst may not be visible in dry air. It has been the cause of several accidents to large passenger jets on final approach or just after takeoff. In dusty regions a microburst sets off a vortex-like swirl which expands outwards across the ground. Over the desert the process may end up as an expanding sandstorm which extends far beyond the originating cu-nim.

In the less violent conditions usually found in the UK one is not likely to encounter the 50 to 70 knot sink of a downburst, but flying through the clear air behind a big cu-nim may take you through miles of distressingly heavy sink. This is one of the factors making cross-country flights difficult on cu-nim days. One can see a way round the cu-nim but unseen regions of sink and absence of any usable lift put the next clouds out of reach.

Snow showers in spring

The little cu-nim which bring scattered snow showers in spring are far smaller and less energetic than summer ones. Sink in and just behind a snow shower can be very strong for a short distance but it rarely extends far. If the ground is not seriously wetted by thawing snow the next soarable clouds are often close enough to reach after skirting a shower. Flying down sun a small snow shower looks dazzling white as if it were a serious obstacle but one may be able to skim round the edge without difficulty. This only seems to be true when the cloudbase is still high.

Beware of the long lines of snow showers which have a low cloudbase, especially if there is no sign of brightness beyond or if there are layers of grey cloud above. These often mark a sudden end to all thermals. Pushing through them may only take you into dead air and leave you with too little height to return.

Cu-nim and dewpoints

Figure 5 shows how a change in the dewpoint can make a big difference to the energy available. On this diagram a dewpoint of 0°C gives a cloudbase of 6400 feet. The double hatched area under the curve A-A shows that little energy would be released. If the dewpoint is raised to 10°C the cloudbase comes down to 2400 feet, but a vast amount of energy is now available under the curve B-B.

The dewpoint indicates the moisture contained in the air. The higher the dewpoint the greater the moisture content. For example, a dewpoint of zero Celsius means that every kilogram of air contains only 4 grams of water vapour. If the dewpoint rises to 25°C each kilogram of air holds 20 grams of water vapour. This means a great deal more energy can be released by condensation of the high dew point air.

Dewpoint rise as a thunder warning

The dewpoints can be a useful indicator of the thunder risk during hot spells in summer. Many of our hot spells start off with dry air and dewpoints below 10°C. If the spell persists, and especially if a light southerly drift develops, the dewpoint starts to rise. Cu-nim can grow in air with a very low dewpoint but they dispose of more energy when the dewpoint is high. A dewpoint rising above 15°C is a warning: nothing may happen till the dewpoint approaches 20°C. Between 18°C and 20°C the risk of dangerous cu-nim grows very rapidly. High dewpoints are apt to precede severe thunderstorms.

The severe storms which arrive at the end of summer heat waves are very different from those which develop in cool unstable north westerly flows. My next article will describe these monsters. •

FLYING & DRUGS

Everything you wanted to know about the direct and side effect of common drugs

Dr. Peter Perry, MB, ChB

AT THE ANNUAL GENERAL MEETING of the Soaring Association of Canada, I was invited to speak on a medical topic. I decided to make a presentation on Drugs in Aviation because over-the-counter drugs are available to us all and sometimes they may interfere with our competence to fly. Tony Burton, God bless his heart and soul, is always looking for articles for *free flight* and he invited me to make the presentation avail able for publication.

When it comes to illnesses and flying, there are two main concerns — your medical condition and the side effects of drugs.

Medical condition We should decide; is the medical condition requiring medication exclusive to flying, and if it is, is it never exclusive, such as in multiple minor ailments that tend to affect us all, or is it temporarily exclusive, such as when we have a head cold, or is it permanently exclusive such as when we are dealing with insulin dependent diabetes myelitis. So in spite of the medication we are taking for the condition we should always consider, should we ground ourselves never, or temporarily for this condition. Transport Canada will decide whether it is permanently incapacitating. So while I am confining this presentation to the effects of drugs in aviation I really think we should consider first whether this condition is to some extent incapacitating for flying, in the short term or the long run.

Drug side effects If we decide the condition is not going to exclude us from flying, but we decide then to medicate ourselves with some over-the-counter medication, we should decide whether the side effects of the medication are likely to interfere with our ability to fly.

Such an interference is sedation which can be produced by tranquillizers and some antihistamines which are available over-the-counter, such as *Benadryl*. These antihistamines are often used as a decongestant in cold remedies, so look at the label first, or if you are uncertain ask the pharmacist if any of the ingredients are likely to be sedating. Quite often when antihistamines are prescribed, the label on the bottle will say "Do not fly for six hours after taking this medication", because they may have a sedative side effect. We have to bear in mind too that this sedation is not necessarily to the extent that one will fall asleep while flying. It may be much more subtle, in that we might make minor oversights such as forgetting to look to see if the dive brakes are closed before taking off, or forgetting to push on the canopy once it is closed to make sure that it is locked. These are very minor oversights that could easily occur which could have far reaching effects, and could easily be produced by a slightly sedating antihistamine.

We also have to make sure the drugs don't produce agitation. Compounds which can produce agitation are caffeine which is present in coffee. It is also present in cold remedies because these as we have said may contain *Benadryl* or an antihistamine which has a sedating side effect so caffeine is added to the mixture to produce a slightly stimulating effect to counter the sedation. Unfortunately however, a plus and a minus do not add up to zero here, so we have a slightly sedating drug and we imagine we are countering it with a slightly stimulating drug. They don't cancel out. We have two different drugs which are struggling with each other and we don't have a new effect ... we have two different drugs. It is worth being aware of that.

Another drug that may produce agitation is *Pseudo–Ephedrine*. This is commonly used as a decongestant in cold medications. It is a compound which is related to adrenalin which is a stimulant, which as we know can agitate, raise your pulse rate, and induce nervousness and even anxiety.

Some people may be unduly sensitive to se dating effects or the agitation effect of some of these medications, so we should know from past experience whether we are going to take an over-the-counter medication before we fly, and we should consider if we should be flying in view of the medical condition we have.

Having put in these two caveats of should we fly with this medical condition, or would the side effects of the medication preclude us from flying, let us look now more closely at some medical conditions and the problems that they present.

Diseases and drugs

Allergy Allergy of the upper respiratory tract produces swelling and congestion of the mucous membranes which might block off nasal airways and sinuses or ear passages. This then can cause obstruction which be comes a problem when we got to even comparatively low altitudes, because with obstruction of a closed ear space we get different pressures which we cannot equalize and the increased pressure in blocked off cavities produces pain which may well interfere with our ability to fly or our ability to concentrate. Once obstruction has occurred in the upper respiratory airways there may now be secondary infection in much the same way that we block off a flowing stream — it becomes stagnant. So we may have secondary infection with its debilitating effects as well.

Allergy can also produce asthma, which is a contra-indication to flying of course. However asthma isn't just necessarily the wheezing situation we are all aware of. It may present itself as an irritating cough which does not settle, so we must be aware that allergy can produce this also.

More seriously however, people can experience angioedema in which there is unexpected sudden swelling of the lips or tongue and airway, which could obstruct the airway, and within minutes this condition is potentially fatal. If we have had episodes of this in the past and we are experiencing allergy we shouldn't fly under these circumstances.

Another major medical problem associated with allergy is anaphylaxis, which is a sudden serious severe state of collapse, catastrophic drop in blood pressure, loss of consciousness and associated abnormal heart rhythms and not infrequently death. This usually appears very suddenly and can proceed very quickly. It can be induced by such a simple thing as a wasp sting. Usually people who are susceptible to this are aware of it, but this is an allergic condition which would preclude us from flying if we know we have this in our past history.

If we decide to fly with minor elements of allergy, then we should not fly for six hours after the onset of the illness to make sure that the effects of the medication have worn off and that the allergy has in fact resolved. Medications that we use to treat allergy are commonly available over-the-counter, such as *Benadryl*, and any antihistamine of this nature may produce drowsiness, dizziness and fatigue, none of which are compatible with flying. However there are some over-the-counter antihistamines which are known to be non-sedating and which are compatible with flying. Such examples are *Hismanal* and *Claritin*, to name just two.

Anesthetics Anesthetics in this case means local anesthetics such as administered in the dentist's office or maybe in the emergency room to suture a laceration for example. Anesthetics often contain adrenalin which is used because it blocks off blood vessels and makes sure that the local anesthetic injected into an area does not get carried away, thus prolonging its effect at the local site. However as we have said, adrenalin can produce excitement, rapid pulse rate and headaches. It may even in some circumstances produce convulsions. Therefore it is recommended that a pilot shouldn't fly for 12 hours after having had a local anesthetic.

Antibiotics If we are taking antibiotics we should also, as we mentioned above, consider the need to take the antibiotic. So, in other words, if we have say bronchitis this might produce shortness of breath and some relative hypoxia if we are going to significant altitudes, so the original condition rather than the antibiotic may be a reason not to fly. If we are taking antibiotics, try to make sure that you know your response to this antibiotic from having had it previously, so that you may not get an allergy reaction to it while you are flying. *Erythromycin* is an antibiotic which is frequently used and it may produce stomach upsets and we could do without this problem when we fly. Penicillin, to take an other example, not uncommonly can produce diarrhea, and this is also undesirable as gliders are not equipped with washrooms or stewardesses, so that if you know that penicillin is likely to do this for you, don't fly.

Cardiovascular drugs

Digitalis This drug is used for certain medical problems which in their own right preclude people from flying, so if you are on this drug you shouldn't be flying until you have a clearance from Transport Canada.

Diuretics These tend to reduce potassium in the blood stream and this can produce abnormal heart rhythms, so diuretics are not suitable for flying. Of course, diuretics as we know increase our urine output and if one is accustomed to flying sailplanes for hours at a time this problem speaks for itself.

Hypertension There is an approved list of drugs which I published in *free flight 1/91*. If you are taking these drugs and are uncertain of their approval, ask your local Civil Aviation Medical Examiner.

Cold medications These may contain antihistamines, pseudoephedrine or codeine and the side effects of these have been discussed previously in this presentation and also the problems associated with congestion and obstruction that may apply with colds.

Digestive system Antacids are acceptable except for *Enos*, baking soda or *Alka–Seltzer* because these have a tendency to produce gas which at altitude expands and may produce abdominal cramps. This is quite undesirable while flying, so it is all right to take antacids which are not gas producing. Anticolic medication such as *Donnatal*, may produce blurred vision. Laxatives may produce cramps or diarrhea.

Immunizations Tetanus and oral polio do not interfere with flying. However the combined injection of diphtheria, pertussis, tetanus and polio, and other immunizations produce local pain and may make the person feel unwell. This being so, it is recommended that you shouldn't fly for 24 hours after receiving that type of immunization.

Pain killers ASA *(Aspirin)* in larger doses may produce drowsiness or commonly stomach upsets. Another drug in this category which is available over-the-counter is *Advil* and it is in the same family of drugs as ASA and also produces the same problems. One of the difficulties with medications such as *Advil* is that it may produce stomach ulcers, which is all very well if you have pain associated with it, because it is an indication you should stop the medication. However some times *Advil* and other drugs in this group may produce a silent stomach ulcer so that the patient is unaware that he has a problem with it, and may in fact be having a bleed from a painless stomach ulcer and not be aware of it. So if you need to take *Advil* make sure that you are tolerant to it before you fly, and also that it doesn't produce sedation. Codeine and injectables are usually narcotic-type pain relievers. The pain itself of course precludes flying if it is of the extent that you need a narcotic, and also narcotics produce sedation, so this type of pain killer should not be used by a pilot who is flying.

Pesticides These relate more to agricultural pilots but also to the avid home gardener. Chlorinated pesticides such as DDT, TDE and Methoxychlor may produce vomiting, excitement and convulsions. Cholinestrase inhibitors such as Parathion, Malathion, TEPP may produce headaches, blurred vision, dizziness and convulsions. These are mentioned because if we inadvertently get these sprayed on the skin, don't recognize it, and absorb this through the skin or absorb the vapour from the spray, we may suffer from these side effects which are incompatible with flying.

Sedatives Barbiturates have a long half life and may well give impaired judgement. If somebody needs to take a sedative they shouldn't be flying in the first place. Secondly with the long half life there may be some minor effects persisting from the barbiturate which may impair your judgement. Therefore it is recommended that you don't fly for 24 hours after taking a barbiturate. The same proviso applies to sleeping pills.

Stimulants *Benzedrine* and *Dexadrine* are common appetite suppressants. These produce agitation which may impair judgement and make a pilot over-reactive. Caffeine also is a stimulant and may produce agitation and nervousness in some people. Therefore don't fly for six hours after loading up on appetite suppressants or caffeine.

Tranquilizers The condition requiring the use of a tranquilizer would exclude the pilot from flying and as well the tranquilizer itself may produce drowsiness, complacency and weakness. Some of these medications also may well have a long half life, therefore don't fly for 24 hours after taking the medication.

Antidepressants Depression itself is a contra-indication to flying. Commonly antidepressants may well have a very long half life and they may produce blurred vision, sedation, agitation, abnormal heart rates and a drop in blood pressure in susceptible people. Therefore don't fly for one week after taking an antidepressant.

Hypoglycemia A pilot who has been flying for several hours without taking nourishment will have his blood sugar gradually fall. He has thoughtfully packed in some sweets or high calorie foods that boost his energy level. However these foods produce a sudden sharp rise in blood sugar and this is now countered in the body by a sudden sharp rise in insulin production, the function of the insulin being to transport this blood sugar across the tissue membranes into the muscles. Because the insulin level has suddenly risen, now the blood sugar level starts to fall. However we can't suddenly turn off the insulin as quickly as the blood sugar falls, so the raised insulin levels may continue to lower our blood sugar below a desirable level before the insulin quietly returns to normal. During this rebound phase we may be hypoglycemic which means our blood sugar may be lower than it should be. Under these circumstances our body now decides to try and counter this condition itself by producing adrenalin whose effect is to release stored sugar from the liver to put the blood pressure back up to counter the hypoglycemia which in fact does occur. However, as we mentioned earlier, adrenalin itself can produce agitation and excitement and nervousness and rapid pulse. This phenomenon is known as rebound hypoglycemia.

In order to minimize this, it is worth having a good intake of protein-type of food before we take off. Protein produces a slow rise in blood sugar and therefore a correspondingly slow rise in insulin. Because protein takes quite a while to digest, it produces a slow offset. This is matched by a slow offset of the insulin production, and we don't get rebound hypoglycemia. So it is preferable to avoid too much high calorie foods. If you are going to eat this though, certainly take some protein containing foods along such as cheese or boiled eggs to add the protein to the snack to avoid rebound hypoglycemia.

Fatigue Fatigue fragments integrated mental activities. It shortens the attention span and degrades accuracy and judgement, therefore we should address all the factors that are likely to add up to fatigue. Don't fly without adequate rest or sleep or with an empty stomach or with a head cold which for a pilot is a serious problem, or sprains, strains or a cast, because swelling inside these may produce compression and pain.

Common sense Flying is a state which involves man and machine. The machine is always monitored very carefully, most accidents are due to the man in the equation.

Major health problems are easy for us to spot and we are all aware of those, and using our common sense, we decide not to fly. However, minor health problems may be fairly innocuous and easy to overlook If we then fly with the problem, we may find that we get fatigued much earlier in the flight as a result of vibration, dehydration, noise, hypoglycemia, etc. So never underestimate the effect of a minor health problem because when other factors are added, it may become important to us at the end of a long flight — we may suffer from fatigue a little earlier and make an error in judgement in, say, an off-field landing.

Conclusion

In the foregoing I have spoken in generalizations to create an awareness of the possible adverse effects of minor ailments in conjunction with common over-the-counter medications which may be taken to combat them. It doesn't mean that we can't fly with these, but we should not forget to DI the pilot first to make sure that these are within acceptable limits. This way we can all enjoy our flying and do it safely. •

ROLLING YOUR OWN

Pulling weather forecasts off the new AES electronic bulletin board system

Steven Foster
Toronto Soaring Club

SPECTACULAR ADVANCES in the power and affordability of personal computing and data communications have opened up new possibilities where none existed before.

Due to the nature of the problem, soaring weather forecasting has much to gain from data services which reflect advances in information technology. Such a new service from Atmospheric Environment Service (AES) offers unprecedented public access to weather information. Configured as an electronic bulletin board system (BBS), a multitude of weather products are posted for users to extract using a modem and personal computer. In addition to general text forecasts, a wide range of specialized super-computer forecast model output, hand annotated regional forecast charts, satellite imagery and radiosonde data are available. With the AES BBS, it is now possible for serious cross-country pilots to make very good personal assessments of soaring conditions so that all-too often missed opportunities and frustrations stemming from a lack of weather information will hopefully be a thing of the past.

Personal Soaring Forecasting: why bother?

In my estimation, there are too few amateur and no commercial interests that require the kind of weather information we are looking for. Few outside of soaring are equally concerned with the qualities of fair weather conditions. Who else cares whether skies are clear vs. light scattered cu, if cumulus have long vs. short cycle times or if they trigger early vs. late in the morning? We are, therefore, unlikely to see Environment Canada spending money on improving the quality and availability of soaring forecasts. The do-it-yourself method is the most practical avenue open to us for improved soaring forecasting. This does not imply re-inventing the wheel or that soaring pilots should all get degrees in meteorology. It simply means that better informed pilots will be able to add their own interpretations to the general, aviation or soaring forecasts already prepared by AES to good effect.

Soaring pilots are in a unique position when it comes to direct observation and interpretation of small-scale dynamics of the atmosphere: success in cross-country or competition soaring depends on it! This leads to a further reason for personal soaring forecasting. A personal assessment of basic airmass properties cannot only improve the effectiveness of task planning on the ground but also help flight strategy while in the air. For example, flight strategy would be different if heavy cu cycling is expected: being too low as the cycle turns down could result in one looking up at booming cu less than an hour later from a farmer's field. Correlating direct, personal observation of thermal conditions with each personal weather assessment is the best way to improve the soaring forecast — no one else, meteorologist or otherwise, will have such tremendous feedback on the forecast!

The Forecast Problem — A Brief Overview

The soaring forecast problem can be distilled down to three simple elements: sunshine, stability and wind. Everything else from isobars to satellite imagery will be evaluated according to the impact they have on these three elements. The following reviews the key aspects and how the data available from the BBS fits in.

Sunshine is our energy source so any interruption will kill all lift. If the general forecast is for cloudy skies and rain, then one can stop right there. But, upper cloud associated with warm fronts and upper troughs (regions of relatively low pressure aloft) restrict sunlight to varying degrees which must be assessed. The amount of the sunlight reduction governs the degree of thermal degradation. Satellite imagery is the best choice to assess the risk of upper cloud killing thermals. With a single satellite image, one can see the location and density of cloud at a glance. It is also straightforward to estimate the direction and speed of upper cloud using a forecast chart in conjunction with the image.

Stability, the tendency of air to move vertically, is definitive to the prediction of soaring conditions. Stability is controlled by the distribution of temperature and moisture with height. A higher atmospheric lapse rate (ie.. the faster the air cools with altitude) implies less stability which is better for thermals. The negative lapse rate of an inversion (temperature rise with altitude) represents a condition of extreme stability — essentially a cap on all thermal activity. Condensation of water vapour (cloud formation) has a significant destabilizing effect on thermals because of the associated release of latent heat. An extreme example of this effect is a thunderstorm which derives its violent energy from instability released by condensation.

Vertical distributions of temperature and moisture are controlled by the large scale (synoptic scale) motions of the atmosphere. The large-scale downward motion (subsidence) of a high pressure system or ridge (typically less than .05 m/s) warms air by compression which produces an inversion aloft and dries out any frontal cloud resulting in clear skies. Large scale ascent associated with a low pressure system or trough cools air by expansion which is a destabilizing factor resulting in cloudiness and precipitation. Temperatures aloft are also affected by the upper winds carrying warmer or colder air over another airmass (temperature advection). Warmer air moving in aloft will increase stability (retard thermals), colder air will decrease stability (enhance thermals). For example, the flood of arctic air behind a cold front is usually fertile ground for good thermals. We can also have moisture advection, ie. moist air being carried in with the winds aloft. Strong moisture advection, usually associated with southerly winds, is generally bad news with lower cloud bases, reduced visibilities and increased chance of overdevelopment.

Tendencies in stability can be assessed from pressure plots showing the location of high and low pressure areas and how the pressures are changing with time. Charts are available which directly depict the magnitude of synoptic scale vertical motions at different altitudes for a more direct assessment of the trend in general atmospheric stability. Further, it is possible to estimate the trend in stability due to temperature advection at a glance using a forecast chart. For precise measurement of stability, either radiosonde or aircraft soundings are used to measure temperature and humidity changes with altitude. An analysis program running on a PC makes short work of interpreting sounding data for thermal forecasting.

For closed circuit cross-country thermal soaring, light winds aloft are most desirable. Strong wind not only makes flying upwind difficult, but it also increases low level turbulence which tends to break up the thermals. General wind conditions are governed by the horizontal changes in atmospheric pressure. Air flows from high pressure to low so that the greater the change in pressure with horizontal distance, the stronger the wind. Because of the earth's rotation, the air flowing from high to low pressure is deflected to the right (in northern hemisphere) so that the wind blows roughly along the isobars on a chart. Consequently, isobar spacing and orientation on an MSL pressure plot gives an indication of the general surface wind speed (eg. light & variable, medium or forget-it) and direction. Similar plots based on pressure level height contours instead of isobars can be used to estimate winds at different altitudes. If the forecast chart is predicting greater spacing between isobars in your area, then expect the wind speed to trend down.

The BBS: Sample Output

The AES BBS represents a large collection of graphics files which can be downloaded to a PC after which each can be viewed on the screen or printed. The BBS contains charts, satellite photographs and upper air data necessary to evaluate potential soaring conditions as outlined in the previous section Figure 1 is an example of a computer generated forecast consisting of four consecutive MSL pressure forecasts at six hour intervals. Each panel allows one to estimate wind strength and direction. Comparison between the four forecast panels shows how the conditions are expected to change, ie. whether a high is building in or moving out, if the high is intensifying or weakening or if the winds are ex-

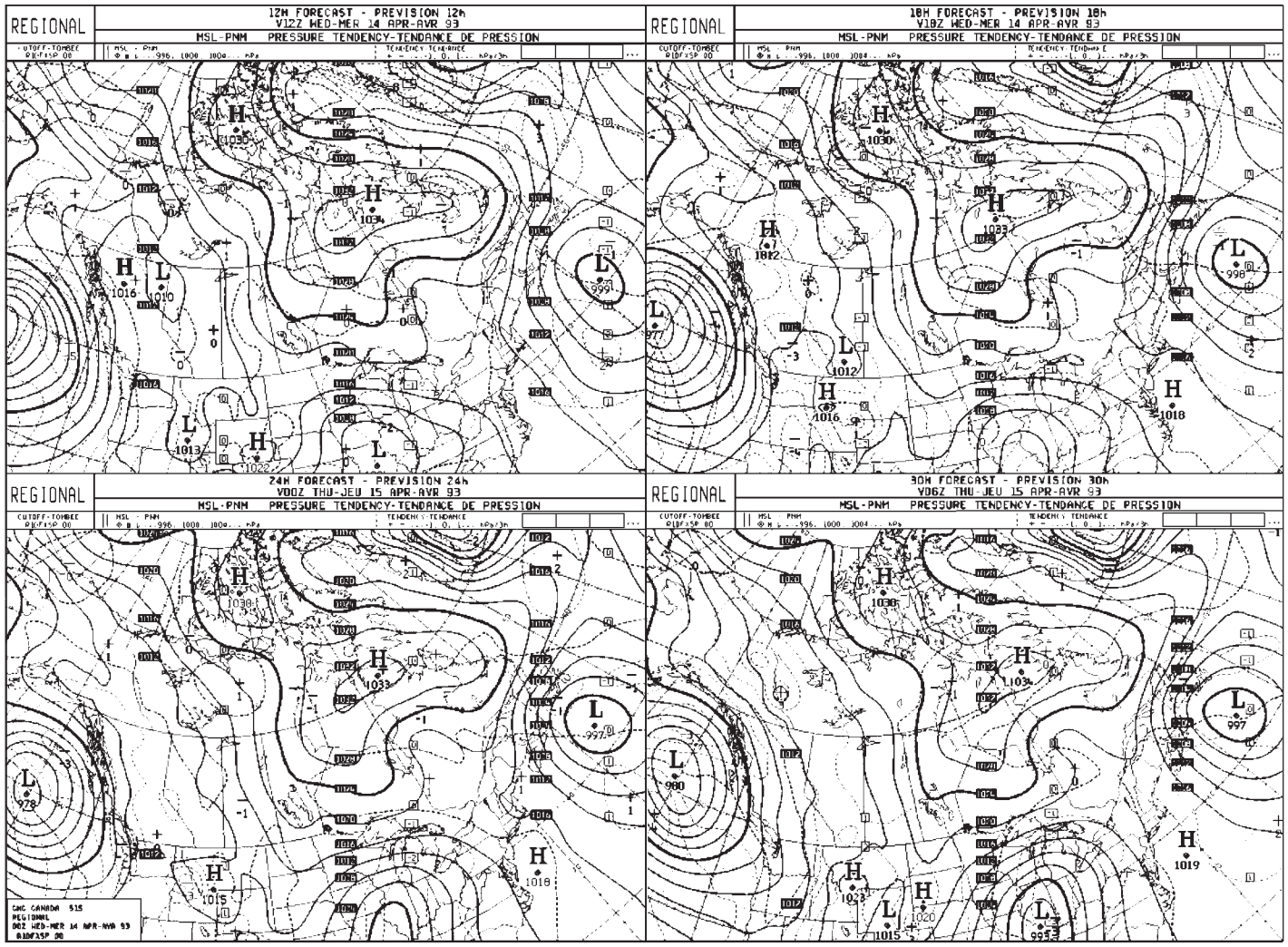


Figure 1 Above. An example of a computer–generated forecast at six hour intervals.

pected to trend up or down. Figure 2 is an example of a hand annotated chart (surface prognosis or 'prog') which includes forecast locations of middle cloud (about 10,000 feet), identification of fronts and areas of precipitation in addition to the pressure systems. The chart focuses on the Ontario region instead of all Canada as is the case in Figure 1.

Figure 3 is a sample satellite image of eastern North America in the visible part of the spectrum (as opposed to infrared). Taken from the geosynchronous GOES-7 satellite, this image is ideal for assessing the big picture, especially when animated using a sequence of 1/2 hourly images (also possible on your PC, preferably a 486). However, it is less than ideal for estimating the density and exact location of cloud cover closer to home. For this purpose, images taken close up from a polar orbiting satellite (NOAA-11, NOAA-12) are ideal. Figure 4 shows an infrared image of southern Ontario region taken at almost the same time as Figure 3.

Unlike Figure 3, however, levels of greyness are based on temperature, not on visual bright ness. Warm surfaces are rendered black and cold surfaces white. Since temperature generally decreases with altitude, dark grey clouds are at low altitudes (eg. stratocumulus) and white clouds are at high altitudes (eg. cirrostratus). As an advantage over visual images, each infrared image looks almost the same at night as it does during the day so

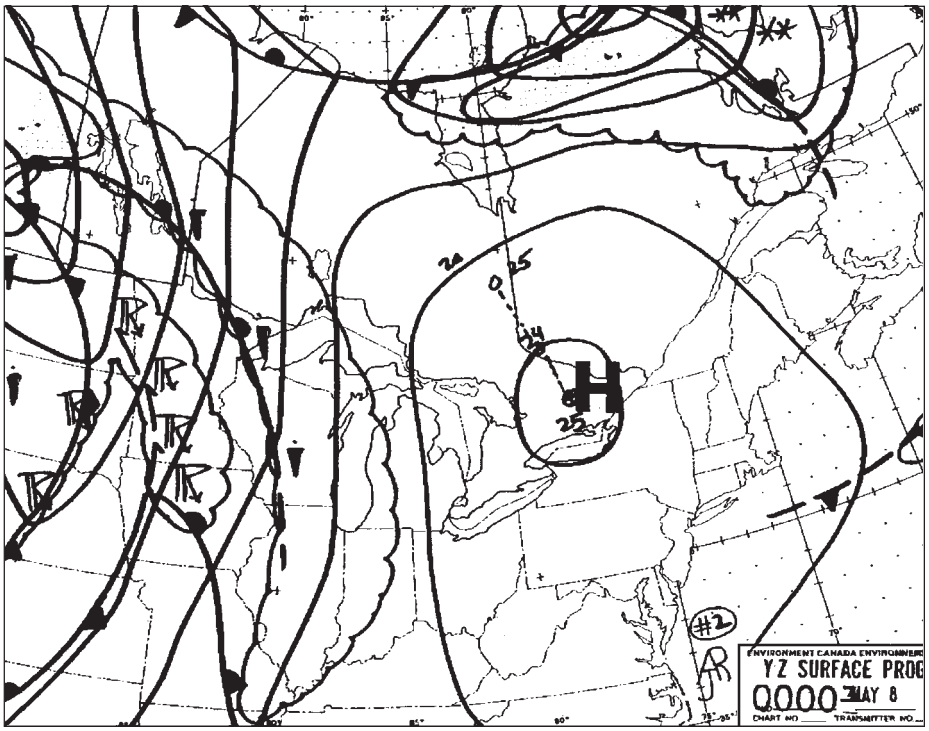


Figure 2 A hand annotated prognosis identifying fronts, middle cloud, and areas of precipitation for Ontario.

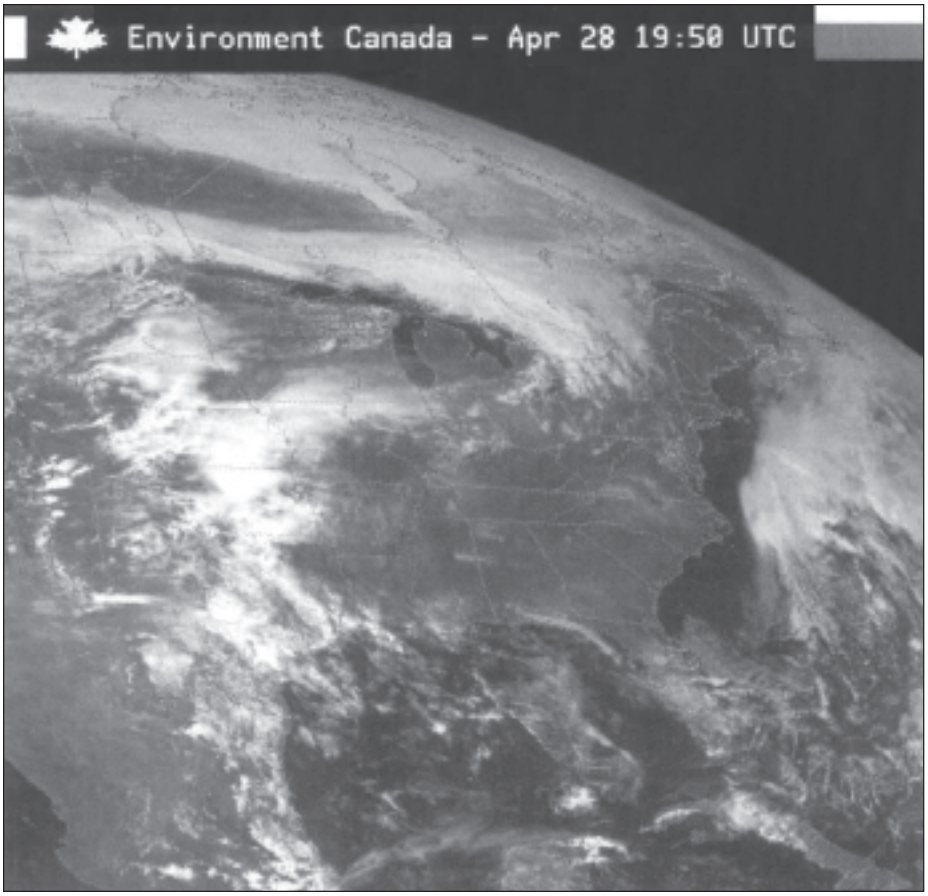
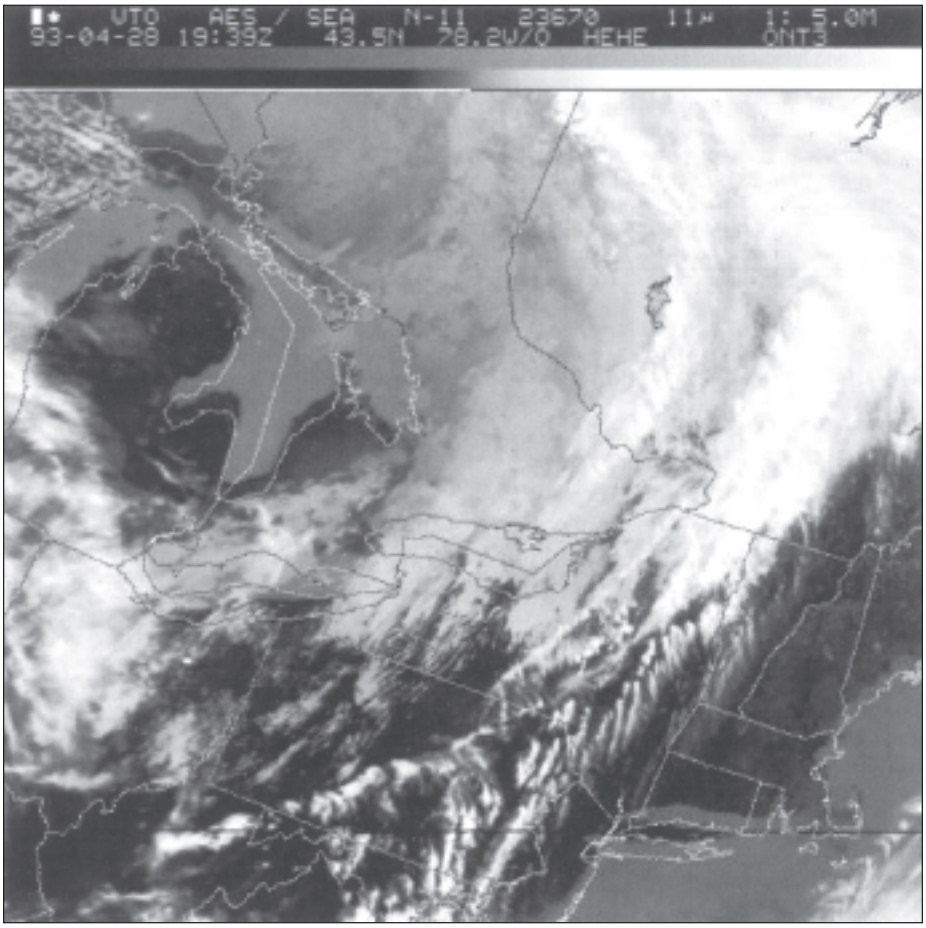


Figure 3 Above, eastern North America image from GOES–7 in visible spectrum.

Figure 4 Below, closeup of southern Ontario from a NOAA satellite in infrared.



that early morning assessments of local cloud can be performed using pre-dawn imagery.

Personal Computer System Requirements

In order to access the BBS, you need a personal computer, modem and a communications software package. The system is accessible from all types of computers, but shareware utilities on the BBS for viewing the graphics files (GIF, JPEG formats) are for MS DOS based systems.

Communications parameters should be set to 8 bits, no parity, 1 stop bit. The BBS supports V.32 bis/V.32/V.22 communications standards at 14,400/9600/2400 bits per second. With a modem operating at 14,400 bits per second, one can download a satellite photograph in less than 30 seconds and a forecast chart in a little under one minute. At 2400 bits per second, the transfer times would jump to 3 minutes and 6 minutes respectively. Whether or not the transfer times at 2400 bps are acceptable depends on the individual; but, as a couple of photographs and at least two charts are probably going to be needed, data transfer times might be a little too high. If, however, only forecasts in text form are required, then a slow modem will be more than adequate. A VGA graphics capability with 256 colours is a minimum requirement for viewing 256 grey-scale images. Running under Windows is ideal as the latest satellite photograph can be in a window on one side of the screen and a forecast chart on the other side in another window for direct comparison.

Charts, but not satellite images, can be viewed on a monochrome monitor, but the resolution on such monitors is less than desirable. Software for viewing GIF and JPEG files is available on the BBS for those who do not have such utilities. The available software known as “shareware” (or “try it before you buy it” software) is quite inexpensive ($20–40).

BBS System Access Status

The system for public access to the mountain of forecast data produced by AES was pioneered at the Central Region in Winnipeg. AES plans to implement systems at each regional divisions of AES. Coordination and further BBS development is being undertaken at the national headquarters of AES in support of the national implementation of the system. The timetables for implementation of the BBS are set individually by the regions of AES, and can be obtained by contacting the Chief of Informatics at the appropriate division (see end of article). The system at AES national headquarters in Toronto is now accessible. As this BBS is a development system, it is subject to changes and modifications. Comments and suggestions are encouraged so as to improve the system. BBS access charges, if any, are to be set by the individual regions so please contact the applicable region for such details. The development system at AES HQ is free of charge.

Dial-up Procedure for BBS at AES HQ

The telephone number of the BBS at AES HQ is 416–739–4226. Once connected, issue ‘bbs’ at the prompt and log-in as ‘new’. The sys-

concluded on page 15

Canadian Triumphs in New Zealand

Paul J. Nelson
Guelph Gliding & Soaring Association

WE CANADIANS ARE A MODEST LOT. Our national modesty even extends into areas normally quite alien — such as the sport of soaring. Not wanting to strut unseemly on the international stage, our fraternity has declined to send any representatives to the 1993 World Championships this summer in Sweden. Any interested observer would have predicted a Canadian pilot to be a near certain winner, given the similar frozen tundra mosaic of both Sweden and Canada.

If we are to demonstrate our unique soaring prowess, albeit reluctantly, surely the only fair test is to try our talents in a more demanding situation. Our naturally superior Canadian gene structure and exceedingly beneficent soaring climate demand that to balance the playing field we must compete in a less hospitable climate. I thought that the mountainous, somewhat desert like conditions of central New Zealand would be enough of a handicap that we could probably justify sending representatives to the 1995 Worlds scheduled for Omarama.

Alas, to date our soaring colleagues appear to be pretending to the world that once again we will not be competing but only because of budgetary concerns. Being fortunate enough last month to be accidentally driving through Omarama, I decided I would sample the local conditions to see if they were sufficiently demanding to test Canadian mettle. On day one, there was consistent ridge flying with modest thermals, on day two, consistent to wave soaring with modest thermals, and on day three, only strong 8500 foot thermals, with no ridge or wave activity.

Regretfully, I must advise that the conditions were totally unacceptable — simply no challenge for your average Canadian sailplane pilot. Clearly, if one was to make anything of the unfortunate situation, a challenge had to be created — even if by artifice.

Not understanding the Canadian psyche, the owners of the Omarama field had a two stage checkout-familiarization procedure for new pilots. Before the usual proficiency and familiarization flight, there was a mini cross-country circuit in the towplane. Apparently the feeling was that the valleys and sheep stations did not provide friendly landing sites if a visiting pilot wanted to sample local hospitality at other than the gliderport. The idea was that in such a situation it was helpful to be able to identify friendly from unfriendly sheep stations — everything else was decidedly unfriendly. The latter were a pronounced majority, with the former having areas that charitably could be called landable. Clearly, the towplane flight was interesting but hardly appropriate for pilots steeped in motorless flight.

Day one came to an end too quickly, with only an hour's time left to scoot along the mountainsides after checkout and great promises being made to accompanying non-flying spouse. Canadian mettle had yet to be tested! Day two, however, provided new opportunities. Autumn having approached (remember these folks are upside down), soaring did not get underway until well into the afternoon. The owner kindly ventured the opinion that he thought there "might be wave up there, if you can get to it." After explaining to him that every Canadian pilot flew in wave every weekend throughout our eleven month season, he generously explained that the oxygen mask was not intended to be fastened to the nether regions. Carefully taking in his suggestions about where to put the mask and how to "connect": I was shortly thereafter launched.

Now in fairness, even for a Canadian pilot, it was a bit of a chore getting "high". I kept climbing up the face of the rock piles, flying a few miles out to mount these fat lenticulars and scrambling back to the lower mountain slopes to try the process all over again! At least the scenery was mildly different even if the soaring was pedestrian compared to Ontario. Finally, on the fourth attempt, success! The turbulence stopped and the steady whine from the vario meant that the books had not all been lying to me for so many years.

In short order the clouds were well beneath. It was interesting that notwithstanding these now relatively small gaps between the clouds, one did not have to be bothered with location or map reading. It should have been rather obvious, even to a non-Canadian, that flying at a constant heading, into the wind at slightly above stall speed, would keep the aircraft nearly stationary. Within fractional distance of Gold altitude, one can well imagine that to voluntarily leave wave, due only to a lack of ground reference, was indeed a difficult decision. In any event, threading the needle between the molecular sized cloud openings, provided the offset to a missed badge leg.

The greatest thrill was yet to come. After crawling out beneath the clouds, imagine the pure delight in being greeted by a totally new vista — mountains in every direction uncluttered by roads, towns, or any sign of human habitation. This of course is why we have maps. Lakes are great beacons, well known to Canadians. If one's map shows a pair of lakes 20 miles north of the field, and these very same lakes are 10 miles north of the present location ... need I go on? Imagine the greater delight in traversing those few southerly miles and finding that the mountains were in fact not obscuring the metropolis of Omarama. Unspoiled mountain vistas still as far as the eye could see.

The day now having considerably waned, lift was no longer abundant. Those lakes, and one little adjacent village were looking awfully friendly — even from 15 miles. Upon arrival, the pure delight of also finding a friendly sheep station, which could be identified from the air, instantly removed the monotony of having endured that initial painful motorized flight.

The extra $40 for the retrieve was a small price. The larger price was acknowledging that this Canadian's myopia probably has disqualified me from being our representative to return in triumph at the 1995 Worlds. Apparently when map reading, one is supposed to allow for the fact that there might be multiple pairs of lakes. Seemingly, one is also supposed to consider that a high crosswind can move a glider 25 miles east in very short order. The soaring being over, the highest price was actually what I had to provide my better half for the rest of the holiday — that's another story! •

Learning from our Misteaks

Peter Hewitt
from *Australian Gliding*

THE BEST WAY TO LEARN is to do it yourself. Unfortunately in gliding that can hurt. Another way is to listen to your instructor, but that only involves short term memory. The magic words, "Now you are solo" trigger total erasure of all those childhood myths passed on by granny from the back seat, and pave the way to a whole new grown up world where you can learn by your own mistakes. Which is where we started, for as in life, growing up can hurt. Of course students can't make mistakes, all they can do is test the instructor.

What about once you are solo? You should learn from checkflights, but usually the instructor is so pleased to fly with someone safe that he doesn't want to do anything to prove you are not. The early solo pilot, who feels every flight is an exercise in nervous trauma, cannot comprehend the relief of an instructor when offered the chance to fly a passenger, and for a few minutes have his destiny in his own hands (even if he suddenly has to remember how to do it).

Imagine how that instructor feels when allowed to lie back and enjoy a flight with someone competent in the front seat, who pays for the flight and acts as chauffeur! No instructor will disturb the flight with reckless proposals like "show me a steep turn".

Rocking the boat is one thing, deliberately rattling a bag of rivets held together with tin foil is quite another. No, learning is something students do, not solo pilots. Of course you can read a book about gliding, but that will be either too basic, too technical or all about competition. How do you learn to fly safely?

The best way is to learn from the mistakes of other people, but most people are too shy to admit they ever made a mistake. I am not shy. I will be pleased to pass on the benefits of my experiences with heavier than air motorless flight. Let me tell you about one of my mistakes. I would say my only mistake, but I am an honest man, so I will tell you about the other one some other time.

Once in days of yore I landed wheel up.

How could this be, since I always do my checks? Well, every confession includes a cast iron alibi, so here is mine. The club had experienced a succession of single seat pilots landing wheels up, so at the next instructors' meeting I pointed out we never raised the wheel in the Blanik when doing training flights.

"No need", the experts chorused, "the Blanik wheel causes no drag."

"But if you don't raise it, how do you KNOW you would have lowered it?"

"Because we always do our checks", came the predictable chorus.

One good feature of the Blanik is that the wheel does not fully retract, so a wheels-up landing does no damage, so the club maintenance officer supported my proposal. He was willing to try anything to prevent more wheels up landings. His fingers were raw from rubbing the bellies of Astirs and Jantars. Like me, the other instructors love flying, and don't like rubbing bellies (fibreglass ones, anyway), so rather than offend him we all agreed we would raise the Blanik wheel on every training flight from then on, just to prove we were doing our checks.

The very next flight, while putting a post-solo student through a gruelling checkflight including simulated sink on the downwind leg, I forgot my pre-landing checks.

This time, because we had raised the wheel after the launch, the evidence was there unmistakeably displayed in the cheering faces of the crowd as they swarmed around us. I was carried away on the shoulders of my admirers, and taken to the bar where I dutifully bought the first of many rounds. But as I quaffed my beer I started to ponder — beer does that, or at least the last one does, just before I fall over. How had it come to pass that I had made this classic blunder?

A basic rule of gliding is, if you are going to do something stupid, do it out of sight of the clubhouse. Alas, I could not explain. I was forced to conclude that I, even I, was fallible. Unlike, I am sure, my honourable readers.

Obviously that was the only time I ever forgot my pre-landing checks, but because until then I never normally raised the wheel in the Blanik I can't prove it. How about you? Thinking of graduating to glass soon? Then take advantage of the Blanik's gentle temperament and oleo'd undercart. Raise that wheel after launch, and if it is still up when you land you will have learned from my mistake. Alternatively, wait until you land a glass ship several inches lower than normal, and you will have learned from your own mistake — as well as buying beers the cost may be many hours helping the club maintenance officer rubbing bellies.

On a lighter note, have you noticed that most articles on gliding are about how the author did something pretty good, and never about the many small mistakes which stopped it being something even better?

Flying cross-country, it's not finding the only ten knot thermal of the day that wins the race, it's leaving that thermal before it drops to five knots. Everybody else may only be using nine knot thermals, but if your average rate of climb is eight knots and theirs is nine, you lost!

I taught myself this by running a stop watch. Every time I started "just one last turn" when I knew I should be off down track, I re-started the watch, and ran it until finally, in disgust and usually in sink, I levelled the wings and set off after my wiser colleagues.

At the end of a long flight, while my betters were downing their second beer I would emerge exhausted from my sweaty glider and observe with horror the accumulated time on that stop watch. Forget about the joy of climbing in strong thermals, weep over the time wasted at the top of them. And when sitting in a field waiting for the crew, don't blame the thermals for stopping too soon, blame the time you wasted circling in weak lift when down track the thermals were still booming. •

ROLLING YOUR OWN

from page 13

tem will then request some basic information in order to initialize you as a new user. After this, you will be able to check out the system but not transfer files. File transfer privileges will be provided only after your account has been validated, a process which will take about one business day. If you have any problems in accessing the system, contact Andrew Hunt at 416-739-4810.

Conclusions

A new bulletin board service from the Atmospheric Environment Service offers an excellent new resource for improved personal soarIng weather assessment. Adding an informed personal interpretation to a prepared weather forecast using the AES BBS is the best way to improve forecasting for cross-country soaring. By virtue of direct experience, soaring pilots are uniquely qualified to determine what atmospheric conditions are the best for soaring. Now that a sophisticated information source is available by personal computer, the do-it-yourself method is capable of delivering high quality weather information to the serious cross-country soaring pilot. AES Regional Chief of Informatics contacts for the new bulletin board service are:

Pacific Region, Vancouver
Simon Whitlow. (604) 664-9166
Western Region, Edmonton
Mike Stevens, (403) 468-7906
Central Region, Winnipeg
Bernie Aftanas (204) 983-7694
Ontario Region, Toronto
Dave Grieg (416) 676-4512
Quebec Region, St Laurent
Roger Bouffard (514) Z83-1141
Atlantic Region, Bedford, NS
Jack Sadubin (902) 426-4318

Acknowledgement

I wish to thank Andrew Hunt of the Informatics Branch's Client Support at AES HQ; Garry Pearson, Head of Professional Training Section; and Mel Prout, Senior Instructor, Professional Training Section, for their assistance during the preparation of this article. •

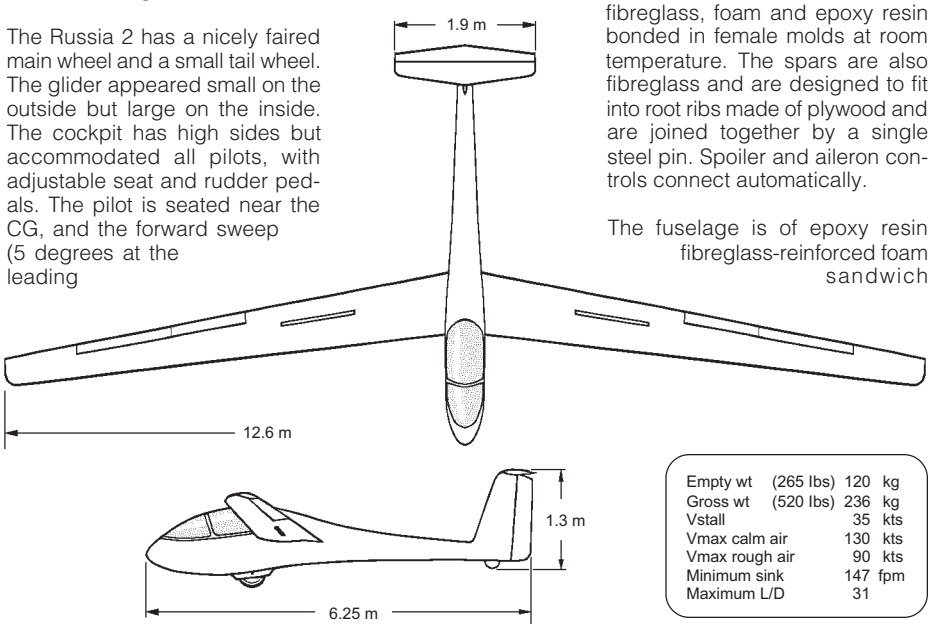
hangar flying

THE RUSSIANS ARE COMING

from the Seattle Glider Council *TOWLINE*

AS MOST OF YOU KNOW, the World class glider prototype fly-off was held in Germany the first of this year. Of the eight gliders that flew, two were from Russia. The Russia 2 glider is a 12.6 metre span version of the 11 metre Russia 1 which had been selected as a design winner for the prototype competition. After a special request to the World Class Management group by the Russian team, IGC officials allowed both gliders to be entered as official prototypes for evaluation at Oerlinghausen.

The Russia 2 has a nicely faired main wheel and a small tail wheel. The glider appeared small on the outside but large on the inside. The cockpit has high sides but accommodated all pilots, with adjustable seat and rudder pedals. The pilot is seated near the CG, and the forward sweep (5 degrees at the leading edge) allowed changes in pilot weight throughout the range of 120 lb to 240 lb without ballast. Stall speed with the heaviest pilot is about 35 knots. The airbrakes on the glider open both above and below the wing, reducing the difference between stall speed with airbrakes extended and retracted. Stall warning were good and no unusual wing drop tendencies were noted. The glider recovered quickly from a spin. Maneuverability is good and the controls seemed well harmonized. Rolls were timed at 3.5 seconds for +45 degrees at 1.4 Vstall. Performance polar measurements showed the glide ratio to be 31.1 and minimum sink of 0.75 m/s. The glider has good high speed qualities; flight test measurements showed about one L/D point better at 120 km/h than the 15m calibration glider. Approaches and landings were made easily and the airbrakes worked well.



Empty wt	(265 lbs)	120	kg
Gross wt	(520 lbs)	236	kg
Vstall		35	kts
Vmax calm air		130	kts
Vmax rough air		90	kts
Minimum sink		147	fpm
Maximum L/D		31	

The Jury of the IGC was favourably impressed with many features of the Russia 2 (now called the Phoenix) with some shortcomings that are being changed. The small size, the light weight of 112 kg, the quality of the structure, the surface finish, the range of pilot weight without ballast, the automatic control hook-up capability, the ease of assembly and the low cost were true to the World class objectives.

Glider description The glider is constructed from reinforced fibreglass materials, has a T-tail and forward swept tapered wing. It has an empty mass of 120.5 kg as tested. Maximum all up mass is 240 kg. The two piece wing is tapered and the leading edge is swept forward 5 degrees to eliminate ballast required for balance. It has a span of 12.6 metres and an area of 7.7 m^2. The upper and lower Schempp-Hirth airbrakes are installed in fibreglass structures. The upper and lower wing surfaces are sandwich panels made of fibreglass, foam and epoxy resin bonded in female molds at room temperature. The spars are also fibreglass and are designed to fit into root ribs made of plywood and are joined together by a single steel pin. Spoiler and aileron controls connect automatically.

The fuselage is of epoxy resin fibreglass-reinforced foam sandwich structure. The tail boom is reinforced with four carbon tape stringers weighing 0.4 kilograms to reduce bending flexure. The cockpit canopy is in two parts with the forward section attached to the fuselage, and the rear section hinge mounted on the right side. The vertical tail is integral with the fuselage, containing a spar and stabilizer attachments. The horizontal tail is tapered with a conventional fibreglass elevator, split in the centre to allow deflection without binding. The elevator automatically connects on assembly.

After reading a lot about the Phoenix and talking to Dick Johnson at the SSA convention, I went to the factory that built the first three birds. After long talks with the Russian firm that owned the prototype, I bought the company and will be importing 40 to 50 sailplanes to the USA in 1993. A refundable delivery place is now available for a deposit of $4000. Since my company takes me to Russia a lot of the year, I am looking for someone to be the exclusive distributor of the Phoenix in the USA. The Phoenix will sell for $13,000 cif Seattle, WA. So, if you would like to be in the sailplane business, give me a call at (206) 334-2116.

Jim Hartwell, A&H Soviet Inc.

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SAC affairs

Report on the March 1993 IGC Meeting

Colin Bantin
SAC/ACC IGC representative

THE 1993 SPRING MEETING of the International Gliding Committee was held in Cape Town, South Africa on 12/13 March, at the Graduate School for Business near the Victoria Docks. The school is a converted prison and has all the appearance of its former self! I don't wish to suggest that there was any intended association with the choice of this venue, but the way these meetings go one can easily feel that you are trapped inside for longer periods of time than is normally comfortable.

My attendance at this meeting was made possible at the last minute by the kind support and generosity of the SAC members at the AGM in London. I wish to thank all those who, in light of the SAC budget cuts, made personal contributions to help defray the costs of my trip and to everyone who supported me as your IGC representative and supported the need for our continued representation at this international body.

Working Groups There were 21 delegates at the meeting and two proxy votes. After the minutes ... were approved, we established the following working groups for later discussions:

Rules (ie. Sporting Code) — Tor Johannessen, Norway
FAI and the 2000 Concept — Alvaro De Orleans-Borbon, Monaco
Flight Verification Systems — Bernald Smith, USA
IKARIADA — Fred Weinholtz, Germany

Before continuing on with the business of our meeting, we briefly reviewed the progress in setting up the European Gliding Union. This group is independent of the IGC and comprises only European gliding countries. It was formed to specifically address the airspace and regulator matters arising out of the general political and economic European union that is taking place. They had their first meeting in Strasbourg last October.

FAI Matters IGC President Peter Ryder discussed the FAI Council Meeting in February. There was some concern expressed that only delegates and commission presidents were allowed to attend the meeting. This was apparently for space reasons, however the IGC, among others, would like to allow observers to be present. The general feeling about the meeting was expressed in a few carefully chosen words, such as boring, a tragedy, and non-productivel Perhaps outside observers can inject some life into this group. Most of the efforts of the IGC are now directed toward getting the FAI moving and functioning properly. These efforts include a re-examination of the structure of FAI and the way it does its business.

There is a need to update and clarify differences between the General Section and (in our case) Section D for Gliders. This includes the definition of an official observer which SAC discussed at its London meeting (more on this later). These differences are a matter for resolution between CASI and the Air Sports. The IGC position is that future conflicts between these groups should be immediately and directly resolved by the FAI Council. We believe that there is some conflict of interest arising from CASI as the rule determining body within the present FAI structure.

The FAI was discussed in a working session. The focus is on individuals rather than institutions. The ideal structure would be territorial (through national committees) with Worlds level coordination of all airsport structures. The IGC approved four resolutions to be carried back to the FAI for discussion:

- Airsport commissions shall have the right to place items on the agenda of FAI meetings;
- The commission presidents group agenda shall include items from the Airsport commission presidents;
- Responsibilities for the General Section should be transferred from CASI to a new committee composed of one member from each airsport;
- Observers allowed at FAI meetings.

Committees The following highlights from the committee reports include the results of the working group deliberations:

Rules I notified Tor of some errors in the Sporting Code that were detected by some of you more observant SAC members. These were gratefully received and announced at the meeting. As a quick summary of these and other changes:

- page 2-9, last section, last line — the word "divided" should be "multiplied".
- page v — "g" is not a force. It is an acceleration given in units of m/s2.
- The reference to electronic barographs is no longer temporary.
- The arc of the Great Circle is computed at sea level.
- Item for further discussion — does breaking a 1000 km speed record also imply a record for 750 km, 500 km and all smaller triangles if it qualifies?

The definition of an Official Observer was discussed. The problem is bringing the Section 3 code (para 7.1.5) in line with the new wording in the General Section (para 4.2.2). It is complicated by the efforts of the SSA, USA, who have strongly opposed the new General Section wording ever since one of their claims was rejected. The initial attempt at a solution was to ask Tor and Bernald to draft a new wording for paragraph 7.1.5. They produced a three paragraph replacement which was intended to clarify how para 4.2.2 of the General Section was to be interpreted. This didn't work. During the discussions I privately read a position paper that had been put together by Bill Ivans and which contained a summary paragraph that was just what we needed. I proposed that this, with a minor modification, be adopted as part of 7.1.5. This was accepted, and a recent notice from the FAI Secretary General reports that this interpretation of 4.2.2 must now be used for all claims. *(see new interpretation on page 20 ed.)*

With respect to the second seat in a multiplace glider in competitions, it is the intent of the rules that the accompanying pilot be of the same nationality as the competing pilot.

Although is doesn't apply to us any more, there is a need for certification (permit to fly, etc.) for using winglets in Swedish airspace.

The issue of wingspan measurement was discussed again with no further resolution. There was a general feeling that "grandfather" rights be applied to all currently flown gliders (ie. already flown in the Worlds), and that tolerances be introduced for new gliders. However, there was a strong feeling that the tolerance should be zero. Where that leaves us I don't know.

There is a proposed World Cup to be introduced at the New Zealand Worlds. John Roake, who is organizing the contest, says that this is necessary in order to attract sponsorship (TV coverage, etc). There is some merit to all this and the presence of a Cup to be won by a country rather than an individual may help us, and other countries, to get some government funding. I urge everyone to pass me their comments. This is an important opportunity to give input to the world scene.

There was some discussion on limiting the entries to a world contest in order to control the costs. There was also a suggestion to split the contest into three separate events for the three classes. The issue was tabled for discussion at the next meeting. In view of our own concerns with the costs of sending a team to a world contest, I am working on a position paper along with Dick Bradley (South Africa) for presentation at the next meeting. I would like to solicit ideas and suggestions for inclusion in the paper. Please let me know your thoughts.

Discussion continued on the use of GPS for flight verification. The need to approve the system within the FAI has been recognized, however no standards and protocols have been developed or approved as yet. Failure rates for the GPS electronics are being quoted at 1 in 10 million or more compared to camera/barograph failures of 1 in 1 thousand or less! The IGC Bureau proposed that GPS units be used at the Swedish Worlds but only for evaluation and gaining information. All units would be welcome. Cambridge is apparently supplying 30 units for rental. The British will be using a unit from E–W (electronic barographs) which accepts an external input from

a GPS receiver. It is important to realize, however, that units which accept an external input could never be acceptable for flight verification since the data input is not secure. Member countries are urged to experiment with GPS systems. The British will be using them this year at their Nationals. We should do the same, and I hope to have some of my own "PathTracker" units available for trials, with PC support software for initializing the units and evaluating the flights afterwards.

In contrast to the open approach at Sweden, John Roake reported that at the New Zealand Worlds the only GPS unit which would be permitted is a rental from Cambridge Instruments, which will increase the entry fee by about US-$200 per pilot. This seems a pity since there is no specification for the units that are being supplied, and the pilots will have nothing to show for it at the end. Most pilots will eventually need to buy their own units for future events anyway. There was some strong objection at the meeting to this "single-sourcing" of equipment.

Discussion on rules for flight verification in general centred on a document by Andreas Doetsch. The approach taken by Andreas has not received much favour. He is proposing categories of verification requirements depending on the level of claim (eg. national vs. world, etc) and on the type of instrumentation used. The approach advocates tighter controls because new electronic instrumentation is capable of more precision. This is not necessarily the way to proceed especially in introducing new equipment. Ironically the use of GPS has not been addressed in his document. The matter was tabled for discussion in Sweden. I have a copy of the proposal if any one would like to review it and give me their input, however I advise that this would be a waste of time. Because of GPS, the contents will become obsolete long before they get approved.

Motorgliders There were no inputs to the motorglider committee this year. Production of motorgliders is increasing and technology is slowly improving.

Club Class Helmut Kiffmeyer reported on current happenings with the Club class. He is working on a new system for evaluating handicap factors based on various thermal types and a wider differentiation between old and new designs. He also made the suggestion that the LS-4 be made eligible for the Club class. There was a short discussion with no resolution.

World Class Glider Selection
Since not all of the conditions for the competition were met by every contestant, there was a movement to open up the contest to a redesign. This was naturally supported by those that were not chosen as a result of the flight testing last October. Reason prevailed, however, and the recommendation of the management committee was accepted. Therefore the new World Class Glider is officially the PW-5 from Poland. Congratulations to the Polish design and production team. I have some performance and technical information if anyone would like a copy.

World Air Games Fred Weinholtz reported on progress with IKARIADA. The working group came up with a number of conditions before the IGC would sanction the event for gliding. There will be invitations for 25 pilots on a first come first served basis (no indication of how to enter yet)). The Games will use the new PW-5 World class glider and be held around 15–24 September 1995. The Greek organizers are required to send observers to gliding competitions. There was mention of a US-$500 entry fee and the contest will be "simple with straightforward scoring". We have yet to see what this means.

International Events

23rd Worlds at Borlange Ake Petterson reported on progress at the 1993 Worlds at Borlange, Sweden. To date $150,000 has been spent on the site, winglets will have to be type approved, and the tow fee will be US $30. It was a short report. It also raised serious concerns about the cost of a Worlds.

24th Worlds at Omarama A report was given on progress for the 1995 Worlds at Omarama, New Zealand. The airfield is in good shape with 11 of 30 chalets built so far. There will be a conference centre/briefing hall built. There are 1400 beds and 78 houses available in the surrounding area at approximately NZ-$450/week. Sponsorship is satisfactory, with ESPN sought for daily TV coverage. An agreement was reached with Cambridge to supply GPS flight verification units which are to be used as the primary system. Cameras are only for backup purposes. No information was given on the specifications or performance of the GPS units. The entry fee is up to US-$1640 from US-$1250. And there will be a contest at the site the year before (yes, it was called a pre-Worlds but we ignored this!). Entry forms will be available at the end of April (I have not seen any yet). You will need oxygen for the southern half of the South Island, and the French are already complaining about the dangerous mountain flying and weather conditions. There is a proposed auction of special items from each country as a means for teams to raise money.

25th Worlds There were no official bids for the 25th Worlds. There were, however, unofficial offers from Poland and France. There was considerable discussion on whether to vote on the unofficial bids, especially since they were not accompanied by budget proposals as required. The voting on the site was deferred until the next meeting, but a motion was made to limit the bidders to Poland and France. The motion was passed, however I voted against it since there would be (and now will be) much less pressure on the bidders to keep their cost down.

Other Items The Lilienthal Medal was awarded to Poland's Franciszek Kepka and the Pelagia Majewska Medal was awarded to Georgette Litt Gabriel.

The President and Vice Presidents remain the same as before. Tor had a good proposal for establishing a fund for helping long-range travellers get to IGC meetings, and that we should meet at a place that minimized the total cost to delegates. All this was totally ignored and the next meeting of the IGC will be held in Spain in March 1994. I voted for Chicago but nobody else wanted to go there in March! •

Coming Events in 1993

5-9 July 1993, **Fun soaring contest**, Gatineau Gliding Club, Pendleton, ON. For sports, club, and 1–26 sailplanes. Contacts: Richard Officer (613) 824-1174, Glenn Lockhard (613) 692-3622.

6-15 July, **National Soaring Championships**, Swift Current, SK. See update on next page.

24 July - 2 August, **Cowley Summer Camp**, Canada's largest and best soaring get–together. Sponsored by the Alberta Soaring Council, contact: Tony Burton (403) 625-4563.

31 July - 2 August, **Ontario Provincials**. Hosted by Guelph Gliding Club. Contact Ed Hollestelle.

7-11 October, **Cowley Wave Camp**. Contact Tony Burton (403) 625-4563.

GUEST EDITORIAL from page 4

illustrated need to examine the current regulations for certified aircraft under 2500 pounds, used exclusively for recreation, and come up with some kind of a compromise which will allow "qualified" people to maintain and sign out their own (factory built, certified) aircraft. If owners could be prepared through a process of training and examination to illustrate their ability to be responsible for their own (not someone else's) aircraft, the whole industry — including the AMEs — could benefit from increased interest and activity.

We need to appreciate and learn from the good things that were done to create Chapter 549. The improvement of our future in recreational aviation will depend largely on how we move in the next three to five years. Once again it is up to us. With sufficient support, RAA is prepared to move the industry forward. Please think about this and if you have a comment, please send it to the RAA. All correspondence will receive a reply.

Recreational Aircraft Association
152 Harwood Avenue South
Ajax, ON L1S 2H6 (416) 683-3517

CAUTION – LARGE TEXT ABOVE!

Noting the comment on text size in the letter opposite, the column immediately above is 9 point, one size larger than normally used, with one size more spacing — the entire editorial from page 4 has a fraction more spacing than above as it spans two columns. Do you like it? It would result in a larger magazine for the same content, which means more cost of course. (I wanted to show you a complete article in the larger size but ran out of space to do so in this issue.)

 from page 5

A THOUGHTFUL SAC CRITIQUE

It was with great anticipation I opened the spring edition of free flight coming out of hibernation as do the majority of Canadians. A few of the issues from the AGM report give rise for concern, so here goes:

Membership Reduction in membership does not look too bad considering the state of the economy, but for sure we must do all we can to retain existing members and bring in new ones. Is there a trend in the declining numbers who is leaving and why? It therefore seems illogical to cut the publicity budget to a whopping one grand (or not so grand!).

Promotion It seems that we are often unintentionally our own worst enemy. How many of our clubs are taking part, even with a static display at local air shows? For example, "Kit Planes" carries an ad for the Toronto Aviation and Aircraft Show and guess what, no mention of soaring among such competing sports as parachuting, hang gliding, etc. among the exhibitors.

While the EAA is increasing its promotion of the sport, SAC is heading in the opposite direction. (The EAA is promoting youth aircraft flights through its "Young Eagles" program, which the SSA is tying into). If this direction is inevitable, although some things are best done nationally, SAC should at least try to promote cooperation between clubs.

SAC should offer unified promotional material to clubs (such as intro certificates), national promotion such as a 1-800-CAN-SOAR number (get Bell promotion) and information kits to the local tourist bureau, flying clubs, etc. It was disappointing not to find any information on soaring at the new Aviation Museum in Ottawa despite the proximity of several clubs.

We should put more emphasis on how the airport operation is run and how the facilities are laid out. Our club for instance has very good facilities, but they are too far from the flight line to be used for flying activities. Gypsy flight line trailers are OUT! The airport should be clearly marked and offer a minimum of facilities for members and visitors, such as refreshments (we currently go to the local Burger King), sale of sunglasses, T-shirts, Tilley hats (a possible sponsor?), maps, *free flight*, etc. Signposts for attracting visitors are nonexistent, with the result that many people pass in blissful ignorance, or are afraid to enter. Clubs are often so well hidden that even the locals can't find them. It took me three hours to locate the Champlain club and it was only with very detailed instructions that I could find the Pendleton club.

How many clubs are giving brochures to local stores, motels and restaurants? Is there a national highway sign for glider airports that we could use to inform the public?

Sponsors It may be hard to find sponsors who are willing to donate cash, but services may be easier to obtain, such as free teleconferencing (Bell, CBC, etc) which would allow us more frequent meetings and seminars, while at the same time reducing cost to SAC.

Affinity credit card A frequent issue in *free flight* and at the club level is the work and considerable cost involved in collecting fees. Many intro flights are probably lost because people don't have $40 of spare change, often miles from the nearest cash machine. An affinity card would be a nice addition to SAC services and possibly also yield some revenue. With the current membership base we should be able to support 5000 cards and provide credit card support to our clubs.

free flight The 2/93 issue was very good, but I would make the following proposals:

- The cover page should have been great in colour. How much, Tony? *(About $300)*
- We should try to publish at least ten times/year as a bimonthly schedule does not promote dialogue. This letter will be almost two months old when you read it, and four to gel any feedback, by which time the season is almost over.
- Larger print would be easier to read (perhaps I need new glasses) and give more volume to the magazine, thus presenting better value for money for resale
- Distribute through clubs with extra copies for resale at the flight line and by members. Only two extra copies per member at $4/copy would gross an additional $10,000/issue. With reduced distribution cost we should be able to make a profit at least in the summer months, as this compares well with the current subscription price of $3.33/issue with postage.
- Print SAC logo, together with *free flight* and single issue price on the top of the cover page to give better visibility when stacked on shelves. Keep rest of cover page as is.
- Add information for the general public on the sport, such as where to find the clubs, telephone numbers and of course a subscription/membership application form.
- Solicit ads from national/international clubs (facilities, courses, intro flights) — how about it MSC?
- More technical articles and news, how does it fly and dissemination of important information such as OSTIV papers on cockpit safety relating to the use of safety belts and cushions (no softies!).

If these proposals were implemented we would in my opinion have a world class magazine. Production cost would increase, but so would revenue and more importantly expo sure and membership. The latter two would directly benefit existing and new clubs, and therefore help reduce the cost of flying. It may be too late to implement these proposals this season, but what better way to enter the '94 season and our following 50th! I suggest we use some of our fund assets, combined with club and membership contributions — perhaps a special 50th fund. $10 per member can go a long way I would welcome comments from the editor and members.

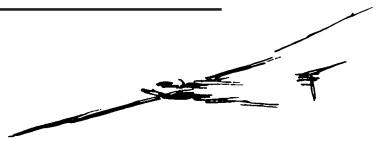
Why not give a complimentary copy of *free flight* to visitors taking intro rides. At MSC we have 600/800 intros a year, so why not put some more effort into obtaining subscriptions and members even if they don't all intend to fly immediately (let's keep the flame lit).

For an unbiased opinion of impediments to increased glider participation in Canada, here are some of my wife's thoughts (my comments in brackets):

- People are afraid because there is no engine (this is a common comment from the non-glider fraternity).
- You have to wait too long for flights and often inaccurate assessment of when you can fly (on busier days we should perhaps reduce the flying time for intros).
- There is no food or drink at the flightline, so you have to bring your own or go to town.
- There is no shade at the flightline, you die of heat and get burnt.
- It's not advertised widely enough so you don't know where to go and how much it's going to cost.
- The clubs don't seem well organized.
- Not enough places to sit down.

Svein Hubinette, MSC

NATIONALS UPDATE



This is the last update before I see you in Swift Current. Things are progressing, although as of 15 May, it appears many pilots are waiting until the last moment to register at the cheap rate! I have heard that some pilots are having difficulty to organize time off work or have some other problem that makes it impossible to be certain in May that they will be able to attend. At least if you let me know you are trying, that's information I can use, and I will be lenient with the late registration surcharge.

Remember that the Nationals rules require that the pilot possess a current FAI Sporting Licence. These are available from the Aero Club of Canada for $15. Phone Beth McCollum at (613) 739-1368.

Jim Oke has finished negotiating the Moose Jaw airspace for us, and Bryan Florence has done a lot of work to borrow a stack of 1:50,000 charts so that I can produce the turnpoint set. Buying them would cost over $350! Thanks to you both.

I will be sending out pilot kits as soon as possible, and am working on early June. One goody will be a grid map of Saskatchewan, which shows every little farm road and track — just the thing for retrieves out of the Great Sand Hills.

We will be using the services of a professional met man who will be setting up shop at the airport for the contest.

This is a call to volunteers for the contest — contact me if you can assist — I still need a flight line boss, and two or three pilots so far are short of crew.

Tony Burton
Contest Manager

Another Ridge Day

Walter Weir
COSA

BAM BAM BAM BAM! "Oh gawd", I thought, "We're going to do this again". I opened my eyes. It was 5:09 am. I knew it was Tom Knauff hammering on the side of my motorhome. It must be another "ridge day". "Let's get going", Barb said.

So — once again — I got up dressed ate shaved smoked the barograph synced the camera clocks put the film in found my declaration filled the water containers put the glider together put the water in put the battery in found Doris to be my OO sealed the barograph sealed the cameras in two places mounted the cameras sealed the cameras to the mount (no kidding — that's in the new rules) took the declaration photos put the barograph in Barb put the lunch in .....

Many others were engaged in this same weird activity. That's how I know I'm normal. Bernie Palfreeman, Andre Pepin, Francisco Diaz, Tom Foote, Hans Berg, Doug Gerard, Dave Key, Tillmann Steckner ... they were all doing it. And there were a bunch of Americans too.

We've done this many times. Sometimes there is no wind on the ridge and we all laugh a lot after. Sometimes we can't cross the first or second gaps at Altoona and Bedford due to low cloud, snow, rain, or poor visibility. Sometimes the wind quits at Cumberland or Covington and we land out or limp home. We never ever ever get to Witten Cemetery, our turnpoint 516 km southwest near Tazewell, Virginia.

The field was wet. We had two inches of snow sitting on it yesterday morning. The only dry places were the "runway" which is asphalt, nine hundred feet long by sixteen feet wide and the gravel "taxi strips" of which there are three, six feet wide and at right angles to the runway. Any watered glider not on the hard part sank in the mud. Our feet were wet. It was +8 degrees C and the wind was blowing.

By this time it was light enough to see the sky and it was overcast. You can't cross ridge gaps without thermals and thermals don't flourish under stratus. Tom took off first and I followed at 7:45 and through the start gate at 7:54. About five minutes later I realized I had forgotten my pee bag. I had a plastic tube pinned to my shoulder strap with two litres of drinking water at the other end and no pee bag. It was cold which always makes it worse. I considered returning, using a camera bag, using my toque, not drinking, and other things too terrible to reveal, but reached no conclusion.

The wind was too strong to get lower than 200 feet above the ridge and the turbulence was unbelievable. We got to Altoona in about 20 minutes, slowed, pulled up to 3000 MSL and sailed across the gap. Bedford came soon after and we wasted 15 minutes trying for 4500 feet, then pushed out into the gap with only 4100 and just made it across.

Cumberland and the "dreaded Keyser Knobblies" came next, where the book says "get into wave and head for Mountain Grove". There was no wave. We dropped south to the ridge just north of Cumberland airport and then ridge soared and bounce-soared the Knobblies, a hair-raising experience. Tom got down to 1700 MSL, about 650 AGL. I managed to stay above 2300 MSL.

We could see cumulus in the distance to the southwest. When we got to Covington, the Ingalls AWOS (automatic weather observation system) reported the wind to be 300 degrees at 23 gusting to 31. Perfect!

The rest of the trip was easy. The ridge south of Covington, where I had never been in spite of six years of trying, was smooth, easy to fly and working well. I finally saw Witten Cemeteryl We had good cu for the gaps and good ridge lift all the way home. My average speed on the way down was 138 km/h and for the whole trip 142 km/h. At times the airspeed touched 120 knots but each time it crept up, another violent smash, head into canopy, made me slow up, crouch down, pull up on the stick with one hand and the crotch strap with the other, and tell myself that "20s never break up in the air, do they?"

It was a good day for everybody. Bernie and Andre got to Mountain Grove and over Covington for personal bests. Francisco went to Williamsport and Cumberland for his distance diamond which completes his Diamond badge. Dave got to what looked like Seneca Rock, which would have been good for a Diamond distance, but it turned out to be the wrong rock. Tom Foote climbed to 12,000 feet in wave very close to the gliderport. Everybody had super flights.

My total time for the 1032 km was 7 hours 14 minutes. And I got home before I needed the pee bagl •

FAI records

Russ Flint, 96 Harvard Avenue
Winnipeg, MB R3M 0K4 (204) 453-6642

The following Canadian records have been claimed:

1000 km speed to goal & return – Open, citizens~ 142.6 km/h, 23 April 93, Walter Weir, ASW-20B, C-GGWW. Flown from Keystone, PA with goal of Tazewell, VA and return. Surpasses previous citizens record of 94.7 km/h set in 1983 by Brian Milner.

500 km speed to goal – Open (not FAI), citizens, 138.4 km/h, 23 April 93, Walter Weir, ASW-20B, C-GGWW. Flown from Keystone, PA with goal of Tazewell, VA. Surpasses previous territorial record of 97.1 km/h set in 1970 by David Marsden.

Out and return distance – Open, citizens,1032 km, 23 April 93, Walter Wein ASW-20B, C-GGWW. Flown from Keystone, PA to Tazewell, VA and return. Surpasses previous citizens record of 1001 km set in 1983 by Brian Milner.

Free distance – Open, citizens, 1032 km, 23 April 93, Walter Weir, ASW-20B, C-GGWW. Flown from Keystone, PA to Tazewell, VA and return. This is a newly established record category.

This is what I would call efficient record flying — four for the effort of only one flightl Well done, Walter. editor

THE CONFLICT OF INTEREST CLAUSE - A RELATIVE INTERPRETATION

The current General Section to the FAI Sporting Code, paragraph 4.2.2 reads: *"An official observer in any record or badge attempt must be independent and not be perceived to have a conflict of interest".* Some national soaring bodies have interpreted this to mean that relatives, wives, roommates, etc. of pilots could not OO for them (SSA has been quite rigid on this point, for example).

At the FAI Gliding Commission meeting held in Cape Town in March, discussion on this subject resulted in the following resolution:

"For the purpose of flights made under Section 3 of the Sporting Code, the General Section paragraph 4.2.2 is made specific as follows: *A personal or commercial relationshlp between pilot and observer shall not necessarily disqualify the Observer, except that any payment to the Observer for services rendered must not be contingent on the success of the flight."*

NEVER MIND! *In the last issue we asked you to send your badge claims to the SAC offlce because Walter was on the road a lot. He still is, but says claims should still go to his home address as usual. He reports there are no FAI badge legs to list In this issue, but seeing as how this is his page normally, I thought it only fitting that his fine flight go here. Lastly, an omission on the Canadian Records table in the last issue also affects Walter — he holds the current citizens 400 km triangle speed record of 111.8 km/h set in 1990. Tony*

SOARING ASSOCIATION OF CANADA
L'ASSOCIATION CANADIENNE de VOL à VOILE
306 – 1355 Bank Street, Ottawa, Ontario K1H 8K7
tel (613) 739•1063 fax (613) 739•1826

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mai 1993

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3	SAC student T-shirt • various colours specify size – S, M, L, XL	12.00				✔	ACVV T–shirt de l'élève • couleurs diverses précisez la taille – P, M, G, XG
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9	Tie • blue with white gliders	20.00				✔	Cravate • bleue avec des planeurs blancs
10	Decal "I'D RATHER BEE SOARING"	.75				✔	Auto collant "I'D RATHER BEE SOARING"
11	Sunshades (sun protector for your car windshield; design SAC•ACVV)	9.00				✔	Sunshades (para–soleil en carton pour votre voiture; dessin SAC•ACVV)
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continued on other side — voir au verso

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31	Student progress book (24 for $60)	3.50				✔	Carnet de vol d'entraînement de l'élève pilote (français) (24 pour $60)
32	Soaring instruction manual rev. Jan 80	5.00					Manuel d'instructions de vol à voile rev. jan 80 (français)
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42	Lapel pin • Glider	10.00					Epingle • Planeur
FAI supplies • certificates, badges (back page of *free flight* has full list)							***Articles FAI • certificats / insignes*** (voir aussi revue *vol libre)*
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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
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SKYLARK 4B, 18m, O2, T&B, radio, parachute, trailer, very good condition. Soars on a puff – the best L/D for your dollar. Bev or Dave Lewtas (514) 455-7786.

LARK IS29D2, C–GBEQ, about 1000h, excellent condition, never spent a night outside, Radair 360, Cambridge elec. vario, O2, instruments, chute, metal encl trailer. $17,000. Denis Gauvin (418) 842-6456.

LARK IS29D2, 1992 models, all aluminum, 37:1, fully aerobatic, +5.3/-2.65g limit. Howard Allmon (305) 472-5863, fax (305) 473-1234.

HP–18, C–FETQ, centre stick, nose–hinged canopy, 6" fixed tailwheel, adjustable seat back, water dump valves, 10 chan radio, Ball vario/audio, netto/cruise. $10,500, $11,000 with wood trailer, or $13,000 with Schreder trailer. Udo Rumpf (613) 475-4009

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TWO PLACE

LARK IS28B2, new models, all aluminum, 34:1, fully aerobatic, +6.5/-4 single pilot g limit, +5.3/-2.65 dual. Howard Allmon (305) 472-5863, fax (305) 473-1234.

LARK IS28M2 motorglider, new models, all aluminum, 27:1, side-by-side, fully aerobatic, +5.3/-2.65g limit. H. Allmon (305) 472-5863, fax (305) 473-1234.

2–22, C–FWTY. En état de vol et avec les instruments de base. Une offre raisonnable nous encouragera à inclure un deuxième 2–22 demandant des réparations aux ailes. Ne manquez pas cette occasion spéciale. Claude Gosselin (514) 444-3450. Nous avons aussi la carcasse d'un **1–26** à vendre.

2–22, C–FWTY, basic instruments. Any decent offer considered – for the right price we will even throw in a second 2–22 which requires wing repairs. **1–26** fuselage also for sale. Claude Gosselin (514) 444-3450, no collect calls please. AVV Champlain.

LK10A/TG4, CF–ZAJ. A classic, taught some of the best in Canada how to fly; with trailer and spares. Ben Lochridge (416) 278-4765 work or (416) 271-3097 home.

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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. $A38.50 surface mail, $A52 airmail per annum. Payable by international money order, Visa, Mastercard. Box 1650, GPO, Adelaide, South Australia 5001.

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15	SAC Flight Trophies application form *(also stocked by club)*	n/c
16	FAI Records application form	n/c
17	SAC Flight Declaration form *(also stocked by club)* per sheet	$ 0.15
18	SAC guide "Badge and Records Procedures", ed. 6	$ 5.00
19	FAI Sporting Code, Sec 3, Gliders, 1992 *(payable to **ACC**)*	$ 7.00

Please enclose payment with order; price includes postage. GST not required. Ontario residents, add 8% sales tax (items 15–18 tax exempt). Items 1–6 and 13–18 available from SAC National Office. Check with your club first if you are looking for forms.

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Insigne FAI 'C', plaqué argent	
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