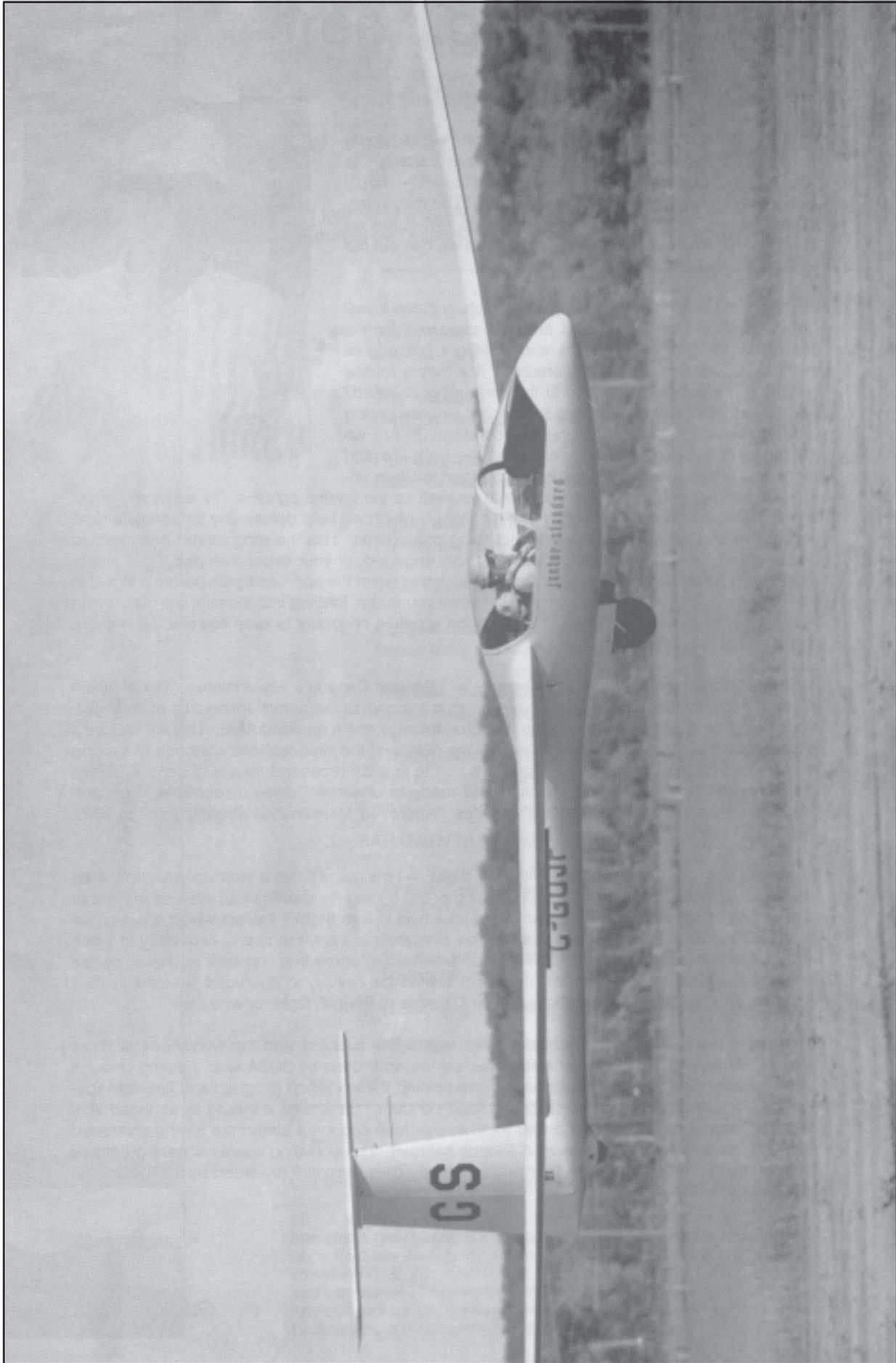


free flight • vol libre

2/89
Apr - May

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POTPOURRI

NOT ANOTHER paragraph on safety! Surely we are doing quite well and need a rest from this constant carping. Is \$200,000 of claims so low we can rest on our laurels? Hardly – we must strive for a zero accident rate and, to do that, safety must be a way of life and always in our mind. What are we doing in SAC which needs to be improved so we can cut our accidents substantially?



Start from the beginning of a flying day which includes a well rested mind and body, well fed and well prepared for the coming flight. Are your checks and pre-flight procedures methodical, uninterrupted and thorough? Are they a routine thing with not sufficient attention to the item being checked? Are they so swift and so attached to rote that you are seeing what you want to see and not the real conditions? Are we rushing people when a vacancy exists on the flight line and pilots and gliders are quickly pushed into place to fill an unexpected tow opportunity? Do you say to yourself as the towline tightens, “fly safely my friend and pay attention during each minute of the flight,” which will help defuse any tendency to drop your guard and accept less-than-perfect flying procedures. Has the wing runner been trained properly and noticed your canopy lock isn’t fully engaged, or your expensive yaw string instrument is jammed in the canopy joint? Does he look back over the approach path before a signal to takeoff is given? Is your canopy dirty which when you return, landing into the sun, will distort your view? This can go on forever and illustrates the absolute necessity to keep self discipline sharp and attentive to piloting detail.

A plan to take advantage of recent changes in Transport Canada’s Airworthiness Manual which allows the training of suitable people in each club to conduct the annual inspection of their gliders is being developed by Chris Eaves, Director-at-Large and a qualified AME. This will require a presentation to Transport Canada to review the details of the proposal and methods of training the selected people as approved inspectors and to include proposed means of control. When the inspectors are trained and qualified and ready to undertake these inspections, Transport Canada will then consider granting the status, “Approved Maintenance Organization” to SAC. This will take time.

How does your club communicate with *free flight* — how many times a year do you submit an article letting us all know how you are operating, or describing the details of an interesting flight or club activity? Some large clubs haven’t had an article in *free flight* for years which is a pity, for their accomplishments and mistakes would be of interest to many members, especially to those who have moved about our ambulating land. Most would agree that first-time submissions are amongst the best stories and new members should be actively encouraged to send in their thoughts, suggestions or descriptions of their C badge or Silver C flight, or whatever.

The Annual General Meeting and Convention was a fine success with the workshops at times filled to overflowing. This kind of spirit reflected the work done by SOSA who, running under a new concept, showed much imagination in developing the workshop program and fine management ability in bringing together such a broad concept. It is also a tribute to all those who attended from all parts of Canada (the weather was foul) and even turned out for the shortened AGM the morning after a well attended Awards banquet. The workshop speakers were great and brought much professionalism to their presentations. They were well rewarded by a large turnout and warm applause.

Have an enjoyable summer with a good proportion of your wants and dreams satisfied. Fly safely for all our sakes.

Gordon Bruce

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Trademark pending Marque de commerce en instance

2/89 Apr/May

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

ISSN 0827 – 2557

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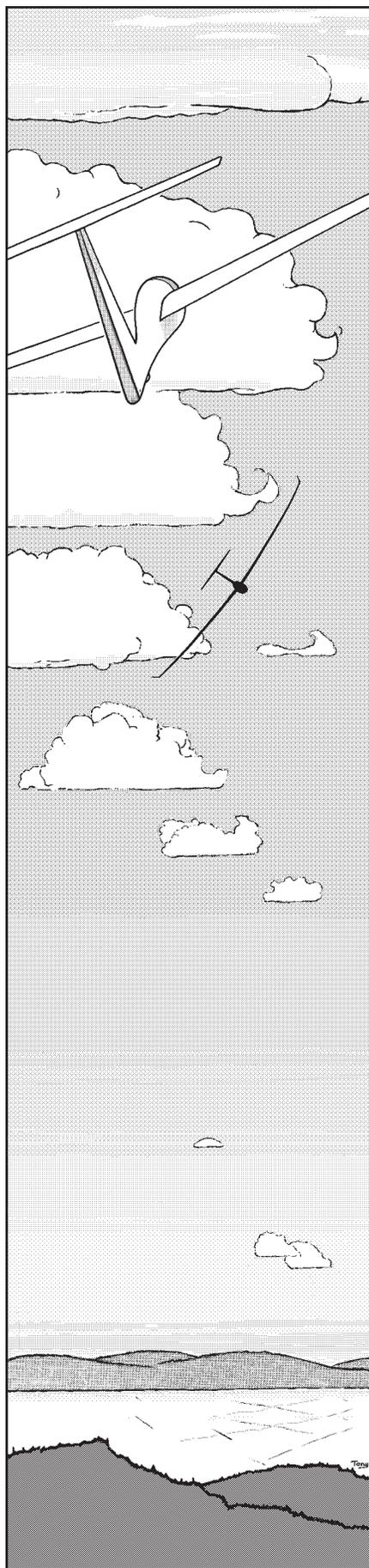
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Cover

Golf Sierra on short final at Hawkesbury.

Photo by Mona Chokly

PS A strange coincidence and a wrong photo credit for last issue's cover. I gave credit to Hugh McColeman, who told me it couldn't be his because he never went to the Red Deer Airshow. I said it must be his because it was on his negative strip containing the Blanik photo of 6/88. Then Rod Crutcher of Cu Nim phoned up and said that was his slide from the Abbotsford Airshow. I did use Rod's slide – and they both took exactly the same photo at the same moment from almost the same location without knowing of each other's presence. Tony



SATURDAY MORNING, at home and feeling down. Why this feeling of melancholy? A year ago to the day, I was at the funeral of an old friend. A friend who I had taken flying on a few occasions and who had often expressed an interest in gliding. I'd encouraged him to go to the club (a few minutes from his home) to try it for himself. However, like a lot of other things in our lives, he never got around to it, and now he's gone.

Another reason for my melancholy feeling is the weather. It's a beautiful spring-like day. Sun shining, temperature forecast to go to +5°C with light winds from the SW gusting to 30 km/h. Small, low level cumulus quickly develop and almost as quickly disappear. The ground is bare, not a snowflake to be seen anywhere. I have to look at the calendar to remind myself that it's the middle of January.

In the summer it's weekends spent flying, in winter it's weekends spent cross-country skiing. The summer of '88 saw very little flying because of the lack of a towplane; and the winter of '89 looks like it will see very little skiing because of a lack of snow.

The phone quickly changes my mood. The club President is on the line; he's rounded up some other Rideau Gliding members who are eager to try some mid-winter flying. Could I tow?? By the time I get to the field, three of our members are already there, and the word is that three or four more are on their way. However, there's one problem. Since we shut down for the winter, two helicopters and their maintenance shed have taken up residence in the hangar. This reduces the space we use, and access to most of our equipment is blocked. It's going to be difficult to get anything but the towplane and the 2-33 out of the hangar.

The next question, will the towplane start after sitting in the hangar for two months? After a couple of attempts the engine catches, oil pressure comes up and it soon settles into an even beat. As I taxi out to the runway, I see what looks very much like the CFI's new van pulling up. The rest of the party has arrived! After a thorough warm-up and pre-takeoff check, the towplane fairly leaps off the ground. It's almost as if it too is happy to be out of the hangar and in the air. But now, the morning's cumulus have developed into a thin overcast, with a few scattered holes. A quick climb finds the cloud base at 1800 feet. It will have to be a low release, or hope that a hole appears upwind of the field. Climbing through one of the holes, I break out into the sunshine at 2200 feet. The overcast is thinner than I thought and is breaking up in the west. I call up the Kingston FSS and ask them to advise any aircraft transiting the Gananoque area that gliders are in the air. The operator rather curtly replies that it's noted on the charts. He must think we do this all year round! Back on the ground, the 2-33 is ready to go, along with the six pilots who are sheltering from the winter wind in the lee of the van.

In two hours, I make six launches. Everyone is getting two rides, once in the front and once in the back. For me, they're nice easy tows; no students to jerk me all over the sky and no thermals to bounce the glider around. Since I last towed, we have had the propellor re-pitched to improve climb performance. Its greater efficiency is readily apparent as I easily climb to release height in four or five minutes. Previously, our new towplane seemed to be a bit short of breath for the last few hundred feet. However, the proof of this pudding will come in the dog days of July and August.

Some of our more venturesome pilots take this opportunity to practise their short field landing technique. The good ones (or is it luck?) are able to hold off their landing so that they can roll on the frozen earth to within a few feet of our launch point. With the others, we have to muscle the 2-33 back onto the pavement.

All too soon it's time to put the aircraft away. The sun is gone, blocked by a high dark overcast that holds the promise of freezing rain. The temperature is dropping and the wind off Lake Ontario has grown stronger. It now has a raw edge to it that seems to cut to the bone. None of the flights have been more than 15 minutes; no altitude was gained, no country was crossed, no speed records set, no endurance attempted. If it was July, it would have been a thoroughly forgettable day. But it's not July, it's January and for that reason the memory of the day will stay with us.

Memories of a cold day and a raw wind, that was warmed and softened by friendship and the rare experience of mid-winter flying. If winter ever arrives, it could be as long as three months before we get to meet here again. So we will savour this day, just like a connoisseur savours fine wine. Hopefully, this short day of winter flying is, as the minister intones at Communion "a foretaste of the feast to come".



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.

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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 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.

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, \$EU 18 dans les Etats Unis, \$EU24 outre-mer) veuillez contacter le bureau national.

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5

HAROLD YARDY HONOURED

Congratulations Harold on being recognized by the Ontario "Corps D'Elite" award program.

You are aware, more than most, that keeping a gliding club going in Canada is a constant battle especially where the population base is small. The club that is able to survive is one that has a number of dedicated members who live and breath gliding and somehow or other attract and keep enough members to keep going. Amongst these will be one or two leaders who never flag and keep pushing to run an interesting and viable operation. You have done this for over twenty years for COSA, and your fellow members, past and present, are particularly pleased to see you being singled out for this award.

On behalf of the Soaring Association of Canada may I wish you many more years of enjoying the sport of gliding and soaring and thank you for your constant and dedicated contributions to our sport. We have all profited from your generosity and example and look forward to your continued advice and leadership.

Gordon W Bruce, SAC president

A GOOD AGM

I would like to commend everyone responsible for the format of this year's SAC AGM and Convention. As a new member of the soaring community I was under the impression that SAC business at the national level had little to do with me or my local club. This year I came to hear Vance Brand. Although this didn't happen due to the weather, there were several unexpected benefits for me.

The convention aspect of the weekend was great! Good workshops with excellent speakers benefitted everyone regardless of soaring experience. This was evident from listening to comments as people left the workshops, not just a measure of what I learned. Even more important is the fact that I gained a better understanding of what SAC could do for our club and why our club should be more supportive of SAC and its programs.

Having the AGM on the Sunday was a good step. Firstly, it allowed those who couldn't (or who didn't wish to) attend the convention portion to still attend the AGM. Secondly, it gave people a chance to interact prior to the AGM and bring themselves up to date on club news and concerns to soaring in general, such as the presentation on changes to airspace regulations. The result was that people could participate at the AGM more fully and in a more informed manner.

Another benefit of this format was evident in the presence of new faces and even more significantly – new young faces. People who

care about this sport know that unless there are new and young members participating not only in flying but in the administrative process the sport will die not grow.

I hope everyone will report to their clubs the benefits of this weekend and share some of the enthusiasm felt here when they get home. If they do, next year's gathering should have even more participation. Congratulations and thanks to everyone who helped to make this such a great weekend.

Martha K. Folsom

Guelph Gliding and Soaring

AN ANTI-CONVENTION VOTE

I was dismayed to read that the format of the 1989 SAC annual meeting had been changed, that the meeting would now be a "convention" which would consist primarily of workshops.

If workshops are to take up most of the short day and a half time period, then there will be little time left to discuss policy. The essence of the traditional annual meeting was the opportunity for members from all parts of the country to listen to and discuss opinions from east, west, and centre. It was an admirable example of parliamentary democracy. The US soaring movement has a yearly convention, but then the Americans do not have a tradition of parliamentary democracy.

The change from the traditional format is a denial of the opportunity to discuss and agree on the policies which the national executive should follow. The annual meeting is the single opportunity during the year for members to voice their opinions and provide guidance to the SAC Directors. I hope that a return to the more traditional format will be made in 1990.

Bob Gairns, MSC

FLORIDA UPDATE

There have been some significant changes in the operations of the Tampa Bay Soaring Society since Boris Mospan's article in the Club News section of the Dec/Jan issue of *free flight*.

Regretfully, our club president, Peter Espenlaub, died as a result of injuries in the crash of an L-19 Birdog in September 1988. Our operations are currently out of Gilbert Field at Winter Haven but we expect to be back at Pilot Country or Topp of Tampa airports by 1 March.

Any inquiries about our club activities can be directed to: John H Mackie, CFI-G / Treasurer, Tampa Bay Soaring Society Inc. (813) 585-0180; or write to, 1001 Ulmerton Road #475, Largo, Florida 34641.

THE MÜ AFFAIR

submitted by **Bob Gairns**

Montreal Soaring Council

Here is a story on the Mü 13, CF-ZPQ, famous in Montreal Soaring Council history. Gordy Hicks and Dave Webb still talk ecstatically about the handling of this machine, probably because at the time it gained flying status, it gave a step forward in performance compared to other gliders in the club.

The article was given to me by Vernon Pope, an ex-CFI and honorary life member of MSC. It was most likely written in 1952. The "chief engineer" overseeing the repair was, I believe, Stefan Brochocki, a design engineer at Canadair, who later designed the BKB flying wing. He is alive and well and lives near Montreal.

By 1956, the Mü had been withdrawn from service because of wing deterioration. It was sold to Walter Piercy of Kingston, who built new wings for it. Then Walter Chmela of York Soaring bought it and resold it to a Western pilot.

[It was Bryan MacDonnell of Kelowna, BC. During 1981, this sailplane was launched off a hill near Kelowna, using an elastic cord (the bungee launch system), probably the first time in thirty years that such a launching system had been used in Canada. — from "Trying their wings" p10, the new book written by Lloyd Bungey. editor]

FOUR YEARS AGO, unexpected by all but a very few, four immigrants arrived in this country. They had been liberated from Germany, had gone to England, and been spirited across the Atlantic. Travel-worn, and showing the effects of their hard lives in varying degrees they were – it was learned, being cared for by the National Research Council until they could be placed in suitable homes – four German-built sailplanes in a very sailplane-hungry land.

Two of the newcomers were Grunau Babys with complete instrument panels and in flyable conditions, or nearly so. Another Grunau Baby was considerably knocked about. The last member of the group was a Mü 13D, badly weathered. After four years of continuous setbacks this last machine is now nearing a flyable state, and its progress has stimulated more curiosity than all three Grunau Babies combined. It is, in fact, doubtful if any other glider in Canada except the Loudon occasioned more comment than the Mü in those four years.

It was at first intended that the gliders should go to clubs at universities. One of the two good Grunaus, however, went to the Navy club, then flying with the Gatineau group in Ottawa, the connections of the latter group with the NRC providing probably the best facilities in Canada for making repairs and conducting research. The other good Grunau went to the Queen's University club in Kingston. The Mü was handed over to the McGill club and the bashed-about Grunau Baby was shipped off to the University of British Columbia.

The McGill club, at the time the Mü was obtained, realized that there was a good deal of work to be done on it, but many of them believed it could be done quickly. The pessimists foresaw it as a long and expensive job. But even the pessimists undershot by two fields and a couple of fences.

The Mü 13D is a development of an earlier model, of which it retains, it is hoped, the desirable characteristics of low rate of sink and good gliding ratio. Some faults existed in the early model, notably poor control characteristics, poor penetration and embarrassingly low placarded speeds. Although the truth will not be known until it is airborne, it is believed that the first of these faults has been largely remedied in the newer model. The last one has been only a little improved if any, according to the placards on the glider when it was received. Penetration, it is believed, is unchanged because it is due to the airfoil section used. There is some hope of slight improvement through the design of a new and better cockpit canopy, but no one expects a really respectable speed range.

When it was brought from Arnprior to the McGill club's workshop the Mü at once became the subject of a small war between

the "rush-it-through" and the "do-it-right" schools. Fortunately the latter won out. The train of events which followed shows that if the former had prevailed we would now almost surely have a pile of bits and pieces and perhaps even an obituary as a reward for eagerness.

Once the course had been decided, the difficulties of really doing the job right began to parade themselves. The design of sailplanes for special qualities of performance leads to the employment of complicated ultralight structures of critical fragility, and in this the Mü is true to type. And there were no drawings, technical information, or even good pictures to be had. Letters to England, France, Germany – to anyone anywhere who might help – gained nothing.

No one we knew in Canada was familiar with the construction of the machine, so it would be necessary to prelude all repairs by very careful design work. So, with many misgivings, the work went forward.

Work was begun with the left wing leading edge and torsion box, which went quite satisfactorily. Biscuit patches were used and pressure applied by means of strips of inner tube. Even a bad portion of skin on the top of the torsion box offered but little trouble. In short order, in 1947, the left wing was presumed to be finished. Then the rudder and elevator were completely disassembled and every piece painstakingly reassembled.

Inspection of the right wing showed that the spar had deteriorated so badly that the entire spar and wing section inboard of the torsion box had to be rebuilt. This, which was to prove the most difficult job of all, was started in McGill's shop on University Street. However, when winter came no heat was forthcoming from "Works and Bricks", so the job stopped. In the spring two club members who had inspected the wing with a great gusto, removing parts and irreplaceable tubular rivets on wing pickup fittings, became inactive. The job then progressed sporadically and slowly, until the McGill authorities pushed the final nail into the coffin by tearing down the workshop!

The parts were stored until the Canadair club was organized with a heated workshop, when the chief "tearer-downer" from earlier inspections became – with one other member – our workshop supervisor and spark plug, and 1949 became a year of progress.

The fuselage was completely stripped and inspected, and every joint and tube was steel woolled. The two main fuselage longerons were so badly corroded that replacement was necessary. The problem of splicing tubing of less than .016 inch wall thickness without buckling the frame had not been surmounted by anyone who had tried repairing Müs in Europe, but we had to try.

Arrangements were made at Canadair through the soaring club to try to effect this extremely difficult repair at cost price. After we had sup-

plied and fitted the new parts, Canadair built a Rube Goldberg structure of 2x4s, piano wire and turnbuckles around, in and on the fuselage, and assigned two of their best welders to it. In eighty hours of hysterical welding and straightening the job was finished. (The bill? \$234.68 for six welds.)

All control cables, fittings and pulleys were renewed and reinstalled. The seat was rebuilt, a new instrument panel made and the fuselage was ready for covering. However, on account of its rather odd shape, outside professional help was decided upon to maintain the constant standard of top workmanship. (Cost \$40 plus five gallons of dope, three gallons of thinner.)

We were now into 1950 and the fuselage, ailerons, rudder, elevator and right wing were finished. The repair of the butt end of the right wing spar had been slowly progressing. Ribs had been built and much talking had been done but the time for taking a deep breath and wading in had arrived.

And now we were in the era of finding a succession of new and unexpected weak spots. The "unkindest cut of all" occurred when we found that the skin of the horizontal stabilizer would peel off as easily as a banana skin. Since this was a stressed-skin part, a jig had to be made to hold the components in shape while it was reskinned. Then the skin and structure had to be redesigned so the skin could be applied in eight sections instead of the original four. Extreme care had to be taken in the clamping and attaching of skins so that bonding could be attained without collapsing the very light inner structure.

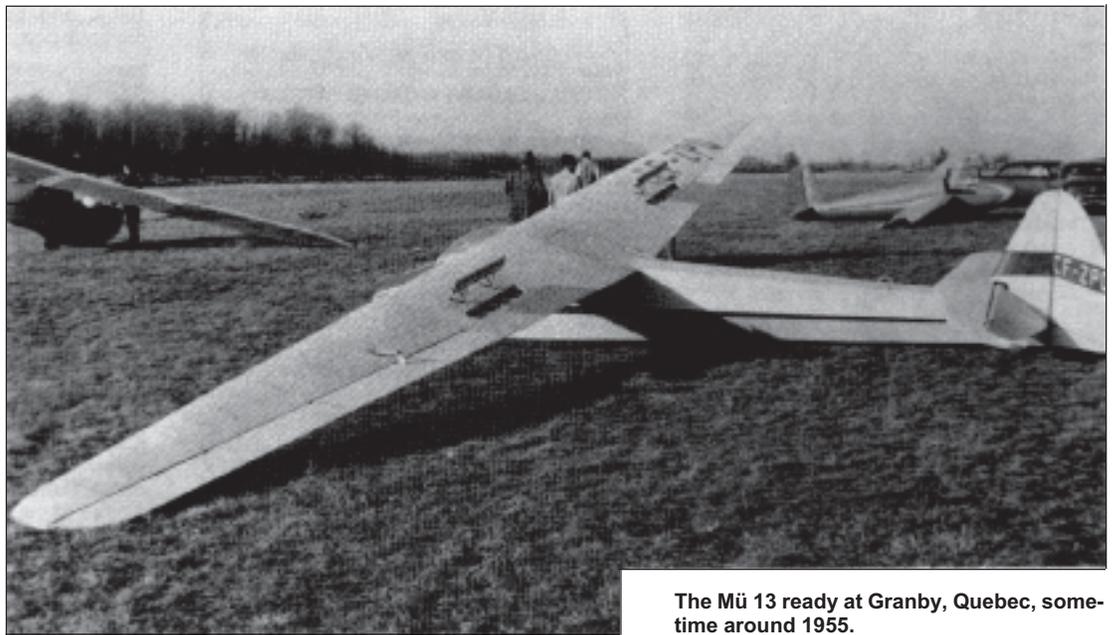
Another example of the difficulties entailed in maintaining the low weight of the original was the replacement of the spoiler torque tube. This tube runs through the wing, butts against and locks into the fuselage spoiler controls at one end and becomes the axis about which the spoiler/air brakes revolve at the other. This tube was badly corroded throughout its length, especially at the bearing points. It was replaced with the lightest possible tubing available capable of handling the loads. Even at that we found that its weight was twice that of the part removed.

It had once been believed possible to have the Mü ready for the St. Eugene Meet in 1950. Now we were hoping that it would be ready for Kitchener in 1951. All repairs to the wing roots were finished. The problem of the tubular rivets to attach the pick-up fitting to the spar had been surmounted by using specially machined bolts. In all, about five hundred hours had been spent designing and building ribs and spar sections and in gluing and

assembling. It only remained to reinforce the spoiler boxes where they had been exposed to the weather, the plywood cover was removed – and there was the same old story. The whole area was so badly weathered that the laminations in the rear of the upper cap-strip of the main spar had separated from it, leaving us a weak sparred, worthless wing.

Every method of salvaging the spar by rebuilding, splicing, etc. was suggested and rejected until we hit upon the scheme of injecting catalyst and glue by means of a pressure bottle attached to a "U" tube and hypodermic needle.

The suspected area was marked and small holes were pierced between the laminations, using an unfluted fretwork drill, about 1-1/2 inches apart along the weakened section, the needle was inserted and the valve opened, so that the catalyst was forced into the hole and along the laminations. The defects were found to extend much further than suspected, because the catalyst shot out of the spar inches beyond the last drill holes. Succeeding areas were then drilled and injected until no further run-out occurred. This "pierce and inject" method was used to test other suspected areas, but the rest was found to be quite sound.



The Mü 13 ready at Granby, Quebec, sometime around 1955.

The glue was injected in the same manner in the same holes as the catalyst, but with a different needle. The catalyst, with the heat generated by hundreds of pounds of air pressure, solidified the glue almost immediately. The whole area was clamped and a very satisfying squeeze-out of glue occurred.

In spite of the success of the gluing it was felt that a static test was necessary to be sure. The loading was worked out in detail and many ideas were put forward for static testing. When "Chem" suggested that the NRC might do it, they were contacted and agreed. The spoiler area from the spar to the opening was completely covered with plywood, some cleaning up was done, and the fuselage and

wings were sent by trailer to Ottawa.

The structures group at NRC took our spanwise loading figure of 4.67 "g" (about one ton) and worked out a chordwise distribution for it. Silence prevailed until Thursday at 1030 pm when a radio message from them told us the wings had passed the test. We certainly want to thank Mr. Parkin, the director of the Aeronautics Establishment, and his staff for all their help. Mr. Parkin even came down from Ottawa on a Saturday afternoon to let the "retrieving party" claim the glider.

With the Mü back in the workshop and all the faith and labours proven by NRC, the last lap is ahead. A man with a great deal of experience on this type of work has been engaged, and he will spend his full time on it.

Of the total cost to date, the portion of the bad news covered by invoices is as follows: plywood \$102.60; glue \$12; dope \$100; fabric \$67; covering (labour) \$40; welding \$234.68. The total comes to \$556.28, but we expect the \$234.68 may be reduced by Canadair to \$100. These figures don't include transportation costs, or items like wood, nails, tape, etc. And so far the job has absorbed well over 1000 manhours. All this on one machine without even getting it off the ground.

Now that they can look back on the long months of work, the boys who have been sweating at this project realize that they might as well have put their time into building a new machine, but it got to the point quite early in the project where it always looked easier to go ahead and finish, than to quit and start something else. Only as they progressed did the new Jokers turn up in the pack. Now that there is at least some real promise of the job winding up in a few weeks, there are a few faithful, sweaty, calloused palms itching for the feel of the controls with a very well justified and proprietary sort of yearning. The sigh of ecstatic satisfaction that goes up when the Mü is towed off the first time will make the pilot think he is taking off downwind. •

HUMAN ERROR

HUMAN ERROR IN AVIATION CAN BE DELIBERATE,
INADVERTENT,
OR REFLECT EXPERTISE

Dr. Carlton E. Melton
ICAO "Bulletin", Oct 1988

"THERE ARE TWO kinds of pilots – those who have landed gear up and those who will." This cynical old saying trenchantly makes the point that erroneous behaviour is inherent in all pilots. Maybe everything has been said on this subject that can be said; but, maybe some new perspectives can still be offered.

To me, pilot error is not a one-dimensional concept. At the peril of adding to an already lengthy taxonomy of error, I distinguish at least three broad categories:

- **Deliberate errors** which encompass conscious, intellectual decisions to carry out imprudent acts, such as a flight into known severe weather, or in an aircraft with known defects, or both.
- **Skill errors** which are those engendered by inadequate training and/or experience.
- **Inadvertent errors** which involve indecision, confusions, reversals, forgetfulness, negligence, etc. exemplified by gear-up landings and confusion of controls.

The generally accepted, traditional single remedy for all errors is more training. However, no amount of training in flight maneuvers and procedures will cause an immature individual to make a mature decision. Anyone who deliberately flies into known severe weather does so not because of ignorance but because of a personal defect.

Supplied with the same data, some people will make good decisions and some will make bad ones. "I did it against my better judgement" is a comment that affirms an awareness of erroneous behavior and a conscious decision to go ahead anyway. Pilots are not much different from automobile drivers in thinking that accidents happen to other people but not to themselves, an attitude called "self serving bias." Indeed, people's attitudes vary widely regarding attribution of cause for life events, ranging from those who feel personally accountable for their actions to others who believe that luck, fate, divinity or destiny determines what happens.

Wichman and Ball¹, human factors researchers, classified such beliefs under the term "locus of control". People who feel personally responsible for their acts are said to have an internal locus of control; those who feel that outside forces determine what happens have an external locus of control.

Wichman and Ball found that general aviation pilots as a group were somewhat more internalized in their locus of control than were non-pilot comparison groups. However, pilots expressed self-serving bias (internalizing successes, externalizing failures) in the feeling that they were better-than-average pilots and less likely than their peers to have an accident.

These psychological concepts generally delineate some of the dimensions of maturity in that they speak to people's capacity for self-deception and delusion. The pilot who should be watched most carefully is the one who offers his accident-free flying history as evidence that he is accident-proof. The longer he goes without an accident, the more he

A germ of self-serving bias is in us all; as a denial mechanism, it is a trace ingredient of self-confidence.

thinks he is unlikely ever to have one. This primitive probability theory reinforces self-serving bias and leads to delusions of invulnerability. Regardless of his flying history, a pilot must exercise the same caution every time he flies because the potential for a human error accident is always there.

The germ of self-serving bias is in us all; as a denial mechanism, it is a trace ingredient of self-confidence. Safety must lie in the middle ground, where people are confident of their abilities but knowledgeable about their limitations and are able to recognize and admit that there is always room for improvement.

Deliberate errors

I have examined reports of 6691 civil aviation accidents and incidents not related to equipment failures that occurred over the two-year period of 1981–1982. There was sufficient information in the reports regarding cause to allow their categorization according to type of error. About half (3300) of the occurrences resulted from poor decision-making and 22% of that portion involved fatal accidents, accounting for the loss of 1602 lives. In other words, the way each of those pilots thought about flying, involving a conscious decision to take risks, was the proximal cause of over 1600 fatalities.

In his book, "The Love and Fear of Flying", Douglas Bond², a World War II US Army Air Corps psychiatrist, explains deliberate risk-

taking behavior in terms of the deeper psychiatric symbolism of flight. Bond points out that subconscious aggressive and sexual motivations may be the drive for risk taking. Although he was writing about World War II combat pilots, much of what Bond says is relevant to unsafe civilian flying of the present time. (A fighter pilot's victory roll over an airbase in England in 1944 is ancestrally connected with the buzzing of a girlfriend's house by a present-day pilot.)

Bond wrote: "The temptation to defy death constitutes a very common disciplinary problem among pilots and contributes heavily to 'pilot error', which is the most frequent cause of aircraft accidents." Later, in referring to pilots who often seem to treat death as a kind of living rival, Bond says, "Here one can see plainly the anthropomorphization of death into a living, threatening father who dwells appropriately in the sky. Every dangerous success ... mocks the authority and power of the father and brings reassurance of omnipotence ..."

A remedy for deliberate errors in civil aviation that is totally effective will probably never be found, although there is evidence that a dedicated attack can yield near-perfect results. It has been reported by A.F. Zeller³, a human factors researcher, that the US Army Air Corps in 1943 lost more pilots in non-combat flying than were lost in battle (3426 vs 2392). Consequently, a flight safety program was ordered that, together with improved equipment and reduced flying activity in the postwar period, cut the yearly number of major accidents from 20,389 in 1943 to 1555 in 1947.

Peer pressure, according to Zeller, has been identified as an important determinant of pilot behavior; post-accident analyses have indicated, however, that performance is directly related to the expectations of the group. "If the social climate is one where adherence to discipline and procedures is the accepted standard and where deviates are ostracized, then precision accomplishment can generally be anticipated," Zeller asserts. "On the other hand, if the social atmosphere is one where violations and deviations are the accepted norm and are not only condoned but rewarded, then this kind of activity can be expected."

Total system management is possible in the military services, but in the civil sector the only available actions are regulation and education, distinctly distant runners-up to total system management. Civil aircraft accidents are investigated, but such investigations frequently provide little more than a chronology of destruction, with external co-factors such as weather identified as the probable cause. A dreary fact is that accident investigation does not necessarily prevent accidents; year in and year out, accidents are attributable to the same repeated causes.

Skill errors

The second most common cause of accidents in my sample was skill deficiency, accounting for 2392 accidents or 36% of the total: of these, 235 were fatal accidents resulting in 371 deaths.

Skill enhancement through directed training and skill maintenance through regular practice are the only true remedies for skill-related accidents. However, the biennial flight review is the only time many US pilots depart from the takeoff-climb-cruise-letdown-land routine. Most of the time such a routine suffices, that is, until an emergency occurs, then lost skills are sorely missed. When you think about it, just about all aviation training is directed toward skill assessment. The paradox is that a pilot's skill is usually mentioned only when he extricates himself from a situation he instigated by an earlier bad decision.

Inadvertent errors

This third error category includes those that are inadvertent – the type of behavior for which many people reserve the word “error”, preferring instead to use descriptors such as human factors, mistakes, blunders, lack of judgement, recklessness, inexperience, or earthier terms, for my other two categories.

These errors are intriguing but, at the same time, they are the least significant from the standpoint of loss of life. In fact they account for only 25 deaths in 999 accidents out of the 6691 total number of accidents in my sample. They are interesting also because they provide some insights into the workings of the error-prone human mind.

The brain, of course, is the anatomical correlate of the mind and is organized in much the same way as a large corporation. It is hierarchical in nature with mutually dependent areas of delegated responsibility (departments) that normally communicate freely with one another. Higher level conscious brain function is analogous to top management; it cannot be bothered with small details, so it merely sets policy or declares intentions. Execution of the declared policy is turned over to lower, largely subconscious echelons.

Sometimes the intention is not clearly stated and sometimes communication between different areas is faulty, resulting in a variety of erroneous acts such as slips of the tongue, word reversals, tangled speech, confusion of controls, etc. Unless one chooses words carefully and speaks slowly, one does not know in advance exactly what words will come out. So-called Freudian slips are familiar to everyone; and sometimes what does come out can be embarrassing.

Inadvertent errors can be subcategorized according to the particular confusion that results. Donald A. Norman⁴ has summarized some of these concepts. He identifies description errors as being those that result when the brain lays out the wrong plan.

Consider the following actual occurrence. A general aviation pilot, 8 km from the airport, requested runway 21 because of the prevailing wind instead of the assigned runway 17. The tower approved and noted that the last 900 metres of runway 21 were closed for construction. The pilot erroneously understood that the first 900 metres were closed and

was chagrined to find on short final that he was high and had less than 750 metres of open runway. Nevertheless, he negotiated a successful landing because of the strong headwind.

The pilot made this error because he described the situation vaguely to himself – “All of the runway is not available.” Memory was searched for a recent similar experience and came up with a scene calling for construction on the first part of the runway. “First” and “last” parts are easily confused because they are both remainders of the runway. Attention was divided among other concerns and tasks (turbulence, strong wind and dust-restricted visibility) that overloaded higher levels of the brain, causing it to envision the wrong part of the runway as usable.

Selection errors, like description errors, occur because the mental description of the task is vague. Take the case of the pilot on an IFR flight plan who was asked by the enroute control centre for his estimate to the next fix. The pilot was unprepared and totally discomfited, so he lowered the landing gear. The conscious brain sounded a non-specific alarm and subconscious levels selected a specific action to forestall the thing most feared by that pilot – landing with the gear up.

Another case involved a pilot who left the wheels of his Bonanza extended to save wear on the gear motor and other moving parts while he practised touch-and-go landings. When he called it a day and came in for his final approach, he raised the gear and landed with the wheels up. He even used the GUMPS mental checklist (gas, undercarriage, mixture, props); when he came to the U for undercarriage, he moved the gear handle the only direction it would go — up!

Capture errors occur when something triggers a habitual response. I take the same route frequently that involves a right turn to go north on an expressway. On more than one occasion when I intended to go south, I have found myself entering the northbound ramp. My behavior was captured by a strong habit.

These inadvertent errors can be reduced by strategies designed to bring their occurrence into consciousness. Such strategies go by the name of “forcing functions” and are known to pilots as checklists, warning horns, lights, taped commands and stick-shakers. Of these devices, good printed checklists are probably the most effective in preventing errors of neglect, forgetfulness and confusion.

There is evidence that many human errors die aborning; that is, they are detected and corrected before they become apparent in some observable act. One psychologist has estimated that four errors are thus thwarted for every one that is apparent. In the United States, the National Aeronautics and Space Administration found a crew error rate of 11.4 per hour on a simulated New York to London flight. Thus, it can be seen that the normal brain is mostly an error-making, error-detecting and error-correcting organ. Sometimes it fails to detect and sometimes it fails to correct.

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FLYING WITH THE RIGHT BRAIN

Ian P. Mcfall
West Wind, Jan 89

I'VE BEEN FLYING GLIDERS for fifteen years and up until very recently always approached the entire process from an analytical point of view. Oh, yes ... I conduct the mechanics of flight by instinct. I don't have to think about making pitch changes to control airspeed or holding the bank angle against a sudden surge under the inside wing; that all happens by "instinct".

But, all the time my instincts are "controlling" the glider I am furiously analyzing where the centre of the thermal is based on frequent glimpses at the vario and (hopefully) the continuous pressure in the seat of my pants. "Roll out a bit towards the ridge – five or six seconds – roll in again. That's better. Now we've got three knots all the way 'round," I say to myself.

Analyze, analyze, analyze. Meanwhile, a pea-brained turkey buzzard is climbing at ten knots just 300 yards away. If nature hadn't blessed him with a pre-frontal lobotomy, he would be thinking to himself, "I wonder why that big white turkey is circling in that crappy lift over there?"

Not to be outdone, I move to the better lift instinctively selected by my feathered competitor. "Better," I say to myself as the vario swings past eight knots. I get to 12,000 feet where my computer says I can head out (over "forbidden" terrain, of course) and then I do some more analyzing.

"Let's see," I say to myself, "the winds aloft were supposed to be 270 at 15 knots; seems a bit more northerly than that to me. Yeah, the cows are facing north (some of 'em are, anyway), and the ripples on the lake look like it's north. In that case the Greenback Mountains should be working."

I head across the valley; I should be able to make it with 2000 feet to spare. A little voice somewhere says "This is not a good idea," but I put it down to my usual fear of striking out into the boondocks. "Gerlock," I call it – named after my state of mind on a particularly spine-chilling flight from Minden to Gerlach and back a few years ago. You know the state: the brain freezes, the bladder shrinks, and you chant to yourself, "Why am I doing this; why am I doing this?"

I cross the valley in 1000 fpm sink and reach the Greenbacks 500 feet below the ridge line. The little voice says "I told you so," and I swear that the turkey buzzard whose thermal I join is the same one I saw earlier. I can tell by the supercilious look on its face. I'm not climbing, he is. "There's better lift in the canyon," says the little voice. "No way," I say to myself as I quickly "analyze" the local terrain for sources of heating – look for signs of the wind direction at ground level. Analyze, analyze, analyze.

"Go now, before it's too late," says the voice, and I dash down the ridge to the canyon. Wham! Six knots of turbulent thermalized rotor. Ten minutes later I see that turkey buzzard below me. That feels good.

"You should listen to me more often," says the little voice, "I will, I will. Just get me home!"

This kind of situation must happen to every glider pilot at some time or another where an "instinctive" reaction pays off when analysis has failed and, frequently, when analysis says the instinct is wrong. I'm not suggesting that we all get pre-frontal lobotomies and start charging around the skies driven by primordial instincts (some pilots I know already do that, but I won't name names). Nevertheless, instincts are sometimes right.

The reason that instinct can sometimes pay off is, I think, related to "split brain theory." This modern theory of the brain is very complex, but basically it suggests that the left brain (which controls the right part of the body) controls our speech functions, writing, arithmetic, and generally our "analytical" processes. It is like a "serial computer."

The right brain, on the other hand, is more of an "analog-parallel processor," which is involved in the creative processes, is almost totally involved in dreaming and dominates most "instinctive" activities like athletics or playing a musical instrument. A good illustration of the way the right brain and left brain interact is to ask a good "left brain" racquetball player "Where do you put your thumb on the racquet?" This simple ploy is guaranteed to ruin their game for hours because it makes them think consciously about what they're doing. It works; I've tried it (I'll do anything to win a racquetball game).

Experiments have shown conclusively that 90% of both right and left handed people have this same division of brain functions. Orsten and Gaalin of the Langley Porter Institute in San Francisco also determined that in "normal" people brain wave activity shifts from the left to the right hemisphere as the subject shifts from analytical to synthetic intellectual activities. In a normal person, the right hemisphere exhibits the alpha rhythms of the "idling" state while the person is doing arithmetic exercises.

Orsten offers an interesting analogy to explain why modern man now has so much contact with the left hemisphere functions and so little with the right. He suggests that our awareness of the right hemisphere functions is a little like our inability to see the stars in the daytime. The sun is so bright that the stars are invisible even though they are still present. When the sun sets we are able to perceive the stars.

In the same way, the brilliance of man's most recent evolutionary accretion, the verbal abilities of the left hemisphere, obscures our awareness of the functions of the intuitive right hemisphere which in our ancestors (and perhaps that turkey buzzard) must have been the principal means of perceiving the world around us.

So when things are not going too well in the air, it may be that your left brain has just got it all wrong. Sit back, relax a bit, and let the stars come out. Your intuition may know something you don't. ●

Human Error

continued from page 9

The rate of occurrence of externally observable errors may be influenced by modulators of error that either increase or decrease the level of arousal of the brain and, therefore, alertness. Stress, fatigue, drugs (including alcohol), workload, etc. are culprits frequently identified as causing error when, in reality, they are modulators that allow inherent errors to become manifest.

Errors are commonly judged by their consequences. It is usually said that an error has occurred if the outcome is negative, meaning that something bad happens. However, if the outcome is inconsequential or even positive, then it is assumed that an error has not been committed — we have a vocabulary for dealing with these latter situations. We say, "No problem," "Forget it," or "He came up smelling like a rose." Shakespeare also contributed, "All's Well That Ends Well."

This manner of thinking about error was brought home to me by a personal experience. I keep similar plastic bottles of glue and eyedrops on my desk. One day I intended to put some glue on a recycled stamp, but I got the more frequently used eyedrops by mistake — a typical capture error. There was no harm done; I swore a little, wiped off the eyedrops and applied glue as I originally intended. But, consider a slightly different scenario. Suppose I had intended to put eyedrops in my eye but had gotten the glue instead. In the first case I was inclined to say, "No problem"; the second case may have necessitated an emergency trip to an ophthalmologist.

For another example with a slightly different twist, consider the Western Airlines DC-10 crash in Mexico City on 31 October 1979. The crew committed a rather common inadvertent error. They made an approach to the wrong runway — 23L, which was under construction, instead of 23R. A dump truck on the runway made a catastrophe out of what otherwise would have been only an embarrassment.

Random and unpredictable external factors such as the dump truck often determine the outcome of errors committed many times previously without discernible consequences. Aviation incident reports do not give us any idea of true error rate because they only report negative or potentially negative outcomes that represent an unknown fraction of total errors.

Errors do not always have negative consequences; they may even have positive outcomes. Lindbergh's transatlantic flight in 1927 is a case in point. By his own statement, he did not sleep the night before the flight. He took off in a heavily-loaded aeroplane from a soft field, became lost, flew into icing conditions, and experienced extreme fatigue; yet, he landed safely in Paris. If he had not made it across the ocean, no doubt there would have been endless cataloging of the errors he made. One could probably argue effectively that heroes are people who have made conspicuous deliberate errors that have had such positive outcomes.

Safety is usually one of the expressed justifications for system improvement; but, let us face facts — such improvements are really made mainly to enhance utilization of the airspace. Some of these so-called improvements have actually made the system more, not less, vulnerable to human error. Although their reliability is greatly increased, the greater mass and size of modern jet airliners have made their operation more critical than was the case with their piston-driven predecessors. Certainly, the negative consequences of human error are much increased in the big commercial jets.

In the mid-air collision of a TWA Constellation and a United DC-7 over the Grand Canyon in 1956, 128 people perished; 583 people were killed in the collision of the KLM and Pan American 747s on Tenerife's Los Rodeos airport in 1977. That is a casualty inflation rate of 355% over a 21-year period. Both accidents are believed to have been caused by human error.

In our present-day system when failure of the machinery is rarely the cause of an accident, safety, in my opinion, can be equated with tolerance for human error which translates into time available for selection and exercise of options. Because the terminal event in an aircraft accident is a collision (fires and in-flight breakups possibly excepted), the separation of aircraft and object — usually Earth or another aircraft — is the prime safety consideration. As separation becomes less, time for selection and exercise of options becomes correspondingly less. For this reason, many accidents involve the approach and landing phases of flight; as closure with the ground takes place, the availability of and time to exercise options, decrease and human error of all types becomes more critical.

The bottom line is that the present fairly stable accident rate is primarily due to undesirable human behavior. This morbidity, in theory, could be reduced by stringent police-like governmental action that would serve mainly to restrict use of the airspace to an elite few. Such governmental action would be inconsis-

tent with generally held concepts of liberty and, thus, would be unacceptable.

Enforcement would certainly be terribly expensive. The only practical and acceptable solution lies in enhanced education and persuasion in an attempt to imbue pilots with a mature attitudes toward flying. If the present accident-rate resistance level is to be penetrated, greater effort is called for to reach pilots refractory to existing safety programs.

Every pilot will have to exert peer pressure to encourage compliance with safe flying practices, including objectivity and restraint in decision making, in the scrupulous observance of all regulations and procedures, in thorough preflight inspection of the aircraft and in preflight introspection about one's present condition and capability to carry out the flight, by constant inflight vigilance and, especially, in the use of good printed checklists. Such self-discipline would go a long way toward mitigating the effects of human error.

On the hardware and procedural side, human error can be mitigated by ensuring that changes intended to promote system utilization do not reduce tolerance for error. Only those changes that provide increased tolerance for error can legitimately be called safety improvements.

Without consideration of these human factors, the present accident rate can be expected to continue indefinitely. ●

(1) Wichman, H. and J. Ball, "Locus of Control, Self-Serving Biases and Attitudes Toward Safety in General Aviation Pilots", *Aviation, Space and Environmental Medicine*, 54: 507-510, 1983.

(2) Bond, Douglas, D., "The Love and Fear of Flying", International University Press, New York, NY, 1952.

(3) Zeller, A.F., "Three Decades of USAF Efforts to Reduce Human Error Accidents", AGARD Conference Preprint No. 264, 1978.

(4) Norman, Donald A., "Post-Freudian Slips", *Psychology Today*, April 1980.

Coming Events

May 20-26, **SAC Eastern Instructors Course**, York-Arthur Gliding Club. Note that 20-22 May is the long weekend. Course coach: Paul Moggach (416) 656-4282.

Jun 4-10, **XC camp**, Edmonton Soaring Club, teaching basics of XC. BBQ 10 June. Contact Jack Despres (403) 487-7317 or Neil Bell 481-6664.

Jun 11-17, **XC practice**, Edmonton Soaring Club, task setting with assistance of coach. Contact as above.

Jun 24-2 Jul, **Western Interprovincial Soaring Contest**, Claresholm, all-POST and handicapped, exploring new rules and scoring, should be fun — more details out soon to western clubs and known competition pilots. Others interested may contact Tony Burton (403) 625 4563.

Jul 11-20, **Canadian National Gliding Championships**, Rockton, ON. Practice 8-10 July. Contact Helmut Buchholz, 2362 Shaver Road, RR2. Ancaster, ON L9G 3L1 (416) 648-5433 (H), 575-1666 (B).

Jul 29-7 Aug, **Cowley Summer Camp**, great soaring and camping at Cowley airstrip at Canada's biggest soaring event. A Master Coach Cross-Country Clinic held concurrently. Cu Nim and ESC gliders available to visitors on arrangement with club. Terry Southwood (403) 255-4667.

Aug 7-12, **SAC Western Instructors Course**, Hope, BC, hosted by Vancouver Soaring Association. Instructor coach: Mike Apps (403) 436-9003.

Sept 2-4, **Mountain Soaring Camp**, Fairmont Hot Springs, BC airport. Spectacular soaring in the Rockies, organized by Alberta Soaring Council, contact Tony Burton (403) 625-4563.

Oct 7-15, **Cowley Wave Camp**, for first time extended through two weekends for a better opportunity to catch the wave. Club ships available as mentioned above for Summer Camp. Organized by Edmonton Soaring Club, contact Buzz Burwash (403) 465-2394.

THE CONTEST LETTERS REGISTRY

Robert Binette

Contest Letters Chairman

Rules

Purpose Contest letters are used to facilitate identification at start and finish lines. They are also used as an aid in assignment of takeoff order, sailplane marshalling at the takeoff line, and in scorekeeping.

Assignment of letters Only SAC members will be allotted contest letters. These will ordinarily stay with the sailplane on a permanent basis, independent of ownership. Transfer of particular letters to another sailplane will be permitted provided that:

- 1 the letters are obliterated on the original sailplane, and
- 2 SAC is notified in writing of the transfer.

Letters may be reserved to a SAC member who, in the near future, intends to own a sailplane. The inscription of these letters in the registry will be dated and, after a period of two years, if the inscription is not renewed by the member, it will be considered abandoned and will be removed from the registry.

Form One or two-digit numbers may be used as well as two-letter contest letters, or a combination thereof as alphanumeric.

Placement On the underside of right wing and on both sides of vertical tail surface.

Design Contest letters shall be as large as possible in the shape of block letters and numerals such as those used for Ministry of Transport identification.

Permitted contest letters

AA to ZZ, 1A to 9Z, A1 to Z9, and 1 to 99 (The π and Σ already in use are only tolerated). An old rule excluded the "I" and "1" in a combination of two letters or digits. We removed this rule after consulting our fellow contest pilots. In Europe, they use any combination of I, 1, zero, O, and do not get mixed up, even with the impressive amount of sailplanes. Here, it would be very surprising to see on a flightline at the same time Alpha India, Alpha One, or India Oscar and Ten. If this happens, the likely confusion will be eliminated by the singularity of the situation.

Les Règles

Objet Les lettres d'appel ont pour objet de faciliter l'identification des planeurs à la ligne de départ ainsi qu'à la ligne d'arrivée. Elles servent également lors de l'attribution des positions sur la grille de départ, lors de marquage des points etc.

Attribution des lettres Seuls les membres de l'ACVV peuvent enregistrer des lettres d'appel. Celles-ci seront assignées en permanence à un planeur sans égard au propriétaire de celui-ci. Par contre, le propriétaire du planeur pourra transférer ou changer les lettres d'appel pourvu que:

- 1 les lettres soient effacées du planeur en question et que
- 2 l'ACVV en soit avisée par écrit.

Un membre de l'ACVV qui aurait l'intention, dans un proche avenir, de devenir propriétaire d'un planeur peut réserver à son nom des lettres d'appel. L'inscription de ces lettres au registre sera datée et, lorsqu'un délai de deux ans se sera écoulé, à moins que le membre ne renouvelle son inscription, elles seront considérées abandonnées et l'inscription sera alors retirée.

Configuration On peut utiliser des nombres d'un ou deux chiffres, une combinaison de deux lettres ou une combinaison alphanumérique.

Positionnement Sous l'aile droite et sur les deux côtés de l'empennage vertical.

Design Les lettres devront être le plus gros possible sous la forme de lettres moulées à la manière du Ministère des Transports.

Les lettres d'appel permises:

AA à ZZ, 1A à 9Z, A1 à Z9, et 1 à 99. (Les lettres π et Σ déjà en usage sont seulement tolérées.) Les anciennes règles interdisaient d'utiliser les "I" et les "1" dans des combinaisons alphanumériques. Nous avons révisé les règlements et éliminé cette exigence après consultation avec nos confrères vélivoles et après avoir vérifié ce qui se fait en Europe où toutes les combinaisons sont permises sans pour cela occasionner les mélanges que les anciennes règles voulaient prévenir. Il serait d'ailleurs très surprenant de voir sur une grille de départ en même temps Alpha India, Alpha One, ou bien India Oscar et Dix. Et si cela se produisait, la singularité de la situation ferait d'elle-même disparaître la méprise.

Current registered letters / la liste des lettres enregistrées à date

You will notice some inaccuracies, corrections are welcome. Toute précision ou correction ou suggestion sont bienvenues.

AB	GULX	ASW-20	Buzz Burwash
AC	FRNN	HP-11	Allen B. Clarke
AJ	GDPJ	Jantar	Ray Richards
AL	GAJS	Duster	Christian Aubut
AM	FSIR	Std Cirrus	Alex Krieger
AS	GAUL	PIK-20	Ariadne Soaring Inc.
BG	GOBG	Diamant 16.5	Peter F. Flanagan
BJ	FBMK	PIK-20	Bernard Palfreeman
BW	GDBW	Jantar Std	Gatineau Gliding Club
CB	FTUB	LS-1	William Roach
CC	GJSO	Jantar 2	
CD	GBIG	Astir CS77	Bob Baptie
CL	reserved		Ursula Wiese
DB	réservé		André Pepin
DC	FBDC	Libelle 201B	Robert Binette
DG	GCTZ	DG-300	Vankleek Sailplanes Ltd.
DH	FZDH	Skylark 3B	Peter Sully
DJ	reserved		Don Jessee
DP	FCUM	SZD 31 Pirat	Paul Dorion
DS	GADS	Pilatus	Arthur Klinge
DW	GQMB	Hornet	SOSA
DZ	GBZO	ASW-20B	Robert DiPietro
EB	GFEP	ASW-20	Karl Doetsch
EE	GPUB	RS-15	Tony Burton
EH	GYRE	Std Libelle	Paul Puky
EQ	GBEQ	Lark IS29D2	Denis Gauvin
EY	GUXQ	Lark IS29D2	Ian Oldaker
EZ	FFEZ	Tinbus	Dave Webb
FJ	GFBJ	Jantar Std 2	Cu Nim Gliding Club
GB		Jantar Std 2	Gilles Boily
GC	reserved		Gatineau Gliding Club
GD		DG-300	Geyer/Webb/Bennett
GJ	GCGJ	Jantar Std 2	Brian Milner
GO	GITZ	LS-4	Bryce Gormley
GP	GORE	PIK-20B	Gary Paradis
GS	GUJF	Jantar Std	Gilles-André Séguin
GY	GINY	PIK-20D	Graham Midwinter
HG	GLHG	Std.Cirrus B	Dugald Stewart
HK	GHDR	Jantar Std 2	Hermann Ksander
HP	FHPI	HP-14	High Performance Inc.
HY	FWSE	RS-15	Harold Yardy
HZ	GPHZ	RS-15	Robert Mercer
JC	FKSS	Phoebus C	Lester Oiland
JF	FFGR	Kestrel 19	John Firth
JJ	GXTS	Jantar Std	Garnet Thomas
JK	GCJK	Std Libelle	Paul Jean
JM	FDN	Std Cirrus	Jos Jonkers
JO	reserved		Jim Oke
JS	GTGO	LS-4	Jörg Stieber
JW	reserved		John Weber
KB	FUXB	HP-11A	Bob Patterson
KC	reserved		Harry Pözl
KM	GDXT	PIK-20B	?
KR	GTYF	Nimbus 2c	Heinz Rominger
KT	GTBL	Lark IS29D2	Rob Maheu
KW	GJKW	HP-18	Keith Williams
KY	FUKY	Phoebus C	Keith Deller
LD	reserved		Lawrence Dobranski
LL		Jantar Std	Paul Anderson
LM	FPLM	SHK-1	Peter Skensved
LS	reserved		Bryce Gormley
LT	FALT	HP-14	Dixon Mory
MB	FFKQ	Kestrel 19	Dave Belchamber
MC	FBON	Libelle 201B	Gail Oneschuk

MF	GEMF	Jantar Std 2	Jim Feyerer	ZZ	GMZZ	LS-4	Jim Carpenter
ML	FKJO	Ka6CR	David McAsey	1Y	GQIY	HP-18	Peter Masak
MM	F-ZBH	Grunau Baby 2	David Fowlow	2C		Nimbus 2c	James Henry
MO	GMOE	DG-100	Georges Cousineau	2L	GORT	Open Cirrus	David Fowlow
MZ	GKIC	ASW-20B	Ulli Werneburg	2W	GGWW	ASW-20B	Walter Weir
ND	GOON	Pioneer II	Ted Lightly	3A	GLDR	Mini Nimbus	Albert Stirling
NG	FBNG	M100-S	Marc Lussier	3B	GRKX	ASW-20	Colin C. Bantin
NJ	GPEN	PIK-20B	Julius Nagy	3K	réservé		Ken Couser
NY	réservé		Gerry Nye	3Y	FRXG	Austria SH1	Black/Officer
OB	FZUZ	ASW-15	Oscar Boesch	4E	GEOD	Std Cirrus	George Dunbar
OC	FBMX	Open Cirrus	Harold Eley	4N	N184N	Std Cirrus	Richard Cook
OR	GFOR	ASW-20	Frank Vaughan	7G	GPRS	Libelle 201B	A.O. Schreiter
OT	réservé		Guy Bourrassé	7Z	GVTZ	Jantar Std	Vancouver Soaring Assn
PC	FWZT	HP-14	Paul Chevrier	9P	FQKE	Std Cirrus	Konrad Heussi
PM	GGGE	ASW-20	Terry Southwood	A1	GDZ	Discus	Ed Hollestelle
PP	GFRM	PIK-20E	F.R. Matthews	B1	FAQV	Std Cirrus	Stewart Baillie
PR	reserved		Peter Lamla	B2	GQLB	HP-14	Lloyd Bungey
PT	reserved		Peter Timm	C1	GUJG	Jantar Std	AVVC
PY	GHMY	Jantar Std 2	Paul Yardy	D9	GUIL	Open Cirrus	Dick Vine
RJ			Rick Ryll	K2	GRXX	LS-6b	Wilfried Krueger
RL	réservé		Roger Laroche	L4	FFGU	Std Libelle	David Springford
RM	FASW	ASW-12	Dick Mamini	L7	FPSQ	BG 12BD	Keith Lee
RP	réservé		Richard Poissant	M7	GYMZ	ASW-20	Jane Midwinter
RS	GTRS	Ventus b	Roland Steimer	P5	GVZT	Std Libelle	Mike Frastacky
SA	GVSA	Grob 103 Acro	Vancouver Soaring Assn	R1	reserved		Douglas Bremmer
SM	FARE	Std Cirrus	Don Russell	R2	GRRM	ASW-20	Rick Matthews
SR		ASW-20	Dave Frank	S1	GVDO	ASW-20	Larry Springford
SS	GXMO	Mosquito	Klaus Stachow	T2	GIZC	LS-4	Paul Thompson
ST	GEST	PIK-20	Dominique Bonnière	T7	GOPN	PIK-20D	Bob Carlson
SX	FXSX	Jantar Std 2	Walter Herten	V1	F-AMG	DG-400	Wolf Thiele
TC	GXWD	PIK-20	Mark Badior	W2	GRKW	Mosquito C	Chris Wilson
TI	GWTI	1-35	?	X1	GIJO	Ventus	Kevin Bennett
TT	GYSA	1-35	David Harper	X6	GJXG	ASW-19	Bruce MacGowan
TW	GCTW	Std Cirrus	Tom Okany	Y3	GYYY	ASW-20CL	Dave Baker
TZ	GBTZ	ASW-20	Robert Gairns	Z1	GZMB	K5	Danny Zdrasila
US		Kestrel 19	Steve Weinhold	11	FSNZ	KW-45	Fred Wollrad
UV	GLUV	Pioneer II	Albert Sorignet	14		Libelle H-301	?
VB	FCYD	Ventus b	Hal Werneburg	18	GAJM	Nimbus 2	Mike Apps
VR	GVRR	DG-202	David Marsden	19	FVNE	Phoebus	Tom Milc
WK	GRUR	Ventus	Andrew Jackson	22	GNBE	Std Libelle	Peter Schwirtlich
WP	reserved		Terry Southwood	23	FXGY	Open Cirrus	Group 79 Ltd
WW	FAOS	LS-4	Ian Spence	24	GSZA	Mini Nimbus	Hans König
XC	GOXX	Jantar Std 2	X-C Flight Association	26	GVRS	Ventus b	Bruce Hea
XI	GVLB	DG-200	Bob Gage	41	GVES	VES1	Jerry Vesely
XL	GFAI	Skylark 4	Chris Futter	44	reserved		Andy Gough
XR	GPXR	Club Libelle	Terry McElligott	52	GMSG	Jantar Std 2	Bo Wasilewski
XU		ASW-15B	Chris Eaves	57		Diamant 16.5	Pierre Pepin
XZ	GTXZ	ASW-19B	Helmut Gebenus	71	FQJS	Libelle	Ruth Thumm
YW	GBYW	DG-202	John Bisscheroux	77	GPON	ASW-20	Jim Oke
YZ	GHEU	Duster	Bruno Schrein	78	reserved		John Brennan
ZF	reserved		Jiri Sojka	94	GNZY	Mini Nimbus	A.O. Schreiter
ZQ	GVQW	ASW-17	Stanley Doda	96	GLYD	1-23 H15	Ruth Thumm
ZT	GIZT	LS-4	Ian Grant	π		ASW-20	Jock Proudfoot
ZX	GTZX	PIK-20	Terk Bayly	Σ	GVJV	Sigma	Dave Marsden

photo unavailable

Boris Karpoff and the DG-202 towing off at MSC.

Club News

ONTARIO SOARING ASSOCIATION DID YOU KNOW ?

- Some clubs have been sending a copy of their newsletter to me for amalgamation and transmission of items of interest to **free flight** in an effort to improve communication.
- Did you know that RVSS and SOSA are listed in the Yellow Pages? Ring their number and an answering machine delivers an often changed message about their club.
- Did you know that the Ontario Ministry of Highways will erect a small "destination" sign, pointing the way to your field for \$150 and \$50 yearly rent? Just great for our hide-away airports.
- OSA has attractive SAC "SOAR / PLANEZ" posters (18"x12") with room for club stamp and directions at \$25 for a hundred. These could go into tourist offices, businesses, nearby flying clubs, etc.
- Paul Finley, a spokesman for the Ontario Ministry of Tourism and Recreation, talked to the November OSA Directors' meeting about government funding — its availability and requirements. Basically, they want to know what benefits government funds spent on soaring will bring to the public and tourism; what benefits will accrue to amateur sport; what are the long and short term goals, and what plans are being formulated to reach them; how is risk management being addressed.
- Did you know that there were 380,000 sports injuries in Ontario alone last year?
- Training and education are projecting seminars in advanced soaring, navigation, and outfield landings; "little guy" and interclub competitions have been re-proposed, as well as beginner cross-country courses.
- Did you know that Jane Midwinter (RVSS) was on Glenn Lockhard's beginner cross-country course less than two years ago — and since then has completed 300 km flights ... on three occasions?
- Following the tragic death of the Rideau Gliding Club's MVP (Hank had an award to prove it!), the club reorganized into smaller working committees, co-opted nearly all the members, learned a hell-of-a-lot, bought a new(er) towplane and, like the Phoenix, are back flying ...we even qualified for a Wintario grant. Our thanks to friends at SAC, Vancouver SA, Huronia, SOSA and Bonnechere ... and especially those at RVSS who invited us to operate from their field, using their towplane and tie-downs — even invited us to a barbecue ... nice people — which is what soaring is, fundamentally, all about. We are grateful to Tom Stacy of Johnson and Higgins for the speedy processing of the

insurance claim, which substantially reduced our "down time".

Ray Lawton
Rideau Gliding Club

MORE FROM DOWN UNDER

My gliding lately has been a mix of good and bad or rather bad and good. In early November, I fell for the old sucker trap of landing in a field already occupied by another glider and learnt a whole heap of lessons.

- 1 Just because there is a glider already down in a field, it doesn't mean it is necessarily good.
- 2 Just because the farmer has made a pile of rocks in one corner, it doesn't mean he has completely cleared the field.
- 3 Farmers don't necessarily plow around the rocks, sometimes they plow over the top of them.
- 4 If there is a rock the plow won't move, then it is solidly fixed in the ground.

From the above four points you will gather that I was rather unhappy after I landed in the plowed field. I hit a rock with my left wing as I landed in it. It was the same colour as the dirt and had been plowed over rather than around and was not visible from above or on the approach. The glider sank into the dirt somewhat which brought the underside of the wing to the rock level.

Fortunately I was carrying insurance and was able to get the Libelle straight into the local repair shop with a half promise of it being ready for Christmas, but on opening the wing the spar was found to have suffered crushing damage so things ran behind schedule and continued to slip further behind schedule as each promised date for completion drew closer. (This turned out to be advantageous once I knew the preprint of my book [*Trying their Wings*] was coming as I then had two reasons to be in Melbourne during the first week of the new year.) Actually, I am quite happy with the quality of the repair job that was done and not really too upset about the slippage in completion dates.

During November and December the soaring weather at Bacchus Marsh was not very good with quite a few days being blown or rained out. Geelong Gliding Club has been working on building glider trailers, three of them, so the poor weather was not a disaster. The DG-300 trailer was finished in time for the Christmas camp, but the LS-4 and SZD Junior trailers are still on the go. The LS-4 trailer is a replacement for its present unsatisfactory one, so was not an urgent requirement. The club has just got the Junior and it

was bought unpainted, so its trailer was not needed yet. When the Junior arrived we discovered that its wing chord was larger than anticipated, so the partially completed trailer for it turned out to be a partially completed trailer for the LS-4 instead.

I helped with the skinning of the DG trailer and the finishing touches which extended into the period just after Christmas. On Boxing Day, most of the club gliders were taken up to Corowa which is on the River Murray, about 80 km north of Benalla. The Super Cub was supposed to be flown up there on Boxing Day towing the K13, but the weather was bad, so the trip had to be deferred. As the tow-pilot who was going to make the trip had to work on December 27th, I got dobbled in for the journey being the only tow-pilot still around town. I had done the trip last year so knew the way. I flew the tow up to Corowa and did a few tows there on the Tuesday, then caught the train back to town as I was expecting the Libelle to be ready at the end of that week.

With the Libelle obviously falling further behind schedule and the book draft not arriving, I decided to go back up to Corowa for the New Year's long weekend. I managed to put in a few days of towing and also got the Standard Cirrus for some local flying (only about 170 km), before returning to Melbourne on the Wednesday, which was just enough time for the Post Office to do its work. After I had run through the preprint for the book, worked out the additions and hopefully found most of the errors, it was into Friday and time for the Libelle to be ready. Instead of it being ready in the morning it was afternoon, so I made a leisurely drive up to Corowa with the trailer in tow.

The Geelong Gliding Club camp was ending on the Sunday, but another of the three clubs which operates at Bacchus Marsh was staying on for most of January, so I was planning on staying for a week or so.

I started off easy with the Libelle and only made a 210 km out and return on the Saturday, but on Sunday went further afield clocking up a 390 km triangle. My most enjoyable flight was on the following Tuesday when I landed 7 km short after an eight and a half hour battle with strong winds on a 500 km triangle attempt. Another Geelong member who had also stayed over with the club LS-4 had suggested it. We did it the wrong way round by going upwind first, then downwind with a quartering headwind on the final leg. I was about an hour ahead of Stan at the first turn and he converted his flight to a 340 km out and return, but by that time I was out of radio contact and stuck to the original task.

In nine days I flew 30 hours in the Libelle covering over 2000 km with just one out-landing. I also got back onto the winch, which the Beaufort club were using most of the time.

One interesting event occurred on the final Saturday that I was there. We had finished flying and were back at the Corowa Gliding Club's hut, replenishing our dehydrated

bodies when I observed a glider out on the strip. As all of ours were accounted for, this had to be from some other site, so we went out to see where they were from. It turned out to be a Twin Astir which had flown in from Waikerie over 600 km away. They were coming to Corowa for the Sports class nationals and decided to have a crack at the two seat Australian distance to goal record. Their final glide lasted 45 minutes and brought them in with 300 feet to spare.

Regards from Australia,
Lloyd Bungey

NEW YEAR'S DAY AT SOSA

I thought that readers would be interested to hear how this year's flying at SOSA started off. On 31 December I travelled from my home in Unionville to spend New Year's Eve with a friend, who lives about 10 minutes from the gliding club. My friend (who has given me a bed to sleep in many a night after gliding) was gracious enough to allow me to spend the night on the couch in the family room. The rest of his unexpected relatives were scattered about in the remaining rooms of the house.

The last time I had flown was on 18 December when I had a 50 minute flight. New Year's Day dawned under a low overcast sky — it looked like about 500 feet agl when I woke up at 8 am. I arrived at the gliding club at around 10. As I stepped out of the car I was greeted by the silence of a deserted airfield in winter. A light winter breeze was blowing loose snow around the icy runways. There was evidence that there had been life around: rabbit tracks in the snow, the open hangar door and a fire burning in the clubhouse wood stove, which was already removing the chill of the winter morning.

Suddenly the silence was broken by a "Happy New Year" from another club member who had arrived just after me, as he entered the clubhouse. We stepped outside to find the person who had arrived early to begin the preparations for the day. We met the eager beaver coming up from the hangar to see who had arrived. We all wandered down to the hangar to see if we could begin to move a towplane out. Soon cars began to arrive at the parking lot, spilling out people who rushed down to the hangar and began to help get the aircraft out, D'd and towed down to the flight line, amongst wishing everyone a "Happy New Year". A towplane burst to life and taxied out to the runway to take off and sniff the day out. The report came back that the ceiling was at 1200 feet, and it seemed that the upper winds were beginning to disperse the low cloud cover.

I waited for the tractor to come back from the flight line to tow out the club's single Astir. In half an hour I was strapped in the cockpit ready to go, and indicated that I wanted a tow to 3000 feet. The tow rope was hooked up, I closed the side window and the vent, the canopy immediately began to fog up, the glider began to move, I quickly reopened the vent as the glider lifted off and the fog began to clear. The tow to 3000 didn't take very long in the cold air. I released from the towplane and settled in to a silent glide back to earth. A big blue hole had opened up in the clouds above; to

the southwest lay the club. A half mile to the north was a sun bathed layer of stratified cumulus clouds at about 1500 to 2000 feet. This was like flying with Air Canada!

I enjoyed the view for a little while longer and even tried to see if there was any lift about; however, my efforts were in vain. The sunshine was to be the only gift that nature was going to give us this day. I began to prepare to enter circuit and realized that the runway I was going to land on was the one that I had used for my first solo flight at SOSA at the beginning of the year. After a year of flying here this would be flight number two from this runway. My circuit and landing were uneventful.

Arriving back at the flight line, there was a whole new group of people to wish a "Happy New Year". I had one more flight during the day, and helped to put away the flight truck at the end of the day — which is a story of its own. All in all we had thirty-four flights between 11:30 am and 4:30 pm. There was a slide presentation and some hangar flying in the clubhouse during the course of the evening. I left early since I had a long drive home, and was working the next day. Hopefully the attendance and weather will be as good in years to come.

Fred Hunkeler
SOSA

NOTICE TO CLUB PRESIDENTS

- You are urged to send a list of your 1989 club executive to Nancy in the National Office as soon as you have completed your elections. The information is needed to ensure that important correspondence from the office to clubs (such as insurance receipts) doesn't get lost or delayed by going to the wrong address.
- Nancy would also appreciate it if club secretaries would inform her of changes of address of their members on a regular basis. Many *free flight* magazines are returned by the post office for lack of a correct address, which both costs a lot in extra postage and it delays delivery.

NOTICE TO EVERYONE

With the AGM insert in this issue, a 20 page magazine is all that I could put together without getting into the next higher weight for postage (and a \$500 added cost to SAC). Some missing items will be back in 3/89. Tony

EQUINOX EXPERIENCES SOARING

This is a notice to all readers that the Mar/Apr issue of *EQUINOX* magazine will be featuring an article on soaring. Terry McElligott reports that he gave one of their writers a ride at SOSA and the writer also attended the '88 Nationals. Given the magazine's normal excellent level of writing and photography, it should be very good publicity for us.

WHY YOUR CLUB CAN'T AFFORD TO KEEP QUIET

Anyone watching recent developments in the USA knows that the "Great Airspace Grab" is a graphic illustration that the wide open spaces in North America are not quite so wide anymore. Canadians are of course now well familiar with similar actions in this country which could curtail soaring to put it mildly. We have, I believe, cool heads prevailing at Aero Club of Canada and Transport Canada. For the rest of us, it has never been so important that Canada's soaring clubs enjoy good relations with everyone concerned.

If your club does not have a person or two devoted to publicity, then by all means get someone. These days, your PR person is as essential as the sailplanes you fly.

I can't stress this point enough.

The last SAC publicity chairman, Grant Graham, circulated a publicity handbook to all the clubs in Canada. It contains some solid advice on the subject and I'd recommend you have a close look at it for ideas on how to increase — and keep — your members. Because our country is so vast and there are so few of us, the job each club does on publicity becomes extremely important.

Publicity projects do not have to be terribly complicated. A simple little thing like having two or three people set up an unmanned mall display with a supply of brochures can work wonders. Even a leaflet or two on public library or college bulletin boards will attract attention. A phone call, or a nice letter to your local community cable channel might well result in an interview — programs are often re-broadcast on several different community cable stations.

Here are a couple of ideas I recently heard about:

- Erin Soaring Society runs a Glider Pilot Ground school every February in the Toronto area and they send press releases out. The result? They get a little airtime, and likely full classes.
- If there is a fall fair in a town near your airfield, try and arrange a static display or flypast. SOSA did this in 1988 at the Rockton World's Fair, which gets 100,000 visitors over Thanksgiving weekends.

It's through projects like these that our sport can be kept in the public mind, which is a concept equal in importance to increasing membership — or, for that matter, keeping members.

I saw a sign once that really sticks in my mind when it comes to publicity:

**When you don't publicize,
something horrible happens
NOTHING!**

Terry McElligott
SAC Publicity Chairman

Hangar Flying

AN IMPROVED SCOUT SPAR

Following the discovery of a cracked spar in the Alberta Soaring Council Scout last year, the aircraft has been put back into service in an improved state. A 1/2" x 1 3/16" wood doubler has been bonded along the top chord of the spar, increasing its compression strength under positive "g" loads by at least 50%. Small clearances have to be cut out of each rib, but the modification can be made without removing the spar from the wing, with consequent savings in labour costs. The stronger spar (although not changing aircraft load limits) will be much more resistant to the cracks which have plagued Scout wings.

The mod is best done, of course, when a spar has to be replaced anyway or when the wing is being recovered. The MoT approved mod is #W88-202, and the drawings (SA-PCK12-88, sheets 1-7), may be purchased from Sunaero Aviation in Claresholm. Contact Jerry Vesely (403) 625-3155.

REICHMANN ON THERMALLING

Professor Dr. Helmut Reichmann, a member of the International Soaring Symposium held last year in Australia, had some valuable hints for pilots working on improving their thermalling techniques.

He started with the words, "Good pilots fly well in any glider, bad pilots fly badly in any glider. Money can buy a good glider, but money cannot make a bad pilot better." His premise was that it is practice and dedication to cross-country training which enhances pilot skills, and not the purchase of expensive and complicated instrumentation. Such instrumentation, he said, only causes the pilot to keep his head inside the cockpit instead of scanning the world for thermals and other gliders.

Helmut described 10 exercises for improving pilot performance. They are simple, yet potentially extremely useful to many aspiring cross-country champions out there.

1 Use one thermal to its top, leave it and lose 1500 feet or so, then rejoin the same thermal and try to work it to the top again more efficiently.

2 Use thermal B, leave it at a fixed height, find thermal C, use it to gain more height, leave it and find another thermal, A, then repeat the exercise.

3 Use the thermals near the airfield but only work them in the lower regions to improve thermalling technique near the ground.

4 Use the same thermal over and over and try to use it to the lowest workable point, again near the airfield.

5 Try to assess the next thermal strength and say it aloud to yourself. When you find the next thermal, note how close your estimate was.

6 Always try to outfly gliders in a gaggle.

7 As most persons have a favoured direction for turning, always try to turn to your non-favoured side when training.

8 Use water ballast on weak days to determine when you should really dump it.

9 Try different centering techniques.

10 Try thermalling without the use of any variometers. Turn off computers and blank the mechanical vario. Fly by the seat of your pants.

Other points Helmut made were:

Flying Straight

- Navigation time is lost time.
- Fly using thermals on track.
- Don't use every thermal.
- Steep pull-ups into thermals are alright, but steep pushovers on leaving are detrimental because you are trying to make the wing do what it is not designed for (operating at negative angles of attack).

Final Glides

- Practise longer and lower near the airfield.
- Practise spot landings every time you fly, ie. 100m from touchdown to end of roll. (If you are a frequent outlander then you'll get lots of practice anyway!)

In Clubs

- Try to discourage envy amongst fellow members, and try to enjoy the successes of others.
- Leave thermals together.
- Team fly on short tasks.
- Put the best pilot in the worst ship!
- When waiting for a fellow pilot, pull the brakes and join him at his altitude; rather than saying, "hurry up!", try to help.

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D. Bonnière (613) 592-0657

photo unavailable

Steve Chokley brings in the MSC 1-26 during a spot landing contest

Photo: Mona Chokley

FAI Badges

The following Badges and Badge legs were recorded in the Canadian Soaring Register during the period 1 January to 28 February 1989.

SILVER BADGE

771 Paul Fortier RVSS

DIAMOND ALTITUDE

Pierre-Julien Parent Lahr 5950 m Pegase 101 Sisteron, France

SILVER DISTANCE

Paul Fortier RVSS 95.0 km 1-26 Kars, ON
Charles Gower SOSA 64.0 km 1-26 Rockton, ON

SILVER ALTITUDE

Jörg Stieber SOSA 4100 m LS4 Julian, PA
Keith Hay Cu Nim 1930 m 1-26 Cowley, AB

SILVER DURATION

Leo Reypert Erin 5:24 1-26 Grand Valley, ON
Witold Pruchinicki York 5:25 Monerai Arthur, ON
Jörg Stieber SOSA 5:56 LS4 Julian, PA

C BADGE

2155 Robert Demchyshyn COSA 1:30 2-22 Chemong, ON
2156 Leo Reypert Erin 5:24 1-26 Grand Valley, ON
2157 Witold Pruchinicki York 5:25 Monerai Arthur, ON
2158 Paul Fortier RVSS 5:18 Astir G103 Kars, ON
2159 Jörg Stieber SOSA 5:56 LS4 Julian, PA
2160 Andreas Klauke Air Cadet 1:38 2-33 Arthur, ON
2161 Rob Brown Edmonton 1:27 1-23 Chipman, AB
2162 Alain Bouliane Outardes 1:40 K8 St. Esprit, PQ
2163 Keith Hay Cu Nim
2164 Pierre Bournival Outardes 1:52 K8 St. Esprit, PQ
2165 Charles Gower SOSA 2:55 1-26 Rockton, ON

photo unavailable

rigging the club Grob at MSC

CURRENT CANADIAN SOARING RECORDS —

Russ Flint, SAC Records Chairman

RECORD TYPE	OPEN	FEMININE	MULTIPLACE (OPEN)	MULTIPLACE (FEM)
DISTANCE (km)				
4.3.2.1 Straight distance	Marsden / Apps 1093 1984	U Wiese 607 1986	C Zwarych (R Adam) 495 1986	not claimed
4.3.2.2 Distance to goal	Marsden / Apps 707 1984	A Williams 305 (C) 1975	Proudfoot (G Fitzhugh) 304 (C) 1981 Zwarych (McColeman) 310 (T) 1984	A Williams (E Bell) 76 1979
4.3.2.3 O & R distance	Apps / Marsden 615 (T) 1983 B Milner 1001 (C) 1983	U Wiese 328 1984	D Marsden (E Dumas) 422 1979	not claimed
4.3.2.4 Triangle distance	H Werneburg 804 1982 P Masak 1007 (C) 1987	J Midwinter 318 1988	not claimed	not claimed
SPEED, Δ (km/h)				
4.3.2.5a 100 km	P Masak 141.4 (C) 1985 D Marsden 111.3 (T) 1982	A Williams 54.5 1976	D Marsden (M Jones) 98.1 1975	A Williams (Stone) 31.0 (C) 1970
not FAI 200 km	J Firth 110.6 1984	M Barritt 68.7 (C) 1970	C Yeates (K Yeates) 79.5 (C) 1987	not claimed
4.3.2.5b 300 km	K Bennett 113.1 (T) 1988 P Masak 148.9 (C) 1985	U Wiese 55.6 1983	D Marsden (E Dumas) 69.9 1975	not claimed
not FAI 400 km	J Firth 99.0 1988	not claimed	not claimed	not claimed
4.3.2.5c 500km	R Mamini 101.8 (T) 1973 P Masak 151.2 (C) 1985	not claimed	J Firth (D Webber) 88.8 1986	not claimed
4.3.2.5d 750 km	W Krug 108.8 1982	not claimed	not claimed	not claimed
4.3.2.5e 1000 km	P Masak 106.5 (C) 1987	not claimed	not claimed	not claimed
ALTITUDE (m)				
4.3.2.6 Gain of Altitude	W Chmela 8321 (C) 1974 J Beattie 8153 (T) 1983	A Williams 5898 (C) 1969 U Wiese 5720 (T) 1982	Shirley (Campbell) 7100 1961	Williams (Kossuth) 2987 (C) 1970
4.3.2.7 Abs. Altitude	W Chmela 12449 (C) 1974 B Hea 10485 (T) 1981	A Williams 9772 (C) 1969 U Wiese 8035 (T) 1982	Chmela (VanMaurik) 10390 (C) 1975 Shirley (Campbell) 9085 (T) 1961	Williams (Kossuth) 4206 (C) 1970
SPEED, O & R (km/h)				
4.3.2.8a 300 km	P Masak 171.6 (C) 1983 H Werneburg 115.2 (T) 1983	U Wiese 59.6 1984	Chmela (Rominger) 65.0 (C) 1976	not claimed
4.3.2.8b 500 km	P Masak 144.3 (C) 1985 H Werneburg 115.4 (T) 1984	not claimed	not claimed	not claimed
4.3.2.8c 750 km	not claimed	not claimed	not claimed	not claimed
4.3.2.8d 1000 km	B Milner 94.7 (C) 1983	not claimed	not claimed	not claimed
SPEED, GOAL (km/h)				
not FAI 100 km	K Bennett 118.7 1985	not claimed	W Chmela (R Zimm) 47.0 1971	not claimed
not FAI 200 km	J Firth 70.0 1970	not claimed	not claimed	not claimed
not FAI 300 km	W Mix 108.6 1966	not claimed	Proudfoot (Fitzhugh) 70.2 (C) 1981	not claimed
not FAI 400 km	not claimed	not claimed	not claimed	not claimed
not FAI 500 km	D Marsden 97.1 1970	not claimed	not claimed	not claimed

C indicates a record by a Canadian citizen originating outside the country.

T indicates the corresponding record set within Canada. These are noted only when a greater "C" record exists.