

free flight • vol libre

6/88
Dec /Jan



The Canadian Soaring Championships, held at the MSC in Hawkesbury, had bad luck with the weather and managed only five days of flying, with three of those resulting in 100% landouts. The food and facilities were only second to the hospitality and generous spirit of the organizers. Thirty-nine gliders entered the competitions, four of these from the USA and one from the West. Fourteen of the competitors were from SOSA.



Our safety record this year is slightly better than last year with sixteen accidents, which represents approximately \$200,000 in claims. Hopefully it will not cause an increase in our premiums. The Nationals had one accident with a nominal claim — since then as the season progressed, a number of serious accidents occurred, fortunately with no major pilot injuries. The spring start-up usually has a rash of accidents as does the fall period. Why the latter? — probably complacency — a feeling of satisfaction with ones revived abilities and obvious skills allows otherwise disciplined and conscientious pilots to relax and drop their guard, falling into a succession of errors, sometimes resulting in colossal damage. The pilots who had such accidents owe us an analysis of their mistakes, even an article or two for *free flight* so we may all learn or ponder the safety implications.

The AGM for 1989 will be in Toronto, hosted by SOSA. Last year we had a shorter version of the usual AGM by limiting all presentations to a prescribed time, and cutting out subjects better suited to a letter or Zone responsibilities. This allowed two extra hours for workshops. The plan is to improve the workshops and emphasize the “convention” aspect of the meeting by including a few well known speakers, and cutting the actual AGM portion. Much energy is being put into this by SOSA and it will be a very worthwhile and stimulating convention for soaring enthusiasts.

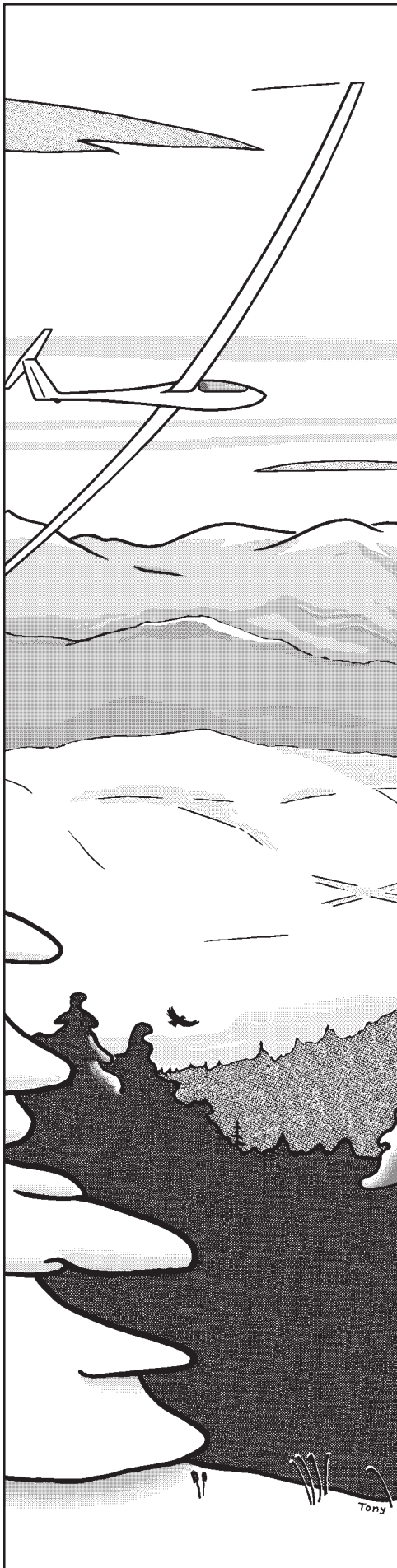
You will see advertised in this issue the American SSA calendar for the same price as offered in the States, which will be \$12.00 (Cdn including postage) and ordered through our SAC office in Ottawa. It is a very much improved calendar with excellent photographs, and includes the main SSA, BGA and SAC events. Thus, in our store we have two calendars, American and German. Surely we will stop there, in any case it will be interesting (in a dull sort of way) to see how they will fare. We do make a bit of money on them, which is rather important these days.

Tony Burton, faithful editor of *free flight*, needs more articles. You have seen his requests for material, but this past year has been a very dry period. This is a shame, for our publication is a refreshing one for Canadians, especially when Canadian stories are available. Every club has someone in it who is a reasonable scribe with a tale to tell. A bit of a push (as a selfless act) to capture someone from your club to meet this request to support Tony and our association's journal, should be a priority.

Our membership is finally over 1300 souls. Imagine, only 1300 people in our country able to enjoy the ethereal joys of soaring! Make a New Year's resolution to do missionary work amongst the uninformed. It would be a pleasant way to bring joy to someone's world and swell our ranks.

Have a Christmas full of merry hours and a New Year of joyous days, high thermals, and safe airmanship.

Gordon Bruce



free flight • vol libre

Trademark pending Marque de commerce en instance

6/88 Dec/Jan

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

- 2 **A Club Cure**
editorial — Tony Burton
- 4 **The Hot Shot**
Your bad example — Don Clarke
- 5 **Building and testing a mobile winch**
Modified 3/4 ton Ford — Dick Vine
- 6 **Completely safe**
Folklore and common sense — John Ashford
- 8 **Recent discovery in Europe**
Leonardo's glider found in cellar — Paton Cleckheaton

DEPARTMENTS

- 3 **Opinions** — Worrying about AIDS, on contests and conventions, cover correction.
- 9 **Hangar Flying** — The KM-400 no-elevator sailplane, naysayers never die, phoning in your finish, on extraordinary German soaring, a Czech boomer, the aerial tadpole.
- 12 **Club news** — Flying in Florida, Bluenose news, student/instructor plaques, a solo baptism, is there life after soaring?, SAC oldtimers identification contest.
- 15 **FAI badges** — accidents, '88 competition seeding list.

ISSN 0827 – 2557

Cover

A drifted-in Blanik waits out the winter at the Edmonton club at Chipman. Photo by Hugh McColeman.

A CLUB CURE FOR A DEARTH OF ENTHUSIASM

Tony Burton

Early in my gliding career, the first sense I had of “post-solo blahs” was of being bored stiff driving a 1-26 in circles over the Gatineau Gliding Club. I then made a conscious decision to abandon the 1-26 for good and fly the club K7 which I always found difficult to coordinate — but I needed a challenge to keep the edge on my enthusiasm for gliding. The greatest boost to my early soaring experience came when the club CFI (John Firth) took me on a two-hour 90 km cross-country to Hawkesbury and back. I’ve always remembered that first feeling of being away from homebase, of having an adventure, while retaining the practical and psychological benefit of the expert behind me to tell me to go faster or get me re-centered in the square thermals. My greatest soaring disappointment came a couple of seasons later when I failed to finish my first long cross-country attempt because no one had told me about final glides — and that it really is possible to glide 40 km back home even though you can’t see it yet. As a result I landed 10 km short by wandering around looking for that last evening thermal. Being told later over a beer that I could have made it home from my last climb really hurt!

All this history is a way of reminding everyone that one cannot stand still in most human endeavours, and this is certainly true of our sport. If you are not actively stretching your abilities (by whatever standards you set for yourself) then you are decaying. It is a fact of club life that the pilots who stagnate after attaining their licence inevitably drop out of the sport. The club racks up one more soul to its sad member turnover statistics, and all the long effort of the instructor has gone for naught. What a bleedin’ waste of time, and what a talent may have vanished!

I believe there is no question that one of the main areas in which clubs fall down is in the lack of *active* post-solo training for the new pilot. Let’s look at him or her for a moment:

- This pilot has only demonstrated to the CFI’s satisfaction that he can take off, glide with some control, and has sufficient circuit judgement to land without incident.
- It is entirely possible that he has not experienced a good thermal climb in training. This pilot knows little about soaring (which is, after all, what this sport is all about), but is in the full flush of a personal triumph — there is still a certain mystique to flying in our blasé times.
- This pilot will now discover that to a large degree he has been abandoned by the club training system and must learn soaring techniques and skills more or less on his own — maybe he can, maybe he can’t.
- This pilot will find that he has almost *no objective* club standards against which to compare his subsequent flying, will not be particularly encouraged to excel, and will probably fly a single seater with such a lousy vario he can barely tell if his thermalling is luck or skill anyway.
- This pilot’s enthusiasm will wither, and he will quit in about one more year.

Folks, the absolutely hottest candidate for long-term membership in your club is your post-solo student with that first flush of flying wonder undiminished. Now what simple, positive things can your club do to keep that person hooked on soaring?

- Start by keeping the attitude right — that their new skills are only the *beginning* of learning the sport. Publish a long list of specific intermediate and advanced gliding and soaring techniques, procedures, and skills to be achieved.
- Give the pilot every opportunity and encouragement to practise these skills. Allow him to proceed at his own pace, but monitor and actively support his continuing progress.
- Have at least one club solo ship reserved for XC which has decent instrumentation, especially a well-compensated vario with a speed ring — how else is our pilot to know if his flying abilities are improving with practice?
- Give the new pilot at least one dual cross-country flight with an experienced instructor (visit a larger club if you have to!). The flight only has to be 20–30 km away but it has the enormous value of literally broadening his horizons, of being the first “safe” experience of soaring out of sight of home, of showing thermals exist out there, and of wonderfully concentrating one’s attention on soaring skills.
- Try the positive feedback inherent in the team approach to progress with a small group of new pilots sharing early training experiences, having competitions like spot landings, sharing crewing for the Silver distance attempt, keeping the trailer ready etc.

So, does your club have a few pilots who don’t show up at the field much any more? You better find out exactly why. If it’s because they are bored with flying, it may say much more about the club operation than the pilot’s state of mind. A serious program of club post-solo training will have many positive benefits: from better pilots, increased safety, a growing membership, and a *lower* instructor workload. Don’t let the enthusiastic newcomer wither on the vine. □



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 which represents 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. Prints (B&W) are preferred, colour prints and slides are acceptable. 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.

All material is subject to editing to the space requirements and the quality standards of the magazine.

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

For change of address and subscriptions to non-SAC members (\$18.00 per year, \$US18 in USA, \$US 21 overseas) please contact the National Office, address below.

President Gordon Bruce
Vice President Harald Tilgner
Executive Secretary Nancy Nault
Corporate Treasurer vacant
Corporate Secretary Nancy Nault

SAC National Office
Suite 306, 1355 Bank Street
Ottawa, ON K1H 8K7
(613) 739-1063

5

Deadline for contributions
5th day of each ODD month

Opinions

L'ASSOCIATION CANADIENNE DE VOL À VOILE

est une organisation à but non lucratif formée de personnes enthousiastes cherchant à protéger 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'ASSOCIATION.

Les articles publiés dans **vol libre** sont des contributions dues à la gracieuseté d'individus ou de groupes enthousiastes du vol à voile.

Chacun est invité à participer à la réalisation de la revue, soit par reportages, échanges d'opinions, activités dans le club, etc. Un "courrier des lecteurs" sera publié selon l'espace disponible. Les épreuves de photos en noir et blanc sont préférables à celles en couleur ou diapositives. Les négatifs sont utilisables si accompagnés d'épreuves.

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 correspondance faisant l'objet d'un sujet personnel devra être adressé au directeur régional de l'ACVV dont le nom apparaît dans la revue.

Les textes et les photos seront soumis à la rédaction et, dépendant de leur intérêt, seront insérés 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 (\$18 par an, \$EU18 dans les Etats Unis, \$EU21 outre-mer) veuillez contacter le bureau national.

EDITOR

Tony Burton (403) 625-4563
Box 1916
Claresholm, Alberta T0L 0T0

Address for courier service:
c/o Claresholm Local Press

COMMERCIAL ADVERTISING
National Office (613) 739-1063

Date limite
le 5 de chaque mois IMPAIR

WORRYING ABOUT AIDS

Open letter to SAC Medical Committee

I am quite concerned about a long time problem in our sport which has been quite hush-hush in the past, as pilots have been too embarrassed to discuss their affliction. Only rumours and whispers have abounded, as a result the problem has not gone away, and I think it is about time that some honest medical advice was openly presented to us in this excellent journal.

I'm referring to AIDS of course, "Aviation Induced Divorce Syndrome." The biggest problem as I see it, which is paradoxical in a way, is that if a person *believes* they may get AIDS, it has a severe affect on their ability to function properly as a pilot, and is often fatal to a continuing ability to fly; but if the syndrome is actually contracted, the pilot can often perform better and may even be a greater asset to the club

All in all, I am getting quite frightened and would like to get some no-nonsense information from you on how I may avoid thinking that I could get AIDS. I have been doing my best to practise safe flying but am worried that this may not be enough. Please help me!

signed,
Alarmed glider pilot

ON CONTESTS AND CONVENTIONS

I have just received your latest issue of free flight (5/88 Oct-Nov) and thought I would sit down with the keyboard right away before my resolve to make a few comments fades. I'm not sure which hat I should have on for this letter so I'll mention a few things in a hatless manner.

First of all, I want to congratulate you on your consistency in getting a quality publication out to the SAC members on a regular basis. As you and I have discussed in the past, this is no mean feat. As editor of SOSA News I appreciate this perhaps more than some. I suppose I should be plugging away at my October issue of the News (it is mid-November as I write) instead of writing this but your recent issue prompts this response.

I should perhaps also apologize to my own club members for my tardiness in getting out the News this year (how's that, eh? — making excuses for a late newsletter in another magazine). My excuse is that I had no idea, as I drove to our annual meeting last February, that I would end up being president of the club, or that the club had such a busy two years ahead. It is one thing to be involved in the administration of a large and active gliding club, but to also be administering the club during a year in

which it is hosting both the SAC AGM and the Nationals is a sure way to cut down on all the board members' spare time.

Which brings me to the real reason for this letter: I read with interest the letter from Andrew Jackson in which he points out that two major Canadian events consistently clash with each other (the Nationals and the Cowley Summer Camp). He figures that this is a ridiculous state of affairs. Three letters before that and about 17 pages apart (nice placement Tony), Bob Gairns has written a letter in which he suggests that the Cowley Camp dates could be changed. Well "HERE'S SOME NEWS, FOLKS", at the first meeting of SOSA's '89 Nationals committee we changed the dates of the contest. The new dates are now June 11–20, 1989. People can take in both events now with time in between to do the driving. I for one would like to see both Andrew and Bob at our Nationals (not just because they are both in the same class). Our major reason for making this change was because of the conflict in dates.

If anyone remembers the Nationals that SOSA hosted in 1982, we have quite a reputation to live up to. We are doing our host to make this contest as exciting and as well run as '82 was, possibly even better. We expect a rather large contingent of US participants and I would like to invite all interested pilots from across the country. Please come sample our hospitality.

The other event that our club is involved with is the SAC AGM and I would like to change the name of that event right now. It is the "1989 SAC ANNUAL CONVENTION and General Meeting". You will note that the emphasis is on the word convention. Here are a few things that will help us make this name change work:

- We are in the process of changing the meeting format so that more time can be devoted to the great workshops and seminars we have planned. Even though we all know that the General Meeting can be very interesting and exciting, no self respecting glider pilot should miss these talks and workshops.
- There will be gliders set up in a display area and most or all of the major glider representatives will be there.
- We will have speakers and personalities on hand that will make it worthwhile travelling to this convention.

Because all of our workshops aren't finalized yet, I won't start mentioning names at this time, but here is a quick overview of how the convention will go. We will have international contest pilots talking to us, a space shuttle commander, FAI

continued on page 14

THE HOT SHOT

Don Clarke
York

Dear Fred:

Well, here I am at a place whose address is not known to a lot of people, but I am sending this letter to you in a plain brown envelope so you can write to me without a lot of people perhaps seeing this letter and seeing where I am and perhaps sending a vigilante gang after me, as the Chief said he would if I ever stuck my nose in the hangar again. Now it was all a "miscarriage of justice" as they say in the courts as I will now tell you. And furthermore, I am not allowed to fly, which is a pity because gliding needs good pilots such as me as examples.

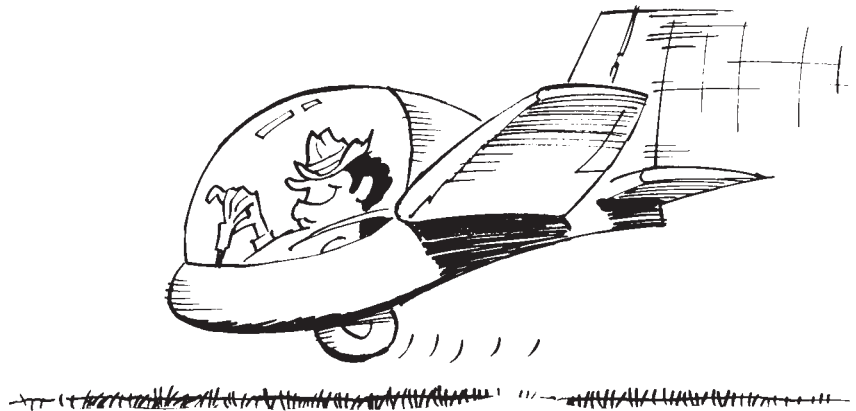
Now as to the events of last week, I think you must agree that it is not fair to have all the good pilots going by the same rules that beginners and those who aren't so sharp on their flying have to obey. What is the use of being a good pilot unless you can do a thing or two out of the ordinary? So you see my point of view and see why the above mentioned miscarriage is wrong and perhaps I should sue for defamation of character on account of the names the Chief said applied to me.

I guess maybe the day got off to a bad start, just because I moved to a high tow position on my first tow when the tug was about 50 feet off the ground. As you know, things can get a little turbulent near the ground, and maybe I did get a bit high, because the nose of the tug seemed to be pointing down a bit once or twice. At any rate, the dumb thermals hadn't started yet, so I was on the ground in a few minutes, but who should come hot-footing it over to me but the tow pilot. He said some things which I cannot repeat to you out of respect to your tender upbringing, but he was so hot under the collar that he was generating a good-sized thermal right on the spot.

So for a while it seemed like it would be better if I mingled until tempers cooled, and as there was quite a crowd taking into flights and instructional flights, I could maybe tell them a few facts about flying. Well pretty soon I spot this babe who seemed to be taking quite an interest in things as she is watching intently as the gliders come and go. So I kind of sidle over and note that she is really quite a knock-out which I would like to be better acquainted with. We exchange a few words and I tell her my name as I figure it is well to start out knowing whom you are talking to, and I tell her all the different places I've been to (I know I haven't been to all of these places, but I know about the gliding that they do there, so it is practically the same thing as actually flying from these places like Black Forest and Pennsylvania and Cowley. "Well," I said, "I am going to fly now, and if you watch me,

I will be in the red glider, and I will show you how an expert can fly." "Thank you very much," she says, "I will be grateful for the lesson."

So I take a tow and the thermals are booming now, and pretty soon, I am at 3000 feet, I figure I will show the lady a loop. (I know I haven't done a loop before, but I know all about them.) Lots of entry speed, so down goes the nose of the 1-36 till the ASI is about 160. I guess I'm kind of scared, but it



is now too late to chicken out. The ground seems to be coming up awfully fast, so I yank back hard on the stick, and hang on. Things got a bit hazy at this point, so maybe I was pulling a few extra Gs. Next thing I know, the horizon is in the wrong place, but I figure maybe this is the top of the loop, so I still hang on. Maybe this was a lucky thing, because pretty soon we seem to be all level again, but going at a good clip.

The next part of my plan was to do a fast beat-up. I was upwind of the field and I could see the crowd watching. So nose down, aim for this side of the crowd, right down the middle of the runway. Worked like charm and I'm moving right along, about ten feet over the ground, and out of the corner of my eye, I get a glimpse of this babe watching things. However, straight ahead I see a 2-33 coming in for a landing, so I move a bit to pass. So it's a student pilot — he should learn to fly in close company — a close pass will just sharpen him up a bit. At any rate, I do a fast pull-up, then a nifty 180 to come in. I figure to come in a bit long, to roll right up to where this gal is, as it always impresses the natives to see how close you can come to them in a roll-out. However, just as I'm rolling along on the ground and start to turn towards the crowd, one wing digs into the ground, and bang! I'm in a groundloop. Of course, somebody had parked a 2-33 too close to the runway, so I kind of dented one wing as the nose of the 1-36 hit it.

Now there seemed to be quite a bit of comment about that, but what the heck? — everyone knows that there are these puller-things that garages use to fix dents in cars, so why not use one on the 2-33? A couple of yanks, and you would hardly know there had been an impact, as they say. However, I was not getting very far with this idea when there was a gawd-awful screech from the CFI who happened to be in attendance. "Look at the dihedral on those wings!" Well, there was a bit of extra slant, now that you looked at the 1-36 from the front. Some smart alec looked inside the cockpit and saw that the drag spar had a sort of a bend in it and everybody started hollering again.

There was a lot of loose talk about pulling too many Gs on the loop and bending the main spar, but I guess they don't make planes like they used to, eh? Besides, a bit more dihedral would stabilize the craft, wouldn't it? So why the fuss? Well, somebody says the Chief wants to see me, so I amble over to the office, but I have a premonition that this will not be a friendly chat, even if it is only about a few minor repairs. But it does not seem to be a friendly chat, in fact, it is hardly a chat at all because it is more of a monologue, except that it isn't even that because the Chief is practically incoherent and I can only understand a few of the words, what with all the spluttering. But I am given to understand that I am not popular, as I said at the first of this letter. But then I notice that there is the babe I was talking to earlier in the office too, and she says, "We have met and you have given me your name, but I did not get a chance to tell you mine, or why I am here. I am an inspector from the Department and I had come to look over the operation of this club. As of right now I am lifting your licence. You will get an official notice later."

So even though I thought it was unethical to use women as inspectors, I figured that there was little to be gained if I stuck around any longer, so I took my leave and thus I am now at the place which is my present address, kind of undercover.

Your gliding pal,
Mort

BUILDING AND TESTING A MOBILE WINCH

Dick Vine
Bluenose

After examining alternatives, a general meeting of Bluenose Soaring Club voted to construct a new mobile single drum winch which would have low maintenance cost, high reliability, and be convenient to operate, service and maintain.

A transfer case was bought in early February, along with a Mercedes three ton rear axle. Both were dismantled, cleaned, painted, and reassembled. It was decided to buy a 3/4 ton pick-up as the base after a BCS general meeting rejected the trailer option in light of previous experience. In the time available, it was impossible to find a 350 cubic inch gas engine truck in good condition. Those we looked at were rusty and not worth repair, since long-term service was one of the central tenets of this project. A 6.91 diesel Ford 3/4 ton pick-up was found. The original asking price was \$12,000 and a deal was finally struck at \$10,600, the box removed and sold.

Construction started in earnest in late February and the transfer case was mounted behind the cab upside down and backwards to give two output shafts to the rear, driven by what was previously the rear drive shaft connection. This position gives the best compromise for drive shaft length and angle.

The gear ratios of transmission, transfer case, and rear axle were measured, and drum size calculated to give steep climb speeds at 2600 rpm, maximum HP output for the 6.91 International diesel. The rear axle was mounted on rectangular steel tubes 2" x 4" x 3/16" wall, above and be-

hind the rear wheels. The wire path runs from the bottom of the drum to the roller guide mounted on a gantry above the cab. The roller guide from the old winch was redesigned and rebuilt to reduce weight since Tost roller guide assemblies were too expensive at \$1700 each. This arrangement allows the driver to sit in the usual seat with all the instrumentation and controls ready at hand designed and built by Ford who are much better at it than we are. An extra large roof window was added to allow the driver to see the glider at release.

To control the drive system through the transfer case, several alternatives were considered. Mechanical linkage was rejected due to complication and the use of excessive space in the cab. The engagement of the wheel drive and drum drive are entirely separate, each has a plunger with a spring-and-ball to maintain engagement. When two small hydraulic cylinders and some high pressure nylon tube were obtained, hydraulic activation became a possibility. It was first proposed to tap the power steering for pressure and activate with solenoid operated four way valves with electric 12V DC switch operation. Although this is straightforward technology, concern for the durability of the power steering system dictated a hand-operated hydraulic system. Two cylinders are mounted side by side and turned into pumps by adding hand levers. Lines to the operating cylinders were arranged so that forward motion engages and backward motion disengages the two plungers. The right lever operates the wheel drive, the left, the drum drive. When the drum drive lever is pulled back, it operates a third cylinder at the rear which applies the drag brake on the drum. The various strokes were adjusted by mounting the cylinders

on the transfer case plungers correctly and by adding spacers to control motion.

The truck brake system is modified to provide power assist braking for the drum and locking system for the front wheels was added. A lever is placed by the driver's seat so that when it is turned "on", with pressure applied to the pedal, this locks the front wheel brakes and maintains pressure constant on the lines. Now, the brake pedal operates only the rear wheel brake and the drum brake. The rear wheels are locked by the parking brake, so that no blocking of the wheels is required when launching. A guillotine is mounted just below the roller guide behind the cab. It's operated by a rope that trips an over center cam to fire the spring-driven hammer.

In future, a double drum conversion can be implemented on the right hand side with activation controlled by hand, as with the transfer case, or by adding a V-belt pulley and pump to the drive shaft to give power activation. Limit switches and pilot lights will be needed to signal full engagement of one or the other drums.

A trailer hitch is provided, and the driver's screen and the roller guide assembly can be stowed on the rear deck if necessary.

The radio communication system consists of two VHF sets with a short range antenna. A press-to-talk switch is affixed to the gear shift. Both receivers are on when the dome light switch is activated: also, a rotating beacon is located on the gantry. (This is inadequate and should be replaced by a xenon strobe.)

The first trial was made in mid-May when five launches were done — enough to realize that the launch speed at max rpm was inadequate. It was discovered that the rear axle ratio was 5:1 and not 2.5:1 as previously measured. This was due to the fact that the ratio was counted through the spider gear system before that system was welded up to give direct drive through the crown wheel and pinion.

After some debate, it was decided to add a tachometer so as to give an accurate measure of engine revs during the launch sequence. This proved difficult and expensive. So, finally, it was decided to increase the drum diameter so the wire speed is the same as the road speed. The drum diameter was increased and the rear axle moved back to clear the rear wheels and the drive shaft lengthened. An extra leaf was added to the rear spring and a vibration problem was resolved by rubber mounts for the transfer case, careful shaft balancing and angle adjustments.

The final trial showed that the winch gives satisfactory launches, but is running flat-out to do so. With two passengers in the K7s, the glider can pull the revs down to give a low launch speed. The operation is smooth and the vehicle works as was intended and is much more convenient than the old winch.

The total work time was about 500 hours, plus about 48 hours of welding time. The total cost is about \$17,000 to date. □



Dick Vine

COMPLETELY SAFE

*Why do airlines achieve what
our organization seems to
find impossible?*

John Ashford

from Australian Gliding

I started some twenty-two years ago. I was told then that the weather only stops gliding once or twice a year, that accidents were rare and in any case only minor damage was likely to result. Gliders were said to have low landing speeds, are made very strong, and all the rest of it.

That same year, gliding was stopped six or seven times due to high winds and rain and someone in another state was killed. This was said to be exceptional. Not long afterwards, the club Kingfisher hit a fence in an outlanding. The damage was substantial and the pilot very lucky not to have been badly hurt. This was also exceptional as a wind change was said to have occurred in the middle of the outlanding. A year or two later, one of our instructors was killed at a national competition due to a mid-air collision (mid-air collisions are not new). This was very exceptional, there was a low inversion and many gliders were towed into the same area, etc.

Over all those years of gliding, there has been a continuous parade of crashes, all over Australia, and sadly, many fatalities and maimings have occurred. I have grown heartily sick of it. We are not completely safe¹ and we are not even improving. So what is wrong and what are we going to do about it?

I fly a lot by Australian, Qantas, and other quality carriers overseas. I have been doing this since age seven with increasing frequency. I am struck by the fact that the possibility of a serious accident never enters my head because it just never happens. I have come to regard the carriers as completely safe.

Why can they achieve what our organization seems to find impossible? They operate in a climate of the most extreme competition and intensive cost pressures. Do you think that it is achieved by unlimited time and money? Is the training and equipment any better relatively speaking than our own?

I don't know much about the airline business except that they have to show a profit and keep to schedules, two restraints we don't have. Perhaps some of our members who are airline pilots might like to come forward and identify those safety-related things which they do that we ignore or are deficient in. Please do it. We might learn something.

I believe we have a most difficult attitudinal problem to overcome, it has taken twenty-one or twenty-two years of gliding for this to surface in me. If it is going to take that long for everyone, we are lost. The problem is that we think the present rate of accidents is "acceptable", that accidents are inevitable and that the errors are made by someone else anyway, so it isn't going to happen to us. It's time to take stock of the situation.

Training There is nothing inherently unsound in our system of teaching people to glide. Over the last four to five years, our training system has been brought to a high level of proficiency and awareness. Club instructors and the national coach are to be commended for their efforts, and visitors from overseas have commented on just how good our system is. If it were deficient, we would long ago have been legislated out of existence or have to work under totally suffocating rules and regulations.

We are not going to fix our problems by having a dozen or so Mike Valentines (*the National Coach*) roaming the countryside. We can also rule out the paid professional instructor versus the unpaid voluntary instructor argument. General aviation have crashes too, so paying to be taught does not fix the problem. (We probably don't pay enough attention to post-solo training, but I believe steps are being taken to improve matters in this regard.)

It is now the job of the general club population to grasp the fact that it is they who must play the major part in an ongoing and unremitting effort to continuously decrease the accident rate.

Equipment You won't find much dangerously wrong with the gliders, but there is a fine line between serviceability and potential lethality where aeroplanes are concerned. We might just have been lucky. Very few of our accidents have been caused outright by an unforeseen airworthiness problem, but some have been caused by the inattention of the people doing the inspections and repair work, some of whom were professionals, so a mistake can bite anyone.

¹ I would define "Completely safe" as no foreseeable possibility of an accident through having done everything possible to avoid it.

² Einstein also made the celebrated quotation "God does not play at dice", think about it next time you say, "Chances are it will be all right".

This is most decidedly an attitudinal problem, if you don't look for something going wrong, it will find you. Unfortunately, this will occur when least expected and most dangerous. We have to be ever vigilant. Quality cannot be inspected into any work, an army of inspectors is no substitute for the man who does his work properly in the first place and looks for all the things which can go wrong and fixes them.

The glider is still an uncomplicated device. Yes, I know we have added water from one end of them to the other, engines, electronic instruments, retractable wheels, flaps and everything else. But it is still relatively easy to see and understand how it all works, what can go wrong and what the remedy is to fix something. Contrast this with a modern airliner. No one person can hope to know it all works. Are we not fortunate by comparison?

Folklore and common sense The folklore of gliding is very strong. Folklore is defined as "traditional beliefs". As for common sense, Einstein² once defined common sense as "all those prejudices which we have acquired by age eighteen." Looked at this way, folklore and common sense, particularly when combined, could be a very potent reason why we won't come to grips with our problems and solve them permanently.

We don't like to surrender traditional beliefs, particularly when our common sense tells us they are good enough. (In Australia we have the blight of "near enough is good enough" and the mythical Mr. Shilby Rite to contend with, "No worries mate, eh!") We could do with being a lot more open-minded, particularly as we grow older and become comfortable with our folklores and common senses. Is it not better to be wrong for part of your life than wrong for an eternity?

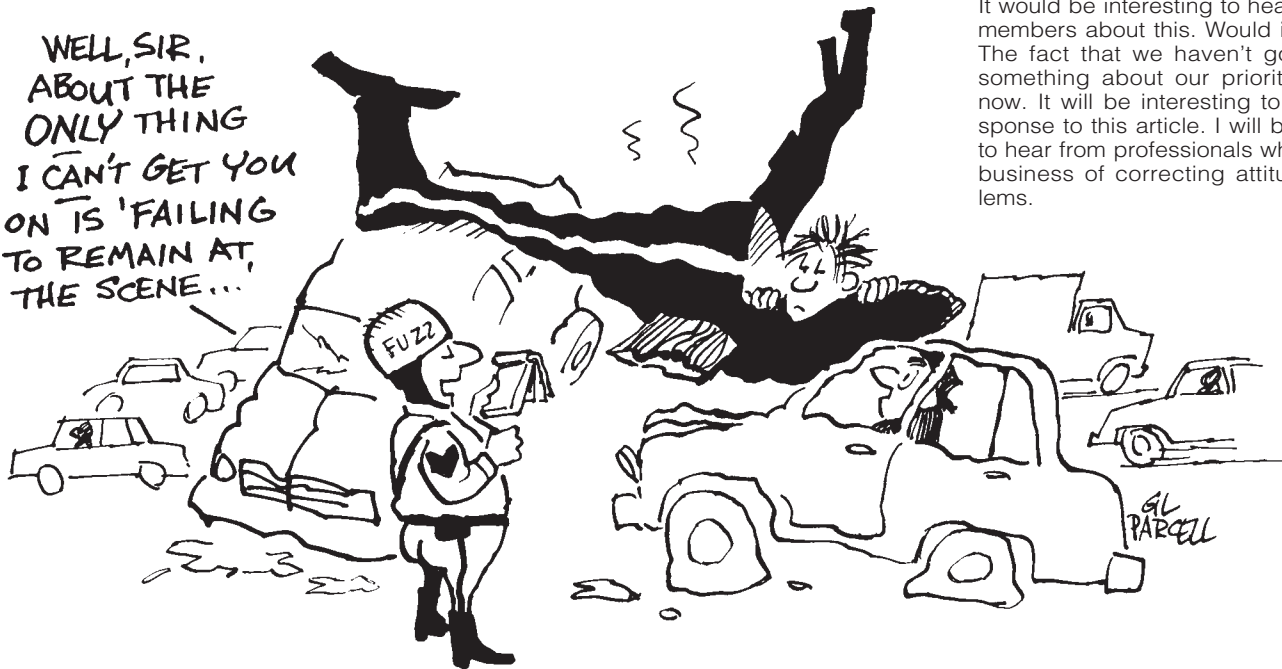
Let us look into all the corners of our Folklore & Common sense armoury and see what we can find that is inhibiting the progress of safety in gliding in Australia. This process could well be applied to the progress of gliding as a whole!

We'll start off with the wheel(s) up landing.

This little item of forgetfulness is usually accompanied by hoots of derision and someone will recite that wonderful little item from the litany of the folklore, "There's them that have done it and them that's going to do it." Some clubs even enshrine the event by having a trophy to present to the poor unfortunate. Wonderful, isn't it. A fundamental flying mistake and you get a trophy for it!

If the pilot didn't put the wheel down, we have to ask ourselves what happened to the rest of the pre-landing check and circuit planning? The prudent instructor would also ask, "I wonder what else this chap might be prone to forget?" and take some strong action about it, do his best to identify it, and eradicate it. In the main, we laugh it off. "Just one of those things." "Probably never do it again, etc." It still keeps happening.

WELL, SIR,
ABOUT THE
ONLY THING
I CAN'T GET YOU
ON IS 'FAILING
TO REMAIN AT
THE SCENE...'



It would be interesting to hear from other members about this. Would it be useful? The fact that we haven't got one says something about our priorities up until now. It will be interesting to see the response to this article. I will be interested to hear from professionals who are in the business of correcting attitudinal problems.

And what about the low circuit? The folklore says everyone will do a low circuit sometime and "properly judged, there's nothing wrong with a low circuit." Then there's the excuses you get: "Very heavy sink on downwind", "balked by another glider", "it wasn't really low, was it?"

By my reckoning, from 1000 feet even the humble Kookaburra flying in neutral air will go about five to six kilometres to the ground. Is the sum of the three legs of a proper circuit ever anywhere near to this? Most of us are now flying gliders far superior to this.

The low circuit starts from an earlier decision to try and reach home when the decision should have been not to, or just plain lousy judgement of angles and distances. The prudent instructor will ask himself, "When this chap goes off cross-country, I wonder how long he will go before making a definite decision to terminate the flight?"

The low circuit ought to be regarded with the greatest of suspicion. It is the start of a decline in flying standards and judgement of the otherwise well-trained and experienced glider pilot and the start of the belief that the modern glider can go on forever³. The low circuit leads to no circuit and then unfortunately to a pile of rubbish in a field somewhere. There's no such thing as a properly judged low circuit. Proper judgement is never having to do one in the first instance.

What do we do? Bit of a reprimand, probably nothing said if it is a senior pilot or instructor. "Every one you walk away from is a good one," says the folklore. We are not always able to speak to the ones who didn't walk away from them. We could go on at great length like this, and we should.

³ Bob Hall has very clearly identified this as a major safety problem in his article in the 5/88 *free flight*. "Is false perception of pilot skills a factor in outlandish accidents?"

We should look into all those stray, strange occurrences which, in isolation "didn't look all that bad".

We should ask the reasons why they happen and whether the explanation is satisfactory relative to the *Instructors Handbook* and the *Manual of Standard Procedures* — not some lesser standard conjured up spontaneously to avoid a conflict, disciplinary action or, more rudely, the need to get off our bums and do something about it.

What will be the result if we allow folklore and commonsense to stand in the way of a move towards a much higher plane of safety standards (excuse the pun). The price we pay for staying as we are or further deterioration is: insufferable regulation (it won't work, but we will get a basin full of it anyway), increasing costs, no expansion in the membership, loss of valuable gliders, and worst of all, loss of some of our most cherished friends.

The prize for making a dramatic and permanent improvement in our safety record will be: an ability to keep regulators and bureaucrats out of our affairs, decreasing costs, an expansion in membership, retention of valuable lives and equipment, and peace of mind.

I am not talking about a bit of window dressing. We've about run out of windows. I am on about a total revolution in the attitude of everyone towards one of striving for the highest possible safety record, not just our present "acceptable" one. *The highest possible safety record is no accidents. Please don't scoff. Go back and read what I said about the airlines.*

Whilst musing over this problem, I observed that in all the awards given in the Gliding Federation of Australia and in my own state association, we do not have one that is specifically given for safety. Maybe we ought to.

I believe that the way of the reformer is always difficult. Even as I write this I can visualize someone getting the pen and paper out to tell us that relative to the ultralights and others we are OK. The statistics freaks will be assembling all sorts of numbers to show that in absolute terms we have improved and others will get on the "accidents are inevitable" bandwagon. Well, before anyone starts, remember when the hang gliders started. They had a dreadful record. Look at them now compared to ourselves. We didn't change.

If you have to think in absolute terms, think of a wrecked glider in a field, and an ambulance. That's fairly absolute. Finally, if accidents are inevitable why the hell would anyone keep flying? Because you don't think it can happen to you, do you?

Everyone at work knows I am a glider pilot, instructor, ground engineer, etc. In fact, my experience has been that the general public know quite a lot about gliding despite the fact that we have publicity demons running around monsterring us to spend heaps of money to tell them. What then is their attitude to us?

(lunchtime conversation)

"Was the gliding good at the weekend. John?"

"Yes, excellent. Some people flew over 300 km and one old geezer flew 500 km for his Diamond badge and it's nearly winter!"

"Well. I often see the gliders there at Bacchus Marsh and Euroa and Benalla and other places and I think it must be wonderful to be up there, no noises, free as a bird, but..."

"What?"

"Well, they still have crashes don't they?" God, I wish the answer was. "NO!" □

RECENT DISCOVERY IN EUROPE

Paton Cleckheaton
Australian Gliding

***...this was no
ordinary plane;
these dusty frames
were Leonardo's
glider.***

AFTER MY research into the activities of Madame Defarge and Les Tricoteuses, I travelled to Italy, where since a disastrous explosion and escape of poisonous gas from a chemical works in the north of the country, there has been a movement away from modern technology, and, at the same time a search for Italian, rather than American, know-how. I found that both impulses have been combined in the production of a new Italian glider, although perhaps it is wrong to call it 'new'.

The 1966 floods in Florence have produced more than one unexpected bonus. Cellars which had not been turned out or even entered for centuries have been explored and, in one such place the remains of a flying machine were found, with plans revealing it to have been a glider.

People in aviation have often wondered why Leonardo da Vinci never designed a glider. With the technology at his disposal, gliding flight would have been possible, but he seemed to have contented himself with drawing fantastic flying machines, birds and parachutes. Now it has been discovered that the great man was hidden in the cellar of a wealthy friend for several months during his stormy career and that he whiled away the time by not only designing, but actually building a glider. Once he was able to escape, he lost interest in the project. It was impossible to remove the glider from the cellar (it is still there), Leonardo never returned to Florence and soon no one even knew of its existence.

Those who rediscovered the machine in 1966 did not know what it was and, but for its size, it would probably have been removed from the cellar and taken away with the rest of the debris from the floods. However, the plans were recognized as being of possible value and were taken to be dried out with many other flood-damaged books and manuscripts. The scholars who sorted and catalogued this material soon recognized Leonardo's famous 'mirror writing' and aviation historians were called in to peruse the plans. They decided that they were of a flyable glider. Careful records had been kept of where all damaged manuscripts came from and a legal battle developed as to who owned these valuable relics of the master genius.

The present owner of the building in whose cellar the plans were found, Signor D'Oro, eventually established his rights over them and was able to sell them to the National Aeronautical Museum for an undisclosed but obviously large sum. He then realized that the large wooden structure which had been left in the cellar might also be of value and looked it over with an antique dealer friend, who fortunately is a power pilot and realized the dusty, neglected pieces were parts of a flying machine. Signor D'Oro established his legal right to it before getting in touch with the National Aeronautical Museum and asking if they were interested in a second purchase from him.

An expert was sent along and realized that this was no ordinary old plane. He called in colleagues, who were working on the

manuscript plans, and they had the great thrill of seeing that the plans had been built from — these dusty frames were Leonardo's glider.

It was decided that it must be studied *in situ*. It would be vandalism or sacrilege to cut up a Leonardo's masterpiece merely to study it in greater comfort in the Museum's workshops.

Signor D'Oro has not sold the remains, he charges the National Aeronautical Museum men for letting them work in his cellar. Because they needed powerful lights and electric sockets for their equipment, they had the whole building rewired at no cost to him and he charges a fee to the tourists who now chatter and walk on a wooden gallery he has had built around the cellar, while the experts try to work.

At first it was assumed that the glider was of wooden construction, although it seemed puzzling that timber had stood up so well to nearly 600 years of damp, fluctuating temperatures and neglect. As they uncovered the structure from its coat of flood-borne oil and ancient grime, it became apparent that it was not made of wood. As a sculptor, Leonardo was of course, familiar with casting of bronze and other metals and indeed made some technical innovations and advances in this field, as in so many others. Yet the structure was too light to be of any metal known at that time and anyway, how would a fugitive hiding in a cellar be able to arrange the casting of large metal structures there? No, if this was a cast construction, it would have to be of some cheap, readily obtainable material whose presence in a household would not arouse suspicion.

Signor D'Oro eventually gave permission for small pieces of the glider to be cut off and removed for laboratory testing. The results were pleasing to every Italian nationalist. What could be more home-grown, more part of 'Italia Nostra' than the material which Leonardo had used to make his glider? It was pasta, cast in moulds (which have not been traced) allowed to cool and harden and then coated with varnish.

As the tourist leaves the cellar gallery, he goes through another room where Signor D'Oro sells souvenirs. Besides the expected photographs of the stages of recovery of the glider, portraits of Leonardo and reproductions of his other works, one can buy facsimiles of the plans and miniature replicas of the glider, mostly made of plastic, but some, more expensive one, of Pasta D'Oro.

Meanwhile, out at the local gliding club workshop, Signor Nanda and some other enthusiasts have nearly completed two full-scale pasta gliders — one from Leonardo's plans and the other to Nanda's own design. Test flights are scheduled for the coming northern summer.

Glider made of this fascinating new material are fully serviceable unless they are allowed to get wet. Hangars and trailers used for storage should be mouseproof. □

Hangar Flying

THE KM-400 FLYING WITH NO ELEVATOR

Designed by Mihály Kesselyák, this experimental single seat sailplane, built and flown in Hungary, is proving the feasibility of controlling pitch entirely with the flap — there is a horizontal stabilizer on the aircraft but it has no elevator.

The general arrangement is a cantilevered shoulder wing, built of mixed materials of light metal and composites. The wing is tapered, and at the trailing edge there are seven segments of control surfaces on each wing. The Schempp-Hirth type spoilers are on the upper surfaces only and are 27% of the span.

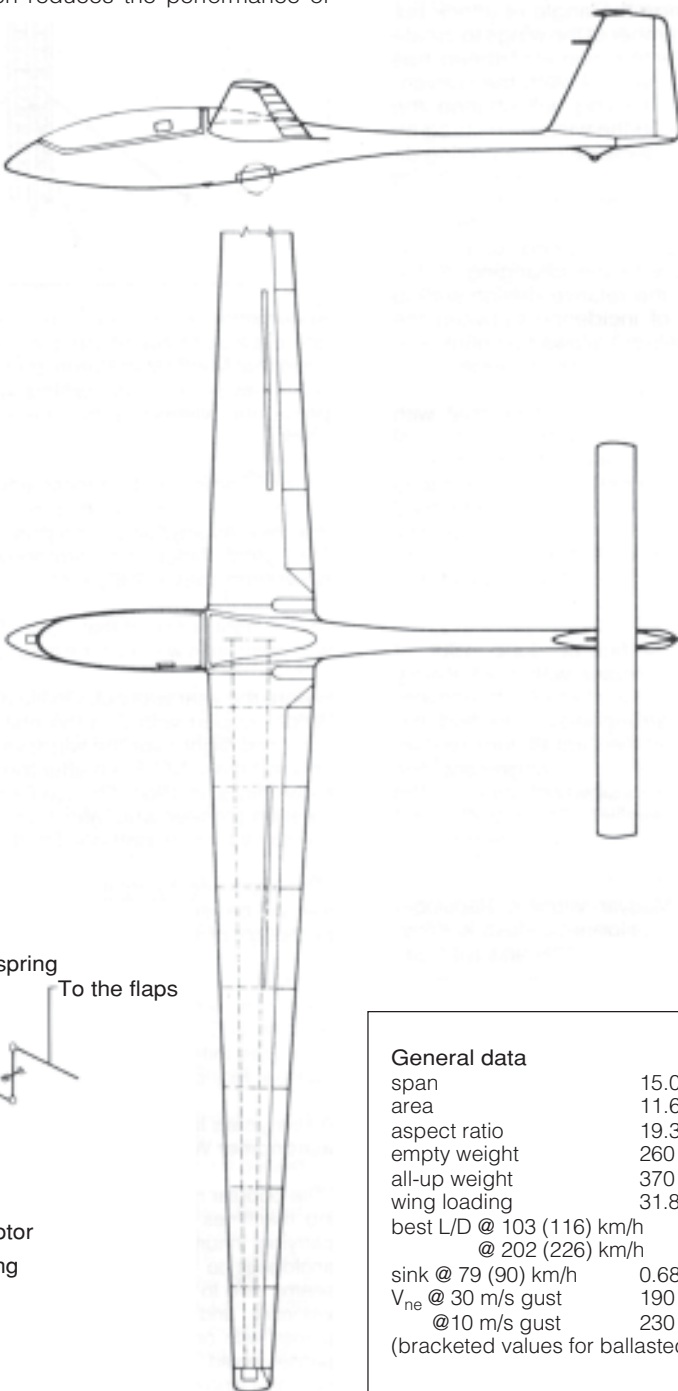
The fuselage around the wings is somewhat flattened, behind the wings the cross-section is drastically narrowed towards the tail. The canopy opens to the side, behind it the fuselage has a plexiglass extension as far as the trailing edges, for better rear visibility. The retractable landing gear is located at the loaded optimum mass center. There is also a small fixed tailwheel. For towing, there are two hooks — one at the front of the cockpit, the other is at the CG point at the bottom of the fuselage. The cockpit contains the usual, conventional-looking controls of stick and rudder pedals. Their purpose and mode of operation is conventional too.

On the vertical stabilizer there is a fixed, narrow "T"-style horizontal stabilizer (having a 1:10 aspect ratio), it only stabilizes the aircraft. In place of the elevator, the segments located at the trailing edges of the wings are used to control pitch. By pushing the stick forward, all of them move together upwards, pulling the stick back all move downwards. As ailerons the right and left surfaces move asymmetrically, the conventional way. These movements are additive, hence at all times the wing trailing edge control surfaces act as elevators, ailerons, and flaps.

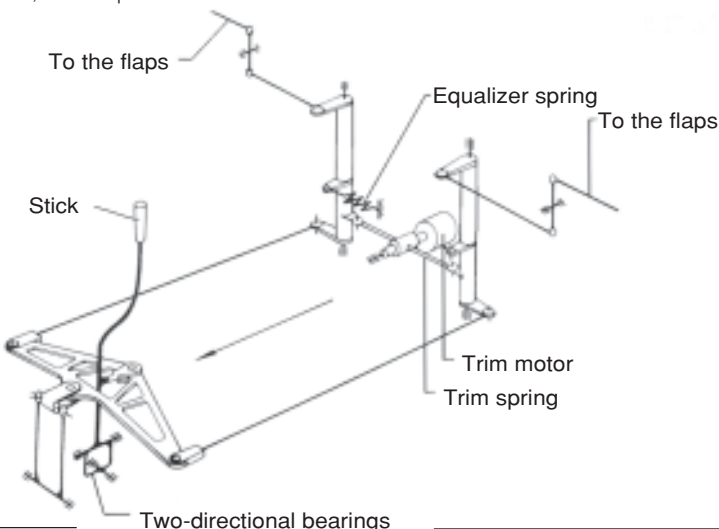
Aerodynamics

Aerodynamics Due to its unique shape, a wing airfoil creates a moment of force that depends on the angle of attack. This “wing moment”, coupled with the mass of the aircraft in respect to the aerodynamic center, applies a head or tail moment to the aircraft. For stable flight, the horizontal stabilizer at the tail will accomplish this work. When the pilot moves the conventional elevator, the aerodynamic balance of the aircraft is changed. This movement on the control surfaces, for the purpose of stabilization, creates induced drag which reduces the performance of

Due to its unique



continued on next page



General data

span	15.0 m
area	11.62 m ²
aspect ratio	19.35
empty weight	260 kg
all-up weight	370 (470) kg
wing loading	31.8 (40.4) kg/m ²
best L/D @ 103 (116) km/h	41.6
@ 202 (226) km/h	20.0
sink @ 79 (90) km/h	0.68 m/s
V _{ne} @ 30 m/s gust	190 km/h
@ 10 m/s gust	230 km/h

(bracketed values for ballasted sailplane)

When we change the angle of attack of the wings with the conventional elevator, apart from the induced drag, the profile drag of the glider changes also. With the "flap steering", the situation is better. By changing the airfoil camber, the lift/drag curve tends to move parallel with itself towards the larger lift/drag coefficients and eventually this will be the correct curve. Therefore with the "flap setting", it is not necessary to change the angle of attack to change the speed (with this system, there is no extra induced drag created by changing the angle of attack). The overall drag on this kind of aircraft can be kept to the minimum over a wide speed range, and the flaps — by the essence of the system — will always be at the optimum setting for the speed being flown.

The fact that the "flap steering" system does not change the angle of attack but changes the camber of the wings to create lift necessary for the change of speed, has further benefits as well. With the conventional system, banking will change the angle of attack on the wings. The drag on the fuselage — because of the varying direction of the airflow — shows a minimum at one particular speed only. This is seen on the speed curve. Since with the new control method the speed change is accomplished with the changing of the wing camber, the relative design setting (of the angle of incidence between the wings and fuselage) allows optimum conditions for a very wide speed range.

Theoretical calculations prove that with this new control system, the longitudinal stability is equal to and, with "hands off", the flight characteristics of this aircraft is better than the conventionally controlled aircraft. There are, however, tests still going on with this aircraft in respect to the size and aspect ratios of the control surfaces, etc.

The KM-400 flew first on June, 1983 at Nyíregyháza, Hungary with pilot Károly Borosnyai. The tests started with conventional control arrangements to find the basic behaviour of the aircraft, then with an ingenious mechanical arrangement, the control system was slowly changed to the "flap steering" system. The KM-400 first flew entirely with the new system in December, 1983.

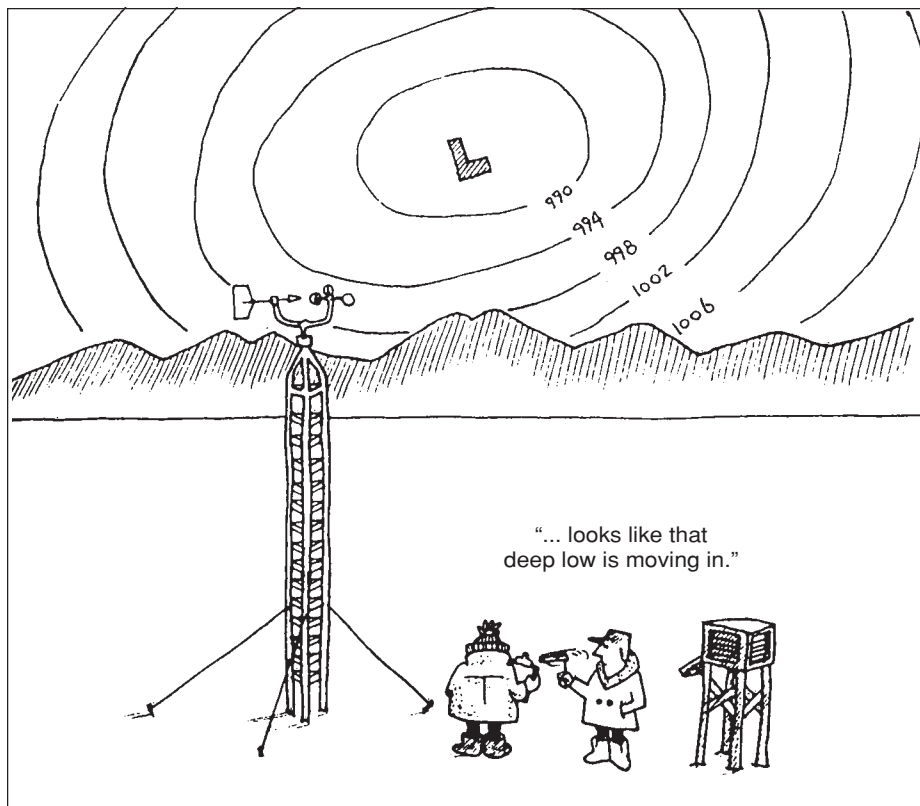
Gábor Jereb, "Magyar Vitorlázó Repülőgépek" (Hungarian Sailplanes), Műszaki Könyvkiadó, Budapest, 1988 ISBN 963-107126X.

Translated by **Csaba Gaal**, York Soaring

NAYSAYERS NEVER DIE

Martin Van Buren, in a letter to President Andrew Jackson in 1829, wrote:

"As you well know, Mr. President, 'railroad' carriages are pulled at the enormous speed of 15 mph by 'engines' which in addition to endangering life and limb of passengers, roar and snort their way through the countryside, setting fire to the crops, scaring the livestock, and frightening women and children. The Almighty certainly never intended that people should travel at such breakneck speed."



Statements like the one above sometimes come back to haunt people. It's a sure thing that Martin Van Buren, then just eight years away from becoming our eighth president, wished he had taken that one back.

Others, while not necessarily against progress, could not picture the flying machine as anything but a passing fancy. The great American astronomer Simon Newcomb said in 1903 that:

"Aerial flight is one of that class of problems with which man will never be able to cope."

Before the year was out Orville and Wilbur Wright coped with it in the first manned, powered flight over the windswept dunes of Kitty Hawk, NC. Even after the epic Kitty Hawk flight, in 1904, Octave Chanute, the aviation pioneer who later had an airfield named after him, persisted that:

"The machines (flying) will eventually be fast. They will be used in sports, but they are not to be thought of as commercial carriers."

Chanute also showed little foresight because just ten years later, in 1914, the first regular U.S. domestic air passenger service was initiated from St. Petersburg to Tampa, Florida.

A few years later, in 1910, the celebrated astronomer William H. Pickering said:

"The popular mind often pictures gigantic flying machines speeding across the Atlantic carrying innumerable passengers in a way analogous to our modern steamships — it seems safe to say that such ideas are wholly visionary, and even if a machine could get across with one or two passengers, the expense would be prohibitive to any but the capitalist who could use his own yacht."

Obviously, Mr. Pickering should have concentrated on the stars. Today, gigantic flying machines such as the Boeing 747, capable of carrying more than 400 passengers, criss-cross the oceans of the world with international businessmen and vacation travellers. A noted British scientist of the time, Prof. A. W. Bickerton, had this to say in 1926 about going to the moon:

"This foolish idea of shooting at the moon is an example of the absurd length to which vicious specialization will carry scientists. To escape the earth's gravitation, a projectile needs a velocity of 7 mi/s. The thermal energy at this speed is 15,180 calories. Hence the proposition appears to be basically impossible."

It's difficult to fault Prof. Bickerton for thinking in 1926 that going to the moon was "basically impossible for who, besides Jules Verne, would have thought the Russians would have a man in space 30 years later. And that the U.S. would have men walking on the moon before 1970.

Martin Van Buren wasn't the only one to "rail" against progress. The following was reported by Egon Larsen in "A History of Invention", published in 1962.

"When they tried to build the first long distance passenger and freight train from Manchester to Liverpool, a great campaign of abuse began. It was claimed that the terrible spectacle of a locomotive rushing by would affect people and animals: ladies would have miscarriages, cows would cease to give milk, hens would lay no more eggs, poisoned air from the engine would kill all the livestock in the district as well as the birds in the trees, and houses along the line would be set on fire by the sparks."

If the tone of that last statement sounds somewhat familiar, it may be because of recent utterances about the supersonic transport; that it would result in the possible death of all fish, birds, and other life forms under its path; or an epidemic of skin cancer from its exhaust emissions; the possible extinction of all life on earth as a result of its flights weakening the protective ozone blanket of the earth; the inundation of all life on earth because its flights might so alter the temperature of the atmosphere that it would melt the polar ice cap.

An advertisement in the New York Times in March, 1970, by the Friends of the Earth organization referred to the SST thusly:

"(SST: 'Airplane of Tomorrow') breaks windows, cracks walls, stampedes cattle, and will hasten the end of the American wilderness."

Naysayers might well profit from the observation made by Sophocles some 2400 years ago:

"One must learn by doing the thing; for though you think you know it, you have no certainty, until you try."

Aviation Week & Space Technology
from Vancouver Soaring Scene

PHONING IN YOUR FINISH

Rick Zabrodski is claiming a soaring first — that of calling contest ground by phone to announce a finish! Flying the club Jantar in this summer's Alberta Provincial contest, the radio failed when on final glide. A licenced Ham radio operator, he then used his hand-held FM VHF radio to connect to a telephone in Calgary and then dial up the Cu Nim number to announce he was on final.

Ursula Wiese, on the finish line, was a bit confused, but he assured her that he had not landed out and will still flying three miles out and closing. It worked!

ON GERMAN SOARING EXTRAORDINARY

from *"The Aeroplane"*, 23 August 1922

The opening days of the Rhön soaring competitions from August 9 to 18 seem to have been attended by unpropitious weather. On August 16, however, Herr Martens made a flight of 18 minutes 45 seconds, including figure eights and circles.

On August 18, the same pilot qualified for the 100,000 Mark prize offered by the "Verband Luftfahrzeug Industrieller" in a flight of one hour, six minutes. He passed the starting line 43 minutes after the ascent and landed ten kilometres to the west, near Weyhers.

On the following day, Herr Hentzen said to be a pupil of Herr Martens and to have flown the same machine, put this performance into the background by a flight of two hours, zero minutes, ten seconds. He cruised in the vicinity of the starting point

for one hour 45 minutes, crossed the starting line and landed nearly at the same place as had Herr Martens.

The conditions to be fulfilled for the award of this particular prize were: that the competitor fly against the wind between two posts on the starting line, 100 m apart, after having been in the air for a minimum of 40 minutes, and that after passing he is to cover a distance from that starting line of at least five kilometres measured in a straight line. The prize is to go to the longest flight, in time, fulfilling these minimum conditions.

When the regulations were published, it was scarcely expected, even in Germany. That they would be fulfilled and the very large margin by which Herr Hentzen has exceeded the minimum requirements is certainly astonishing. There can be no doubt as to the very great lead held by the Germans in this branch of aeronautics.

The qualities which permit flights of this type are: (a) suitable wind conditions, (b) skilful piloting, (c) high aerodynamic efficiency, and (d) great controllability.

The wind conditions are out of human control and this at once puts a limit to the practical value of soaring, at least in most civilized countries. The precise type of skill needed by the pilot may, or may not, be of value in normal flying.

But the qualities required from the machine are qualities required for the efficiency and safety on any aeroplane.

The Germans have chosen to experiment under conditions which call for these qualities of high efficiency and controllability in an extreme degree. They have achieved startling success, and there can be no reasonable doubt that they will be greatly helped in producing military and commercial aeroplanes of greatly improved economy.

This is the important aspect of the German soaring experiments. Nobody with any knowledge of the facts will expect to see the aero-engine disappear in the future on the strength of flights which — so far as pure performance is concerned — are the equal of Wilbur Wright's first public flights in Europe 14 years ago. But one may reasonably look to the doubling of the weight per hp carried by the aeroplane of a few years hence as the direct outcome of the knowledge acquired in these trials.

Submitted by **Dave Baker**
Vancouver Soaring Association

A CZECH BOOMER

When exceptional weather comes, and you're ready for it, great flying can happen, and it doesn't have to be over the desert.

On 24 April 1988, favourable soaring conditions over all of Czechoslovakia produced 23 flights over 300 km, 16 over 500 km, five over 750, and three over 900, all in one day! One of those flights was a 626 km out and return, from the northwest edge of

the country, while two of the flights, to the west, from a centrally located soaring site was a 774 km triangle, and 923 km of what appears (from a rough map) to be a failed 1000 km quadrilateral.

from Seattle Glider Council *Towline*

THE AERIAL TADPOLE

The hot-air balloon, such an elegant craft in many ways, is a thermodynamic disaster. It burns propane at over 1000°C, and just lets this temperature decay to 50°C or less, with no attempt to exploit the heat-flux for propulsive power. The snag, of course, is weight. A conventional gas engine would be far too heavy to be lifted by its waste heat discharged into a balloon.

Now Daedalus plans to use the balloon itself as an engine. His idea is to burn fuel in bursts, so that the envelope expands and contracts, ideally in mechanical resonance. This requires a closed envelope, without the conventional opening at the bottom. In the 'expansion' stroke, pressurized propane is released into the envelope through a valved injection burner, entraining air as it enters and burns. In the 'contraction' stroke the valve closes, and the hot air in the balloon cools and leaks out through the carefully controlled porosity of the fabric. Fins on the oscillation envelope could swim it through the sky like a gigantic jellyfish.

But the radial oscillation of a spherical balloon would not propel it very efficiently, even with very big fins. Daedalus' 'aerial tadpole' variant has a much superior mode of oscillation. Its long, cylindrical Zeppelin-type envelope is divided longitudinally into separate chambers, each with its own injection burner.

Each chamber is stressed just to buckling by internal sprung and tensioned fibres, so that in the cold the aerial tadpole takes up a zig-zag shape; each chamber is buckled in the middle. But the buckling of an inflated cylinder is very sensitive to small differences of internal pressure. If the burner on any chamber is briefly fired, the sudden rise of pressure straightens that chamber convulsively; inertial overshoot makes it buckle in the opposite direction during the subsequent cooling and contraction. So by firing the burners in proper sequence down the balloon, the sequential straightening and buckling of the chambers will create a lateral travelling wave of large amplitude, a huge resonant tadpole wiggle of the whole balloon, which will propel it with great efficiency.

The aerial tadpole will extend hot-air ballooning far beyond mere recreation. It can travel in any direction, even against the wind: it can hover like a helicopter, while being wonderfully silent, safe, cheap, and, of course, delightful to look at. All sorts of short-haul travel lifting and patrolling and aerial joyriding will become simple and easy. Aerial tadpoles may even make flying safe enough for individual commuting, making possible the long-predicted traffic-jam in the sky.

Daedalus, from *Nature*

Club news

IS THERE LIFE AFTER SOARING?

Gordon MacDonald SOSA

Is there life after soaring? Many years ago, sitting on the grass outside a Brantford hangar and watching the sky above, I would have expressed grave doubts that there could be much in life beyond flying. The year was 1964. I had just soloed the 1-26, and for the rest of the day after that flight I felt like I was walking with my feet several inches above the ground. Hardy Nelles, one of my most patient instructors, who was sitting beside me at the time, disagreed about the future. Hardy's estimation was that people remained in gliding an average of only 11 years. I remember looking at him to see if he was pulling my leg (as Hardy was sometimes known to do), but he seemed to be quite serious.

Well, it took me a bit longer than Hardy's average. In fact, it was only after 22 years that I put my wings away (temporarily, of course) to become an Associate member. I did so for a number of reasons, most of them unconnected with flying.

Now that I've had some time to reflect on my decision, what are my feelings? Do I miss flying? You bet! Especially when I see those cu building (how many have I surveyed over the years — all different?), or find myself caught in the sudden breeze from an unleashed thermal or watch, with envy still, the soaring birds circling high overhead. It's not hard to imagine, at such moments, that I have the stick in my hand as the wings respond to the up-rushing air.

While SOSA nurtured my flying interests, it also helped to sustain my love of camping. It never ceased to amaze me that I could put the city and most of its problems behind me on a Friday night — to wake up to a different world with the coming of dawn. I suppose I'm mostly a morning person, which often meant that the best part of the day for me had gone by the time the thermals started! Thus, I was without the natural soaring advantage of people who reach their peak only later in the day like my former sailplane partner.

However, my early morning proclivity was good for instructing. And instructing was good for me — it may even have been good for my students. I do know that it was very gratifying to watch their skills develop, and to try to give them the combination of guidance, encouragement, and the freedom to make it all happen.

Of course I managed to sneak away from time to time for some personal flying. One of the most memorable experiences of my life was my first flight in wave. It was straight out of the textbook, sitting there in perfect smoothness and solitude — I was captivated by the altimeter winding all the way to Gold and beyond with the world becoming smaller and smaller far below. And there were other flights — "personal" cross-countries that sharpened my skills and, often enough, reminded me how much there was yet to learn.

continued on next page



Angus Livingstone

A perfect solo baptism! Karen Ostrom and Bruce Feuchuk of Vancouver give a precisely-timed wash to Claude LeBlanc after he survived his first flight alone at Hope, BC.

FLYING IN FLORIDA

During our winter, it's difficult to continue to inch line in our exciting sport. Some of us however do venture south to escape the cold and snow, or take a Christmas vacation. Unfortunately, gliding clubs are not normally found next door to beach-front hotels. The idea of writing this came to me when a fellow Champlain member asked where I flew in Florida. I would also like to tell readers about an American club operation, Tampa Bay Soaring Society, their policies and fee structure. I hear some Ontario pilots have flown there already, so I hope this is informative for most free flight readers.

Tampa Bay Soaring Society is at Pilot Country Airport (Hwy 41 and SR 52) about an hour north of Tampa, Florida and they fly on weekends and Wednesdays. Their telephone number is (813) 996-2909, and their current president is Peter Espenlaub (961-3571). The fee structure is:

Lifetime	\$US 250
Monthly	25
Sailplane rental (1st hour)	5
- no set fees for over an hour -	
Tow — 2000 feet	15
Instruction, per hour (\$6 min.)	12
Sailplane rides	45

Hardware: 2 Blaniks and a Lark

The airport manager also rents a 2-33 in very good shape to the club and visitors

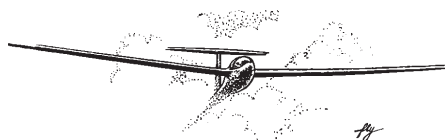
(\$24/hour). You must have a valid USA licence, which is available from the regional FAA office at the Clearwater airport on presentation of your MoT licence.

On Wednesday 24 Feb 1988, I was checked out for the back seat of the 2-33 and then I was able to give a ride to a power pilot friend who loans his J-3 to me. We managed to climb to 3600 feet the highest of the day. Cloud base was at 3500 and the conditions only lasted a couple of hours. I was there again on Saturday at one, when Peter started giving rides in his Twin Astir. It was mostly blue with small puffs dissipating as soon as they formed in 10-20 mph winds from the northwest. I worked out a deal to fly the Blanik with an instructor. Thermals were scarce and yielding 50 ft/min at best — needless to say, both my flights were short. Nonetheless, they were fun and added to my experience.

Few Canadian pilots have the luxury of keeping their hand (and feet) in soaring during the winter. Should Club Med include soaring in their resort package?

PS There is also another club in the area that I didn't get to — at an airfield near Winter Haven (about an hour's drive east of Tampa), where you may also be able to rent (813) 299-8689 or 293-2501. Check it out.

Boris Mospan
Champlain



An aspect of SOSA that I miss, perhaps most of all, is the companionship. Soaring works as a great equalizer, it matters not what you do for a living or what your background is, it only matters that you share a common dedication to flying. If, like many people, I had confined my friendships to neighbours or business acquaintances, I would have missed a lot. I am truly richer for the SOSA experience.

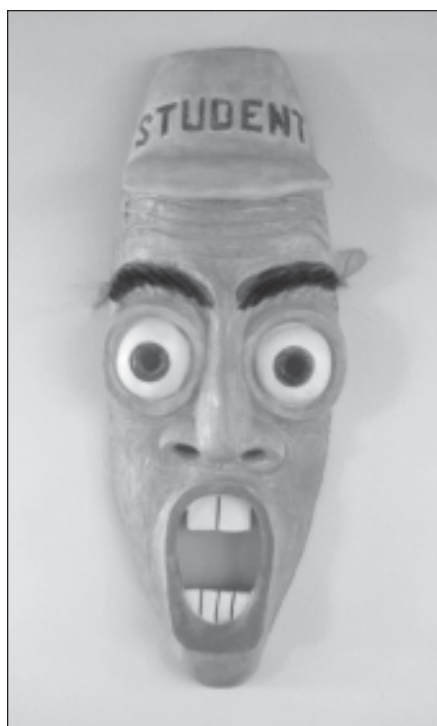
Well, if SOSA was so good for me and to me, why don't you see me more often at the flightline? Only because there are compensations. In fact, some things have taken on an even broader dimension. I continue to enjoy my camping, but now I am no longer limited to a particular place and time. I still wake up at the first hint of

dawn, but I don't have to race out to sign the book! More seriously perhaps, I no longer feel the responsibility of being there, every weekend, because people depended on me (as I depended on them).

Interestingly, the weather has taken on a new dimension too. I've discovered that I can enjoy more than one kind! Have you seen for example, that a high cirrus sky — anathema to active soaring pilots — can lead to an exciting and beautiful photograph? That even a gentle rain can be pleasurable, rather than making the day a failure?

By the way, in case you are wondering as to the cause of all these musings, I was asked during a recent telephone conversation if I would be coming back to fly and the innocent question led to this. Is there life after soaring? My answer is a definite YES. Will I be coming back for another go? Chris, I don't really know . . . Was that a thermal, just now, outside the window?

from SOSA News



Thought you might get a chuckle out of these 14" high ceramic wall hangings made by Norm Taylor of the Winnipeg Gliding Club. A most suitable place has been found for them beside the fireplace in our new clubhouse. Mike Maskell

BLUENOSE NEWS

BSC has had a pretty good year — ten good students, all but three soloed and some licenced already. It's been great to have Graham and Hope back from the Arctic. He's a first-rate CFI — unflappable and sees everything!

We lost a lot of members last year, but are up to 35 again with some licensed air cadet pilots with us for the first time ever. I did a 300 km in C-GUIL (*Open Cirrus*) this year, undocumented unfortunately. The

day turned out much better than expected, had one near landout but clawed my way up and got back easily from then on.

Hope to do some ridge flying in the (*Annapolis*) valley now that we can take the winch plus glider trailer on the highway. Our launching site next to the ridge is very short so it will be twitchy with the big birds although the K8s will be OK.

All the best from the east.

Dick Vine

SAC DIRECTORS & OFFICERS

PRESIDENT & DIRECTOR-AT-LARGE

Gordon Bruce (1987)
154 Shannon Pk,
Beaconsfield, PQ H9W 2B8
(514) 697-1442 (H)

VICE-PRESIDENT & PACIFIC ZONE

Harald Tilgner (1988)
90 Warrick Street
Coquitlam, BC V3K 5L4
(604) 521-4321 (H)
(604) 263-3630 (VSA)

ALBERTA ZONE

Al Sunley (1988)
1003 Keith Road
Sherwood Pk, AB T8A 1G2
(403) 464-7948 (H)
(403) 453-8330 (B)

PRAIRIE ZONE

Paul Moffat (1988)
1745 King Edward Street
Winnipeg, MB R2R 0M3
(204) 633-5221 (H)
(204) 947-9400 (B)

EXEC SECRETARY

Nancy Nault
306 - 1355 Bank Street
Ottawa, ON K1H 8K7
(613) 739-1063 (B)

ONTARIO ZONE

Dixon More (1987)
27 Roslin Ave South
Waterloo, ON N2L 2G7
(519) 886-2424 (H)

QUEBEC ZONE

Alex Krieger (1987)
1450 Oak Avenue
Sillery, PQ G1T 1Z9
(418) 681-3638 (H)
(418) 656-2207 (B)

MARITIME ZONE

Gordon Waugh (1987)
5546 Sentinel Square
Halifax, NS B3K 4A9
(902) 455-4045 (B)

DIRECTOR-AT-LARGE

Chris Eaves (1988)
185 Canterbury Drive
Dorchester, ON N0L 1G0
(519) 268-8973 (H)
(519) 452-1240 (B)

TREASURER

vacant

COMMITTEES

AIR CADETS

Gordon Bruce
154 Shannon Park,
Beaconsfield, PQ H9W 2B8

AIRSPACE

Dave Tustin
581 Lodge Avenue
Winnipeg, MB R3J 0S7

FLIGHT TRAINING & SAFETY

Ian Oldaker
135 Mountainview Rd North
Georgetown, ON L7G 3P8
Mbrs: Mike Apps
G. Eckschmiedt
John Firth
Denis Gauvin
Fred Kisil
Alex Krieger
Paul Moggach
Manfred Radius
Richard Vine

PUBLICITY

Grant Graham
966 Glenbanner Road
London, ON N6E 1N2

SPORTING

Colin Bantin
1374 Avenue Road
Toronto, ON M5N 2H4
(416) 483-9608

Mbrs: Robert DiPietro
Wilf Krueger
Al Sunley
Hal Werneburg
Ulli Werneburg

• CONTEST LETTERS

Robert Binette
3819 Berri
Montreal, PQ H2L 4H2

• FAI AWARDS

Larry Springford
45 Goderich Street
Kincardine, ON N2Z 2L2

FREE FLIGHT

Tony Burton
Box 1916
Claresholm, AB T0L 0T0

HISTORICAL

Christine Firth
542 Coronation Avenue
Ottawa, ON K1G 0M4

INSURANCE

Bryce Stout
2244 Belfast Crescent
Mississauga, ON L5K 1N9
Mbr: Al Schreiter

MEDICAL

Dr. Peter Perry
695 Coronation Blvd
Cambridge, ON N1R 7J9
Mbr: Dr. W. Delaney

METEOROLOGY

Larry Hill
Box 234
Kars, ON K0A 2E0

• FAI RECORDS

Russ Flint
96 Harvard Avenue
Winnipeg, MB R3M 0K4

STATISTICIAN

Dennis Miller
108 Midcrest Cres. SE
Calgary, AB T2X 1B5

TECHNICAL

Herbert Lach
330 Banting Street
St. Bruno, PQ J3V 1Y3

TROPHIES & CLAIMS

George Dunbar
1419 Chardie Place SW
Calgary, AB T2V 2T7

WORLD CONTEST

Al Schreiter
3298 Lone Feather Cres.
Mississauga ON L4Y 3G5
Mbrs: Hal Werneburg
Bruce Finlay



THE SAC OLDTIMERS IDENTIFICATION CONTEST. This photograph is from the SAC AGM in Montreal, probably 1951. **free flight** has already identified Paul Schweizer, Brother Hormisdas,

Hank Janzen, "Shorty Boudreault", "Chem" Le Cheminant, and John Agnew — but who are the rest? A copy of this photo will go to the SAC Historian with as many names as you can give us. ed.

OPINIONS .. continued from page 3

executives giving talks, government experts on interesting topics, a soaring in the Olympics update, and an Alcor project update. We will also have miniature and full size aircraft on display. Just to give you an idea of the kind of participation we are looking at, Helmut Reichmann said he would have loved to participate, but his classes started at that time and he could not make it. He did say that maybe next year he could fit something in for us. This convention will have world-renowned aviation people participating — in other words, it is going to be a fun weekend.

Prizes will include a slim-pack parachute, donated by Niagara Parachutes, and some simulator time.

Well, Tony, I hope you can see that this is a pretty active year for SOSA. And to top things off, we have just finished a flying season that is the best that we have had for at least a decade. The club has even done its first full-fledged airshow for the Rockton World Fair (no kidding, this fair gets about 100,000 people over the Thanksgiving weekend). Now, if Rebecca can keep correctly reminding me which committee meeting is next, I'll get through the next year or so with no problems.

Paul J. Thompson

A COVER CORRECTION

As the pilot pictured on the cover of 5/88, I would like to point out that the sailplane (C-GIAK) belongs to the Rideau Valley Soaring School (RVSS aka Kars).

Dugald Stewart
SOSA

Coming Events

Jan 11 **Glider Pilot Ground School**, 10 sessions. Wednesdays, 7–10 pm at Bathurst Heights Secondary School, Toronto. Registration details (416) 789-0551. Course instructor, Paul Mogach (416) 656-4282.

Mar 3–5 **SAC AGM**, Toronto. Prince Hotel, 900 York Mills Road. Reservations and details on page 16.

Jul 11–20. **Canadian National Gliding Championships**, Rockton ON. Practice 8–10 July. For more info contact Helmut Buchholz, 2362 Shaver Road, R.R. 2, Ancaster L9G 3L1, (416) 648-5433 (H). 575-1666 (B).

Variometer / Calculator

"Varicalc-1" Only \$500.00

Versatile pressure-transducer / microprocessor based Variometer and Final-Glide Calculator

photo unavailable

Digital Averager
Speed to fly
Variable Damping
Adj. Dead-band Audio
Alt. Compensation
Wet/Dry Polar

Key in:
– Distance, Wind
Provides:
– Min. Height
– Best Height
– Suggested Ring

SKYTRONICS

45 Carmichael Crt, Kanata, Ontario K2K 1K1

F. Vaughan (613) 820-3751
D. Bonnière (613) 592-0657

FAI Badges

Larry Springford
45 Goderich Street
Kincardine, ON N2Z 2L2 (519) 396-8059

The following Badges and Badge legs were recorded in the Canadian Soaring Register during the period 1 September 1988 to 31 October 1988.

DIAMOND BADGE

72 Peter Masak York World Number 4439

GOLD BADGE

242 James Beattie Kawartha
243 Graeme Craig Regina

SILVER BADGE

760 Gary Bozek Regina
761 Iain Colquhoun Cu Nim
762 Ron Feyerabend COSA
763 Toni Lindschinger York

DIAMOND GOAL

James Beattie Kawartha 308.6 km Cobra Omeme, ON

DIAMOND ALTITUDE

Serge Woinowsky-Krieger Quebec 6250 m Pegase 101 St. Auban, France

GOLD ALTITUDE

Gary Bozek Regina 3290 m Club Astir Estrella, AZ
Graeme Craig Regina 3190 m H301 Libelle Cowley, AB
Serge Woinowsky-Krieger Quebec 6250 m Pegase 101 St Auban, France

SILVER ALTITUDE

Gary Bozek Regina 3290 m Club Astir Estrella, AZ
Richard Grocholski York 1036 m Std Jantar Arthur, ON
Iain Colquhoun Cu Nim 1760 m 1-26 Black Diamond, AB
Michael Thompson Vancouver 2036 m Blanik L-13 Hope, BC
Roger Harrop Air Sailing 1200 m ASW-20 Belwood, ON
Cesare Gnechchi-Rusconi Rideau Valley 1300 m Puchacz Kars, ON

SILVER DISTANCE

Gary Bozek Regina 62.5 km Club Astir Estrella, AZ
Iain Colquhoun Cu Nim 75.0 km 1-26 Black Diamond, AB
Ron Feyerabend COSA 61.7 km Astir CS Chemong, ON
Toni Lindschinger York 61.6 km 1-23 Arthur, ON

SILVER DURATION

Gary Bozek Regina 5:15 h Club Astir Estrella, AZ
Daniel Tennisco Kawartha 5:12 h Astir CS Omeme, ON
Mike Read Toronto 5:34 h Ka6CR Conn, ON
James Green Toronto 5:08 h 1-26D Conn, ON
Ed Hollestelle Jr. SOSA 5:15 h 1-26 Rockton, ON
Roger Harrop Air Sailing 5:34 h ASW-20 Belwood, ON
Ron Feyerabend COSA 5:12 h Astir CS Chemong, ON

C BADGE

2137 James Green Toronto 1:02 h 2-33 Conn, ON
2138 Alex Smith York 1:07 h 1-26 Arthur, ON
2139 Ed Hollestelle Jr. SOSA 5:15 h 1-26 Rockton, ON
2140 Michael Thompson Vancouver 5:18 h Blanik Hope, BC
2141 Thomas McWhirter Erin 1:05 h 1-26 Grande Valley, ON
2142 Jean Richard Outardes 3:31 h Ka6B St. Esprit, PQ
2143 Adrian Burtenshaw Air Cadet 1:09 h 2-33 Mountainview, ON
2144 Roger Harrop Air Sailing 5:34 h ASW-20 Belwood, ON
2145 Robert Cooper York 1:11 h 1-26 Arthur, ON
2146 Lloyd Weber SOSA 1:39 h 1-26 Rockton, ON

ACCIDENTS

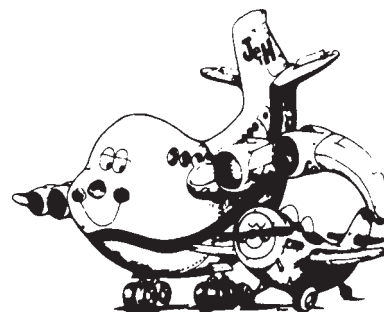
K7, C-GGHL, 2 Oct, Prince Albert. Heavy landing. Slight rear fuselage damage, \$1-2000.

BLANIK, C-FYSR 17 Oct, Erin. Flying at Sugarbush, VT. landed extremely heavily in turbulent circuit conditions. Front seat pilot sustained cuts, rear seat pilot was cut out of fuselage due to suspected back injuries. Aircraft a write-off. \$17,000.

Total claims to date (and hopefully final) \$170,000. Previous years: 1985 — \$161K, 1986 \$129K, 1987 — \$209K.



We're big and small in aviation.



Johnson & Higgins Willis Faber Ltd. handle a major percentage of the world's aviation premiums. We cover them all — from fleets of jumbo jets to classic Cubs. And our list of aviation clients continues to grow, as a measure of our ability to handle complicated insurance of any kind.

Big or small, in the air, on the ground, or on the ocean, complicated or straightforward — whatever your insurance problems are, we'd like a crack at them. For the finest, most complete coverage possible, come under our wing.

Johnson & Higgins Willis Faber Ltd.

Box 1010, Scotia Place, 40 King Street W, Toronto, ON M5H 3Y2
Tom Stacy (416) 867-4304, Tony Wooller 867-4400, FAX 867-3913

1988 COMPETITION SEEDING LIST

The following (truncated) list is the latest update to the national ranking of competition pilots following the 1988 Nationals. The top twelve pilots comprise the Canadian team squad, from which the team pilots are selected for the next world contest in Austria in 1989.

The score given each pilot is a maximum of 100, 70% of which is contributed from the placing in the recent Nationals and 30% of which is contributed from the best placing of the prior two Nationals.

1	Ulli Werneburg	91.09	22	Dave Mercer	45.21
2	Jörg Stieber	87.53	23	Robert Binette	40.34
3	Ed Hollestelle	86.73	24	Robert DiPietro	36.31
4	Wilf Krueger	85.71	25	Andy Gough	36.27
5	Jim Oke	85.49	26	Dave Frank	34.34
6	Harry Pölzl	78.42	27	Jim Carpenter	29.00
7	Ian Spence	75.59	28	Dave Webb	28.43
8	Chris Wilson	74.65	29	Jos Jonkers	27.86
9	Stan Janicek	72.47	30	Mike Apps	26.88
10	Walter Weir	71.41	31	Larry Hill	26.02
11	André Pepin	70.98	32	Peter Masak	24.73
12	Nick Bonnière	70.57	33	Larry Springford	24.62
			34	John Firth	23.81
13	Colin Bantin	69.70	35	Kevin Bennett	23.79
14	Bob Gairns	63.38	36	David Hogg	23.36
15	Karl Doetsch	60.87	37	Tony Burton	21.98
16	Stewart Baillie	60.33	38	Walter Pille	21.14
17	John Featherstone	59.98	39	Brian Milner	21.01
18	Ian Grant	55.21	40	Bruce Hea	20.77
19	Paul Thompson	52.82	41	Dave Marsden	19.25
20	Walter Herten	52.50	42	Colin Tootill	17.63
21	Bryce Gormley	48.21	43	Tom Okany	16.71

Is the 1989 SAC Convention & AGM for you?

Meet Other
Soaring Enthusiasts

GUEST SPEAKER:
Vance Brand
NASA Shuttle Pilot

Learn How To
Better Market Your
Club

See The Latest In
Sailplanes and Equipment

Participate In The
Growth Of Soaring In Canada

Attend Workshops On
Cross-Country Flying And
Other Areas Of Interest

**AND
MUCH
MORE**

It's for all of us!

Note: Trading Post and
back cover pages omitted.

See You At The Prince Hotel, Toronto, March 3, 4, 5, 1989

Reservations: 1-800-268-7677. Look for the brochure outlining
program events and registration in your mail in early February