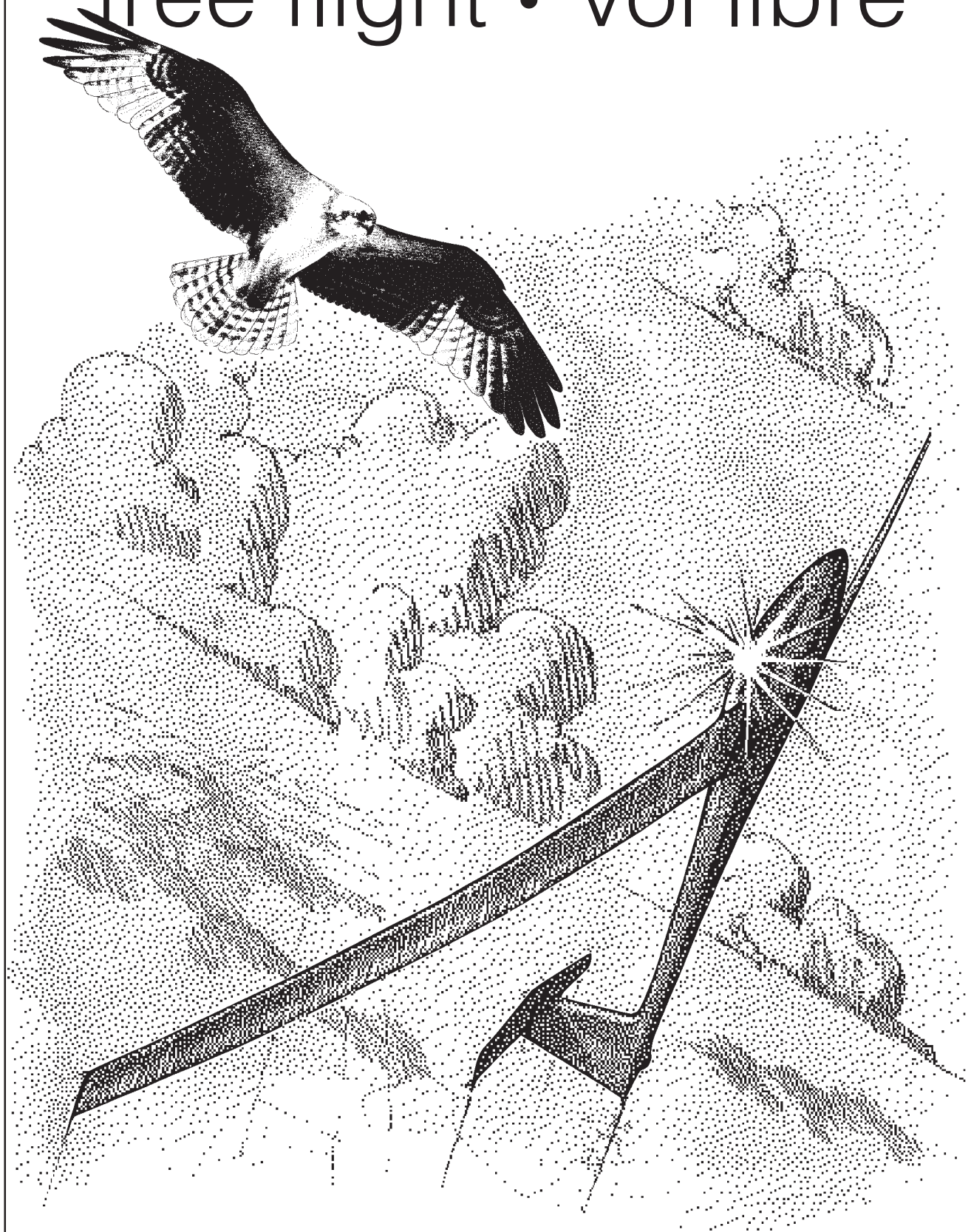


free flight • vol libre



POTPOURRI

It is 1993 and let us all push for it to be more successful than the last year was.

Our membership in 1992 did not keep up to the level of 1991. We lost more than ninety members, or about eight percent. This is in spite of all the new people who joined our clubs. How many members did we really lose? I believe all clubs should do some serious research into why they lost those members, phone them, send them questionnaires, or whatever else it takes to determine why they dropped out, and what is necessary to keep them coming back. If we only encouraged twenty percent from NOT dropping out, our membership would be increasing every year. GO FOR IT.

Delivery date of the calendars, both US and German, was a problem again this past year. Segelflug-Bildkalender had a reorganization and SSA had problems with printing. Maybe 1993 will be the year everyone will have them in time to mail out for Xmas.

The SAC AGM is being held in London at the Ramada Inn on March 5,6,7; please see page 16 of this issue for details. The National CFI Seminar is also held there, so would all clubs please encourage their CFIs to attend and notify Ian Oldaker of their intentions.

By now all clubs should have their statistical reports mailed to Randy Saueracker, 1413 7 Avenue, Cold Lake, Alberta T0A 0V2. If not; hurry, hurry. Also Ian Oldaker and Harold Eley are looking for applications and claims.

George Eckschmiedt of Flight Training & Safety goes to a great deal of effort to present us with a detailed analysis of the accidents and incidents that occur each and every year so that we can take steps to prevent them. However, his job becomes very frustrating when he hears third hand of both situations with nary a word to him. This past year was no exception — so how about everyone making a solemn promise to faithfully report to George any and all incidences or (heavens forbid) accidents you may become involved in, that includes both me and you. I will anxiously be awaiting George's report for 1993.

In the last issue I welcomed a new secretary to our organization — since then two more have been welcomed and have left for greener pastures. We must be doing something wrong — but what? Joan must be getting rather tired of training and more training. We have decided to put things on hold until April. Thank you, Joan, for continuing to support us.

By now everyone will be closely monitoring the weather in anticipation of the coming thermals and rushing to get ready for the new season. Please take time to get yourself properly prepared and trained.

Here's to a successful soaring season and please,
Don't be careless.

Al Sunley

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Trademark pending Marque de commerce en instance

1/93 Feb/Mar

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

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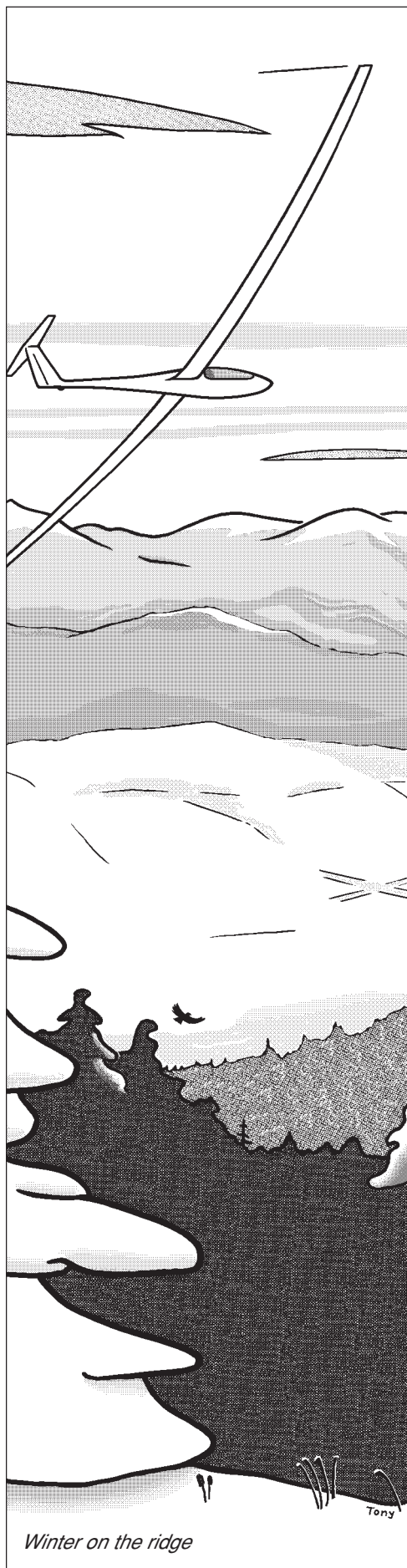
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Cover

It is -31°C and snowing lightly as I "assembled" this illustration for the cover, so you can imagine why it represents the dream of a better soaring season to come. The "sunstar sailplane" originated as a sketch by Hans König and the hawk was added through the usual miracles of computer technology. Tony Burton



Winter on the ridge

GUEST EDITORIAL

A concern for the future of Canadian soaring

Ed Hollestelle
Chairman, Canadian Advanced Soaring Group

I currently have some great concerns about the future and advancement of gliding and more particularly soaring in Canada. Regrettably our sport does not seem to be growing at all and it seems that we have come to a point where membership is decreasing and fewer people show up at our provincial and national competitions. Most technical advancement is derived from top level sports events. The latest engine/transmission/suspension/tire technology is found at the world's renowned car racetracks. It is the constant advancement at that highly competitive level that filters down and changes the cars on our roads. In gliding the situation is similar. It is at World Championships where improved equipment and better flying techniques become evident.

I think it is vital to the survival of our sport of soaring in Canada to participate actively at a world level. I know we have found ourselves in a "Catch 22" situation but if we do nothing about it now I think we might be in worse trouble than ever before. The fact that soaring is not a visible sport makes it difficult to find corporate sponsors. And because Canadian pilots have not done so well lately at the Worlds it becomes even more difficult to acquire any funding. At the time I write this it looks like Canada will not have a team participate at the World Gliding Championship in Sweden in 1993 because there is no money in the SAC world team fund. If we do not start raising money now there will be no funds for a world team to go to New Zealand in 1995. (This will be even more expensive.) If the top Canadian glider pilots are having difficulties in ranking well at world level competition now I would hate to see the scoring results in 1997 if we do not participate and improve our techniques and skills for the next five years. If Canada does not have the monetary means to send a team to represent the country it becomes obvious that this will halt the advancement of soaring in many ways:

- The Canadian Nationals will no longer serve their purpose. Promising up and coming new contest pilots will not devote their time, efforts and money to drive wherever in Canada to participate in this event, because even if they win and "make the team" they go nowhere.
- Provincials, which quite often serve as a stepping stone for the new competitor or warm up for the experienced, will no longer have any meaning.
- There will be no new competition pilots going back to their respective clubs dying to share their newly-learned skills with the other club members.
- Nobody will bring in the latest types of gliders and go through lengthy type-approval procedures. Consequently their current gliders will not become available as "affordable" used gliders and so on ...

Behind these thoughts lies the importance of a "Canadian World Soaring Team" and why I think the CASG should try and help with the funding.

I wish you good health and hopefully a better soaring season in 1993!



The SOARING ASSOCIATION OF CANADA

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

free flight is the official journal of SAC.

Material published in *free flight* is contributed by individuals or clubs for the enjoyment of Canadian soaring enthusiasts. The accuracy of the material is the responsibility of the contributor. No payment is offered for submitted material. All individuals and clubs are invited to contribute articles, reports, club activities, and photos of soaring interest. A 3.5" disk copy of text in any common word processing format is welcome (Macintosh preferred, DOS ok in ASCII). All material is subject to editing to the space requirements and the quality standards of the magazine.

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

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

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

For change of address and subscriptions to non-SAC members (\$20 per year, US\$22 in USA, and US\$28 overseas), please contact the National Office, address below.

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Deadline for contributions:

5 January, March
May, July
September, November

L'ASSOCIATION CANADIENNE DE VOL À VOILE

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

vol libre est le journal officiel de l'ACVV.

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

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

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

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

Pour changements d'adresse et abonnements aux non membres de l'ACVV (\$20 par an, EU\$22 dans les Etats Unis, et EU\$28 outre-mer) veuillez contacter le bureau national à l'adresse qui apparaît au bas de la page à gauche.

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letters & opinions

EAGLE FIELD NEEDS HELP

Dear friends, this is a plea for help in fighting a threat to Eagle Field. The problem is a new highway that could obliterate the airfield and leave us with one less outstanding flying site. An avalanche of letters — computer, handwritten or otherwise — from all over North America could be effective in ensuring that the final location will not affect the airfield.

Here is a sketch of the situation: US route 220 from Cumberland to Elmira is being replaced with a four lane limited access highway. A decision has been made to re-route it over Bald Eagle Ridge and this puts Eagle Field in jeopardy. Penn DOT is studying various corridor locations and engineers will narrow the choices to three by March and pick a final route by October 1993.

Early input (squeaky hinge theory) will give planners room to select an aerodrome saving alternative, so your voice is important. Here are some points to consider:

- Soaring is being squeezed and we must save the sites we have.
- Eagle Field is a unique and irreplaceable site in that it is located on the most productive record setting mountain range in the world.
- Six men and three women have established numerous world and national records from Eagle Field.

The highway folks refer to tax maps and last names, but if you mention "Striedieck" or "the airstrip near Skytop" it will be clear what you are talking about. Address letters to:

Mr. George Khoury,
District Engineer, Penn DOT
1924 Daisy Street, Clearfield, PA 16830

I suspect these people rarely get interest about their work from outside the area of impact. A ton of letters from the four corners of North America plus Europe should be a novel experience for them and will facilitate a routing that doesn't cancel another gliding site. Please write soon. Nothing fancy or long-winded is necessary. Mail volume is everything! Thanks.

Karl H. Striedieck
RD 1, Box 118
Port Matilda, PA 16870 (814) 237-7996

HP-18 AILERON KIT ERROR

Something came up down here in Houston that HP builders might be interested in. A friend of mine, David Colling who is a young graduate aeronautical engineer had been perplexed by the extremely poor roll response of the HP-18 sailplane that he had purchased.

To make a long story short, the problem was determined to stem from the mismatch between the leading edge thickness of the ailerons and the aft spar thickness of the main wing to which it was attached. The ailerons were about 1/4 inch too thin at their leading

edges all along the span. Because of the gap covers used, the mismatch was not quite as apparent as one might think. David built completely new sets of ailerons for the HP and, lo and behold, the roll rate as measured by a stopwatch increased over 200%!

Apparently the poor roll response arises from the fact that with aileron deflection applied, the airflow completely separates from the wing in front of the aileron, resulting in the top surface of the aileron doing absolutely nothing. David checked with Dick Schreder to discuss the problem, and found out that all of the HP kits had predrilled trailing edge spars. This meant that the thickness of the aft spar was "factory-set", in this case unfortunately "incorrectly-set" for all of the HP kits shipped from the factory.

Over the years, builders have tried to increase the roll rate of their HPs by increasing the throw on their control systems, and sometimes by linking flap segments to the ailerons. If the real cause of the problem had been known years ago, the HP would have been a much more delightful airplane to fly.

I believe that this is a very significant improvement in the handling and safety characteristics of this aircraft and I hope that this information receives widespread publicity.

Peter Masak

INSURANCE QUESTIONS

In 1990 a relatively small number of private owners chose to insure outside of the SAC scheme. At one time the SSA had a group scheme, which eventually collapsed, due in part to insurers offering "attractive" rates to individuals and clubs.

The Insurance Committee felt some measures were in order to maintain the integrity of the plan, and raised the issue at the 1991 Annual General Meeting in March. The result was a motion, passed by a large majority of voting delegates, instructing the Board to either institute a waiting period, or a fee, as a condition of rejoining. The amount and/or term was left to the discretion of the Board. In light of this, the President's plea for suggestions in the Aug/Sept 1991 issue, and others, was somewhat redundant.

For 1992 the SAC Board approved a 10% reduction in premiums for gliders flown by one pilot (essentially private owners), as an apparent "solution" to the matter (see Potpourri in the Oct/Nov 1992 free flight).

In previous years the approach had been

a) the same fee structure for all, regardless of potential variance in the risk related to such factors as experience levels, type of flying, claim history, etc. This principle is quite

continued on page 17

Simply flying to Never-never land

Charles Yeates

Bluenose Soaring

THE TITLE OBLIQUELY REFERS TO A PERSONAL ODYSSEY during which my real flying began the same year the SAC was formed in 1945. More specifically it refers to the gradual progression over many years from flying the simple Kirby Cadet to soaring the super-refined Schleicher ASW-22, a ship that gives its pilot the feeling that it will never never land. The times and technologies are contrasted here:

	Cadet	ASW-22
Span	38.4 ft	78.9 ft
Area	172.5 ft ²	166.0 ft ²
Aspect ratio	8.5	37
Empty weight	276 lbs	904 lbs
Payload	174 lbs	746 lbs
Gross weight	450 lbs	1450 lbs
Structure	wood, fabric, 2 strut, 2 spar wing, casein glue	carbon fibre, glass fibre, Kevlar, resin
L/D max	15 @ 30 mph	57 @ 65 mph
Minimum sink	3.5 ft/sec	1.4 ft/sec
6 ft/sec sink @	42 mph	129 mph

How did it all begin? Ground school started in 1930 when I was three.

The family — red-haired father, school teacher mother, and urchin — were happily travelling from Detroit to Kansas City in a new Chev Coupe. Father had accepted a transfer to a new territory. Being NORDO, they sang to pass time as the sunny, warm countryside moved by; My Old Kentucky Home in recognition of mother's background and other favourites of the time. When they started a rousing version of Pop Goes The Weasel, I joined in at the appropriate moment by sailing father's fedora out the open window.

The car was stopped and father, muttering, walked back to retrieve the dusty hat. Some minutes later, back on course, the song restarted and again at the key moment I laughed and whipped the hat out the window. The mood shifted instantly. A hard backhand to my left ear was followed by, "To hell with the hat! The monster should ride the rest of the way in the rumble seat!" Therefore, Lesson #1:

Consider the risks and potential consequences before flying someone else's equipment

The back of our house in Kansas City looked over wide grassy fields. One day a pack of kids appeared and set up kite flying. Hanging on the fence, I watched in fascination as brightly coloured diamond and box shapes climbed into the sky, shimmered, swung and dived as their pilots ran, shouted and waved the controlling strings. The event remains a warm memory. Lesson #2:

Flying can be a glorious adventure

A German immigrant family lived next door. With Kinder my age, friendships developed and invitations to lunch became frequent. Our mutual gate in the fence became the passage way to delights unimagined — Wurst, Pumpnickel and home-made beer. Unfortunately mother was a teetotaler, very uncomfortable with the neighbour's habits brought from their recent European home. Suddenly the gate was locked shut! After days of struggling to generate climbing skills, the peak was surmounted and I achieved at least another exotic lunch. Lesson #3:

One must strive to reach worthwhile goals

Around the corner was a barber/hair setting shop. After my turn in the chair, mother gave me a large penny (bigger than today's quarters) to play with while her hair was being coiffed. Suddenly it was noticed that I was in distress and definitely starting to turn blue. Mother leaped across the room, observed that the penny was not in sight, lifted me bodily and raced around the corner to the German family's house, up the stairs and through the front screen door into the presence of Frau Reidel. Quickly she up-ended me and stuck a finger down my throat. The offending penny and everything else popped out. Everyone, and especially me, was relieved! The gate was reopened for as long as the two families were neighbours. Lesson #4:

Misuse of equipment can kill you!

Midway through the Great Depression the family gathered at our grandparent's farm near Bowling Green, Kentucky. An uncle convinced my father that they should harvest a grand wasps nest built on an easily reached post by the road. It would be an imposing exhibit for the city kids that uncle Glen taught. They could use smoking torches made of newspaper stuffed with grass to expel and eradicate the wasps. They were half right.

I watched this adventure from afar. The wasps roared out, saw the cause of their troubles and attacked. Father and uncle yelled, howled and ran a quarter mile down the dirt road, waving their arms in a vain attempt to keep from being stung until they could throw themselves face down in the creek. I laughed until tears came. They didn't think it was funny! Lesson #5:

Don't aggravate other pilots with inconsiderate actions

After the swellings had mostly subsided, the plucky pair took on another project. A new well was needed in the barn yard. The procedure was uncomplicated; dig down fifteen feet to the underlying shale, line the hole with rock in dry wall fashion, set off a half stick of dynamite to crack the shale and let in water, put the windlass and bucket in place.

It seemed at some point that a whole stick of explosive should be better than a half. They placed it carefully and lit the one minute fuse. We ran to a position behind the barn door. After no results at two minutes, it was decided in conference that they would cautiously approach the hole while I remained peeking from behind the barn door. Half way there they were immobilized by a roar that lifted the lining out of the silo and sent rocks in all directions. The lead rock, of some size, arced upward and curved toward the barn, gathering enough speed on its downward flight to punch through the roof and drop into the haymow. Lots of water came into the hole and the two project initiators long discussed, as they repaired the roof, how they might salvage the well. Lesson #6:

Always flight plan with due respect for the unexpected

Now for some old snapshots out of the album:

1934 In tough straights, the family retreated to Brantford, Ontario to live with father's parents and start over.

1937 Dawn Patrol – the original movie – the excitement and bravery of those grizzly days fired the imagination and stimulated a burst of model building.

1938 Father arranged my first real flight in a J3 with short Johnny Mctavish as pilot. The side window was folded up to give me the feeling of the old open cockpit days. That was it — I MUST BECOME A PILOT!

Johnny's short stature caused him grief later. Starting up a Cessna 172 between hangars, with the throttle opened a tad too much, the engine caught and revved up. The 172 lurched forward and the seat, not locked in its most forward position, slid back and turned Johnny from a pilot into an anxious passenger. The drama ended when the ship plunged its prop and nose through the wall of the adjacent hangar. Johnny was mortified but unharmed.

1939 War! — but one cannot join the Air Force at age 12.

1940 Fleet Finchs arrived at the Brantford Aero Club, marking the beginning of the Commonwealth Air Crew Training Plan.

1944 Evenings in a machine shop producing landing gear parts for Lancaster bombers led to Lloyd Carpenter and I crawling over the local #5 SFTS airport fence to be at the lift-off end of a runway so that we could take a head-on photo of the first visiting Lancaster. The runway was a little short and so Lloyd and I almost had our heads removed by landing gear parts that I had made. The four howling Merlins passed ten feet over our heads and left us with ringing ears. The photo of the monster just at lift-off was a treasure.

1945 I LEARNED TO FLY. That summer

CFI Tom Senior returned to the Brantford Aero Club field right after the war ended with crates containing two brand new Tiger Moths. The assembly and rigging was followed so closely that I was the first student. The syllabus was simple then and solo came after 6.3 hours of dual. At \$5.50/h the course cost \$34.65. The good old days? Not really, as my summer factory job paid \$95/month before deductions!

1948 University took up most time and money so that flying experience after three years totalled only 19.5 hours. (Forty-two years later, three days of flying in an ASW-22 generated, by coincidence, a similar 19.5 hours.)

1951 We turned to gliding as a simpler, cheaper way to fly (imagine!!). Roy Byrne, Russ Flint and I bought a Kirby Cadet that had been built and briefly used by air cadets in St Catharines. Two of four struts were missing but we made replacements from J3 parts and began flying at the airport below the mountain, off Kenilworth Avenue in Hamilton's east end. The syndicate was perfect — one flew, another held a wingtip and the third drove the car.

The Cadet was car towed to 250–300 feet, enough height for a gentle left circle to a landing within a minute. It was a hard way to build up flying experience other than takeoffs and landings but we were enthusiastic. Then a right turn was tried with almost disastrous consequences. It rolled too far too fast and full opposite ailerons wasn't going to be effective in time. Hard top rudder slid the craft into the dihedral of the lower wing and the wings levelled enough to save the day.

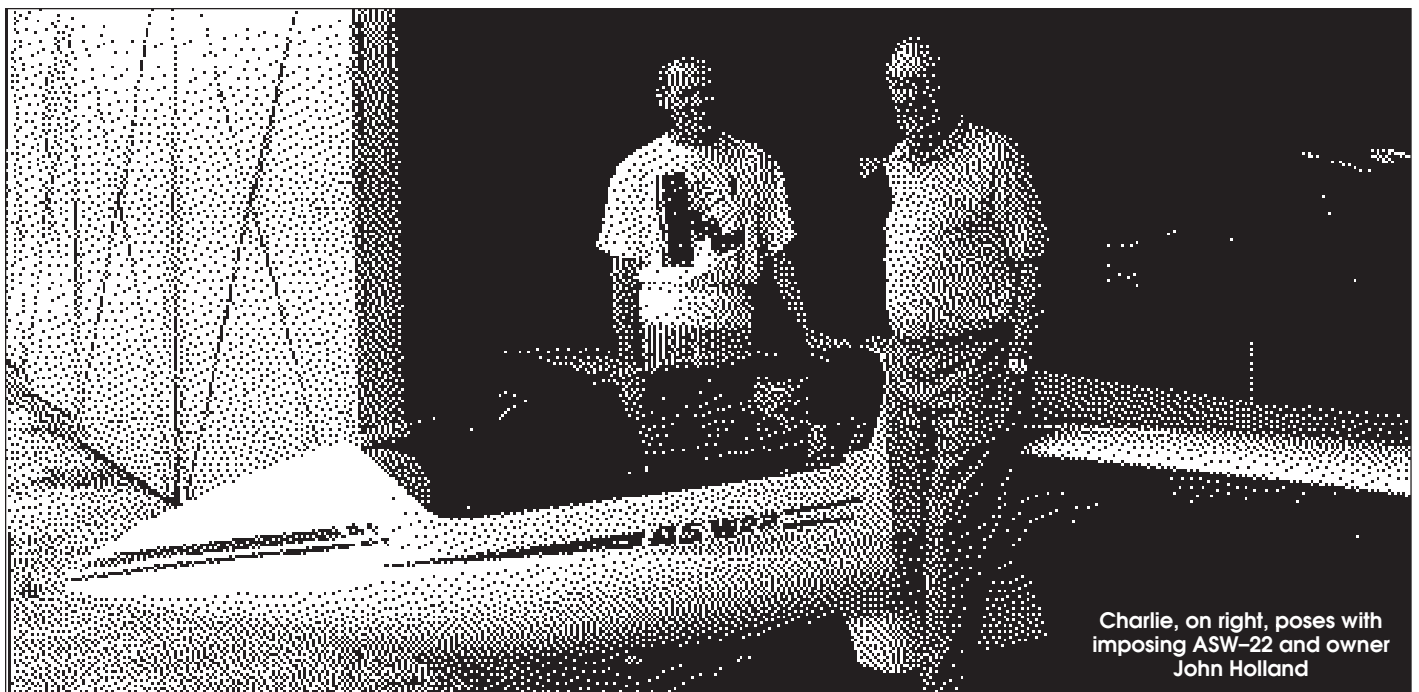
When calmed down we moved everything to the hangar. We propped up the Cadet wingtips and looked at it from a hundred feet in front. Basic modelling skills showed us that the port wing was twisted so as to produce a high angle of attack at the tip. The problem found, the solution seemed simple. We removed the outer bolt from the front strut and the wing untwisted itself. Simple! By eye-ball-

ing the strut we determined how much should be cut out. A hacksaw cut the tubing and Roy re-attached the end fitting with his torch. It worked perfectly. Things were simpler then.

That summer we joined those assembled at the Kitchener–Waterloo airfield for the Nationals. Jack Ames was there with the Loudon. Albie Pow had the Lawrence. Ron Claudi brought an LK-10A. Someone else brought a Schweizer 1-19. We attached a LONG rope to the Cadet and reached 650 feet with our car tow, risking a blowout of the engine.

The syndicate approached Chem LeCheminant about aerotowing the Cadet. The focus was on whether or not a Tiger Moth could fly above its stalling speed without pulling the Cadet beyond its Vne. A trial was arranged and a photo of the Cadet at takeoff showed the plywood veneer covering on the fuselage rippling like fabric. The pilot vibrated too, I recall, but the controls were certainly solid. The ground seemed far away when looked at from the open cockpit after release but only the red pith ball rose in the tubes of the variometer and the landing came too soon. Tow-planes were few and far between in those days and so the syndicate returned home and resumed car tows at Hamilton but we had learned something important. Simply flying was not enough!

Forty-one years later The ASW-22 experience last December at Waikerie arose from an invitation by John Holland, owner, who slipped into the roles of expert crew member and adviser for my flights. The 24 metre machine weighed three-quarters of a ton loaded with water and ready for launch. The wings were so flexible that the tips at rest were about eighteen inches off the ground. The takeoff roll was started with the flaps in full negative setting to lower the wing tip angle of incidence (ailerons are interconnected with flaps as in many ships today). Even the large side by side dual wheel undercarriage helped by causing a slight righting moment if a wing dropped. Even so, the tip holder ran



Charlie, on right, poses with imposing ASW-22 and owner John Holland



photo unavailable

**A lovely little flight
of perseverance
when everyone else
was on the ground**

Sue Eaves, London Soaring
from the CASG Newsletter

UNLIKE MOST SATURDAYS THIS SEASON it wasn't raining — actually it looked somewhat promising, so I decided to try flying with water for the first time in our LS-4. Having my map ready for the past few weeks I decided to declare a 300 km flight: Embro – Hanover – Orangeville – Embro for a total of 311 km.

Leaving the field on course I encountered only a few bumps of lift — not very encouraging. It wasn't until I was at Stratford, 24 km out that I got something a bit better, managing a climb to 3000 feet agl. Continuing north I took advantage of bits of lift here and there in the blue and wondered if I'd even make 50 km before landing out. I heard Alan Wood in "Agent Orange" on the radio so I called to see what the SOSA "Task du Jour" was. It seems that gang wasn't able to get away which wasn't very inspiring.

So far my working band was between 2000 and 3000 feet, no great ground speed, I just kept plodding on. Actually it was amazing to see just how far I was getting, the first thing I knew I was nearing the first turnpoint. I remember Ed Hollestelle saying at our last cross-country clinic "There is always lift ahead in the blue, don't give up!" I didn't believe him then, but it's true!

Near Hanover, the first turnpoint, things were looking better with a band of clouds stretching out on the next course line to the east. I was getting higher than before and could easily see the turnpoint. Before I took off, Chris, my crew said, "See how long it takes to get to Hanover and if you are too slow you can always cut the task short and come home." Well, it's now 2:30 and I've taken 2-1/2 hours to do 112 km — at this rate I should have packed an overnight bag!

I got as high as I could west of Hanover then went in to photograph the turnpoint (I need more practise). On course to the second turnpoint I was beginning to relax and was actually enjoying myself — I never thought that I'd make it this far. The decision to continue was easy since the going was a lot easier now and I could always drop in on Toronto Soaring and visit the good people who hosted the Provincials a few weeks previous.

The working band was higher on the second leg which made it easier and faster to get to Orangeville. As I neared Orangeville, the clouds were dissipating quickly, so thinking that this was it — get as high as you can and photograph the turnpoint, then dump the water. It's been a terrific flight so far — just head out on course and probably land out since it's all blue towards home. There is no chatter on the radio so everyone else has probably made it home from their flights and are drinking a cold beer now. But in the back of my mind was Ed's "Don't give up!" and Jörg Stieber's cool and calm "Use the energy" that kept me going. Not giving up, I continued using the energy that was to get me home. Arriving at Elmira, 60 km from home at 1000 feet I banked to check the windsock at the airport when I started to go up! Since there was no other traffic I continued the turn and up I went. Wow, one knot! I worked that one for all it was worth to 3000 feet. At this point Chris called on the radio to see where I was so I gave a quick position report — gosh I could drink a nice cup of tea right now!

Flying towards the early evening sun made it difficult to see. That last climb would get me closer to home anyway. At 1500 feet and 22 km from home I heard Jörg's voice in my mind saying "use the energy". (No, I'm not going nuts, after three cross-country clinics you get used to people talking to you). Then Ed's voice came on the radio — this time for real, he was driving by in his van and heard me talking to Chris and was wondering what I was doing on a blue day when no one else was on the radio.

Cruising in a lot of zero sink I got down to a 1000 feet 8 km out, then divine intervention put some birds beside me in a thermal that got me the extra 500 feet to make it home. Put the kettle on!

It took over six hours to get around and I was very excited. After I landed my jubilation must have been obvious, but Chris thought I was just happy to make it back home, not realizing that I actually did 300! When I told him I made it around he said in astonishment, "You're kidding!" Perhaps my success occurred because I finally got used to the final glide computer and remembered to press "GO" when I set out on course! •

... NEVER-NEVER LAND

as long as possible at the beginning of each launch.

The landings proved less risky. Electrical solenoids are switched on to open four wing drains; speed is reduced to 45–50 km; the wheels are lowered and locked; the flaps are moved to full down (about 45 degrees) and you are set up. There is one surprise at this stage of the downwind leg. A look to port or starboard shows the wing tips are so far down that you are convinced they will drag on the ground before the landing gear touches. It looks most strange from the ground, I was told. This results from the large increase in lift from the inner wing panels as the landing flap is selected. The cure is a crack of the brakes which reduces the inner lift and forces the tips to rise. In fact the combination of flaps and air brakes allows steep, precisely controlled final approaches. A hydraulic wheel brake system is powerful enough to guarantee short field landing capability.

The prone pilot position is one of the most comfortable that can be imagined. Lots of room and full body support are fundamental but the softness of the ride, even during rough thermal conditions, has to be experienced. A seven and a half hour flight on the third day was not exhausting. In retrospect pilot stress and workload are minimized by a hydraulic damper in the airspeed trim system. A little finger trigger on the stick disengages the damper so that you can easily move the usual trim lever low on the left side of the cockpit to set any speed desired. Releasing the trigger disengages the damper and the set speed is held so positively that hands can be removed from the stick without the speed varying more than plus or minus five knots, even under turbulent conditions.

Thermal entry with the long wings, as may be expected, is not super fast but there is a long-wing trick that seems characteristic of the giants. Entry is initiated by rudder and a rapid movement to full opposite aileron to obtain, in this case, the beneficial effects of adverse yaw. Once swing momentum is felt the ailerons are moved in the usual direction to establish the desired angle of bank. This technique proved usefully faster than a more normal "hard over and wait" type of thermal entry. Once thermalling, entering adjustments were made by using top rudder to slip in the desired direction. This latter method may not have been efficient but it comfortably produced desired results.

Cross-country in this kind of a giant is also a joy. It took time to adjust to the fact that from 8000 feet agl, one only needs a thermal every hundred kilometers to stay in a working band above 3000 feet. Minor dolphing along the way assures this and allows sampling of many thermals. Even when blue thermals were being used in the middle of the day achieved speeds of 115 to 120 km/h were usual. John told me that when clouds mark thermals he often averages 140 km/h for the middle hours of a strong day. Fancy eh?

Dreaming of a day when thermal strengths will allow use of a giant's 2 metre sink speed of 200 km/h, the adventure continues. I'm glad I threw my father's hat out the car window! •

A Procedural Solution to Towplane Cylinder Cracking



Scott McMaster & Mark Janoska
SOSA Gliding Club

ANYONE in the soaring community who believes towplane letdown procedures are well understood need only ask around to find out that there are as many different letdown procedures as there are gliding clubs, and each towpilot (and glider pilot for that matter) has their own version of how and why a particular letdown should be done.

Normally this confused state of affairs is merely of academic interest, but if you belong to a club having problems with cracking cylinders on towplanes, the problem can cost large sums of money and the confusion surrounding the cause of the cracking can lead to considerable friction within the club.

Such was the state of affairs at SOSA a number of years ago. We had re-engined some of our 7GCBC Citabribs with 180 hp engines, essentially turning them into Scouts from the firewall forward, and were having difficulty exceeding 1000 hours on an engine without cracking cylinders. There were many competing theories as to why we were cracking cylinders, and it soon became obvious that we needed more than hand waving arguments if we were ever going to solve our problem. Jan van der Heiden (then Chief Towpilot) suggested a data recorder be developed that would allow the cooling rates of the engine to be examined in different flight regimes and thereby find the optimum letdown. At the time (1985) this was not technically feasible on our budget, but by 1989 the means were available and the SOSA membership voted to allow the project to proceed.

The authors first contacted R. Moffet, Manager of Project Engineering at Textron Lycoming. He recommended a maximum cylinder head temperature (CHT) cooling rate of 50°F (28°C) per minute but cautioned that this is not a hard figure due to the number of variables involved in cylinder cracking. With this criteria in hand we began design of a monitoring device, which quickly became known as the FMS (Flight Monitoring System). The FMS is a self-contained microprocessor based system, capable of recording up to 16 data channels every 1/100th of a second and storing the data for later off-line analysis. For our

flight tests we record airspeed, altitude, rpm, and CHTs at a rate of one record set every 2 seconds, and at this rate we can hold up to 4 hours of flight data in the FMS's memory.

One of the primary concerns during the design phase was the flight safety of the device

and after consulting with our maintenance people at Kovachik's Aircraft Service, we decided to make the FMS completely independent of aircraft systems. This meant that the airspeed and altitude were obtained from our own pitot head instead of the aircraft's, the rpm was measured using a photo cell mounted on the cowling, and the CHTs were measured using thermocouples independent of the aircraft CHT probe. The only use of aircraft systems was the 12-volt main power. All installations were approved by Kovachik's before they were put into operation.

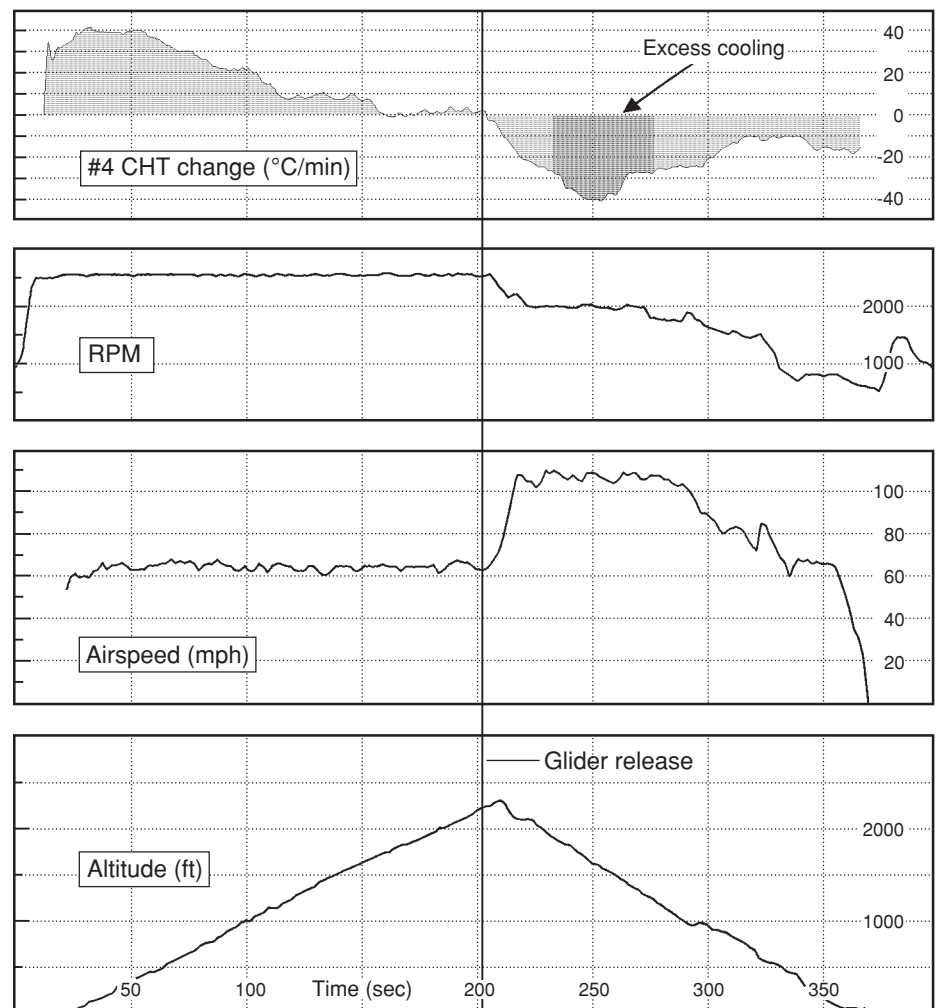


Figure 1 FMS data for a typical SOSA letdown using the original 110 mph IAS and 2000 rpm procedure. The section of the letdown that exceeds the 28°C recommended maximum cooling rate is highlighted.

Initially flight data recording was restricted to the monitoring of normal club towing. This seemed prudent at the time, as there was no way to be certain exactly where in the let-down procedure the excess cooling was occurring. When we were experiencing the cracking problems our letdown consisted of a gentle throttle back to 2000 rpm while accelerating to 110 mph IAS. An example of one of those letdowns is shown in Figure 1. As can be seen, there is a large cooling spike about 30 seconds after 110 mph is reached. These cooling spikes occurred on every letdown and sometimes reached over 50°C per minute, or almost double the recommended maximum. Developing a letdown that removed the cooling spike would obviously go a long way toward solving the cylinder cracking problem.

Once it had been established that the first minute after glider release was the problem, we began a systematic investigation of the letdown during that time.

To ensure that we obtained the best possible combination of descent rate and low cooling, we mapped out the cooling and descent envelope for the Citabria from 60 to 90 mph IAS and 1900 to 2300 rpm. These tests were done with full flap and the ball in the center. The procedure was as follows: immediately after glider release, flaps were extended and the IAS and rpm rapidly established. Generally this took no more than ten seconds and the reason for doing it so quickly was to ensure that we would not need any "fuzzy" procedures (like "reduce rpm slowly") in our final letdown. The aircraft was held at the desired speed and power in straight and level flight for one minute and then the standard letdown resumed.

After taking 12 to 15 data points (two to three hours of towing) the flight data in the FMS memory was transferred to computer. Using software that we developed, we obtained the peak and average cooling rates and the average rate of descent for the first minute after release for each data point taken. Peak cooling rate was the maximum value of the first derivative of an 11 point, least squares, second order polynomial fit to the #4 CHT data, the polynomial fit being required to minimize any digitization errors in the rate information. The average cooling and average rate of descent information were just first derivatives of linear least squares fits to the #4 CHT and altitude data respectively. The #4 CHT was used because it is one of the rear cylinders and they run hotter and are subject to larger temperature swings than the front cylinders (typically peak cooling rates on the front cylinders are 30% lower than on the rear ones). After 65 tows, it was possible to generate the cooling envelope in Figure 2 with reasonably good statistics. The standard deviation on the cooling rates is 2°C and on the descent rates is 300 ft/min (for those not familiar with statistics this means that about 70% of the time the measured rate falls within one standard deviation of the value read off the chart).

What is readily apparent from an examination of Figure 2 is that it is impossible to get any reasonable descent rate and not exceed the 28°C per minute maximum cooling rate. Fortunately, the flight data we had gathered indicated that, once the cylinders had been

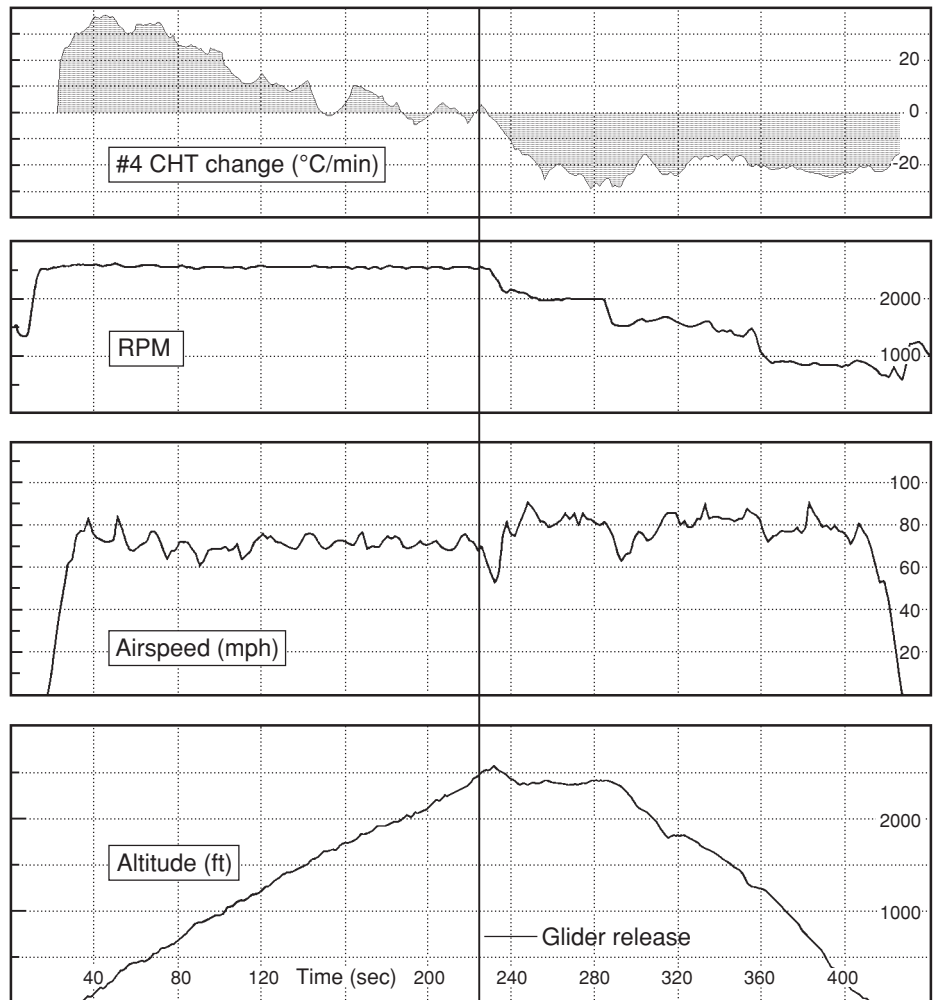
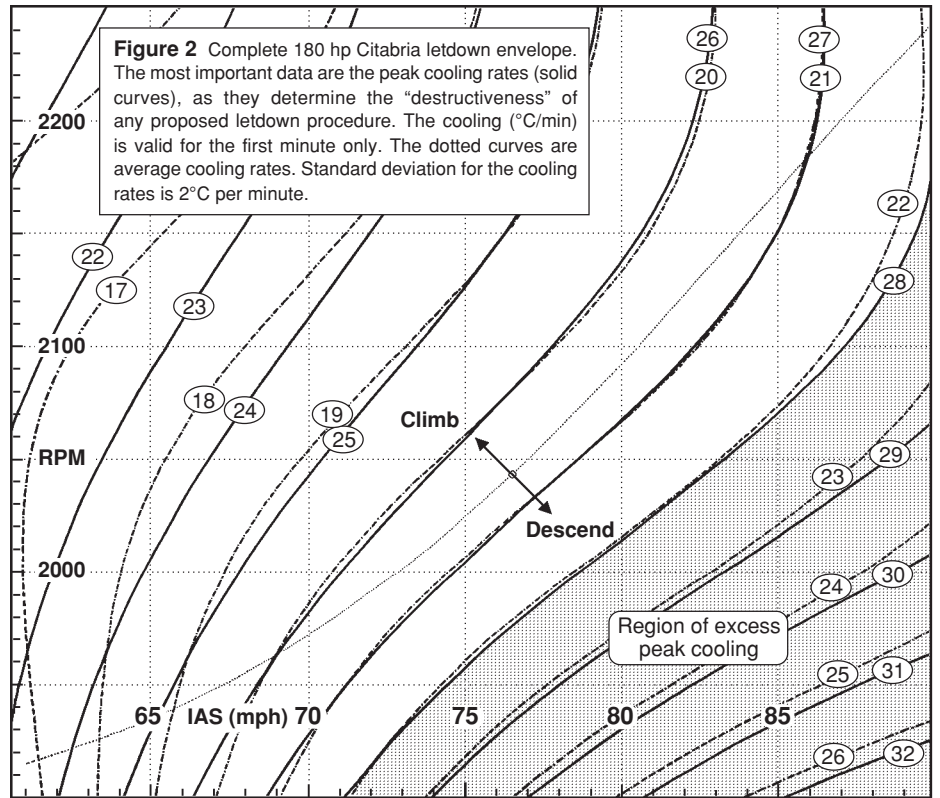


Figure 3 FMS data record for the new 80 mph IAS, 2100 rpm two stage letdown. Note that the peak cooling rate never exceeds 28°C per minute.

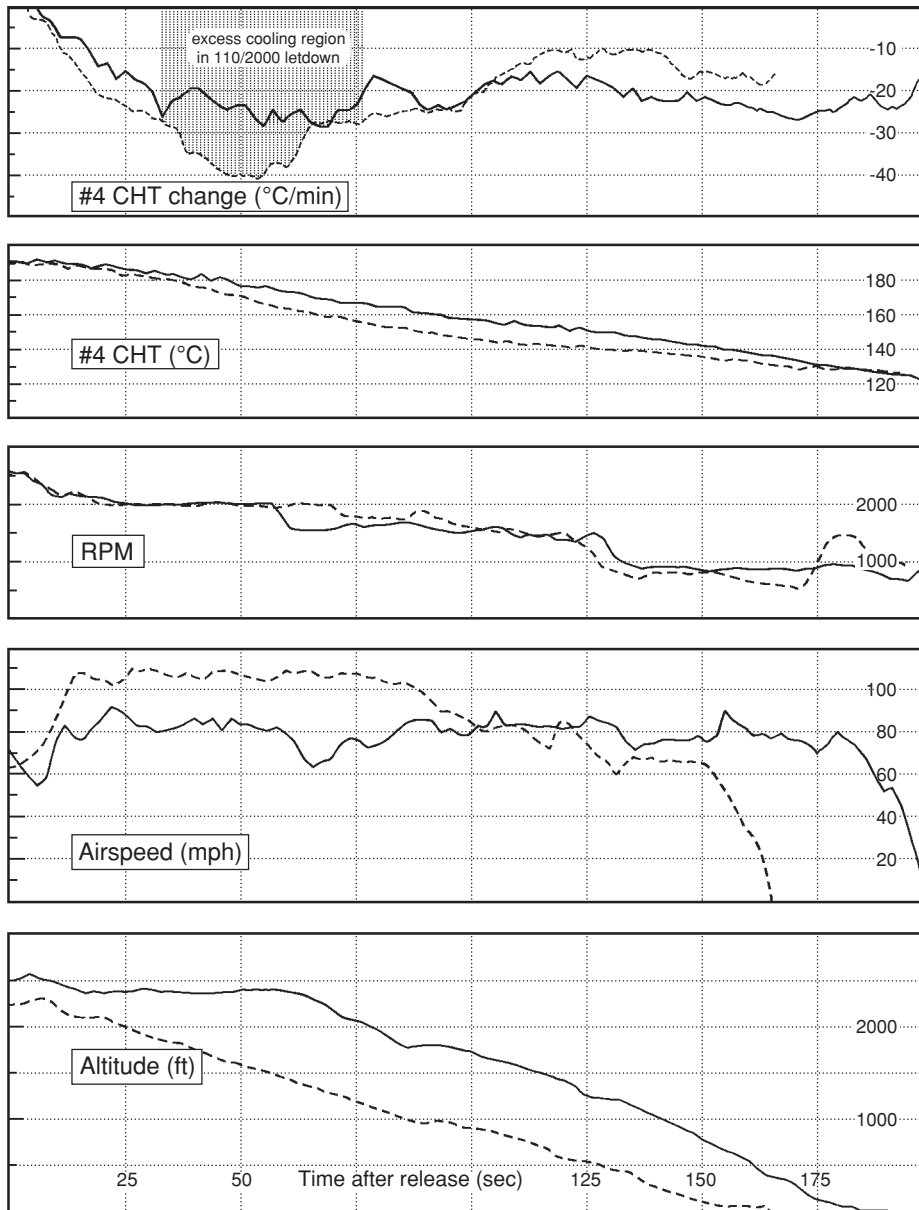


Figure 4 Comparison of the old (dashed line) and the new (solid line) letdown procedures; note here the relatively constant cooling rate of the new letdown compared to the peak of cooling using the old letdown. The “plateau” in altitude after glider release using the 80/2100 is readily visible.

through an initial cooling, we could reduce power and increase airspeed with no further danger of high cooling rates. Using Figure 2, we selected 80 mph and 2100 rpm as the initial IAS and rpm and then tested a series of criteria for allowing higher speeds and lower power. We eventually settled on using a standard CHT value as sufficient to ensure no risk of shock cooling. The result is our current letdown:

- Immediately after release:
 - a) 2100 rpm
 - b) full flap
 - c) 80 mph
- After the aircraft CHT read less than 315°F:
 - a) not less than 1600 rpm
 - b) not higher than 90 mph
 - c) full flap

The 90 mph and 1600 rpm are held as long as practicable in the circuit (usually until on

base leg) and then standard aircraft handling resumes.

Using this letdown, the peak cooling rates are below the maximum allowable for the entire descent and the average turn around time for a 2000 foot tow increased only 10 seconds from 7.34 minutes to 7.43 minutes. Also the higher descent rates at 1600 rpm and 90 mph means that the time for a 3000 foot tow is actually reduced from 10.17 minutes to 9.56 minutes. A cooling profile for this letdown is shown in Figure 3 and a comparison between the original and final letdowns is shown in Figure 4. The only disadvantage of this letdown that we have found is that pilots accustomed to the old style letdown feel distinctly uncomfortable during the initial cool-down when the descent rate is nil. This can be partially overcome by using turns in the descent as long as strict IAS control is maintained. As shown in Figure 2, above 90 mph no amount of power will avoid exceeding the 28°C per

minute maximum safe cooling rate. In addition to these specific results we were able to make the following general observations:

- The effect of changes in outside air temperature on peak cooling rates is much less than 1 standard deviation within the temperature range we flew in (5–30° C).
- Contrary to a theory popular at SOSA for some years, there is no correlation between descent rates and cooling rates.
- Small amounts of skid (about 1/2 ball travel) have no effect on cooling, including no observable differential cooling. It is not possible to be definitive about larger slip angles due to the difficulty in measuring IAS accurately but it appears that the above holds at larger skid angles as well.
- Steep turns have no effect on cooling rates distinct from the rpm and IAS effects previously noted.

After the completion of the Citabria project we repeated the investigation on SOSA's 235 hp Pawnee in August of 1992. Because of the lack of Pawnee operators in Canada we will not go into detail about our results other than to note that the Pawnee has a completely different cooling profile than the Citabria. It retains engine heat much better and has much higher descent rates at any given cooling value. While this tends to make the Pawnee much harder to over-cool initially, it can lead to excess cooling when the power is brought back on final if the initial letdown was not aggressive enough to ensure adequate cooling before landing. This effect is seen on about 10% of our tows, and the only times we see Pawnee cooling rates above 28°C per minute is on final after a letdown that was insufficiently aggressive.

In summary then, the Citabria is extremely vulnerable to high IAS for the first minute or so after glider release and therefore high power and lower speed are required until the engine has cooled. After sufficient engine cooling, the aircraft can be handled much more aggressively in order to expedite the descent, and this has led to the two stage letdown detailed above. A note of caution is in order. Cooling profiles are very aircraft specific (as shown by the Pawnee cooling data we collected) and operators should be careful about extrapolating our data to other types. We currently believe that aircraft with similar cowlings, particularly similar increases in the space between the cylinder and cowling towards the rear cylinders, will have similar cooling profiles, but because our study was limited to our aircraft this interpretation must be treated as speculation.

We hope that the data presented here can help operators experiencing towplane letdown problems. Anyone wishing additional details can contact the authors through the SOSA Gliding Club.

Acknowledgements: The authors would like to thank Jan van der Heiden for the initial idea and moral support for the FMS; Dugald Stewart, Fred Hunkeler, and Bruce Finlay for their support on the SOSA Board; and the people at Kovachik Aircraft Service for their technical support.

EARLY ADVENTURES in MSC

In my early years in Canada I was given copies of *free flight* for 1955. Therein was this story of attempted ferry flights written by Ken Withers, then a prominent member of the Montreal Soaring Council. After consultation with Oscar Estebany some errors have been corrected. It still makes a good tale. Bob Gairns, MSC

Ken Withers

On the long weekend of June 24–26 (June 24 being St Jean de Baptiste Day in Québec, therefore a holiday) we had promised André Dumas, *c/o* of the Auxiliary Squadron RCAF at Three Rivers, to carry on three days' operations at Cap-de-la-Madeleine Airport to help promote a glider club among his officers and airmen. This meant moving all our machines and gear some 80 or 90 airmiles north across the St Lawrence River, but we figured on aerotowing three machines and trailering the rest. The writer was first on the field at Granby on the Friday morning — imagine my shock to find two machines missing from their tiedown spot. Both were found in an adjacent field. MSC's 1–19 (CF–ZAU) will never fly again*, the fuselage was so rolled up it would have fitted easily in the trunk of my car. Jacques Codère's TG–2 was found on its back with canopies, top of fuselage and rudder bashed in, and one wing bent. Actually Jacques' loss was the greater, for he planned to take the TG–2 to Three Rivers to sell it to the new club; he not only lost the selling price but is now faced with the expense of repairing it. The cause? A minor(?) tornado had passed over the field on the previous Tuesday, and double thickness tiedown ropes (total 2400 lbs test) had not broken, but four foot steel ground pegs had pulled out. Undamaged, but in the same tiedown line were our 1–23D, 2–22, Codère's Tiger Moth (now sold to the Québec City club) and MSC's Fleet Finch. Our Mü13 was, fortunately, on its trailer in a farmer's barn.

From this point on, a comedy of errors far beyond Shakespeare's wildest concept began. Oscar Estebany was to fly the 1–23 behind the Finch, but decided that the day was too far advanced and turbulence too heavy, so he elected to wait till later in the day to make the trip. There was nothing for Jacques Codère's Tiger to tow, so Russell Lightbody set out for Three Rivers with it unloaded. King Nener set out in the club Tiger with the 2–22, flown by those intrepid airmen, Graham Davies and Hillar Kurlents. John Agnew had to return to Montreal to pick up his wife, and took the 1–23 trailer with him so we could use it on the return trip Sunday night, because Codère's Tiger was going to Québec and it was doubtful whether King Nener would be available.

* The 1–19 did fly again, but it was spun in at Hawkesbury by a student trying to stretch his glide and it was unreparable. The pilot suffered shock and a deep cut in his cheek. Ben Price and Dave Webb bought the TG–2 in 1958, piloted on occasion by Audrey Price together with Sylvia Webb. Bob Gairns

I set out with the Mü on its trailer and had fuel pump trouble all the way. Then the trailer broke down and we had to drag a welder away from the St Jean de Baptiste celebrations in his particular village. In Sunday best he performed his electric arc miracles and away we went. (He only charged two bucks, it's easy to see that the unions haven't gotten to some parts of Québec yet). After backing and filling car and trailer on to the St Lawrence ferry, we reached the airport amid a cloudburst to find Russ Lightbody pacing the field casting anxious looks into the gloom. The cause of his concern was King Nener, the Moth, and our 2–22. By Russ' calculations, the Moth had run out of gas two or three hours ago, and why the blazes hadn't they phoned to report their position if they were down? Also, where was the Finch with the 1–23 in tow? There was less than an hour of daylight left. This Cap-de-la-Madeleine airport was an RCAF station during the war, but is now being used by the Army's tank outfit. It took us the best part of the remaining hour of daylight to find a key for the hangars, and when we did get in found all but one were filled with Sherman tanks. How low can the noble eagle sink? Tanks, yet?

As twilight deepened into dark night, we wound our sad way to the Officers' Mess at Three Rivers to toast the memory of our missing brothers in deep brown ale. Not having eaten since early morning, it wasn't long before the conversation turned highly maudlin and, with tears in our eyes but staunch looks on our faces to impress prospective members of the Three Rivers crowd that "it really is the safest form of flying", we debated whether to call the Provincial Police or the Air–Sea Rescue. At ten to twelve, in walked the noblest of all glider pilots ... John Agnew himself. With him were his wife and Russ Lightbody's wife, Maya. So far nothing unusual; we knew they would be with him, though five hours overdue. But stay ... who are these two woebegone, sheepish-looking types? No, it can't be ... our intrepid airmen, Davies and Kurlents. But what of the 2–22? Oh, it's out on the trailer ... Oh...oh well then, everything.. WHAT?

At this point, so much ale-inspired bedlam broke loose that your reporter finds his notes somewhat confused. It appears that some fifteen minutes out of Granby, the rope broke ... (you now the old story; it just broke, that's all) and the 2–22 came down in a small field. King Nener looked the field over and decided it was too small to tow out of with the Moth, so help and a trailer was needed. He remembered that Agnew had taken the trailer back to Montreal, as King flew back to Granby to phone John. Fortunately he reached the Ag-

new residence just as the master was leaving for Three Rivers. Needless to say, said master was none too pleased to learn that he had to drive all the way back to Granby and find a small field in the middle of nowhere. In the meantime, Oscar Estebany and Len Yerger (a new member from the States) had been flying the 1–23 using the Finch for towing. Len made his Silver C height, so the day was not a total loss.

King persuaded Oscar to fly back to the stranded 2–22 to see if he could lend a hand, flying the Finch, more powerful than the Moth. Eventually, John and the trailer showed up and the job of loading began. Before taking off to return to Granby, Oscar noticed that the prop hub was cracked, but decided to try to return anyway. With some difficulty in the rough field, he managed to get it in the air and clear the fence at the end of the field. As the Finch took off, the boys on the ground thought that it didn't sound quite right, but it seemed to be climbing okay, so they didn't think too much about it. Climbing out things seemed fine, but on levelling off a nasty knock was heard. However, Oscar found that by flying nose up the knocking disappeared and he was able to fly back to Granby safely. Needless to say, the Finch never did get to Three Rivers. Amid rain and deep gloom, Agnew drove close to a hundred to his destination and I'm sure his caustic comments about glider pilots and broken towropes must have been quite poetic. The night was finished off with several rounds of the long green, with a more jovial atmosphere prevailing.

Saturday and Sunday found a great deal of flying, despite having only one towplane and two gliders on the field. Three Air Force types were soloed (all hold commercial tickets) and Lorraine Smith, one of Jacques Codère's students, made her first solo in the 2–22. Sunday afternoon, Gordon Hicks and the writer took the 2–22 up to 2500 feet to determine whether or not it could be spun. It can't ... not with our combined weight, at any rate. On landing, we were surrounded by most of the thousand or so locals who had turned out to watch and we were pointed out in awed tones as "les acrobats là". Heroes for the moment ... the moment when up in the blue two tiny specks appeared. King Nener's Moth, and Oscar Estebany in the 1–23 had arrived, only 24 hours late. Horst Georges took up the 1–23 and put on an aerobatic display to make anything Gord and I did in the 2–22 look pale.

Best duration flight of the weekend was made by Hillar Kurlents in the Mü13; he kept her up for 2:45 before the lift died. On Sunday, John Agnew kept up the 1–23 for :50 until he realized that his wife had been waiting for him at the hotel for the past hour. He made one of the most hasty descents in the history of Canadian soaring. The machines were left at Three Rivers as it was decided to fly there again the following weekend ... another long one. While in Three Rivers we heard that definite plans had been finalized for the formation of a club and that they had chosen the name St Maurice Gliding Club. We wish them every success. •

World Class Glider Winner?

Jury report on ground and flight evaluation tests

THE GROUND AND FLIGHT EVALUATION tests for the selection of the World Class Glider took place at Oerlinghausen airfield, Germany, from September 13 to October 3, 1992, hosted by the Oerlinghausen Segelflugschule and with technical support by the Institute for Flight Mechanics of the German Aerospace Research Establishment (DLR). Seven glider prototypes were present:

- 1 Cygnet, entered by D. Roberts, Cygnet World Class Inc. (USA)
- 2 SZD 51-2, entered by J. Smielkiewicz, PZL Bielsko (Poland)
- 3 Solo, entered by V. Zajic and M. Meciar, Group LET (Czechoslovakia)
- 4 Velino, entered by Aero Club d'Italia
- 5 PW-5, entered by R. Switkiewicz, Warsaw Technical University (Poland)
- 6 Russia 1 (11 m), entered by V. Fedorov, Group MECHTA, Moscow
- 7 Russia 2 (12.5 m), entered by V. Fedorov, Group MECHTA, Moscow

During the evaluation period two entrants who were unable to complete their prototypes in time, visited the evaluation site and exhibited parts of the wing and tailplane and the assembled but incomplete glider, respectively.

Several days were required to ascertain that the gliders, some of them in particular, could be declared "fit-to-fly". Not only the validation in Germany of the flight permit and insurance coverage were required, but also demonstration that some conditions (freedom from flutter, winch launching, etc) were reasonably fulfilled. Specific ground and flight tests were carried on for this purpose in several cases. Each glider component was weighed, and weight and CG were then determined for the glider empty and with each of the four test pilots, adding ballast wherever required.

After careful examination of the documentation provided, ground inspection and consideration of additional data provided by the entrants, the Cygnet was unanimously declared "insufficiently prepared" for the flight evaluation, therefore this glider was not flown. However, ground inspection and evaluation were carried on. Russia 1 (11 m wing span) was also not evaluated in flight, after a failure occurred in the supporting structure of the airbrake control system in flight compelling the Russian pilot, who was carrying on a demonstration flight, to land out.

A flying time of 74.7 hours in 106 flights was spent for familiarization and evaluation of the five prototypes by the four test pilots, some members and consultants of the Jury and invited pilots of international reputation and great experience (De Orleans, Johannessen, Peterson, Piggott, Ryder, Weinholtz). Initial flights were made to familiarize test pilots with the

gliders. These flights were followed by calibrations of airspeed instrumentation. Compliance with the World Class Technical Specifications was then verified, with particular reference to:

aerotow	winch launching
longitudinal stability	directional stability
roll rate	airbrake effectiveness
aileron/rudder coordination	
stall speed	stall warning
stall behaviour	stall sensitivity to bugs
tendency to spin	handling in thermals
landing gear	wheel brake
suitability for early solo flights	
trim range and effectiveness	
cockpit ventilation	
polar (particularly at max L/D and min sink)	

The Polish entry was the best of the lot but still needs a lot of work to meet the design goals of the competition.

At the same time, ground inspection and meetings between entrants and jury members, consultants, and test pilots took place, aimed at the evaluation of construction methods and production costs, ballast for balance, ballast for all-up weight, rigging and de-rigging, ground handling, storage, and cockpit features and arrangements such as:

instrument panel	emergency jettison
seat and harness	head rest
restraint system for equipment	
ventilation	pilot height/weight
supplementary equipment	
visibility	stick & rudder pedals
airbrakes control	crashworthiness

On October 1 the documentation was collected and made available to everybody within the fourteen person group. Then meetings of this group took place (October 2 and 3) exchanging views, opinions and comments.

Conclusions

1 All entrants, for different reasons, fall short of the World Class Technical Specifications.

2 The PW-5 glider is closer than other entrants to meeting the above specifications. The Jury estimates that the items of non-compliance can be satisfactorily corrected on this glider.

3 The Jury unanimously recommends that the PW-5 should be considered as the World Class glider, subject to the following items being attended to:

- Confirmation that costs will be kept within the World Class guidelines, supported by detailed cost analysis and by the consideration that the expected rise of labour costs will be at least partially compensated by a reduction of man-hours allowed by the industrial organization of the production.

- Provision of shock-absorbing tail skid or wheel.

- Canopy jettison mechanism to be reduced to 2 handles instead of the present 3.

- Relocation of tow release handle.

- Provision of effective wheel brake.

- Explore the possibility of reducing the stalling speed (airbrakes extended) to less than the present 70 km/h, without extensive modification of the airframe.

- Improve rearward vision from cockpit.

- Provision of fairing around main wheel to prevent fouling of launch cable in the event of a winch/auto tow over-run.

- Provision for automatic control hook up.

- Provide information and provisions for kit building, based on 49/51% rule.

The above items are in addition to the glider achieving JAR-22 type certification within one year from the date of the appointment of the winner.

4 An alternative solution, not unanimously supported, could be a postponement of the competition, ie. to declare a Phase 3 of the competition at the end of which a new evaluation would be made. Prototypes admitted could be the ones presented this year, completed and improved, and those selected for admission to Phase 2 but not ready in time this year. Pros and cons of this solution are:

Pros possibility to have a glider even closer to the spirit of the World Class and perhaps better meeting the low cost requirement, and possibility to have the gliders evaluated this year completed, improved and partially type certificated.

Cons loss of time (one year), possible loss of actual favourable circumstances, and additional IGC work.

Piero Morelli,
Chairman of the Jury

This is an edited version of the report. Anyone interested in a complete copy should contact Colin Bantin, SAC IGC representative.

training and safety

OFF-FIELD LANDING TRAINING AT BLUENOSE

After the lamentable accident to our Grob single seat club glider in 1982, we realized that it is expensive to learn the strategies for cross-country soaring survival by chance. Our terrain has great variety. In the Annapolis Valley region there are enough hayfields to provide a reasonable likelihood of a safe landout, but in many other parts of Nova Scotia there is little to find from the air. For this reason many Bluenose pilots spend some of the non-soaring days driving the boonies looking for refuge in dire circumstances. We have maps marked up with this vital information gleaned from travel in the central region to the east of the valley which we must cross to complete long tasks.

The club's teaching program for beginners mentions the possibility of landing away from the home field but it is made clear that to do so by accident is considered to be a serious misdemeanour. Once the basic circuit and basic soaring skills are learned, considerations of further experience come to the fore. A 50,000:1 topographic map is included with the student package. It shows the area immediately around the Stanley airport. Each student is required to mark up the map with all the fields considered safe to land in, giving a brief description of the parameters. This is then discussed with an instructor, who will point out the relevant facts based on the experience of several years soaring.

The next phase is a series of power flights to look at these fields from the air and compare

them with others the student does not recognize from ground observation. Finally, a number of approaches are flown into known and strange fields to show how the appearance of a particular landing will change dramatically during the last 500 feet.

North of Stanley there is a large area of woods, swamp and rocky forest. This is considered out of bounds to beginners at less than 4000

**unfriendly terrain
dictates careful
training**

feet and there are three lakes to define the limits. It is not absolutely forbidden to soar beyond this, and it has acted as a demonstration of the need to fly

away from the desired destination in order to gain enough height to return to base with virtually no risk of falling in the trees.

After the careful study of a lot of local fields which the student flies over most days, it is thought likely that when over unfamiliar places, it will be safe to choose an unknown field from the air. So far this has been borne out; we have had many satisfactory outlandings in the recent past — not all in ideal conditions, but with a safe outcome; we haven't put a mark on a glider since 1982.

The next most important issue we consider is a good circuit strategy. In ab-initio instruction, we teach according to SAC methods which do not relate to ground features. If the student uses the aiming point fix for the circuit geometry, it isn't long before the view from the glider at the corners becomes very familiar. For this reason, it should always be the same at the local airport, so that when outlanding at some unknown elevation, to fly the familiar circuit looks safe and normal. The

only other issue is to be sure that the student realizes that his outlanding will probably encompass not only the field chosen but maybe two others. It is difficult to set up for a landing in a field two away from that where one's downwind leg commences.

Anyone who has landed away a number of times will remember the rapidity with which it all took place! A decision to land is taken — and one is on the ground. This demonstrates the concentration given to the process; all else is driven from the mind. For this reason it is very easy to make handling errors, so a further case for having the circuit process as automatic as possible. Entry at the right height, adjustment with spoilers as needed, consideration of height remaining at the corners and well-banked turns at all times. Too much height is almost as much of an embarrassment as too little. Regular practise of emergency height reduction is a very good idea. Slipped final glide approaches make sure the skills are available when needed under pressure in an outlanding circuit which is on the high side.

For the club's instructors, this process can seem to be difficult and time consuming but consider the alternative of — busted glider, maybe busted student too. These take much longer to fix.

We consider it to be vital to monitor our member's day to day flying habit and to keep one another up to the mark. This does not need to be a big power trip by the club heavies, but should be a regular feature of mutual concern for the safety of the club community which is seriously harmed by accident and injury.

In closing — my advice freely given at all times, if we wish to soar into old age:

**LOOK BEFORE YOU TURN — SPEED UP
NEAR THE GROUND.**

Dick Vine

BOOK REVIEW

GLIDING SAFETY, by Derek Piggott
published by A & C Black
available from Knauff & Grove, Inc.
\$29.95 US plus shipping
RR1, Box 414, Julian, PA USA 16844

Once in a while one sees a book which really stimulates and is great bed-side reading. Gliding Safety is one of these books. It is geared to helping instructors understand and solve their student's problems, and therefore presupposes a good knowledge of the principles of flight on the part of the reader.

The first section on avoiding accidents in a large range of flying and non-flying situations is both fascinating and perhaps controversial (which wing do you hold on a crosswind winch launch and why?). The second section deals with moving on to other types of gliders, and the chapter on polishing flying technique is excellent. The third, on better gliding instruction, is very valuable and useful coming from one of the world's most noted instructors. The last section deals with power pilots converting to gliders. The book is certain to provoke healthy discussion amongst instructors.

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OXYGEN ANALYSIS REPORT

CANOX, which supplies the breathing oxygen for the Alberta Soaring Council's oxygen cart, gave ASC a copy of the results of a gas analysis they had done on the oxygen they used to fill our large cylinders. The impurity gases look pretty awful — I'm sure glad the quantities are measured in parts per million! (The analysis method is gas chromatography.)

Component	Cylinder	Allowed
oxygen (% nominal)	99.9	>99.5
water vapour (dew point, °C)	-73	-63
carbon dioxide (ppm)	2.0	10.0
methane (ppm)	24.2	50.0
nitrous oxide (ppm)	0.2	4.0
halogenated		
hydrocarbons (ppm)	nd	2.0
ethylene (ppm)	0.2	0.4
acetylene (ppm)	nd	0.1
ethane and higher		
aliphatic hydrocarbons		
(ppm, ethane equiv.)	trace	6.0
odour	nd	none

nd = not detected

Note that the maximum moisture content allowed corresponds to a dewpoint of -63°C. Medical oxygen has more water vapour in it to prevent patients from getting their pipes dried out, and for this reason is unsuitable for aviation as it could cause the regulator to ice up at high altitude.

Tony Burton, from ASCent

IGC LOOKING AT CRASHWORTHINESS

An IGC sub-committee is considering sailplane crashworthiness. There are a number of design standards being looked at including shape of the seat pan, seat belt attachment points, strength of the forward fuselage to ensure progressive collapse and better energy absorption, and headrests of minimum size, strength, and energy absorption.

(Tom Knauff suggests that a new cockpit standard similar to Indy race cars be investigated. Thirty inches of impact absorbing materials forward of the pilot's feet would cost almost nothing. If every manufacturer was required to meet this standard, we would see the end of the extremely fragile designs offering almost no pilot protection that are imported presently.)

If you have suggestions or comments for this committee, write to Alan Patching, 22 Eyre Street, Balwyn 3103, Australia.

from Soaring Pilot

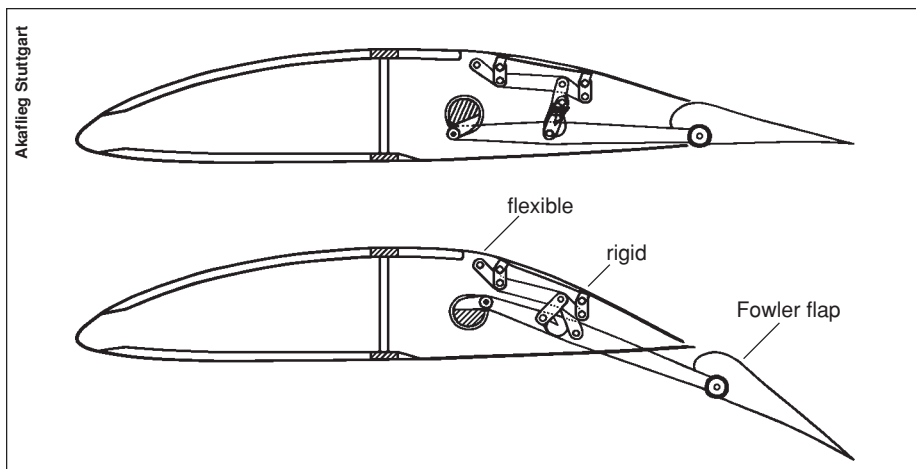


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hangar flying



NEW VARIABLE GEOMETRY WING

After seven years of design and construction, the Stuttgart Akaflieg has flown a new sailplane featuring a unique wing with Fowler flaps. It is possible that the fs-32 could leave behind the sailplanes built in the workshops of the renowned German manufacturers.

The German Akaflieds developed two concepts of variable wing geometry which are well known: flaps were tried at the Akaflieg Braunschweig (SB-11), Akaflieg Darmstadt (D-40), and Akaflieg München (Mü-27). All three sailplanes with these flaps offer an increased wing chord and therefore an increased wing area for slow flight. At the same time an increase in the camber improves the coefficient of lift of the wing airfoil. A problem of the reduced effectiveness of the rudder and the smaller wing aspect ratio with its higher induced drag remained with these designs. Akaflieg Stuttgart attempted to overcome these disadvantages with the only sailplane with a variable span (between 13.3 and 19 metres) — the outboard portion of the wing telescoped into the inner. The wing of the fs-29 could therefore offer the best shape for slow flight and cruise; however the increase in wing area at constant chord had to be paid with very high weight.

Physicist Dieter Althaus developed a new camber Fowler airfoil in numerous tests in a laminar wind tunnel. This offered the possibility to use the advantages of the flap without paying for the disadvantages. The idea was to develop a flap that would produce a high airfoil camber and a high coefficient of lift with very little increase in wing area, but also counteract the high drag caused by the slot between the wing trailing edge and flap. This was done with a moveable upper wing surface which closes up the upper and lower surfaces when the flap extends. The fs-32 is the result: 15 m wing, 6.62 m length, 260 kg empty weight, 250 km/h maximum speed.

At the beginning of the season the builders of the fs-32 were unsure whether the increase in performance as calculated and measured in the wind tunnel would actually manifest it-

self in flight. Would the costly construction of the flaps also function in flight? How would the flight characteristics of the fs-32 change during activation of the Fowler flaps? After flight tests in February of 1992 it was clear that the research and effort put into this unique wing construction were worthwhile. The first few flights demonstrated a stall speed of 62 km/h, according to Werner Scholz, test pilot of the fs-32 and one of the few Akaflieg members who has been with the project from its beginning. In later flights, 60 km/h was achieved, matching the theoretical calculations for the airfoil. A much tighter turning radius can be flown in a thermal compared to sailplanes of the same class, who make it barely below 75 km/h.

"You normally have either a sailplane with good climb characteristics, or good glide characteristics, however the fs-32 offers both", explains Scholz. This wing geometry actually achieves the two opposite requirements: low wing loading, high aspect ratio, good control in a thermal, and high wing loading for a high cruise speed. It should be said that today's sailplanes with flaps are so highly developed that a remarkable increase in performance can only be achieved at very high cost.

This sailplane was very expensive to build both through the enormous time involvement alone in research development and construction (estimated at about 26,000 hours), and in the cost of materials of about DM50,000. It has been made possible through the Institute for Airplane Construction which offered workshop and Meister. Also a great number of donations and more than 400 supporting aviation companies are to be thanked who in turn will profit from these technical improvements.

Although the fs-32 is unique, exceptional piloting skills are not required. "If one can fly a normal flapped sailplane, one should be able to control the fs-32 satisfactorily", explains pilot Werner Scholz. He also flew the fs-32 in the German Nationals in 1992. However, the Akaflieders are again working on improvements such as sealing and aerodynamics to achieve the desired L/D of 43.

from VDI nachrichten, 20 Nov 92

SAC affairs

SUMMARY OF WINTER DIRECTORS' MEETING

AGM Chris Eaves gave a progress report on the upcoming AGM at London. Friday will be occupied by the CFI Seminar, Provincial Associations meeting and a Directors' meeting. Saturday will be devoted to workshops with a training orientation. On Sunday morning the AGM is scheduled and the incoming directors' meeting follows right after.

Life Membership The Life Membership donation will be increased to \$1500.

Budget On the request for all committee chairmen to submit a budget it was noted that only one (Ian Oldaker) complied. It should be noted that with the monetary restraints in the coming year it becomes difficult to properly apportion the budget if incoming expenses are not known.

SAC Procedures Manual There was agreement in principal on the revisions required. Each Director is to assume responsibility for a section, still to be worked out, and to consult with Ursula Wiese. Ursula is to estimate the expense. Format of the sections has been suggested by Ursula and the Board is to decide on the one to adopt.

Financial report A preliminary financial report was given by Jim McCollum. At the present reporting, membership is down approximately 100 from last year which results in drop of \$6000 from the budgeted income. Investment and sales income are also down so that total income appears to be down approximately \$9000. Fortunately some of the budgeted expenses such as salaries, office expenses, free flight and publicity were also less than expected so that the deficit appears to be around \$900.

The proposed budget for 1993 is balanced at approximately \$133,000 to allow for reduced membership possibilities and reduced investment income due to the much lower interest rates. This is a bare bones budget and considers that there will not be a fall directors' meeting. A fee increase or increased membership is the only way to obtain more money for increased programs.

It was proposed that 1993 fees for Club Affiliated, Independent and Corporate Members be set at \$85 and \$53, for all other members and half year fees be \$43 and \$27.

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Sporting George Dunbar gave an update on the 1993 Nationals to be held in Swift Current, Saskatchewan from July 6th to the 15th. Tony Burton is the Contest Manager. George Dunbar reported on a proposed rule change for Jury member requirements. Four potential members of the World Team have declined to attend the 1993 World Contest in Sweden. The Board wants Colin Bantin to strongly emphasize to the IGC that SAC is very concerned about the very high costs of world contests and their continuing escalation.

AI Sunley reported on correspondence from the SSA on their concern about the new FAI amendment to the duties of Official Observers. The Board's decision was that SAC would work through the Aero Club of Canada to express our concern. A meeting of the Aero Club will be taking place during our AGM. SSA will be notified of our intentions.

The Board decided that SAC will not send a representative to the IGC meeting this year.

Directors liability A business report indicates both commercial and non-profit organization directors can be included in liability suits. The Board will request information from

the Insurance committee chairman regarding liability coverage for SAC, provincial association, and club officials.

Expense reimbursement The reimbursement for car expenses will be raised from 21 to 25¢ per kilometre effective March 1st, 1993.

Training & Safety Harald Tilgner requested that clubs show more discipline in sending in accident and occurrence reports to the Flight Training and Safety Committee during the year instead of waiting until December. The Western Instructors School will be 9-13 August, 1993 at Hope, BC.

Clubs Gordon Waugh gave a report on the Aces club, and there was discussion on its structure or proposed operation, considering the merit of them becoming a new club or becoming part of the Bluenose club.

Ulli Werneburg wondered if clubs were putting enough emphasis on attracting power pilots to become members. Board discussion suggested that Publicity committee prepare articles for clubs on how to approach the media and to have some ad work prepared for clubs to use. Ulli and Pierre to prepare guidelines and contact Publicity.

Paul Moffat brought up the problem of communications between the national office and the clubs. One suggestion was that the office prepare a form for reporting membership and send it to the clubs prior to the start of the

New info

SAC AGM

March 5-6-7, Ramada Inn, Hwy 401
London, Ontario

Theme:	"Training - It's Never Over"	for more info call
Friday	CFI Seminar	Chris Eaves
Saturday	Workshops, Awards Banquet	(519) 268-8973 (H),
Sunday	Annual General Meeting	452-1240 (W)

hotel reservations call 1-800-268-8998 or (519) 681-4900

AGM rate - \$59 single, \$65 double

airline reservations (ask for best rates), Canadian, phone 1-800-665-5554
refer to Canadian conference # 0104, Aero Club of Canada

NOTE: A less expensive alternative to a connecting flight from Toronto to London is a **shuttle bus service** offered by "Robert Q Airbus, Inc", \$50 return with 15 round trips daily. Call (519) 673-6804 and state you are going to the SAC convention for this special rate and get dropped off at the hotel.

Workshop topics (tentative): Motorgliders in training?, Winch operation, Cross-country training, CASG meeting, Badge claims, Insurance - liability, hull, and health outside Canada, Glider & towplane maintenance, Medical.

The CFI Seminar on Friday will be important and interested pilots are urged to make arrangements to attend if possible.

membership year. Also brought up was the problem of the clubs not reporting promptly on changes of mailing addresses.

Directors will send Tony Burton their rated choice of the best article published in free flight by a Canadian author.

Al Sunley, SAC president

RADIO OPERATORS LICENCE EASIER TO GET

Recent changes in the Department of Communications regulations now permit the club CFI to administer the radio operator's licence exam and to issue the certificate. Clubs should check with their district office of DoC for the procedure.

Paul Moffat, SAC Radio Chairman



Coming Events

5-7 March 1993, **SAC AGM & CFI Seminar**, London, ON. More information on previous page.

6-27 June 1993, **World Soaring Championships**, Borlange, Sweden. For info contact Hal Werneburg (403) 238-1916.

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. Practice days 4-5 July. Supported by the prairie clubs. More details later. Contest manager, Tony Burton (403) 625-4563.

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.

9-13 August, **SAC Western Instructors School**, Hope BC. For details, contact Ian Oldaker, (416) 877-1581.

7-11 October, **Cowley Wave Camp**. Sponsored by the Alberta Soaring Council. For details contact Tony Burton (403) 625-4563.

FAI records

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

The following Canadian record has been approved:

500 km Out & Return Speed – Open, territorial, 126.3 km/h, 9 Aug 92, Kevin Bennett, Ventus B, C-GIJO. Flown from Black Diamond, AB with turnpoint of Medicine Hat A/P, AB. Surpasses previous record of 115.4 km/h set in 1984 by Hal Werneburg.

SAC Directors & Officers

PRESIDENT &

ALBERTA ZONE

Al Sunley (1992)
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(403) 464-7948 (H & F)

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Director-at-Large

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Mbr: Doug Eaton

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12546 - 22 Avenue
Surrey BC V4A 2B7
(604) 535-0507 (H)

Contest Letters

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Whitby, ON L1P 1E6
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FAI Records

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Ken Brewin
Geo. Eckschmiedt
Fred Kisil
Paul Moggach
Richard Vine
Harold Yardy

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Mbr: Dr. W. Delaney

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(519) 452-1240 (B)
Mbr: Herb Lach

Trophy Claims

Harold Eley
4136 Argyle Street
Regina, SK S4S 3L7
(306) 584-5712 (H)

general among other group schemes, such as supplemental medical insurance, etc.

b) The SAC negotiated a premium with the Insurer, then allocated it to the insureds on a per glider basis.

Shifting a significant portion of the insurance costs to club owned aircraft is, in our view, a major change and not supported by historical performance, eg. in 1992 private owners paid \$136,000 in premiums and claimed \$91,000, compared with \$161,000 versus \$73,000 for clubs. Records have not been kept for previous years, but 1992 is likely representative.

As President of Erin Soaring Society, and at the request of its Board, we twice wrote the SAC President earlier in the year, asking for rationale for the change, and expressing disagreement with it. We also recently spoke to the Chairman of the Insurance Committee, who advised the revision related to a potentially higher liability risk for gliders flown by more than one pilot. In this regard, it should be noted that in the history of the scheme there has never been a significant liability claim paid relating to a club-owned glider, so it is difficult to support the theory. Even if this is a variable to be addressed, it would seem logical to make an offsetting decrease because of lower hull losses. Unless we are prepared to address the many risk variables, we should leave the scheme alone.

There is normally a short time span between negotiating the upcoming year's insurance, and the Annual General Meeting. Consequently the SAC Board, and more importantly, the membership at large has little time or opportunity to consider all the aspects. In this case, we submit that the two level premium schedule should be reconsidered and withdrawn. If you agree, now is the time to express the wishes of your club to the SAC Board.

Bryce Stout

Erin Soaring Society

EDITOR PICKING ON PIERRE

Dear Tony, re my letter published in the 6/92 issue — no I am not a member of that very fine club MSC. I still am, and have been for 16 years, a member of Champlain.

Secondly, I think it was a great idea to publish the "Soaring Stuff" list as a 2 page order form. I believe you should do that for the next few issues to see if that will increase sales. SAC does need the revenue. I will, soon I hope, have a picture (B&W) produced describing the clothing items that you will be able to use with the ad.

Pierre Pepin

AVV Champlain

Abject apologies, Pierre. I can't seem to get it right with you somehow. (In 4/92 I mistook him for his brother, André in a photo caption.) Including "Soaring Stuff" in *free flight* rather than separately printing as an insert will save SAC some money, and make editing a lot easier when I'm 2 pages short of a full issue.

club news

GATINEAU GLIDING CLUB 1992

1992 was for GGC a reasonably successful year. The highlight of the year was the 50th anniversary celebration (described below. ed)

In terms of soaring activity, the year was somewhat subpar, mainly because of the worse than average weather — the rain seemed to coincide with the weekends. The membership remained roughly the same as last year, but flying activity was significantly down. On the bright side, our club members played a big role in the successful holding of the Canadian Nationals at Hawkesbury. Particularly Ken Brewin (Contest Director), Rick Officer (Chief Field Manager), Beth McCollum (Office Manager), and Ted Froelich (weather info and photo interpretation) contributed very substantially to the organization.

On the flying side, Nick Bonnière placed a close third in the 15 metre class, only a few points behind the winner, Walter Weir.

The club sold its Grob Astir single seater and replaced it with a Schweizer 1-36. The reasoning behind this move was that the 1-36 was held to be easier to fly and to maintain. So far, this has proven to be the case. Another decision was to partially resurface the east-west runway. The cost for that will be approximately \$40,000.

Cross-country flying was down a bit, again because of the weather. However, particularly in July and August, the weather was good enough to fly cross-country on many days, but not for long distances. There is a good number of pilots who venture on cross-country flights wherever possible. Nick Bonnière, Frank Vaughan, Ulli Werneburg, Ian Grant, Wolfgang Weichert and Peter Sully are the pilots venturing out most often.

Unfortunately one of our towplanes had its gear collapse on landing, fortunately late in the year. The repair will be completed by the start of the '93 soaring season. On the lighter side, an eighteen hole golf course is being built immediately adjacent to the airfield, so members who get fed up with soaring conditions will be able to go across the road and take out their frustrations on a golf ball. Good flying to all for 1993!

Ulli Werneburg

GATINEAU GLIDING CLUB'S FIFTIETH ANNIVERSARY

On the sixth of September several members of MSC were pleased to visit Pendleton airfield (some arriving by sailplane) to help the Gatineau Gliding Club celebrate the fiftieth anniversary of GGC and Pendleton airfield.

It was on the Labour Day weekend in 1942 that #10 Elementary Flying Training School, operated by the Hamilton Flying Club, moved from Mount Hope Airport to Pendleton Airport

where it commenced intensive flying training operations. In the same year (1942) the Gatineau Gliding Club was formed. They started their flying operations from a field located in an area that is now completely built over with the Bayshore Shopping Centre, then they moved to Mulvihill field by the Eardley escarpment, then to Carp Airport, and finally in 1949 to Pendleton. I believe that they were finally able to purchase the airfield in 1961.

The anniversary celebrations included excellent radio controlled model aircraft flying displays, where 1/4 scale Tiger Moths and a Spitfire flew very much like the real things; Tiger Moth fly past; glider aerobatics; Pitts aerobatics; and to close the celebration, a formal dedication ceremony where the old hangar was named after our old friend "Shorty" Boudreault and a plaque was unveiled in his honour. Throughout the day visitors were free to wander around the old base area and see some of the old building sites and installations which had been identified to enable one to have an idea of the original scope of the complex. There was also an interesting historical display in the old hangar, consisting of war time era photos, press clippings, etc.

To close the day a dinner buffet was held at the St Pascal Community Centre, some 5 or 6 km from the airfield. Elvie Smith was MC for the evening (as well as having been commentator during the day's events) and did an excellent job. GGC had invited people who had been associated with Pendleton Airfield in any way during the war to attend the function and I think that we were all a little surprised to find that some ten or so were present. After dinner we received an interesting talk on those wartime training days, followed by a brief history of the GGC. A most enjoyable day. Thank you, Gatineau Gliding Club.

Terry Beasley, Montreal Soaring Council

... Postscript from **Bob Gairns**, MSC

Terry missed some important features. One was that the aircraft used for training at Pendleton by the RCAF were Tiger Moths. The club organizers arranged for three Tiger Moths to be at the field, and any Air Force pilot who was trained at Pendleton was offered a nostalgic flight in one of these venerable aircraft. Then at the evening banquet, the featured speaker was Russell Bannock, DFC, DFM, etc. an ex-President of DeHavilland Canada.

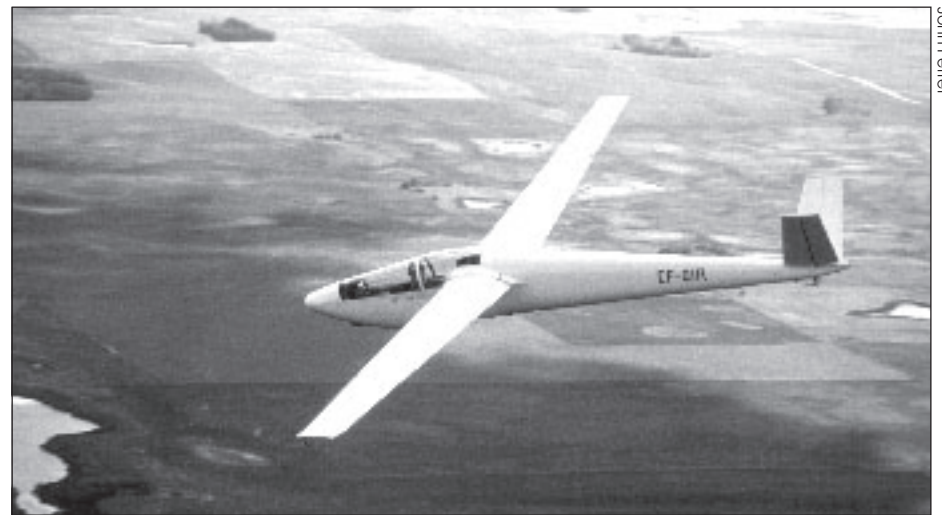
ALBERNI VALLEY

With only three hours on the club glider our 1992 season can only be considered disappointing. Private gliders accumulated many more hours, but mainly at other locations. As always, next year promises better things. The new airport is an excellent location and with the possibility of a sufficiency of instructors and towpilots a fair number of beginners may be accommodated.

A highlight of the year was a visit to the Derbyshire and Lancashire Gliding Club in the UK. There had been no real hope of gliding in England in November, but even in heavy rain and high winds it was a worthwhile visit. Approximately 50 parked gliders indicated a large and successful operation and an 18th century farmhouse provided accommodation and a dining room and bar. All launches are by winch and have resulted in 500 km distances and 20,000 feet heights. If one is anywhere near the area and provided with a good map and navigator, the club is well worth a visit even if just for the scenery and the beer.

One thing that Alberni still provides is pretty flying. From 7000 feet there is a clear view of the snow capped Coast Range, the whole width of the Gulf of Georgia with all its islands, Vancouver Island itself with its plethora of shapely lakes and mountains, and off to the west the blue, if chilly, Pacific. Hopefully there will be enough activity here next year for many to enjoy the gliding in this area.

Doug Moore



John Perret

Horst Dahlem of the Saskatoon Soaring Club flies his modified HP-11A near Cudworth, SK. The original builder extended the cockpit about 18" and moved the main wheel back, intending to fly it as a quite small two-seater, but it was not approved by DoT. These mods also mandated a nose wheel (which is also retractable). Horst enlarged the front seat area again to fit his six foot frame and now has a rear space which will only fit a pet dog or small child.

**SOARING ASSOCIATION OF CANADA
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SOARING STUFF / ARTICLES DE L'AIR

February 1993

	Price Prix	Size Taille	Qty. Qté	Amount Total	T A X	
1 GLIDING BEE-SHIRT (see design above) black on yellow specify size – S, M, L, XL	12.00				✓	T-SHIRT "ABEILLES" (voir dessin ci-dessus) noir sur jaune précisez la taille – P, M, G, XG
2 GLIDING T- SHIRT navy with gold and white crest specify size – S, M, L, XL	12.00				✓	T-SHIRT de VOL à VOILE bleu marin avec un écusson or et blanc précisez la taille – P, M, G, XG
3 GLIDING GOLF SHIRT specify size – S, M, L, XL	25.00				✓	CHEMISE de GOLF de VOL à VOILE précisez la taille – P, M, G, XG
4 GLIDING SWEAT SHIRT specify size – S, M, L, XL	25.00				✓	SWEAT SHIRT de VOL à VOILE précisez la taille – P, M, G, XG
5 HOODED SWEAT SHIRT specify size – S, M, L, XL	35.00				✓	SWEAT SHIRT à CAPUCHON précisez la taille – P, M, G, XG
6 GLIDING HAT baseball style	6.00				✓	CASQUETTE de VOL à VOILE style casquette de baseball
7 GLIDING BEANIE white with blue gliders	10.00				✓	CHAPEAU de VOL à VOILE blanc avec des planeurs bleus
8 GLIDING TIE blue with white gliders	20.00				✓	CRAVATE de VOL à VOILE bleue avec des planeurs blancs
9 Decal – "I'D RATHER BEE SOARING"	.75				✓	Auto collant – "I'D RATHER BEE SOARING"
10 SUNSHADES (sun protector for your car windshield; design SAC•ACVV)	10.00				✓	SUNSHADES (para-soleil en carton pour votre voiture; dessin SAC•ACVV)
11 1993 SSA calendar	15.00				✓	1993 calendrier de SSA
12 1993 German "Bildkalender"	28.00				✓	1993 calendrier allemand
13 Tost rings (4 for \$110)	28.00				✓	Anneau de remorquage Tost (4 pour \$110)
Books from international authors						Livres des auteurs internationaux
20 SOARING CROSS-COUNTRY by Helmut Reichmann	55.00					SOARING CROSS-COUNTRY par Helmut Reichmann
21 FLYING SAILPLANES by Helmut Reichmann	48.00					FLYING SAILPLANES par Helmut Reichmann
22 WINGS LIKE EAGLES by Paul Schweizer	55.00					WINGS LIKE EAGLES par Paul Schweizer
23 PRACTICAL WAVE FLYING by Mark Palmer	17.50					PRACTICAL WAVE FLYING par Mark Palmer
24 STALKING THE MOUNTAIN WAVE by Ursula Wiese	15.00					STALKING THE MOUNTAIN WAVE par Ursula Wiese
25 TRYING THEIR WINGS (BC gliding from 1920 to 80s) by Lloyd M. Bungey	15.00					TRYING THEIR WINGS (vol à voile en Colombie Britannique 1920–80) par Lloyd M. Bungey

continued on other side — voir au verso

	Price	Size	Qty.	Amount	T A X	
	Prix	Taille	Qté	Total	X	
Manuals and flying aids						Manuels et accessoires de vol
30 GLIDER PILOT LOG BOOK (box of 60)	7.50 360				✓	CARNET de VOL pour pilote de planeur (boîte de 60)
31 STUDENT PROGRESS BOOK — rev. 85	3.00				✓	CARNET de VOL d'entraînement de l'élève pilote — rev. 85 (français)
32 SOARING INSTRUCTION MANUAL — rev. Jan 80	5.00					MANUEL d'INSTRUCTIONS de vol à voile — rev. jan 80 (français)
33 AIR INSTRUCTION NOTES (for instructors) — rev. May 88	3.50					INSTRUCTIONS en VOL — NOTES (pour instructeurs) — rev. mai 88 (français)
34 CISTRSC (green) / SWAFT (red) cockpit checklist (self-adhesive)	1.25				✓	CISTRSC (vert) / SWAFT (rouge) liste de vérification (auto collante)
SAC crests and pins						Ecussons et epingles de l'ACVV
40 CREST "SAC•ACVV", embroidered	3.00				✓	ECUSSON "SAC•ACVV", brodé
41 "SAC" LAPEL PIN	3.50				✓	EPINGLE "SAC"
FAI supplies for certificates and badges (back page of free flight has full list)						Articles FAI pour certificats et insignes (voir aussi revue vol libre)
1 FAI 'A' badge, silver plate pin	5.00				✓	Insigne FAI 'A', plaqué argent
2 FAI 'B' badge, silver plate pin	5.00				✓	Insigne FAI 'B', plaqué argent
3 SAC BRONZE badge, pin (available from your club)	5.00				✓	Insigne ACVV BRONZE (disponible au club)
4 FAI 'C' badge, cloth, 3" dia.	4.50				✓	Insigne FAI 'C', écusson de tissu
5 FAI SILVER badge, cloth, 3" dia.	4.50				✓	Insigne FAI ARGENT, écusson de tissu
6 FAI GOLD badge, cloth, 3" dia.	4.50				✓	Insigne FAI OR, écusson de tissu

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Please enclose payment with order. Price includes postage. GST not required. Ontario residents, add 8% sales tax for items having an asterisk in the "Tax" column. Do not forget to indicate the size you want for shirts.

Votre paiement devrait accompagner la commande. La livraison est incluse dans le prix. TPS n'est pas requise. *Les résidents de l'Ontario* sont priés d'ajouter la taxe de 8% pour les articles marquées d'un astérisque. Ne pas oublier de mentionner la taille des chemises.

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THE SAC VIDEO LIBRARY

**ITEMS NOW
AVAILABLE**

Training & safety (new)

Name and description	running time
Accidents and pilot planning	24:00
A pilot's decision-making process, illustrated and clearly explained by Ian Oldaker.	
Collision avoidance in gliders	16:15
A slide presentation by Ian Oldaker. How to avoid real and potential airborne collision situations.	
Better communications for better safety	25:16
How inadequate or misunderstood communications (radio, intercom or verbal) can be a safety hazard.	
Safety by stress management	39:42
How stress can affect our flying skill and judgement.	
The wrong stuff	51:10
Different personalities and their effect on flight crew performance. Wrong assumptions leading to tragic results.	
Why planes crash	44:00
A "Nova" TV program. Pilot error versus equipment failure	
To be a pilot	28:32
A man and his wife both take flying lessons. She is careful and learns by the book. He is brash and careless and learns the hard way.	

Entertainment

Free Flight	50:41
By Derek Piggott. What makes a glider fly? Some gliding history. Wasserkuppe, Schleicher factory. John Jeffries, Gerhard Waibel.	
Soaring — Region 5 comp 1988	27:40

Typical contest and short history of gliding. Les Horvath. Glider performance. Aerobatics in a Salto.

Soaring, harmony with the wind 14:00

Good ridge soaring in Vermont (Stowe Aviation). Simple questions and answers (good music at end).

Pure Flight — Transition to Soaring 32:46

With Cliff Robertson. USAF pilot compares soaring with jet fighter. The feeling and freedom of soaring compared with birds. Doug Jacobs. A recruiting video? Sustaining engine retracting in flight.

Base Borden Soaring Group 36:53

Good amateur quality video of a day with the BBSG. Original music. Imaginative editing.

Silent Sky 18:34

With Oscar Boesch. An artistic and almost ethereal rendering of gliders in flight. Excellent background music.

Soaring the High Sierra 38:40

Good airborne footage. Background music. Aerobatics, Kimberley's intro.

Chasing Phantoms
Aerobatics in British Columbia 8 min

These are short but sweet. The first one is composed of colour slides cleverly put together with a musical background. The second is aerobatics in a Grob 103 over the Fraser River. Both by the VSA.

Sailors of the sky 28:36

Made at Central Ontario Soaring Association near Peterborough, ON. Some history. Rigging and flying a Jantar. Loops and spins in a Blanik with Walter Weir.

Riding the Mountain Wave 27:00

The fall wave camp at Cowley in 1982. Good ground and airborne footage. Made by CBC.

The Sport Aviation Show — Gliding 28:10

An in-depth interview with Charles Yeates. His soaring experience over 39 years. Made on location at the Bluenose Soaring Club.

Come fly with me 35:45

Airborne footage over Stanley and Shearwater, NS with classical music background. Some voice-over commentary.

Running on Empty 23:07

With Cliff Robertson. The story of a soaring competition in SW USA with international gliding champions.

The Quiet Challenge 28:00

The Barron Hilton Cup, flown in Nevada by world-class glider pilots.

The "Worlds", Benalla 1987

Janet Foster flies in a 2-33 22:00

The first couple of minutes are missing from the "Worlds" but it's a very interesting video. The Janet Foster bit is a nice little clip from one of her famous travelogues.

Spring soaring on the prairies
A fam flight at the Winnipeg club 27:00

A charming little spring lifter-upper put out by a Winnipeg TV station followed by a typical familiarization flight at the Starbuck gliderport.

TV interview, Tony Burton and
Ursula Wiese
Building the AV-36
Soaring in Alberta in the '50s 69:00

Good interview with Tony and Ursula. They answer many layman's questions about gliding and soaring in general and introduce the public to soaring.

The next two items are classics. They tell about the construction of the Fauvel AV-36 flying wing glider by members of the RCAF Tenardee club in Calgary in the early 50s and the activities in southern Alberta that led eventually to the discovery of the mountain wave and the establishment of Cowley as a soaring centre. Ursula edited this material from old home-movie films by A.W. (Bill) Riddell, one of the builders of the AV-36 and founder of the original club, and arranged for an informative voice-over by Bill.

Bluenose Soaring Club — 1986 to 1992
about 30:00 each

These are seven separate documentaries describing the activities, the growth, the people and the equipment of the Bluenose Soaring Club in Nova Scotia. Available singly or in a set of two 2-hour tapes.

I am prepared to make copies of these items and sell or rent them to clubs or individuals in the Association at cost (buy for \$5 plus shipping from Halifax, or rent for two-way shipping cost only). There are some items which are protected by copyright, eg. "Running on Empty"; in these cases the club will be expected to pay for the shipping both ways and, in case of damage or loss of the video, to pay the replacement cost which is about \$50.

Some of the items have been grouped together on one tape to make a showing length that would be convenient for a club meeting, say 30-40 minutes, while others are long enough to stand on their own.

The quality of the items vary. They are all at least "viewable" and the sound and picture quality varies from acceptable all the way up to excellent. I have excellent dubbing equipment but if the videos that I have are second or third generation, the copies will be mediocre. I am always on the lookout for originals to improve the basic quality of the library.

Gordon Waugh
Editor, SAC Video Library
5546 Sentinel Square
Halifax, Nova Scotia B3K 4A9
phone (902) 455-4045
fax (902) 443-0094

FAI badges

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

The following Badges and Badge legs were recorded in the Canadian Soaring Register during the period 3 November to 31 December 1992.

GOLD BADGE

264	Francisco Diaz	Champlain
265	Donald Matheson	Alberni Valley
266	Sylvain Larue	Cold Lake

SILVER BADGE

841	Heinz Schwarz	Saskatoon
842	Sylvain Larue	Cold Lake
843	Roy Eichendorf	Saskatoon

DIAMOND ALTITUDE

Francisco Diaz	Champlain	5029 m	DG-202	Sugarbush, VT
David Morgan	Cu Nim	5307 m	HP-11AT	Cowley, AB
Donald Matheson	Alberni Valley	5100 m	RHJ-8	Cowley, AB

GOLD DISTANCE

John Toles	Saskatoon	315.9 km	Phoebus C	Cudworth, SK
Sylvain Larue	Cold Lake	333.7 km	Slingsby Dart	Cold Lake, AB
Richard Longhurst	Air Sailing	307.2 km	Ka6E	Belwood, ON

GOLD ALTITUDE

Francisco Diaz	Champlain	5029 m	DG-202	Sugarbush, VT
David Morgan	Cu Nim	5307 m	HP-11AT	Cowley, AB
Donald Matheson	Alberni Valley	5100 m	RHJ-8	Cowley, AB

SILVER DISTANCE

Terry Healy	Toronto	57.0 km	Ka6	Conn, ON
Heinz Schwarz	Saskatoon	55.7 km	Phoebus C	Cudworth, SK
Sylvain Larue	Cold Lake	333.7 km	Slingsby Dart	Cold Lake, AB
Roy Eichendorf	Saskatoon	100.8 km	Phoebus C	Cudworth, SK

SILVER DURATION

Heinz Schwarz	Saskatoon	5:08 h	Phoebus C	Cudworth, SK
Roy Eichendorf	Saskatoon	5:06 h	Phoebus C	Cudworth, SK

SILVER ALTITUDE

Terry Healy	Toronto	1670 m	Ka6	Conn, ON
Mary Ellen McNamara	SOSA	1300 m	1-26	Rockton, ON
David Morgan	Cu Nim	5307 m	HP-11AT	Cowley, AB
Roy Eichendorf	Saskatoon	1400 m	Phoebus C	Cudworth, SK

C BADGE

2360	Mary Ellen McNamara	SOSA	4:45 h	1-26	Rockton, ON
2361	Alain Berinstain	Gatineau	1:45 h	ASK-13	Pendleton, ON
2362	Samy Benzekry	Montreal	1:09 h	2-33	Hawkesbury, ON
2363	Andrew Atkins	York	1:42 h	1-26	Arthur, ON
2364	David Lea	Kawartha	1:08 h	2-22	Omeme, ON
2365	Roy Eichendorf	Saskatoon	5:06 h	Phoebus C	Cudworth, SK
2366	David Brooks	Winnipeg	1:13 h	L-Spatz	Starbuck, MB
2367	Maxime Michaud	Quebec	1:32 h	2-33	St-Raymond, PQ

Right now is a good time to head for the stationary store to buy the grease pencil you are going to need for canopy marking in front of the turnpoint camera next season. It would be a shame to miss a Silver distance day because you had nothing to mark the canopy.

Don't know what I'm talking about? Then you obviously haven't read the new FAI Sporting Code Section 3, or the SAC guide to "Badge and Record Procedures", edition 6. See the *free flight* back cover items 18 and 19. Order your copies now.

CANADIAN ADVANCED SOARING GROUP

The CASG had a very active year in 1992 and it looks like the new year will be just as busy. Sue Eaves managed to produce four newsletters with plenty of interesting articles.

In the Ottawa area our members organized the Nationals at Hawkesbury with initial CASG funding and the help of several local clubs.

There was a workshop in the morning of the Ontario Soaring Association meeting in Toronto and several cross-country clinics were held during the summer. Ulli Werneburg and Robert DiPietro had a successful clinic at Pendleton for eastern Ontario pilots. At SOSA we tried something new this summer by splitting the clinics for beginners and advanced. The advanced clinic by Jörg Stieber and myself was almost a washout and we only managed two scrappy days. The beginner's clinic organized by Paul Thompson and Richard Longhurst enjoyed much better weather and had almost a full week's flying. We were also involved in organizing the Ontario Provincials at Toronto Soaring Club and the SOSA "Mudbowl".

A contest kit is almost complete now and will be available to any club willing to host a contest. It should provide everything needed to run a contest so all a club needs to provide is the site and some local manpower (CASG is willing to supervise). We will print a list of the contents of the kit at a later date.

During several contests in Ontario this summer we had formal and informal meetings with our members where we had a chance to discuss the future of the CASG. There was also a SAC directors meeting in the fall at SOSA. The result of these meetings is that the CASG will be incorporated as a federal non-profit organization under the name of the "Canadian Advanced Soaring Association" to foster and promote all aspects of cross-country flying in Canada. The current (interim) board will stay on until our first official annual meeting during the 1993 Nationals at Swift Current, Saskatchewan this summer. More information and details will be available during the SAC AGM in London in March where we plan on having an informal session.

We will continue the workshops and clinics as we have done in the past. In addition to the beginner's and advanced clinics we are organizing a top level training camp/clinic at Uvalde, Texas in August. The details and who is invited are being worked out, but it will be based on the official seeding list. We are also working on the entry level standards for our beginner's clinics.

SAC's Flight Training and Safety Committee has indicated that they will be adding post-solo and advanced training to their syllabus. The plan is to work together with Ian Oldaker and his committee to come up with a training plan where CASA takes over at the level where the club training stops.

Fund-raising for the forgotten SAC world team fund is also on the agenda and we are looking at ways to attract corporate sponsors as well as club and individual contributions on an ongoing basis.

Our USA counterpart, the Sailplane Racing Association, has made their 15 page booklet, "Guide to Soaring Competition" available to us and it will be available to our members as soon as we have "Canadianized" it.

Ed Hollestelle

PENDLETON'S 50TH ANNIVERSARY

Own a piece of Canadian aviation history
A limited edition video cassette of interest to the Canadian gliding community
documentary on the 50th anniversary of the Gatineau Gliding Club

video only \$34.50, taxes and postage incl.

Maspie Videography
53 Glengarry Road, Ottawa, ON K1S 0L4 (613) 233-3500

— this 1 hour video features —

Shorty Boudreault – Canadian glider pilot licence #1, Silver Badge #1, and member of Canada's 1952 international team in Spain, Elvie Smith – Order of Canada in 1992 for his contributions to Canadian aviation, Chem LeCheminant, a founder of SAC, five Tiger Moths and many other interesting people and aircraft

Trading Post

SINGLE SEAT

1-23G, C-FZDO, \$12,000 firm. Basic instruments, electric vario. Kurt Hertwig (519) 686-0332 or Andy Gill (519) 660-0532.

M100S, C-FBNG, #59, 540h, never damaged, re-covered with Imron paint (white/red trim) 1987. Standard instruments, Ball 401 TE with audio, chute, covers, wing stands, enclosed metal trailer. \$8700. Mike Perrault (514) 331-9591 eve.

PIONEER II, C-GLUV, in mint condition, new canopy, standard control stick mod, elec. vario. Aluminum trailer can be towed by small car. \$9000. Paul Daudin (514) 621-2535 or Albert Sorignet (514) 331-4614.

SKYLARK 4B, 18m, O2, T&B, radio, chute, trailer, very good condition. Soars on a puff - the best L/D for your dollar. Bev or Dave Lewtas (514) 455-7786.

BG-12, CF-RCU, 150h, needs canopy and work on one wingtip, trailer available. \$3750. Jim Howse (403) 457-1883 (H), 493-5341 (B) or John Klute 475-8336.

Ka6CR, C-FRWO, good condition, full instrumentation, O2, chute, trailer radio, hangared, 1/3 share, located at Rockton, ON. Reg Nicholls (519) 927-3645 eve.

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

LIBELLE H301B, CF-XGE, O2, 720 chan radio, wing covers, encl metal trailer. \$15,500. Rob Minchin (403) 639-2365 (H), 594-6719 (W).

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

COMMERCIAL ADVERTISING

	B&W	Colour
Full page (7-1/4 x 10)	\$275	\$750
Back cover inside	325	1,000
1/2 page	160	475
1/4 page	95	
1/9 page	55	

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

USED SAILPLANES WANTED FROM CLUBS & PILOTS

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

TWO PLACE

Grob 103, 880h, all ADs done, standard instruments front and rear, custom fittings for trailer (trailer available separately. Alberta Soaring Council, (403) 625-4563.

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.

MISCELLANEOUS

PA18-150 towplane, immaculate, constant speed prop (100 smoh), 61 gal tanks, KA-134 audio panel, KX-135 nav/com, two KR-87 ADF's, Xpdr, ELT, horizon. 250h since re-fabric, new wing struts/forks, zero time 0-320 Lycoming, Cleveland wheels/brakes/tires/tubes/cowling/fairings. 6200 ttaf. \$45,000 negotiable. (403) 481-3866, 6-10 pm MST - no collect please.

123.4 MHz crystal set, for Genave Alpha 10, \$35. Harold Eley, (306) 584-5712.

Open glider **trailer**, 25' x 4', torsion bar suspension, 480 x 8 tires. **Blanik winch launch bridle**. Niagara "Chairchute" flat 26' canopy, red container, '92 repack. Replogle **barograph** (new) with extra graph paper and seals. Scott **O2 mask** with mike, outlet hose and elbow for A14A regulator, new and never used. Bob Sturgess, (403) 526-5248.

Wanted - radio for use as a contest ground station. Must be 720 chan and be able to run off batteries. 5W o/p preferred. Case not essential nor is power drain critical. Contact Kerry Kirby 9-5 at (416) 668-9328 or eve (416) 668-0902, fax (416) 668-7394.

Mechanical vario & ASI, metric scales, best offer. Mike Cook, (604) 427-5471.

Pilot parachute, 26 ft "Baby Cobra" by Niagara Parachute, slim backpack style. Inspected and repacked by Terry Grimm Nov 92. New price \$1200, asking \$700. Roy Hinton (416) 822-0230 H.

Crew wanted for Ventus driver at 1993 Canadian Nationals. Call Andrew Jackson (403) 435-4425, fax (403) 435-1627.

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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Sunaero Aviation. Glider repairs in fibreglass, wood, & metal. Jerry Vesely, Box 1928, Claresholm, AB T0L 0T0 (403) 625-3155 (B), 625-2281 (F).

Vankleek Sailplanes Ltd. Specializing in sailplane repairs in wood, metal, or composites. Call Günther Geyer-Doersch (613) 678-2694.

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Variometers, winglets, mylar seals - all products designed and built this side of the Atlantic! Peter Masak, Performance Engineering, Inc. tel (713) 431-1795; fax (713) 431-2228.

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

Firmal Electronics. Cambridge variometers and flight computers, including new L-Nav. TE probes, netto filters and gust filters. Cambridge warranty service and repairs. Call for details, (613) 731-6997.

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

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Glaser-Dirks. Vankleek Sailplanes Ltd, since 1978. 332 Pleasant Corner Road, Vankleek Hill, ON K0B 1R0. Günther Geyer-Doersch (613) 678-2694.

Lark. Single, two place, motorglider and parts. Flite-Lite Inc. (gliders), (305) 472-5863, fax 473-1234.

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

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

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

Schweizer parts. Walter Chmela, (416) 221-3888 (B), 223-6487 (H), #203, 4750 Yonge Street, Willowdale ON M2N 5M6.

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288 Bertrand
Le Gardeur, PQ
J5Z 4R9

AERO CLUB SPORTAIR
c/o Denis Trudel, 1120 Wolfe
St-Bruno-de-Montarville, PQ
J3V 3K5

CLUB DE VOL A VOILE APPALACHIAN
Box 271
Sherbrooke, PQ
J1H 5J1

ASSOCIATION DE VOL A VOILE CHAMPLAIN
30 des Orties
La Prairie, PQ
J5R 5J3

CLUB DE VOL A VOILE DE QUEBEC
Box 9276
Ste Foy, PQ G1V 4B1

MONTREAL SOARING COUNCIL
Box 1082
St. Laurent, PQ H4L 4W6

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

ONTARIO ZONE

AIR SAILING CLUB
c/o OC Rec. Platoon, CFSPER
Don Mills, ON M3B 3N6

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

BASE BORDEN SOARING
c/o OC Rec. Platoon, CFSPER
CFB Borden, ON L0M 1C0

BEAVER VALLEY SOARING CLUB
Box 394
Thornbury, ON N0H 2P0

BONNECHERE SOARING
Box 1081
Deep River, ON K0J 1P0

CENTRAL ONTARIO SOARING ASSOCIATION
Box 762
Peterborough, ON K9J 7A2

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

GATINEAU GLIDING CLUB
Box 883, Station B
Ottawa, ON K1P 5P9

GUELPH GLIDING & SOARING ASSOCIATION
183 Norfolk Street
Guelph, ON N1H 4K1

KAWARTHA SOARING CLUB INC.
Box 168
Omamee, ON K0L 2W0

LONDON SOARING SOCIETY
Box 773, Station B
London, ON N6A 4Y8

RIDEAU GLIDING CLUB
Box 307
Kingston, ON K7L 4W2

RIDEAU VALLEY SOARING SCHOOL
Box 1164
Manotick, ON
K4M 1A9

SOSA GLIDING CLUB
Box 81
Rockton, ON L0R 1X0

TORONTO SOARING CLUB
c/o S. Foster
10 Blyth Street
Richmond Hill, ON
L4E 2X7

WINDSOR GLIDING CLUB
Box 2172
Walkerville, ON N8Y 4R8

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

PRAIRIE ZONE

GRAVELBOURG GLIDING & SOARING CLUB
Box 213
Lafleche, SK S0H 2K0

PRINCE ALBERT GLIDING & SOARING CLUB
219 Scissons Court
Saskatoon, SK
S7S 1B7

REGINA GLIDING & SOARING CLUB
Box 4093
Regina, SK S4P 3W5

SASKATOON SOARING CLUB
Box 7943
Saskatoon, SK S7K 4R6

SWAN VALLEY SOARING ASSOCIATION
Box 850
Swan River, MB R0L 1Z0

WINNIPEG GLIDING CLUB
Box 1255
Winnipeg, MB
R3C 2Y4

ALBERTA ZONE

COLD LAKE SOARING CLUB
Box 2108
Medley, AB T0A 2M0

CU NIM GLIDING CLUB
Box 2275, Station M
Calgary, AB T2P 2M6

EDMONTON SOARING CLUB
Box 472
Edmonton, AB T5J 2K1

GRANDE PRAIRIE SOARING SOCIETY
Box 446
Grande Prairie, AB
T8V 3A7

PACIFIC ZONE

ALBERNI VALLEY SOARING ASSOCIATION
Box 201
Port Alberni, BC V9Y 7M7

BULKLEY VALLEY SOARING CLUB
Box 474
Smithers, BC V0J 2N0

MILE ZERO CADET SOARING ASSOCIATION
Box 603
Dawson Creek, BC
V1G 4H4

VANCOUVER SOARING ASSOCIATION
Box 3251
Vancouver, BC V6B 3X9

SAC SUPPLIES FOR CERTIFICATES AND BADGES

1	FAI 'A' badge, silver plate pin	\$ 5.00
2	FAI 'B' badge, silver plate pin	\$ 5.00
3	SAC BRONZE badge pin (<i>available from your club</i>)	\$ 5.00
4	FAI 'C' badge, cloth, 3" dia.	\$ 4.50
5	FAI SILVER badge, cloth 3" dia.	\$ 4.50
6	FAI GOLD badge, cloth 3" dia. <i>Items 7-12 ordered through FAI awards chairman</i>	\$ 4.50
7	FAI 'C' badge, silver plate pin	\$ 5.00
8	FAI SILVER badge, pin	\$39.00
9	FAI GOLD badge, gold plate pin <i>Items 10, 11 not stocked - external purchase approval given</i>	\$35.00
10	FAI GOLD badge 10k or 14k pin	
11	FAI DIAMOND badge, 10k or 14k pin and diamonds	
12	FAI Gliding Certificate (record of badge achievements)	\$10.00
	Processing fee for each FAI application form submitted	\$10.00
13	FAI badge application form (<i>also stocked by club</i>)	n/c
14	Official Observer application form (<i>also stocked by club</i>)	n/c
15	SAC Flight Trophies application form (<i>also stocked by club</i>)	n/c
16	FAI Records application form	n/c
17	SAC Flight Declaration form (<i>also stocked by club</i>) per sheet	\$ 0.15
18	SAC guide "Badge and Records Procedures", ed. 6	\$ 5.00
19	FAI Sporting Code, Sec 3, Gliders, 1992 (<i>payable to ACC</i>)	\$ 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.

ARTICLES ACVV POUR CERTIFICATS ET INSIGNES

Insigne FAI 'A', plaqué argent	\$ 5.00
Insigne FAI 'B', plaqué argent	\$ 5.00
Insigne ACVV BRONZE (<i>disponible au club</i>)	\$ 5.00
Insigne FAI 'C', écusson de tissu	\$ 4.50
Insigne FAI ARGENT, écusson de tissu	\$ 4.50
Insigne FAI OR, écusson de tissu <i>Les articles 7-12 sont disponibles au président des prix de la FAI</i>	\$ 4.50
Insigne FAI 'C', plaqué argent	\$ 5.00
Insigne FAI ARGENT	\$39.00
Insigne FAI OR, plaqué or <i>Les articles 10, 11 ne sont pas en stock - permis d'achat externe</i>	\$35.00
Insigne FAI OR, 10k ou 14k	
Insigne FAI DIAMAND, 10k ou 14k et diamonds	
Certificat FAI de vol à voile (recueil des insignes)	
Frais de services pour chaque formulaire de demande soumis	
Formulaire de demande pour insignes (<i>disponible au club</i>)	
Formulaire de demande pour observateur officiel (<i>disponible au club</i>)	
Formulaire de demande pour trophées de vol de l'ACVV	
Formulaire de demande pour records FAI	
Formulaire de déclaration de vol de l'ACVV	
ACVV guide des procédures pour FAI certificats et insignes (éd.6)	
FAI Code Sportif, Planeurs, 1992 (<i>cheque payable à l'ACC</i>)	

Votre paiement devrait accompagner la commande. La livraison est incluse dans le prix. TPS n'est pas requise. Les résidents de l'Ontario sont priés d'ajouter la taxe de 8% (les articles 15-17 exempts de taxe). Les articles 1-6 et 13-18 sont disponibles au bureau national de l'ACVV.