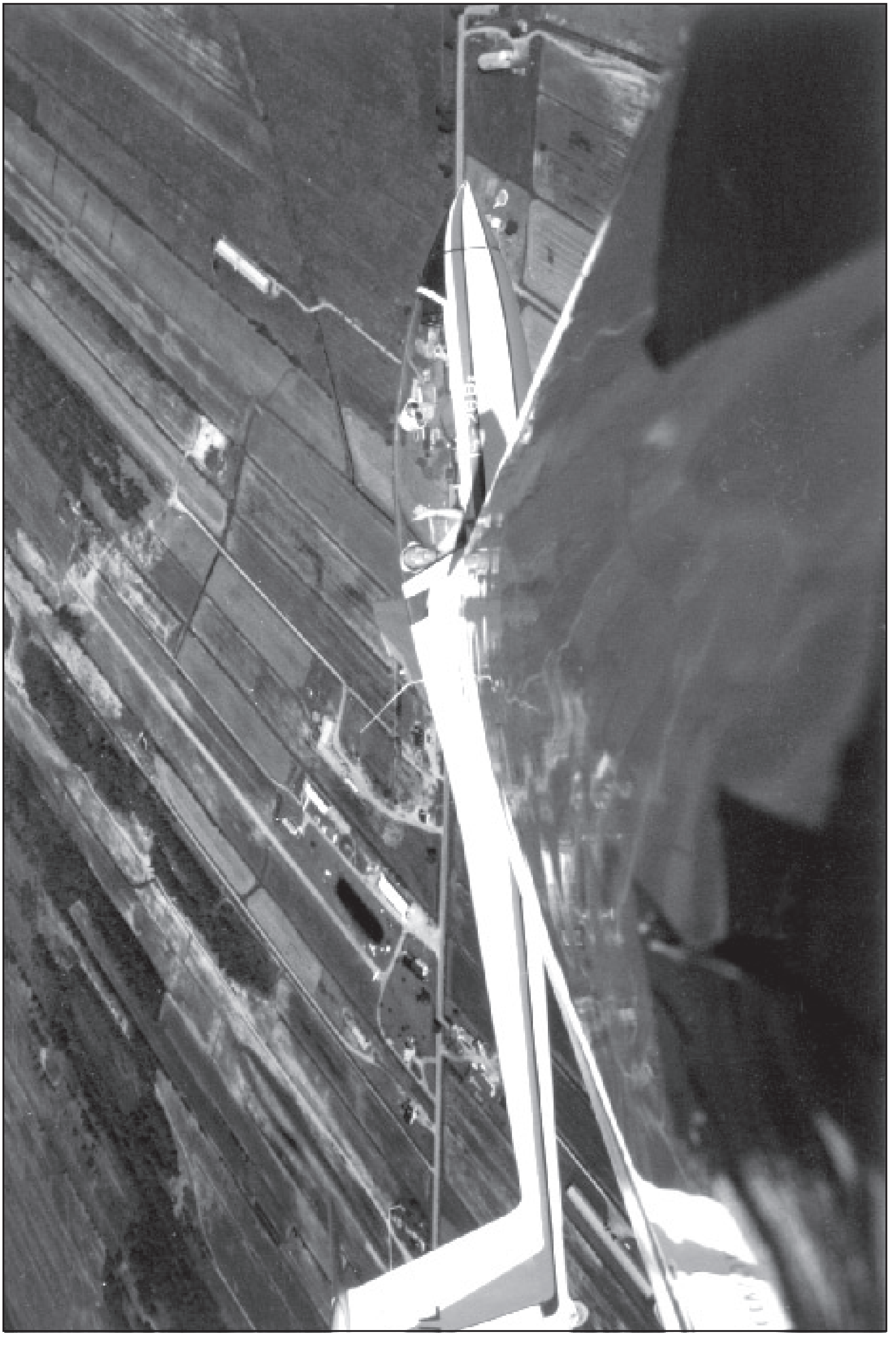
free flight • vol libre



3/91
Jun/Jul

POTPOURRI

Hello everyone, I hope you have all had your annual spring checkride by now and are aware of those bad habits that need eliminating, and are also aware of the forgotten procedures that need to be reinforced — such as continual scanning and repeating circuit checklists with awareness, not by unconscious rote. I have heard quite a few pilots say "wheel and water" without giving the least indication of checking that the wheel was actually down and locked.

I also know that some of us need to add "tail dolly" to the start of the CISTRSC checklist and keep it there. It is another item along with spoilers that wing runners need to be briefed on.

In my previous column I asked for inputs to help solve our problem of Insurance Drop–outs. So far I have heard nothing, and Tony Burton reports no letters to free flight on the subject. What incentive should be introduced to keep the private pilot in the SAC group insurance scheme? How do we combat the response, "Why should I support SAC for an extra four hundred dollars a year, that's more than all my tows will cost me!" Believe me, I have heard several responses such as that and I'm sure others have heard them too.

Do we introduce a higher premium for two years for those owners who have dropped out and wish to come back into the SAC policy when the rates from outside sources become greater than SAC's? Will that stop them from dropping out? Do we reintroduce the system where the insurance premiums for all ships are divided equally between all members and everyone pays a fixed amount in addition to the membership fee — or something else?

You, the members, have requested that the Board take action but you don't want penalties applied as you think that won't cure the problem. Then what is the alternative? Remember — if private pilots keep dropping out, the club's premiums on their gliders are going to increase drastically and club membership fees will have to rise to cover them. Please give your inputs to your Zone Director, we need them for our October meeting.

Don't forget to support our pilots competing in the Worlds at Uvalde, Texas. Buy the T–shirts or logos they will be selling or give donations to the "World Contest Fund". Tax receipts will be issued to all donors who are at "arm's length". Remember that the federal government does not support our sport. "Good luck, Canadian team pilots — keep the competition behind you."

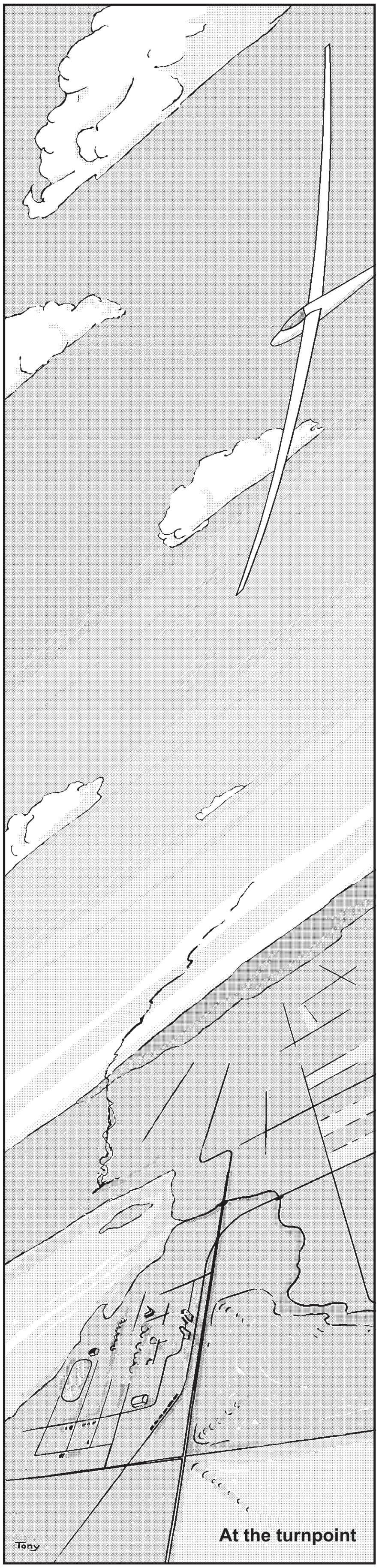
Everyone fly safely and, to those of you flying in contests or for records, remember that high speed finishes are risky and have led to accidents — are they worth it?

Al Sunley

STOP PRESS FROM EDITOR

The computer at the National Office choked on the member database and printed out about 800 more mailing labels for this issue than we have pilots! Many labels were for persons listed as not having paid up for '91 (although perhaps their money is in the hands of laggard club Treasurers).

In order not to delay free flight delivery, the quick and dirty solution was to manually strip off all mailing labels from the printout that didn't represent a corresponding current paid–up SAC Member. If you or someone you know in your club didn't get their personal copy of this issue, contact your Treasurer first to see if your membership went in, then the National Office.



At the turnpoint

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Trademark pending   Marque de commerce en instance

3/91 Jun/Jul

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

ISSN 0827 – 2557

DEPARTMENTS

Cover

Bob Bell and Carol King fly the Lark over Champlain's new club location in Ste–Dominique, Quebec, and invite *free flight* readers to visit.

Photo by Carol King

50 YEARS AGO – TODAY

How a Zögling Primary came into being ... again. The Eley brothers ... still flying after all these years.

Harold Eley
Regina Gliding & Soaring Club

In 1934 there was precious little in the way of aviation in Saskatchewan and particularly so at the farm of Joe Eley, where Norman Eley lived. He had long wanted to fly, but did not have the means or the money to do so. This didn't stop him from dreaming or from scheming for a way in which he might get into the air. One day he spied an ad in the paper listing a primary glider for sale in Winnipeg. This might indeed be the way for him to realize his dream.

The above scenario pointed Norman to a different glider which was in no way complete, but of better workmanship than the first. This was the beginning of the present primary (training) glider of the German Zögling design.

This design goes back into the 1920's and its original purpose was to train German youth in the intricacies of flying while still adhering to the restrictions imposed by the Treaty of Versaille after the first great war. (In the end this didn't do much for their later war effort but it did make them leaders in the gliding field, which they still are!)

After many setbacks, Norman, a young man in his twenties, with the strong support of Art, in his late teens, completed construction of the glider in 1938. Norman can tell you many sad tales of lack of work space, farm chores taking priority, and damage by animals. But, in the end, they persevered and got it going, about four years after they had started.

Norman learned to fly by faithfully following procedures set out in a manual and was quite successful. Many others of like mind in other areas, notably British Columbia, did not fare as well and usually ended up with their gliders demolished and, often as not, themselves severely injured. Norman knew enough to take it "in slow and easy steps" until he had it mastered. Then he got Art going and then his younger brother Ben. He finally got to me, Harold! I was only 12 at the time and small for my age. He added extra weight for ballast and put blocks on the rudder bar so my legs would reach and away we went. We all did quite a few flights over the summers of 1938 and 1939. We did not get especially high, probably 400 feet maximum, but we had fun and felt good about it. It's too bad we did not keep logs or any records, they would have been very interesting to us now.

In the fall of 1939, the glider was moved outside because the shed was needed for grain storage. That was the beginning of the end because the glider was blown over in a storm and damaged quite a bit. It was partially repaired and flown briefly in 1943 by myself, Wilbur, and possibly Donald. Norman, Art and Ben were off to the war. Wilbur admits to being pretty scared at the time. The whole operation was deemed "unsafe" by Norman and they shut us down after a handful of flights.

After that, the glider was shifted from shed to shed and into the loft at times; mostly under very poor conditions. Over time it weathered to a poor state. Always the dream was that we would get it going again because we were not yet ready to shuffle it off

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 are acceptable. No slides please. Negatives can be used if accompanied by a print.

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

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

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

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Deadline for contributions:

5 January, March
May, July
September
November

L'ASSOCIATION CANADIENNE DE VOL À VOILE

est une organisation à but non lucratif formée de personnes enthousiastes cherchant à développer et à promouvoir le vol à voile sous toutes ses formes sur une base nationale et internationale.

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

vol libre est le journal officiel de l'ACVV.

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

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. 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 apparait 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 ($20 par an, EU$22 dans les Etats Unis, et EU$28 outremer) veuillez contacter le bureau national.

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novembre

Left to right: Wilbur, Harold, Don, and Norman, pose for a photo in the same positions they did about 50 years ago.

to the museum, but other priorities were always in the way. We were finally reconciled to the fact that it should go to the museum if this part of aviation history was to be saved. By this time however, it was too late; the machine was too far gone to just donate it to the museum "as–is".

About the mid 80's we resolved to restore the Zögling, rebuilding as necessary. Norman and Wilbur built the wing ribs — 32 in all — in Norman's basement in the spring of '88. This took almost a month as the ribs are fairly complex. In early 1989 I built all the tail structure in Regina. Now it seemed we might actually do it; but we had a long way to go. After buying spars made in Alberta we finally set out to make the wings. In early 1990, Wilbur came to Regina and we went at it! With the ribs already made, it went quite quickly, about a month in all. Later we covered it, with a Ceconite fabric. This required quite a bit of work, including rib–stitching which holds the covering tightly to the ribs. Next it was "doped" which makes the fabric smooth and makes it impermeable to the air, and also adds the colour; in this case we made it orange like the original. In the meantime, Doug, Norman's son, had built the fuselage in Saskatoon. Whenever possible we used fittings or other parts of the original that were still "good enough". Notably, we still have the original seat including safety belt, and the control stick and fittings.

With all of the above combined effort, we were finally ready to put everything together, or "rig" it as they say in aircraft lingo. For a couple of weeks, myself and Wilbur (with the emphasis on the latter) were doing just that — pins, bolts, cables, and steel rigging wires were measured and put in place.

On April 9 this year, with the odd misgiving as to whether we had everything right, we tried a few flights. Everything worked beautifully; Norman, Wilbur, Doug and myself had done it! Quite a feeling. More than fifty years later the Zögling was in one piece again. This time we won't wait fifty years again — it's going into the Western Development Museum at Moose Jaw pretty quickly. This part of our past deserves to be preserved. •

THE 2026 KM FLIGHT

NEW ZEALAND, 14 DECEMBER 1990

Ray Lynskey
from NZ Gliding Kiwi

THE SOARING SEASON HAD STARTED well in the South Island but November arrived and surprised everyone with its low temperatures and frequent heavy rain. The westerlies which followed in early December were very disturbed, ruling out long flights but often providing excellent soaring conditions for relatively short distances. On Saturday, December 8, a moist northwesterly flow spread onto New Zealand, giving heavy rain on the west coast and hot, dry föhn conditions to the east of the ranges. This heat wave lasted about five days, scorching eastern plains while — ironically — rivers fed from the high country were in flood, closing some roads. Rain spread east off the mountains at times with the passing of a front, but dried out quickly.

On the evening of December 13 the forecast indicated that the wind had generally backed further to the west, and appeared to be less disturbed by fronts than had been the case previously during this weather system. An active cold front was not due to move onto the South Island until later on Friday. It looked possible for a 2000 km attempt so we raced around getting rigged and making the usual preparations for an early start.

Up at 0430 on Friday morning, the wind was blowing at about 10–15 knots northwest, and first light at Woodbourne showed 2/8 stratocumulus on the tops and some scruffy roll cloud in the Waihopai Valley, but no high cloud or lenticulars. It was worth a go! We were airborne at 0600; Jamie Halstead seeing me off and John Sinclair towing in the old Cessna 172. We really appreciated the length of Woodbourne's runway as the Cessna worked at getting the heavy Nimbus into the air.

Releasing over the field at 3000 feet, I headed directly for the ridges to the south, following a vaguely marked wave which allowed a slight climb. I was then able to climb slowly in ridge lift and turbulent wave–induced thermals to 4000 before moving across to the western end of Blairich and climbing to 6000. Normally from here the choice is to drop downwind into the Awatere wave or follow the ridges further west, but the best option appeared to be to head straight northwest to the roll cloud in the Waihopai and hope to get there high enough to contact the lift.

I actually reached the rough lower part of the wave at 4000 and thermalled back to 6000, straightened up into wind and climbed rapidly, at up to 8 knots, until lift weakened markedly at FL140. Looking to the south, waves were marked by lines of cloud which were more like stratus than roll cloud, but it looked reasonable. It took about an hour to get established in the wave.

The wave clouds were aligned more to the west than northwest, and did not parallel the upwind ridges. I flew south just west of the Awatere, descending to 10,000 before climbing to FL150 over the Acheron River. Continuing on, I hoped that conditions would be stronger to the south, allowing a higher average speed.

My track took me east of Hanmer and out over the Culverden Basin, remaining between FL120 and FL170, but it was not possible to cruise fast in steady lift for very long. It was necessary to stop and climb frequently. Entering Lees Valley climbing slowly through FL165 and above all the cloud except some cirrus, I suddenly flew into violent clear air turbulence. This unnerving and very unpleasant air took me by surprise and for a few minutes the cockpit was a mess with all sorts of things flying around. I immediately slowed but it was impossible to hold any set speed — it was fluctuating between 40 and 90 knots. The "rolling" turbulence made it difficult to descend, and in fact I was climbing. I guessed that it was the shear between two different wind velocities or interference between a higher and a lower wave system. Whatever it was, I just wanted to get the hell out of it! Back down at FL150 it was smooth again.

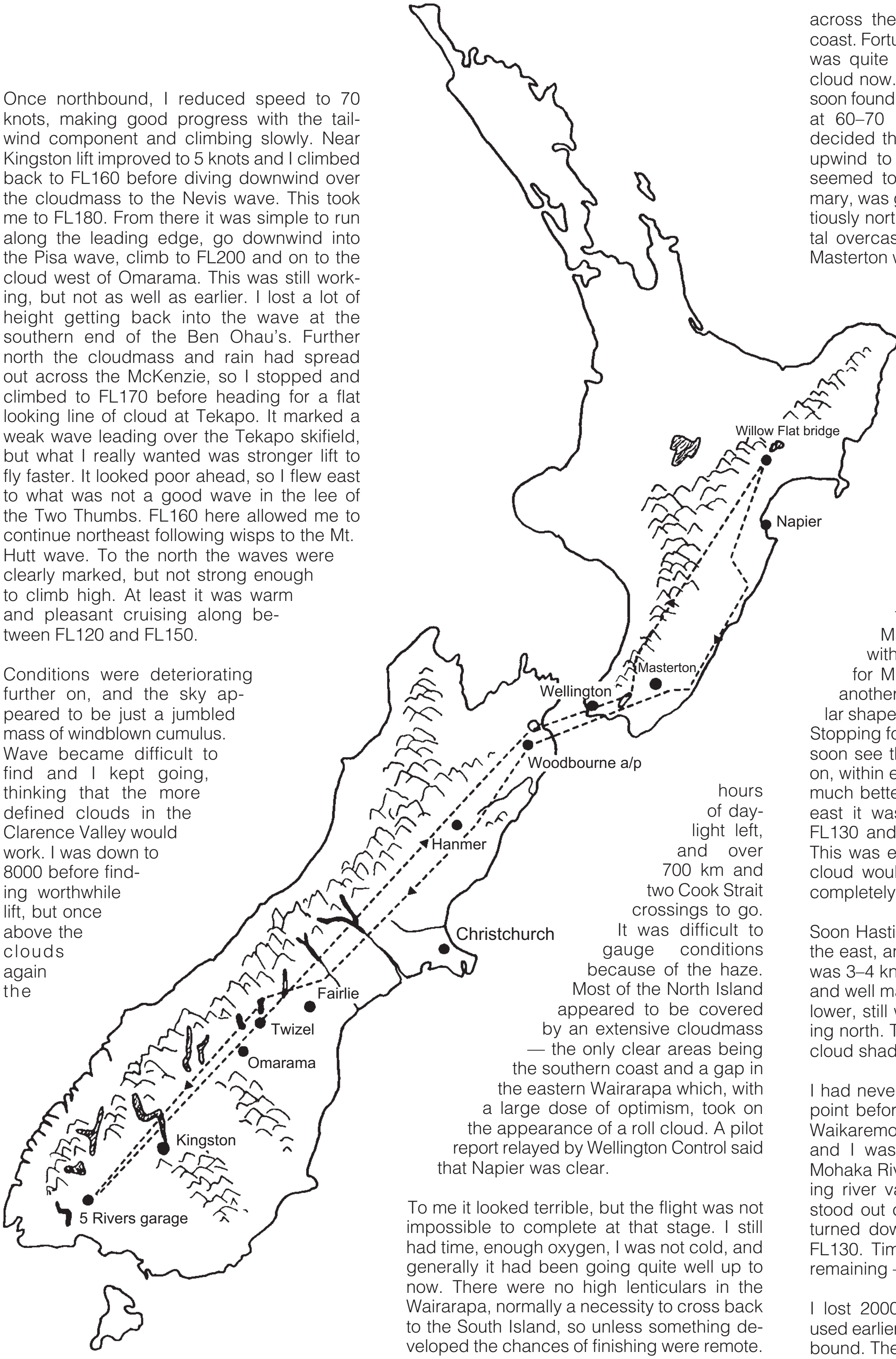
I followed small wisps in the lee of Torlesse and Hutt, and climbed in quite strong lift to FL210 at Mt. Somers. This bit was good and it looked like an easy glide to an obviously active roll cloud in the north Fairlie Basin. I misjudged this and ended up using a weak lift at 11,000 behind the Ben McLeod Range to avoid getting stuck. This slow climb was frustrating, but I needed it, and as soon as possible left for the growing roll cloud further south. It looked great, and as I sped off towards it I expected to pull up into at least 10 knots. But no! Nothing. Another small wisp was just forming further upwind. Ah, there it is! Off again, flat out. This time — reducing speed in anticipation as I flew just over the top of the developing cloud; again nothing except less sink. Yet another wisp was forming upwind and other small clouds were drifting in a line off the top of the Two Thumbs. I was baffled and not tempted to continue upwind, so tracked south at about FL130, trying to pick out the wave by carefully observing the scattered wisps. Eventually I stumbled into a reasonable good climb near Burke's Pass, which took me to FL170. From here I headed straight for a flattish cloud in the middle of the McKenzie, which was weak but allowed me to maintain height past Simons Pass.

It looked pretty broken and mixed up ahead, so the best option, something I would have preferred to avoid, was to take the gamble that the scruffy–looking Ben Ohau wave was working. If the sink was any indication, it should be booming. I was down to 7500 west of Twizel, the cloud looked very rough but there was a short straight shadow on the ground from the cloud's leading edge. It took a few minutes in very turbulent air to climb in the strong gusts to cloudbase and then settle down in a steady 8–9 knots. About time too! It had reduced to about 3 knots at FL180, so I headed to the next well marked wave west of Omarama where another good climb allowed me to fly over the top of the extensive cloud upwind to Merivale, and on to FL200 in the excellent Pisa wave.

A Queenstown weather report passed on by Christchurch Control earlier said that the rain had stopped and the sky was clearing. Luckily for me it was not completely clouded in further south. It looked even better from FL250 in the Nevis.

As usual, the wind velocity in the south was markedly higher, and it took 10,000 feet to penetrate the sink to cross the next lot of cloud to an edge west of Kingston. Lift here was much weaker — not quite strong enough to maintain height at the airspeeds necessary to make any progress..

The turnpoint at Five Rivers garage was under cloud but I pushed on further southwest until it was visible through a gap and I took the photos. I did not want to descend and risk spending time trying to climb up again. The time was 1200 — six hours and 650 km so far. I expected a faster trip north.



Once northbound, I reduced speed to 70 knots, making good progress with the tailwind component and climbing slowly. Near Kingston lift improved to 5 knots and I climbed back to FL160 before diving downwind over the cloudmass to the Nevis wave. This took me to FL180. From there it was simple to run along the leading edge, go downwind into the Pisa wave, climb to FL200 and on to the cloud west of Omarama. This was still working, but not as well as earlier. I lost a lot of height getting back into the wave at the southern end of the Ben Ohau's. Further north the cloudmass and rain had spread out across the McKenzie, so I stopped and climbed to FL170 before heading for a flat looking line of cloud at Tekapo. It marked a weak wave leading over the Tekapo skifield, but what I really wanted was stronger lift to fly faster. It looked poor ahead, so I flew east to what was not a good wave in the lee of the Two Thumbs. FL160 here allowed me to continue northeast following wisps to the Mt. Hutt wave. To the north the waves were clearly marked, but not strong enough to climb high. At least it was warm and pleasant cruising along between FL120 and FL150.

Conditions were deteriorating further on, and the sky appeared to be just a jumbled mass of windblown cumulus. Wave became difficult to find and I kept going, thinking that the more defined clouds in the Clarence Valley would work. I was down to 8000 before finding worthwhile lift, but once above the clouds again the lift went up to 8 knots. I stayed in this lift until reaching FL200, then flew slowly on, maintaining height.

At this stage in the flight, approaching Lake Grassmere, I was trying to ascertain what conditions were like in the North Island. The time was 1500; it had taken three hours to the Blenheim area. A little less than six and a half hours of daylight left, and over 700 km and two Cook Strait crossings to go. It was difficult to gauge conditions because of the haze. Most of the North Island appeared to be covered by an extensive cloudmass — the only clear areas being the southern coast and a gap in the eastern Wairarapa which, with a large dose of optimism, took on the appearance of a roll cloud. A pilot report relayed by Wellington Control said that Napier was clear.

To me it looked terrible, but the flight was not impossible to complete at that stage. I still had time, enough oxygen, I was not cold, and generally it had been going quite well up to now. There were no high lenticulars in the Wairarapa, normally a necessity to cross back to the South Island, so unless something developed the chances of finishing were remote. It certainly did not look inviting, but having completed the southern leg I decided to continue regardless, even if it meant gliding across Cook Strait and landing at Masterton. There was still a chance.

I advised Wellington Control that I intended to carry on and set off for the Wairarapa. As I approached the coast it became clear just how much cloud there was; it spread right across the divide and out toward the east coast. Fortunately the gap over Martinborough was quite wide and looked more like wave cloud now. I crossed the coast at FL120 and soon found weak lift, enough to maintain height at 60–70 knots. Approaching Masterton I decided that it would be better to penetrate upwind to where a more developed cloud seemed to be working. This wave, the primary, was good for FL140 so I continued cautiously northward, toward what looked like total overcast, the plan being to turn back to Masterton when it became obvious that it was not sensible to continue.

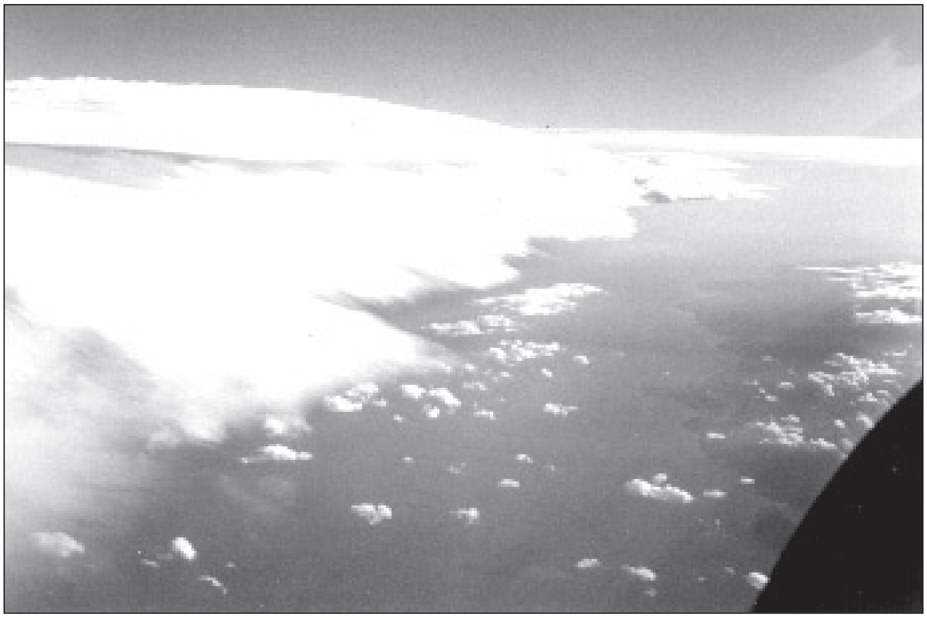
It was interesting that in places gently undulating stratus had formed above the bubbly looking cloud below, and this did mark weak but reliable lift. At the bottom of the layer the cloud was quite thin and actually did have some small gaps, the main problem being that the ground was under heavy shadow and was quite dark, making it difficult to locate features. In the lee of the Manawatu Gorge there was an area with no gaps, and before turning back for Masterton I decided to keep going another couple of miles to a more lenticular shaped cloud. It worked, up to 3–4 knots. Stopping for a while to climb to FL150, I could soon see that there were better gaps further on, within easy gliding range. In fact it looked much better, about 7/8 cover; and out to the east it was clear. I continued on between FL130 and 160, finding lift up to 4–5 knots. This was encouraging, and I hoped that the cloud would tend to clear rather than fill in completely.

Soon Hastings and Napier came into view to the east, and cloud cover reduced to 4/8. Lift was 3–4 knots at best, but reasonably steady and well marked. Wind speed was now much lower, still with some tailwind component going north. The sun was getting lower, and the cloud shadow spread further east.

I had never seen the Willow Flat bridge turnpoint before and hoped I could find it. Lake Waikaremoana came into view in the distance and I was sure that I was flying over the Mohaka River, so I visually followed the winding river valley until I spotted the bridge. It stood out clearly in the sun. Great! Shortly I turned downwind and took the photos from FL130. Time was 1720. Four hours daylight remaining — it was actually still possible.

I lost 2000 feet pushing back to the wave used earlier, and followed a similar track southbound. The cloud was definitely increasing. It became very slow going, although the lift was still there. When I reached the Norsewood area it was obviously totally closed in to the south, but I was in 4–5 knots lift — the best for some time. There were two wide wave clouds with small gaps between them to the east, and beyond that it cleared.

What was most intriguing was that even further east a long, thin, high lenticular–shaped



R Lynskey

Southbound over the east coast of North Island at about 28,000 feet.

cloud had developed. Earlier it had appeared to be only a thin cirrus line, however now it took on the right shape. I contemplated this cloud for a few minutes; but the choices were clear: return north to land at Hastings, or take the chance on the lenticular and if it didn't work Waipukurau was not far away.

I turned southeast, stopped briefly in two waves to top up to FL160, and kept going. The lennie was right over the east coast, and the closer I got the better it looked. Sure enough — just like magic — smooth and lovely, 6–8 knots up. I could barely believe it. Maintaining a southwesterly heading at 55 knots, I climbed in front of the best looking part to FL285. Further south it was not so well defined, but I was descending only very slowly at 80 knots. The only part of the North Island that I could see was the east coast. The rest was covered by a great glaring white mass of cloud. It took time to progress south and I was very uneasy about the lower cloud spreading further east. My intentions were to follow the lennie all the way south, and then push upwind to Lake Wairarapa to see if there was any possibility of making a return Strait crossing, but I really wanted to know if Masterton was clear enough to reach safely.

Nothing changed for some time apart from getting very cold, but passing Castle Point I was reassured to see that the southern Wairarapa had only 4/8 cover, and Masterton was no problem. With a safe diversion available, all concentration was focused on how to "cross the ditch."

Over Lake Onoke there was a vague roll cloud/lenticular — it appeared to be "blurred" around the edges. I headed for that. There weren't many other options. Before leaving it I climbed slowly back to FL280. I could not yet see the South Island apart from the seaward Kaikouras way off in the distance, due to the haze and low sun. Time was almost 2000.

After the push into wind I flew just south of the wave cloud and at FL190 found lift — 3–4 knots initially — where I stayed until it was less than one knot at FL215. I was now becoming a little optimistic because the upper wind was not too strong, although it was around to the west, and I did not anticipate the heavy sink associated with an upper wave system. There were also clouds out in Cook Strait which could possibly help. I have made six double crossings previously and thought that FL215 should be enough to get home, but without my normal safety margin. To allow the abandon decision to be left until much later I requested that I be able to use Wellington as an alternative rather than returning to the Wairarapa. Within a few seconds this was approved and I was on the way.

I could see Lake Grassmere shining in the sun, and part of Arapawa Island, but still could not pick out the southern coastline. The glide went well for a while but soon the sink was on the stops down. I passed about three miles south of Karori Rock at FL150, watching the altimeter unwind at an alarming rate, and heading for the south side of a line of cloud slightly lower than I was and aligned west–east. It appeared to be caused by some convergence effect rather than wave, but would it help? Yes! Remarkably, heavy sink turned to zero sink and I could even climb a little at 65 knots. This continued for some miles and did make the glide look better. I was reasonably happy with how it looked at mid–strait, even with the headwind and more sink expected. But the fact remained that I had to reach one coast or the other; and Wellington was getting further away. Very soon I would be committed to continuing on to the South Island.

The whole southern coast was not quite clear, and the surface of the sea showed a moderate northerly at low level. A final glide to the south coast remained a reasonable prospect and I made the decision.

Tracking directly for the White Bluffs I could see several scruffy westerly roll clouds straight ahead and they worked as advertised; quite strong sink and rough but useable lift. I stayed between 5–6000 until there was only three miles to go then flew at 130 knots toward the northern face of the Bluffs. Reaching them at 3000 feet I could then slow down to maintain height before pushing into wind and onto the Wither Hills just south of Blenheim.

I continued until Woodbourne, it was a very short, very comfortable final glide. In a couple of minutes I had made a finish and landed. The time was 2100; 20 minutes daylight left. Done!

John and Jamie were waiting, and quite a number of Marlborough Gliding Club people arrived within minutes, knocking the tops off bottles. The party was about to begin.

With the completion of this flight, it is a most appropriate time to thank all those who helped during this and previous attempts, and a special thanks to the Wellington and Christchurch air traffic controllers. •

J Halstead

Finishing the longest flight ever achieved in a sailplane 15 hours after takeoff.

A FINAL GLIDE CALCULATOR

Practical, almost ready to assemble (batteries not included)

Tony Burton
Cu Nim Gliding Club

This article, based on two others written by George Adams and me which appeared in free flight in 1978, will enable you to construct a practical speed–to–fly and final glide calculator. The first how–to article by George induced me to make one of the calculators, and I subsequently wrote the second to demonstrate some improvements. In these days of $1000 plus electronic versions, you may be happy to find that the most expensive part of this model is probably the cost of the map you stick on the back of it! I have used this calculator with success, finding only that the biggest problem is always believing what it tells you! In the next issue I will discuss how the calculator is used during a flight — it's quite straightforward.

Some effort has been made in steps 1 to 3 to explain the mathematics used in preparing the calculator scales so that one could re-draft the calculator with modified scales or different distance units if so inclined. However, by following just the subsequent steps, one can make this calculator for any sailplane if its polar data is available. The glide slope curves shown on the BASE have been plotted for the RS–15 but may in practice be used more or less as–is for any sailplane in the max L/D of 35 to 38 or a handicap factor in the early fibreglass range (weather uncertainties or piloting factors are probably well within this range of error in any case).

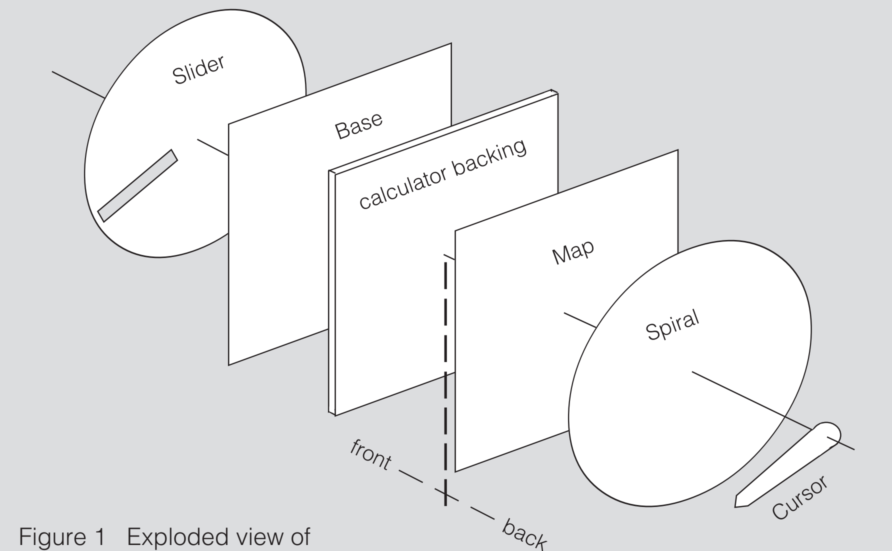


Figure 1 Exploded view of final glide calculator

Figure 1 shows the calculator in exploded view. The BASE and SLIDER can be made by glueing a copy of these parts onto any backing material (I used 1/8" Plexiglass for the BASE and thin aluminum for the SLIDER). The SPIRAL and CURSOR can be copied onto transparent film and laminated with plastic for some extra protection and stiffness.

The overall diameter of the SPIRAL (6") and the 1:500,000 scale map used determines the maximum final glide range available of about 45 km. One could easily enlarge the base and extend the spiral curves and cursor to increase the usable range, at the possible disadvantage of having a bulkier calculator to manipulate in the cockpit.

Step 1 Glide slope scale on BASE
In Figure 2, the logarithm of the glide slope has been plotted onto the BASE of the calculator in polar coordinates. The range chosen is 10 to 60 plotted around 180 degrees with 10 at the 0° point at the bottom and with the angles measured counter–clockwise. This range and position around the circle is arbitrary. For the range given, the following equation applies:

with 180° = log 60 – log 10, any other angle A and slope S has the ratio

$$A/180 = (\log S - \log 10)/(\log 60 - \log 10)$$

$$\text{so } A = 231.5(\log S - 1)$$

Step 2 Distance scale on SLIDER
Distance (D) values were plotted on the SLIDER shown in Figure 3 using the same ratio as in step 1, but plotted in a clockwise sense, with 20 km at 0° and 120 km at 180°. The angular position (A) for the selected distances were found using an equation similar to step 1, giving the equation below, and then plotting D around the scale:

$$A = 231.5(\log D - 1.301)$$

Step 3 Altitude scale on BASE
The position of the altitude scale is not arbitrary since it depends on the position of the L/D pointer placement on the SLIDER. This pointer was drawn arbitrarily in the middle of the unmarked area of the slider which turned out to be at 126.7° counter–clockwise from the bottom (it would have been more straightforward to locate it at some simple angle like 130°, but it's unimportant). Plugging this angle into the step 1 equation gives a corresponding glide slope of 35.3. So, now that a glide slope value and distances are known, a couple of heights and associated angular positions can be calculated and the altitude scale derived.

in 20 km (A = 0°), $H = 20 \bullet 3281 / 35.3 = 1859$ feet
in 80 km (A = 139.4°), $H = 80 \bullet 3281 / 35.3 = 7436$ feet

Using these height and angle values in the step 2 log equation, we find:

$$\frac{A}{139.3} = \frac{\log H - \log 1859}{\log 7436 - \log 1859}$$

$$\text{or } A = 231.1(\log H - 3.269)$$

Using this relationship, a table of scale positions (A) were calculated for selected altitudes (H), and then the altitudes were plotted on the calculator.

Step 4 Polar data
The set of polar curves shown on the BASE in Figure 2 may be used as–is if your sailplane has the performance suggested at the beginning of the article. If not, obtain the polar of your sailplane in airspeed versus L/D. If you suspect that the polar provided by the manufacturer is a bit optimistic, you should perhaps derate it a few percent. If you have

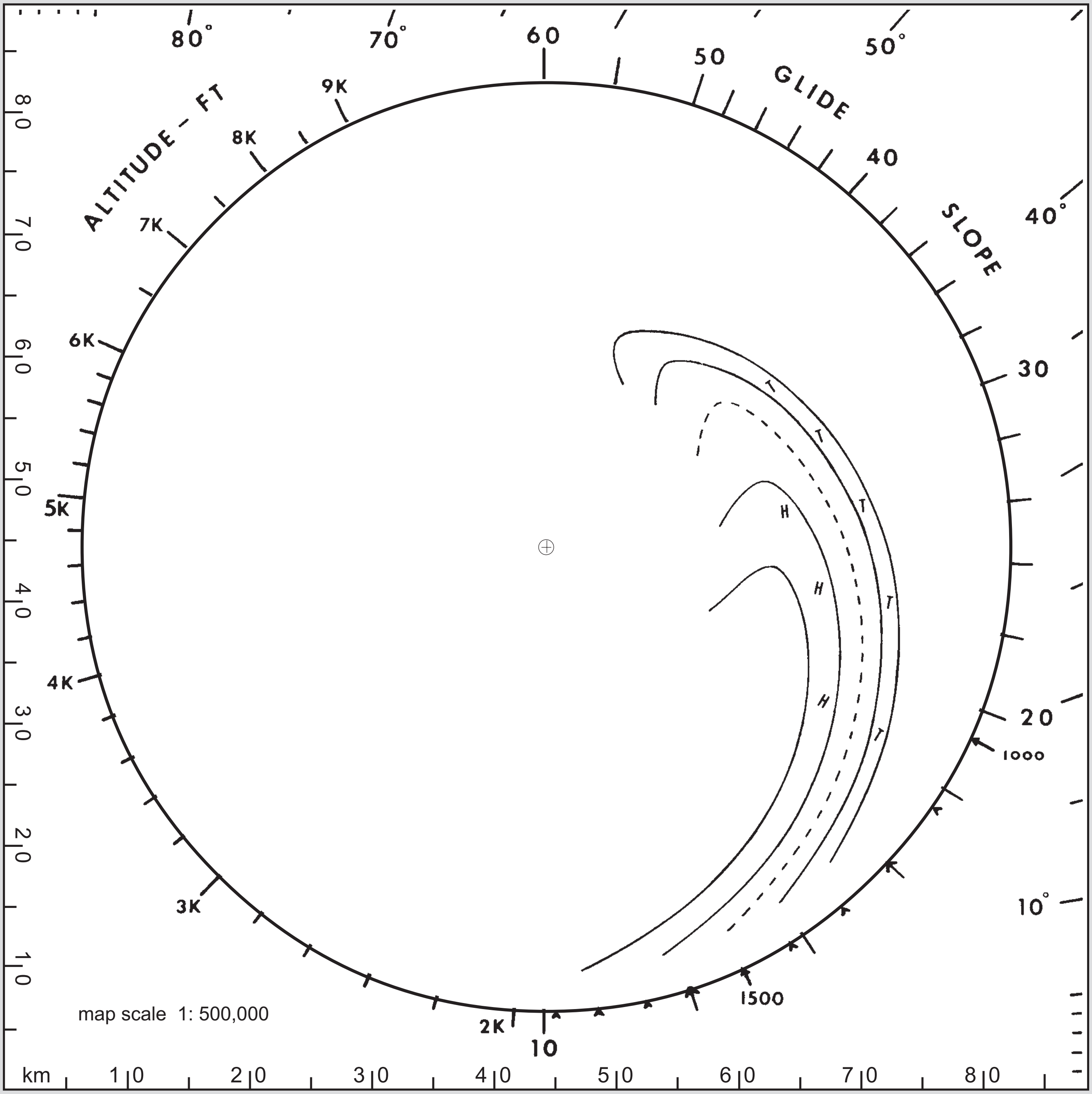


Figure 2 Front of BASE

polar data in units other than knots and feet per minute, you will have to use a different conversion factor than 101.3. Also, you may wish to modify the data to customize the polar for your normal all–up flying weight rather than the gross weight of your sailplane, for example, or calculate a second set of polar curves for water ballast. The Table 1 polar is for an RS–15 flying dry at an all–up weight of 740 lbs. The polar was derived from flight test data fitted to a polar equation as described in Reichmann's Cross–Country Soaring.

Table 1 RS–15 Polar

Speed(kts)	V_{sink}(ft/min)	L/D
45	135.0	33.8
50	139.3	35.4
55	152.3	36.6
60	174.0	34.9
65	204.3	32.2
70	243.3	29.0
75	291.0	26.1
80	347.3	23.3
90	486.0	18.8
100	651.3	15.6
110	867.3	12.9

L/D =101.3 x speed (kts) / Vsink (ft/min)

Step 5 Achieved glide slope

The final glide takes place from a known position and altitude to a chosen altitude over the landing place. Since the slope of the final glide for a given airspeed is affected by the wind, the following relationship holds:

$$\text{Glide slope} = \frac{\text{speed(V)} \pm V_{wind}}{V_{sink}}$$

where all speeds are in the same units — a tailwind is added, and a headwind is subtracted. From Table 1 polar data and two values of headwind and tailwind, the glide slope values at various airspeeds are calculated. Table 2 on the next page lists these values.

Step 6 Polar plot of speed

On the front of the calculator BASE shown in Figure 2, lightly draw in pencil arcs of circles every 1/8" per 5 kts of airspeed beginning at

Figure 3 SLIDER

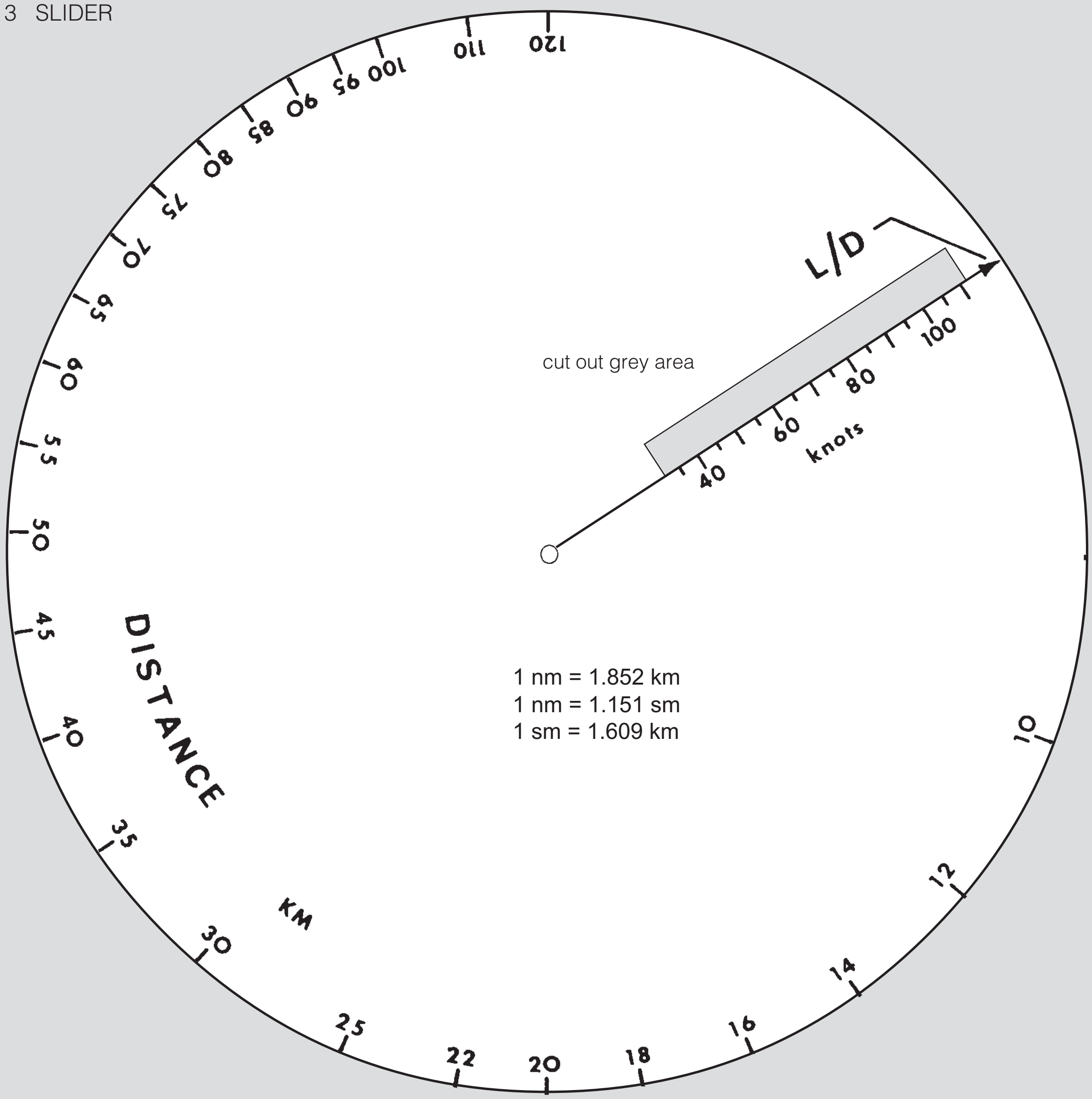
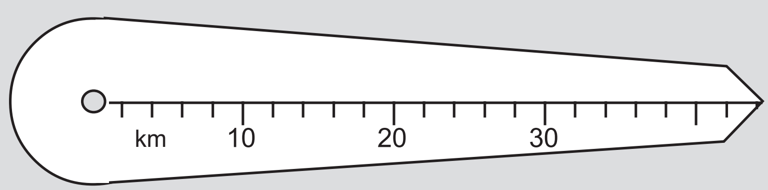


Table 2 RS–15 Glide Slopes

V	Headwind		Calm	Tailwind	
kts	20	10	0	10	20
45	18.8	26.3	33.8	41.3	52.4
50	21.8	28.4	35.4	42.4	49.8
55	23.3	29.9	36.6	43.2	49.9
60	23.3	29.1	34.9	40.8	46.6
65	22.3	27.3	32.2	37.2	42.1
70	20.8	25.0	29.0	33.3	37.5
75	19.1	22.6	26.1	29.6	33.1
80	17.5	20.4	23.3	26.3	29.2
90	14.6	16.7	18.8	20.9	22.9
100	12.4	14.0	15.6	17.1	18.6
110	10.5	11.7	12.9	14.0	15.2

Figure 4 CURSOR (transparent)



1" (40 kts) over the sector covered by the sailplane glide slope (this is at the same scale as you see drawn under the shaded airspeed "window" on the SLIDER), and draw radial lines from the centre to the glide slope values. This is now the curved airspeed/slope graph on which you plot the polar data. Plot the columns of data from Table 2 on it and then accurately ink in the curves, using a french curve to assist. The construction lines may now be erased. (These curves are the only part of the computer that is specific to a given sailplane, so they can be plotted on a separate piece of paper and accurately positioned onto the BASE if you contemplate changing gliders in the future.) You may colour code the curves to make them easier to interpret when read through the "window".

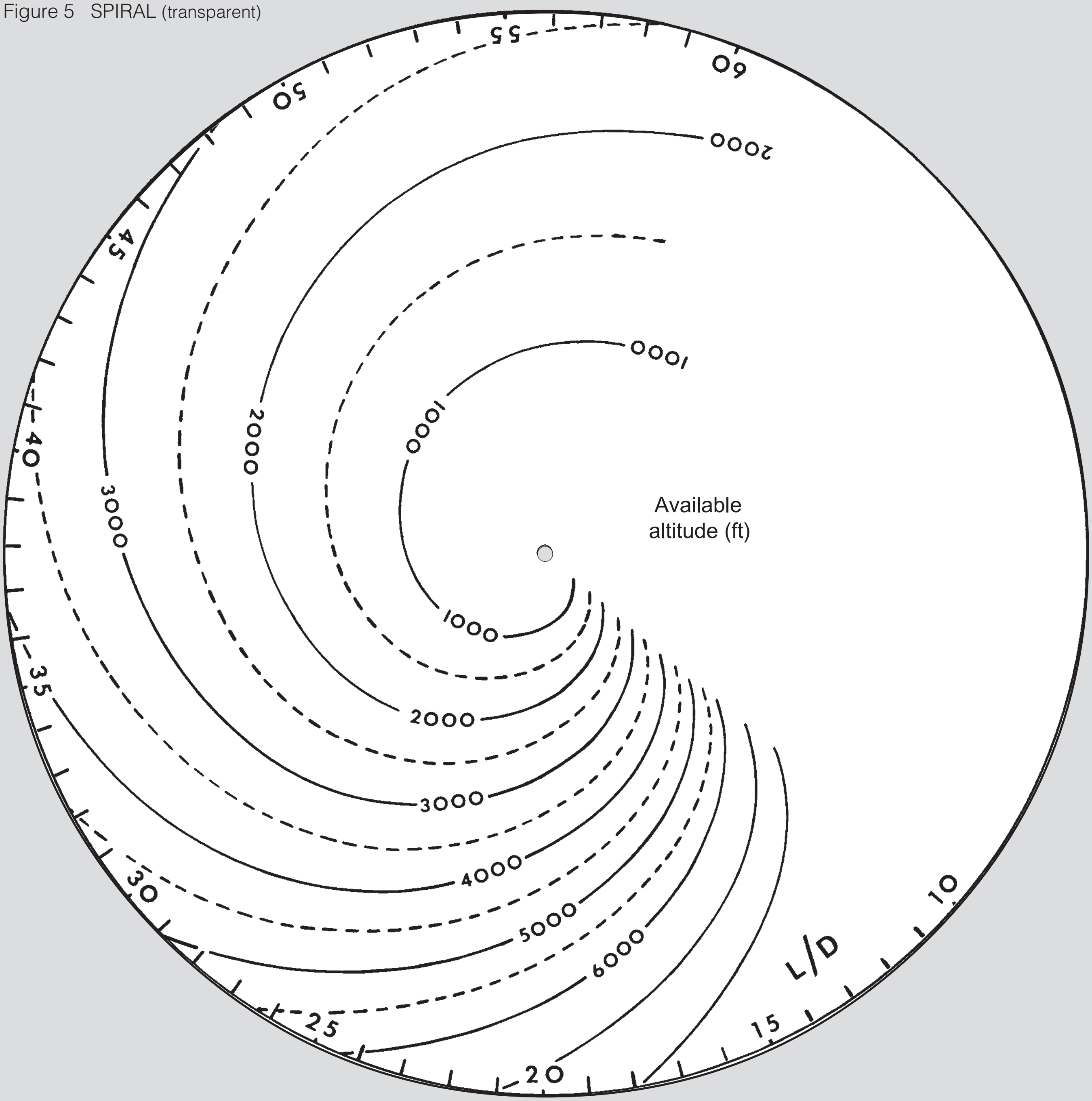
Step 7 Spiral height loss scale

The spiral scale shown in Figure 5 is now constructed. The distance covered in a final glide is related to the altitude loss available (or chosen) and the glide slope:

glide slope = distance / height loss
= 3281 • km / height loss (ft)

For this calculator, a table of distances covered for height loss increments of 500 feet to 9000 feet and glide slope increments of 5 was then calculated (not shown here).

Figure 5 SPIRAL (transparent)



Step 8 SPIRAL
A series of light radial lines are drawn on the circle representing the range of glide slopes from 10 to 60 at an arbitrary spacing of 5° per unit change in glide slope. The radial distance was divided in kilometres according to the scale of a 1:500,000 map (1cm = 5km). The transparent spiral scale was then plotted from the calculated height loss data prepared in step 7.

Step 9 CURSOR
The cursor (Figure 4) is a transparent strip that rotates over the map to mark the track of the final glide. It overlays the available altitude SPIRAL and distance is marked on it from the origin at 5 km per cm (the scale of the map).

Step 10 MAP
A seven inch square portion of a standard aeronautical chart centred on the goal of the final glide is cut out and placed on the back of the BASE. This should be done in some non–permanent manner (rubber cement is good) so that maps can be changed when you are flying from different locations.

Step 11 Assembly
• Cut out the BASE drawing in Figure 2 and bond permanently to the front side of the backing material chosen.
• Cut out the circular SLIDER on Figure 3 and bond permanently to a thin disk of aluminum. Cut out the shaded "window" above the speed scale so that the headwind/tailwind curves on the BASE will be visible. I also found it helpful to raise small dimples on the surface of the SLIDER in order to give your thumb something more to push on.
• Photocopy the CURSOR and SPIRAL onto transparent film, trim, and laminate.
• Drill a hole through the centre of all pieces at the diameter of your bolt and assemble the parts in the order shown in Figure 1 using the bolt and a self–locking nut (you may be able to find a hollow bolt and screw used for some technical manuals.

Summary
The calculator shown will be reasonably accurate for most medium performance sailplanes. The only part that will change with various gliders are the five polar curves plotted and placed on the front of the BASE. •

THERE I WAS . . .

Roger Brewer
from Seattle Glider Council "Towline"

THE PILOT WAS STANDING in the middle of the runway at Eloy, Arizona. He felt the serene, friendly welcome that all small airports gave him. He was taking a moment to enjoy his fulfilled dream of achieving his Silver badge. This just completed flight had been his first solo cross–country and finished the last requirement for the badge. It was very peaceful here with only an occasional thermal disturbing the air. The ticking of the barograph just seemed to make the silence deeper.

The pilot tied the 1–26 to one of the tiedown pads and went looking for a telephone to call for his aerotow back to Estrella. There were a few old buildings at the west end of the airport, but no sign of any people. The airport seemed abandoned. As he walked around the first building, he noticed an open door into the next building and heard a radio playing. When he went into the old hangar, he found a maintenance ship and some crop duster aircraft that were being repaired. There were signs everywhere that someone had just been there, but when he called, "Hello, anyone home," there was no answer. The pilot looked at the open lunch box and the almost full cup of coffee on the workbench, and felt like he had stepped into a Ray Bradbury story.

Behind the hangar the pilot found a house-trailer and three chemical vats that crop sprayers use. He knocked on the door and a woman about 50 years old answered. The pilot asked if he could use her phone and told her that he would pay for the call back to Estrella. She asked the pilot if he had arrived by glider, and when he said yes, her mood changed. "We don't let glider people use our phone," she said, and slammed the door. The surprised pilot walked down the road leading away from the airport. There was only one other building in sight, and that looked like an abandoned restaurant. As he passed the building, he saw a phone booth with the door missing, but the phone still in place. As he got close, a huge jack rabbit came bounding out. The pilot's heart just about stopped, he was already a little nervous about poisonous snakes. As the pilot was walking, he had looked at the sky going back toward Estrella, and it didn't look good. The cus were starting to overdevelop already. The phone worked, and the Estrella office answered quickly.

The pilot explained where he was and asked if the towplane could leave right away because the weather looked like it was changing for the worse. The voice on the other end of the phone said the weather looked good to them, so stand by and the towplane would be sent after it had launched the local flights.

The pilot had about three hours to enjoy the solitude of the airport, but he was becoming nervous because the weather was getting worse. He had seen pictures in the Estrella office of the sandstorms that sometimes develop, and they were very scary. This Pacific Northwest boy hadn't even been to Ephrata yet, he had only flown at Issaquah (near Seattle). He was beginning to feel a bit out of place in this strange land of heat. By the time the towplane arrived, there was a real storm just northwest of the field, the direction home to Estrella.

The pilot had positioned the glider so that there was about 2500 feet of runway for the takeoff, but the towpilot said he wanted to use the whole length. He watched from the towplane as the pilot pushed the glider in the 115 degree heat. The storm was so close now that there was loud thunder and lightning flashes were everywhere.

The exhausted pilot ran the towrope, hooked it to the glider and climbed in wondering if he was capable of this flight. He knew the best thing to do as to wait out the storm, but the towpilot didn't want to.

As the towplane and glider lifted off the ground, a bolt of lightning hit alongside the runway, close to the glider. The pilot knew he was going to be put to the test. The air was very turbulent and the higher they got, the worse it was. At that time, Estrella was using flexible towropes. They would stretch and contract and, to make things more difficult, the tow was at 80 to 90 mph with 235 hp Pawnees. Soon the pilot was using spoilers and slips just to stay behind the towplane. There was no way he could keep the slack out of the rope. His biggest worry was that the rope would release itself backwards. Much of the time there would be big loops of rope below or to the side of the glider and a few times even above. He kept hearing the loose towring clanking inside the towhook. Every time it banged he expected to see the towrope leave. The final straw was when he glanced down at the ground. He was getting an aerial view of the dust storm that he had seen in the pictures. The ground wasn't visible at all, just billowing clouds of dust. The pilot felt like he was trapped — he didn't even have a parachute — he was scared.

This went on for about 20 minutes before they flew out from under the anvil storm cloud and could see the ground again. Suddenly the towplane's flaps came down and it started to descend and slow down at the same time. This gave the pilot a few more new things to contend with. When they were slowed down enough, the towplane window came open and an arm came out, the hand was pointing down to a huge airport just ahead. It didn't take the pilot long to figure out that signal, he released and was away before the towplane's wings started to wag. He saw the field was almost abandoned — just a few old airliners parked on the ramp. On short final, the pilot saw that the runway was broken up like the surface of a dry lake bed, but he picked the smoothest spot and landed, followed by the towplane. The towpilot said they would have to wait out the storm here because the storm was covering Estrella too. The towplane taxied away toward the airliners and the pilot sat in the hot cockpit of the 1–26 waiting for the wind and dust to get there. He watched as the rolling dust clouds came to the far end of the runway, stopped and then collapsed like the air being let out of a balloon. Not even a breath of wind got to the glider.

The flight from Goodyear Memorial Airport back to Estrella was smooth and uneventful. The pilot was glad because he didn't know if he could handle much more that day ...

I have always questioned the safety of aerotow retrieves after a long or demanding flight. The physical and mental condition of the pilot, the weather and the launch conditions should be considered. After a long or demanding flight, a pilot may be physically and mentally stressed and tired to the point that he is unsafe. I have also seen aerotow retrieves done in very bad weather. This, to me, is asking for trouble. Often the launch is done off narrow runways with lights sticking up along the sides and without a wing runner. When the sailplane has a CG hook, it is even harder to do.

After a long hard day, consider these factors before you call for an aerotow retrieve. Treat yourself gently. When you make a decision on the side of safety, it's hard to prove yourself right except for the fact that both you and your sailplane have the option of flying the next day, and that's a nice option.

By the way, after almost 3800 glider flights, the one in this story is still the scariest I have ever made. •

BUILD A BETTER TAILWHEEL

David Croft
Guelph Gliding & Soaring

HOW OFTEN HAVE OWNERS of Schweizer gliders groaned that the tailwheel needs changing again? The original wheel amounts to nothing more than a hockey puck with a hole drilled through the centre and fitted with a metal bushing, a simple enough arrangement, but even with light duty loads it is soon worn out and refuses to turn smoothly.

Faced with the situation of bad tailwheels on three aircraft a few years ago, an improvement was designed, tried, and found to be very successful. This spring, a new tire was fitted to the 1–34, and another will soon be made for the 2–33, but the metal hubs and bearings were found to be in “as new” condition. The 1–26 continues as is for yet another season.

Access to a metal working lathe is necessary, but perhaps one of your club members is a machinist, or can get the machine work done. Home–workshop size tools are plenty big enough for the parts involved. A single ball bearing is used — an SKF #6203–2RS or equivalent from any other bearing manufacturer. Make sure it is the sealed type (that is what the –2RS implies), because otherwise water will get in and rust it. Two snap rings are also required, a Tru–Arc #N5000–156 and a #5100–187 or equivalents. These parts can all be bought at a local bearing supplier such as Canadian Bearings, and should only cost a few dollars.

Drawings of the parts are shown. The hub is turned from aluminum bar stock, either 6061–T6 or 7075-T6 alloys being suitable. The bore for the bearing is dimensioned as 1.574" but it is usually more satisfactory to use the bearing itself as a gauge. The bearing should be a light press fit in the hub — under no circumstances should the bearing slip.

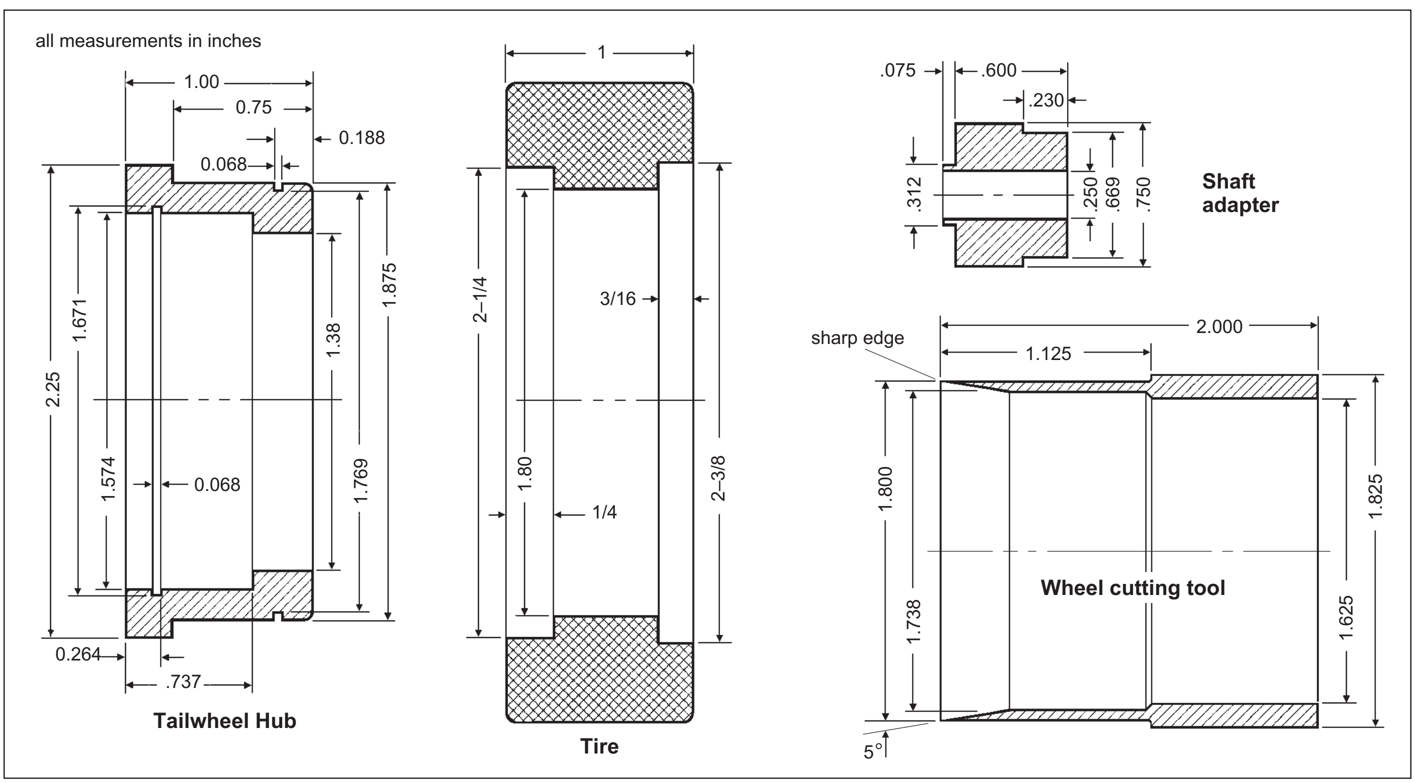
Two shaft adapters are required, and may be turned from 3/4" aluminum bar of the same alloy as the hub. The ideal diameter should be 0.787", but 3/4" is close enough. The little register (shown as 0.312" dia. x 0.075" high) is a refinement. It requires that the hole in the tailwheel mounting on the glider is opened up with a 5/16" drill from 1/4", and also that the mounting shall be sprung over the wheel at assembly. The advantage is that the original bolt is not required to take shear loading, and is only used to clamp the device together.

The tire is the only other thing required. The original worn out wheels may be used, and that is what was used for our three gliders. They did seem rather soft, and the newest one, just made for the 1–34, is a hockey puck, and much harder. It had a tread pattern molded around its periphery and the words “OFFICIAL — Made in Czechoslovakia” super-imposed on the tread. Somehow that seemed fitting for a glider, even one of North American manufacture.

A special tool was made to cut the hole in the rubber. This resembles a tubular punch of the type used to cut holes in leatherwork. It is not used as a punch here, but is held in the lathe and applied to the rotating puck, with a water lubricant. It is likely best to go in half way, and then to turn the puck around and finish from the opposite side. Almost any steel will do for this tool. Mine was made from a short length of stainless steel tube that happened to be available, and it has cut 4 or 5 wheels now with no problem. It doesn’t have to be hardened. The other cutouts in the tire are done with a small modeler’s knife blade held in the lathe instead of a normal cutting tool and applied like a knife to the rotating rubber.

The tire will have to be stretched a bit to get it on the hub, but this will ensure a good snug fit. When in place, add the #5100–187 snap ring. Then press the bearing in place and add the #N5000–156 snap ring. Press a shaft adapter in on each side of the bearing, spring the whole thing into place under the glider, and replace the bolt, washer, and nut.

The increase in weight is negligible. Remember that a substantial volume of rubber is being cut away, and this offsets the weight of the metal parts. •



A VOYAGE INTO UNKNOWN SKIES

A pilotless glider will soar where others cannot

Richard Monastersky
from Science News

SOMETIME THIS SUMMER, an aircraft called Perseus will sweep over the Mojave desert at the uninspiring speed of 30 miles per hour. The lanky, long–winged craft will rise a few hundred feet above the ground, and perhaps even top 1000 feet — hardly a record–breaking altitude.

But beyond that modest maiden voyage, Perseus' designers have set their sights on truly ambitious missions into some of the most dangerous parts of the atmosphere. The winged robot, a hodge–podge of borrowed technology and parts, is designed to fly higher than any other non–military airplane, reaching altitudes of more than 80,000 feet. This, and the absence of a pilot, make Perseus ideal for carrying scientific instruments into the middle of the Antarctic ozone hole and other places where humans have never flown.

Atmospheric researchers have no problem dreaming up ways to use such a unique and inexpensive machine. "It has developed a very strong backing in the scientific community," says James Anderson of Harvard University, an atmospheric chemist who designed the instruments Perseus will carry on its first scientific mission. "It's really an idea whose time has come."

If Perseus succeeds, it may forever alter the way researchers probe the skies. John S. Langford, who conceived the project, has drawn up plans for an entire fleet of these unmanned aircraft, some designed to fly for months on end and others that could reach altitudes of 35 km or higher.

The inspiration for Perseus arose from two planes that couldn't have been more different from each other. In April 1988, a Greek cycling champion pedalled the 31 kg(!) Dædalus from the island of Crete to the island of Santorini, 116 km away, in a journey that tripled the distance record for human–powered flight. Dædalus, developed by Langford and his colleagues at the Massachusetts Institute of Technology, owed its success to computer–designed wings that gave the craft a remarkable ability to remain airborne while powered only by its internal human engine. Several months before the Dædalus feat, and halfway around the world, a revamped US spy plane called the ER–2 completed a series of extremely dangerous piloted missions into the outer margins of the Antarctic ozone hole. This high–flying laboratory collected air samples in the polar stratosphere, providing scientists with the evidence they needed to prove that chemical pollutants cause the ozone hole. The missions carried out by that NASA ER–2 demonstrated the scientific value of high–altitude aircraft. The flights also revealed the need for a plane that could reach even higher.

Therein lies the connection with Langford and Dædalus. Although Dædalus flew no more than a few metres above the sea, Langford knew its wing shape would also work at extreme altitudes. That's because both Dædalus and high flying jets such as the ER–2 confront the same basic problem — not enough air.

> Using low speed, high lift technology gained from the manpowered flight achievements, new pilotless aircraft are planned for scientific research flights at 80,000 feet.

Airplanes get their lifting power from air flowing over their wings, and most create the airflow by propelling themselves forward at high speed. But because the human–powered Dædalus averaged only 30 km/h, relatively little air passed over its wings. To compensate, its engineers designed and built a very efficient wing providing maximum lift at low speed. A plane flying at 80,000 feet, where the air pressure is about a thirtieth of the sea level density, would face a similar challenge. Langford reasoned that the technology that made Dædalus a success could also help atmospheric researchers obtain information from high altitudes. He contacted Anderson, and the Perseus project took off.

Aurora Flight Sciences Corp. in Alexandria, VA looks more like a software firm than an aircraft factory, where personal computers appear to outnumber personnel. Founded by Langford in 1989, Aurora is designing and constructing three Perseus'. Unlike big aircraft companies, which can sink several hundred million dollars into designing a new airplane, Aurora hopes to produce the three for less than $3 million. To reduce costs, they've tried to borrow off–the–shelf parts and designs instead of developing custom elements, making the plane a sort of patchwork of hand–me–down technology.

Because Perseus and Dædalus face similar airflow problems, the Aurora team can use the wing design of the human–powered plane. Perseus will get its motor through another technological transplant. At one point, the design group planned on borrowing a Honda motorcycle engine. Now they're considering a motor from a military drone. In either case, the high–flying craft will carry canisters of liquid oxygen, since the air at its target altitudes is too thin to sustain combustion.

Loaded with fuel and scientific instruments, Perseus will weigh about 400 kg (880 pounds). Aurora is building the plane with extremely lightweight and strong materials such as graphite and Kevlar, and project planners have dispensed with any equipment they deemed unnecessary. Noticeably absent are the numerous safety features required for manned flight.

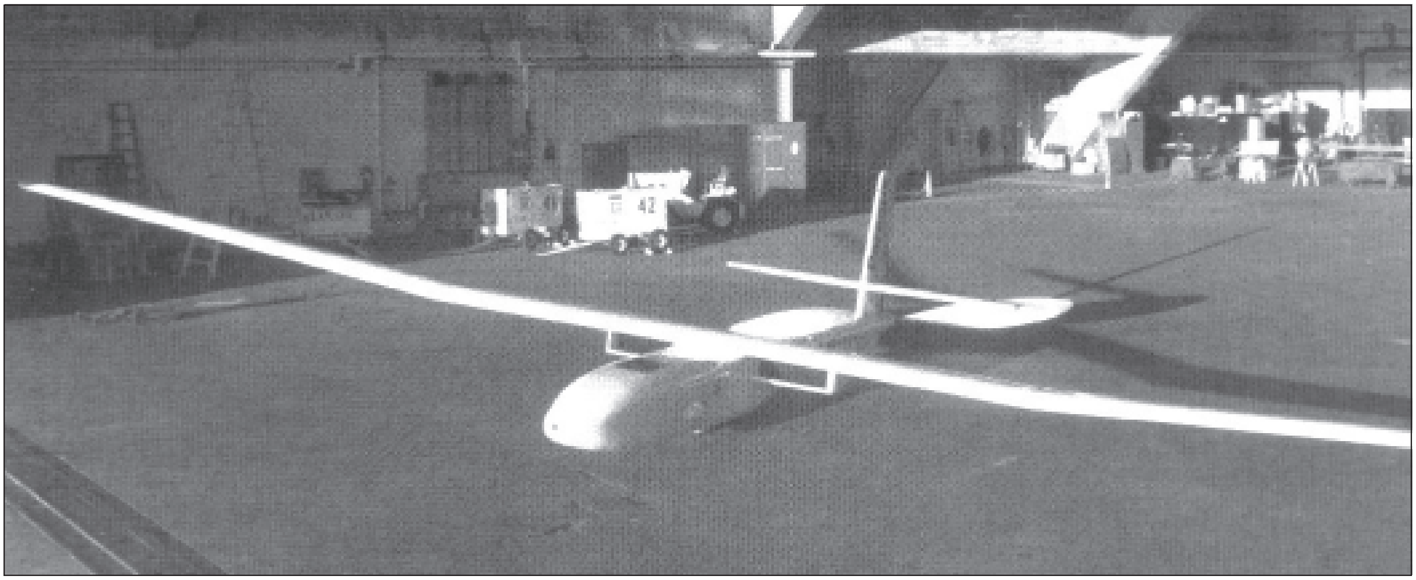
At sea level, the plane will fly at a pokey pace of 50 km/h, but at an altitude of 25 km, Perseus will sustain speeds of about 280 km/h, still slow compared with most planes.

On takeoff it won't cruise down the runway as the plane's giant propeller is so long that it can't turn freely while the craft is on the ground. Perseus will take off in the manner of some sailplanes, pulled forward with the help of a winch–driven cable until it's airborne, at which time the motor will engage and the cable will release the craft.

Perseus can carry only enough fuel for the upward journey, a steep climb that should take about 90 minutes. One flight plan calls for it to cruise at an altitude of 25 km for an hour or so, until it runs out of fuel. Then comes a two to three hour glide back down to Earth. Although a technician on the ground can command the vehicle remotely, Perseus will largely pilot itself, using an onboard computer that carries preprogrammed flight plans. As the plane flies, the computer will determine its location by receiving signals from Global Positioning System satellites.

Langford believes unmanned planes like Perseus can offer some critical advantages over other high–altitude research craft.

Scientific research balloons — some of them 100 times bigger than the Goodyear blimp — haul heavy instruments to extreme altitudes. Yet these uncontrollable vessels follow the whim of the winds, often heading in unwanted directions. What's more, researchers can launch them only in the calmest conditions —



Aurora Flight Sciences

a rare occasion in the Antarctic and other regions prone to bad weather. Investigations often must wait days for suitably light winds.

Jet airplanes such as the ER–2 face different problems. Although the celebrated ex-spy plane has proved invaluable on its ozone expeditions, it cannot reach altitudes of more than about 20 km. Over much of the globe, that's too low for studying the critical section of the stratosphere where most of the ozone resides. Perhaps even more limiting are the safety considerations that apply when any plane carries a human pilot. On many of its research missions, the single–engine ER–2 has ventured into remote and risky territory. During the Antarctic flights an engine failure would cost the pilot's life. It is so cold there that even if the pilot bailed out successfully, he would be dead from exposure before he reached the ground. An unmanned plane, on the other hand, can fly into zones where no one would dare send a pilot.

Under current plans, Perseus may earn its wings in the skies over Antarctica during mid–1993. Three copies of the plane, broken down into sections, will be transported to McMurdo Station at 72°S. From there the planes will fly to the stratospheric ozone hole, collecting air samples in an area previously explored only by balloons and satellites.

The plane will also spend considerable time in the skies above the Arctic. Although this region has yet to suffer the kind of wholesale ozone destruction seen each spring in the Antarctic, scientists worry that ozone holes may develop there as atmospheric levels of chlorine pollution reach even greater concentrations during the next few decades. ER–2 expeditions in the Arctic have already detected some ozone loss during winter.

If the polar regions seem far away, consider the stratosphere over our own heads. Perseus will fly there as well, assisting in studies of the slow erosion of the ozone layer over the northern mid–latitudes. Satellite and ground measurements indicate that the wintertime ozone concentration over this portion of the world dropped by several percent between 1969 and 1986. There isn't enough data yet to determine whether chlorine pollution caused that decline, but many suspect such a link. If true, the erosion may accelerate as chlorine levels continue to rise.

Perseus Technical data

Wing span	17.9 m (58.7 ft)
Wing area	16 m^2 (172 ft^2)
Take–off weight	400 kg (880 lbs)
Payload	50 kg (110 lbs)
Max altitude	more than 82,000 ft
Flight duration	6 h (1h at altitude)

A proposal by aircraft companies to build a fleet of supersonic commercial jets poses another potential threat to the ozone over the United States and other mid–latitude regions. Because they travel in the lower stratosphere, their exhaust could possibly lead to ozone destruction. A NASA–directed research project is currently investigating whether the high–speed planes would present an appreciable threat. A major portion of the funding for launching the Perseus project comes from that same research program, says Michael Prather of the NASA Goddard Institute for Space Studies. Like most other researchers in this field, Prather sees considerable potential in the Perseus project. "If they can do it, it will be a great new opportunity for all of the atmospheric sciences," he says.

Langford stated that at a cost of three planes for $3 million, the Perseus venture carries a relatively economical price tag. Balloons might seem cheaper at $15,000 to $100,000 a piece, but their price adds up because each can fly only once. What's more, in harsh regions such as Antarctica, scientists often cannot recover instruments released by the balloons. A balloon–borne equipment package can cost several hundred thousand dollars. Perseus is reuseable, and after producing the initial three planes, the Aurora designers believe they could build subsequent versions for under $500,000 each. Langford notes that these planes won't last as long as commercial jets, which make thousands of trips before their retirement. Aurora hopes to obtain about fifty research flights from the planes involved in difficult missions and perhaps hundreds of flights from those engaged in more routine work. But if a Perseus accomplished only three flights, it would still represent an economically viable alternative to balloons.

Its many virtues notwithstanding, the high–flying plane can only carry a 50 kilogram load of instruments and will spend relatively short periods of time at its peak altitude. "Perseus is too small to be the ultimate solution," Langford says.

The Aurora team has sketched out designs for a virtual fleet of unmanned planes, each serving a particular need. Another model of Perseus, for instance, could fly for several days at slightly lower altitudes. Storm experts hope to send it above the tops of hurricanes, into the region that apparently controls the movement of these storms. A larger plane called Theseus could fly even higher than the original Perseus and could carry a payload of more than 200 kg. Much farther down the road, a solar–powered plane called Odysseus might float over the globe on year–long flights, carrying instruments for extended investigations previously conducted only by satellites.

But before these models can come to life, Perseus must prove itself — a process that may take several years. Aurora has yet to build the actual research plane; it has only produced a proof–of–concept craft for use in tests this summer. With sufficient funding, Aurora says it can have a high–altitude version ready to fly within two years.

A number of aeronautical experts outside the project have voiced support for the Perseus venture. "What Langford is proposing is a very important and reasonable challenge," says Paul MacCready, who heads AeroVironment, Inc. "The only question is: is it medium hard or very hard? It's not a trivial project." MacCready has fashioned many award–winning cars and planes, including the Gossamer Albatross, the first human–powered plane to cross the English Channel. "I'm very confident in the Perseus project's success," he says, "but it will take a fair amount of effort."

Langford and his co–workers, undaunted by that challenge, maintain high hopes for their slender craft as they await its first date with the winds. •

1991 FAI International Gliding Committee meeting

Colin Bantin, IGC representative
(excerpts from the report to SAC)

A meeting of the IGC was held in Queenstown, New Zealand on March 15 and 16, 1991. The meeting was hosted by the New Zealand Gliding Association and they did an absolutely wonderful job. We were treated to great hospitality, warmth and friendship. The NZGA also threw in a boat trip on Milford Sound and a banquet for good measure.

Operating and Working Groups

The Minutes or the March 1990 meeting in Paris were approved. We then established several working groups, as we did so successfully in Paris, to sort out the details of many issues in parallel. This time the groups (and chairpersons) were: motorgliders (Piero Morelli, Italy), World Air Games (Fred Weinholtz, Germany), Rules (Tor Johannessen, Norway), IGC Meetings and FAI Fees (Bernald Smith, USA) and Airspace (Tom Zealley, UK).

FAI Matters

The 1991 World Air Games have been dropped. The next Games are planned for Greece in 1995. The committees have been asked to state what their intentions are, and the IGC needs to consider if gliding should be represented. It was noted that Greece does not have a history of strong involvement in gliding and would require a lot of help. An advisory group would be established to help Greece.

There is continued movement to have the FAI voting structure include the presidents of the committees. There is no resolution as yet.

The FAI has approved the use of sanction fees for world events. Each committee has the right to set these fees and has complete control of its own money so raised. At this point, the IGC were not imposing any fees in 1991. This was also a topic of discussion following a working group report, where the IGC took a much stronger stand on the issue.

Sub–Committee reports

Rules The Rules group went through the second draft of the Sporting Code Section 3. I will have a copy for those who are interested when I receive the minutes of the meeting. The only notable thing from the discussions was the method by which the 15 metre span of gliders is to be measured. This was a difficult issue to deal with since there are winglets to consider and, coupled with the fact that the wings flex considerably, the extremities of the tips can easily exceed 15 metre under some conditions. The IGC adopted the recommendation of the working group as follows: the span would be determined by "the maximum distance between two vertical planes, normal to the lateral axis of the glider, that are tangent to the extremities of the wings at any angle of deflection". This means that outward tilted winglets would not be allowed unless they start at a point less than the full original span. It has also been pointed out that many production gliders (without winglets) would fail this test today! I don't believe that we have settled this issue by any means.

The Rules group also discussed the use of modern flight verification systems (ie. electronic barographs). The group decided that the approach that was being taken by the Technical committee of IGC was wrong. We shouldn't be tightening up the verification requirements simply because the new devices are more accurate and offer additional features, rather we should be looking to simply approve the use of new devices. Three categories of new devices were identified: unit replacements (ie. the use of an electronic barograph instead of a mechanical one), inter-connected systems (ie. altitude and time), and fully integrated systems (ie. altitude, time and position reporting). The Code amendment to permit electronic barograph for national level flights has been extended to March 1993.

World Class Glider Of the 42 entries to this contest, 11 were selected to continue on to Phase II. Unfortunately, none of the Canadian entries was included. The selection was done by a committee chosen by the IGC and included such notable gliding authorities as Oran Nicks, who presented their report. I can provide details for anyone who is interested.

IGC Meetings One recommendation of this group was to have only one full meeting per year, unless unusual circumstances dictate otherwise. However it was also recommended that there be a Europe–only meeting in between the full meetings. This meeting would be open to all members but only matters limited to European members would be discussed. The agenda would be circulated ahead of time to all members and any issues could be deferred to the full meeting if requested. This would greatly speed up the full meetings and allow more in–depth coverage of important issues. The IGC accepted the group's recommendations.

FAI Fees On the subject of FAI sanction fees the working group came to a rather surprising recommendation, which on reflection made sense in the context of the efforts of all the sporting committees to have more recognition and control over financial matters. The IGC subsequently adopted the recommendation, namely that it "rejects the concept of a sanction fee". The IGC is prepared to do a great deal (if not all) of its activities on its own, even in a world forum. We raise money ourselves when it is needed (eg. contest entry fees). There are substantial monies already flowing to the FAI from each committee by way of annual fees. Without further insight and control over the allocation and spending of these funds it makes very little sense to be told that we "are now allowed" to raise additional money through sanction fees (or through any other means for that matter). Peter Ryder will take this position to the June FAI meeting for further discussion.

Airspace Discussion on airspace was centred on the new ICAO airspace classification system. I do not have any details on this but I can get some information if anyone wishes. Tom Zealley discussed a position paper that he has prepared in consultation with André Dumas on the requirements for the control of gliders. Other countries are in a much more precarious position than Canada regarding the potential mandatory use of transponders. A compromise position is refer-red to which utilizes low power "passive" transponders that do not require any pilot operation or intervention, and no pilot communication with the control authorities. I have copies for anyone who is interested.

International Events

22nd Worlds, Uvalde Plans are progressing well although some concern was expressed over the entry fee. It is almost twice the amount that was mentioned when the bid was made. At the moment it appears that we can have seven entries, three each in the Standard and 15 metre classes and one in the Open class. There will be four photo start points rather than a start gate, and it is hoped to have some turnpoints in Mexico. There was a general consensus amongst the delegates that the pilots do not like the harsh penalty for being late back from a POST task. This is the only issue remaining to be settled.

23rd Worlds, Sweden We had a brief update on progress for the 1993 Worlds. There will be opportunity to fly at the site in 1992.

24th Worlds Awarded to New Zealand as there were no other bids. The site for the contest is Omarama (pronounced Oh–marra–mah) in the centre of the South Island. I have some photographs of the site which is close to the Southern Alps. There will be a lot of mountain flying, however we were assured that there were plenty of landing places in the valleys. The soaring can be spectacular.

Other items

We had a presentation from Dave Sharples (Australia) on an engine conversion for a Pawnee. They have successfully converted and installed a Ford V6 (Canadian made!) and are reporting dramatic improvements in launch costs. I will have more information when I receive the Minutes of the meeting. Let me know if you would like a copy, or write to Dave Sharples, Box 209, Everton Park, Brisbane 4053, Australia.

We saw a hand–held Global Positioning System receiver working. These devices may be the way of the future for gliding events.

The Lilienthal Medal was awarded to IGC's own Fred Weinholtz. Fred has done a lot of work for the IGC as well as gliding in general and richly deserves this award.

Ed Makula (Poland) and Piero Morelli (Italy) stepped down as Vice Presidents and have been replaced by Tom Zealley (UK) and Ake Pettersson (Sweden). John Roake (New Zealand) is the 1st Vice President.

The next full meeting of the IGC will be held in Paris in March 1992. The European meeting will be in October. •

TRAINING and SAFETY

POWER PILOT TRANSITION Q & A TO TOM KNAUFF

Dear Tom,
... It seems to me that some published comments from you would be worthwile on the differences in approach, lesson content, and responsibilities involved when dealing with "students" who are transitioning from power (mainly single engine, land) ratings into gliders. Legally, these pilots are in "student" status ... but in a larger sense, they are not really student pilots. Many that I have worked with have had more logged time than I have. They fully understand such matters as current airspace regulations, navigation, traffic patterns, radio procedures, coping with crosswinds, weight and balance and so on.

My point is that in the real world, one doesn't treat these pilots as if they were beginners. In effect, one gives them credit for that part of their previous experience which is directly applicable to soaring. In other words, I as an instructor I do not consider that I am teaching these people to fly — I am primarily teaching them the new skills they need to acquire such as aerotow, emergency procedures, thermalling, use of spoilers, off field landings, and cross–country techniques.

My experience has shown that the two greatest problems with transitioning pilots lies in their unawareness of the necessity for using rudder to coordinate turns and in their oblivion to the world outside the cockpit. Of course, many other problems surface, such as reluctance to make steep turns in thermals, too much altitude and speed on final approach, and too passive in their response to towplane vertical and turning movements.

An instructor who deals with licensed power pilots transitioning to gliders has to have a different perspective and a different relationship with the student than does one who is dealing with primary flight students. Your comments would be most welcome.

Torrey Williams

Response by Tom Knauff:

You're right about the transition pilot. They require a different approach to flight training than the ab–initio student.... Some power pilots come with vast experience, and superb pilot skills. There is no requirement to re–teach skills the pilot already has. However, the instructor must be sure the pilot has received instruction in all areas, and the skills and knowledge are current.

We find many power pilots who hold a rating, but have little recent flying time. They are looking for new challenges, and perhaps a new form of flight that will satisfy their basic desire to enjoy flight in one of its purest forms — soaring. The challenge to the instructor is to satisfy these desires and expose the pilot to what he or she was searching for when they started to fly in the first place. Basic power flying requires little skill, and has almost no challenge other than making a smooth landing at the end of the flight. Soaring requires the pilot to strive for better flying skills so the glider performs to its maximum, and we have the added problem of finding and using lift if we can find it, when flying cross–country.

Flying a power plane versus a glider is much like driving a power boat across a lake versus a sailboat. Any fool can jump into the power boat and, with little instruction, drive it across to the other shore. Ah, but the sailboat! That requires skill and knowledge.

When I am approached by a current power pilot, I assume the pilot has all the skill required to be a power pilot. That pilot, however, must prove that the skills and knowledge are present. We do all the basics of flight required by the FAR's. If a weakness in any area is discovered, we go right back to the begin-ning and cover that area thoroughly.

As we all know, aerotow is kind of like formation flying, and the power pilot assumes it won't be difficult. Fortunately for us, we easily get the power pilot's attention as they discover how difficult it is. This makes the rest of the training program easy for us. They have more respect for the seriousness of learning what they assumed would be easy.

Power pilots seldom make continuous turns (as in thermalling). Many power courses spend little time with the basics of flight. Many stalls, such as cross–controlled stalls are barely covered, and long ago forgotten.

Landings in gliders are seldom a problem if you go through a modified version of "TLAR" (That Looks About Right) found in all my flight training textbooks. The new edition of *Transition To Gliders*, a flight training manual for transition pilots, is now being shipped...

Our job is not only to make these power pilots safe glider pilots, but to expose them to the challenges of soaring flight. The challenges of cross–country soaring, FAI badges, and competition flying are probably what the pilots were searching for when they started flying in the first place.

from New Soaring Pilot

NOTES FOR INSTRUCTORS

Criticism is the basis of instruction. Every effort of every pupil should be criticised verbally and dispassionately, unless the pupil has wantonly disobeyed his instructions or the laws of common sense.

If a pupil has done badly, he should be told how he could have done better. If a pupil has done well, he should be told how he could have done better, but in this case, he would also be told how he could have done worse. This is very important, because many hundreds of wasted hours are flown by pupils with apparent success — wasted because the pupils have unconsciously and not consciously avoided some dozen of mistakes which they might have made.

Unless a pupil knows all the possible mistakes and can give reasons in words for not doing the things which constitute those mistakes, he is liable at any time to make one of those mistakes without warning. The instructional value of success is absolutely nil, unless the pupil knows and can say in words why it was that he succeeded and did not fail.

It is therefore a waste of machines and petrol to let solo pupils take off, fly around, and land again at their own sweet will, uncriticised, because with criticism much more value would have been obtained from the flight.

The fact that the aeroplane is intact after a solo flight is no proof that all has gone well. The pupil may have made in a small degree or shown a tendency to make several mistakes which could be (stopped) by criticism from an instructor watching from the ground. If he is not stopped, the pupil will some day make the same mistake in a greater degree and wreck a machine simply because he did not know that such a mistake was standing by ready to be made...

Excerpt from early RAF training manual, reprinted in Feb 1951 RCAF Roundel.

(I found this particular issue inside an abandoned log cabin in the BC Interior. Tony)

ON WALK–AROUNDS

Maybe pilots don't really believe deep down that a club glider can go unserviceable between flights — maybe that's why you see so few walk–arounds before the next instructor and student jump into the 2–33 or Blanik.

Perhaps what is needed is a couple of "for instances" in free flight of serious problems found when a proper pre–flight check has been done. Will your club contribute the example that happened to them? We need to make believers out of the doubters.

Tony Burton

BLANIK STABILIZER "L" PIN

This is the pin that you take out to fold the stabilizer for trailering. As you may notice, the Blaniks have some up–and–down play in the elevators that is apparently caused by wear of the pins or bushings.

The Vancouver Soaring Association was having difficulty finding oversize pins, when one of their new members, Rudy Rozypalek, stated he could get some — his old club operates from the Blanik factory field! The pins come in sets with several oversize pins.

Contact VSA for further information.

from Vancouver Soaring Scene

Hangar flying

ZEN AND THE ART OF SOARING

What a pleasure it is to strap on my Discus and roam about the springtime skies. A soaring flight has been an itch that has been waiting to be scratched all winter!

The first flight of the year was something unique for me in that it was the first time I've flown the Discus with only the mechanical vario, as my air data computer was out having a green LED screen installed.

On one hand, I've preached about the need for an audio when flying with other sailplanes but on the other, what a pleasure it was to fly with a big hole in the instrument panel — no noise and almost no needles bouncing around in front of me. The lack of audio, averager, and extra indicator really forced me to listen and feel what the ship had been trying to tell me for the last six years. Why, I could actually hear the change in wind noise coming from the tail if I was a bit too agressive on the rudder when entering a thermal or making a turn. During a stall I could hear pre–stall rumble being transmitted from the wings into the fuselage and forward into the cockpit — amazing!

For the last six years I have allowed my on–board electronics to keep me separated from the very secrets my sailplane was trying to show/tell me. What a concept — engineless and noiseless flight.

The next rush of enlightenment came upon me as I realized and remembered that this is one of the things I enjoy most about teaching soaring in that trusty old drag bucket ... the "too dirty three". It never goes anywhere in a hurry, but if you can convince your students to listen and feel as well as to see, then Ernie, Paul and Bill's strutted wonder can instill all the basics needed by the budding novice.

Does this mean I'll be roaming the skies sans bells, whistles, and buzzers? No. What it does mean is that I'll be making a little stick–on cover for one of the vario indicators in order to block it from view from time to time. It also means that I'll be turning down the audio (when I'm by myself), and that I'll cover up that LED screen that I spent bucks to have modified.

What all this means is that I will perform the above mentioned exercise in order to ensure the tactile, auditory, and yes, spiritual links that connect me to my flying machine are intact and in place.

Bill Hill from Towline

MASAK BUILDING "SCIMITAR"

A group of people, led by Peter Masak, is currently building a new 15m sailplane wing which will be mated to his ASW–20 fuselage, and the combination will be called the Scimitar — probably because the wing planform features a rearward curving leading edge somewhat similar to the Discus. The wing will have carbon skins, integral ballast tanks, "Masak" winglets, and feature electronic boundary layer control.

If wing performance meets expectations, the Scimitar should have a max L/D of 48:1 and be able to fly with wing loadings of 6.2 to 10.2 lbs/ft^2. He expects the wing to be ready for flight tests later this year.

Peter has also built his winglets for the Discus, and tests have shown a decrease of about 4% in the sink rate at 50 kts. He stated that the chief gain comes in climb performance, and pilots competing with them this summer have been consistently reaching the top of the thermals first.

Tony Burton

❦ SPRING FEVER ❦

Oh, what a glorious day!
to be tending my garden this May
little bird's harmonizing,
bumblebees bumble–izing,
for what could a
mere mortal pray?

A sudden gust ...
What's this ... a thermal?

What am I doing
in this stinking weed patch
when I could be soaring?

Jack Olson

LET'S MAKE A LAW!

There are always funny legal fossils on the bylaw books of most towns. Some looney laws controlling aviation and airport activities are no exception. For example:

- It's a violation in Fort St. John BC to carry an ice cream cone in a pocket while either flying or waiting to board a plane.
- In Yarmouth NS, citizens aren't allowed to board an airplane within four hours of eating garlic (sounds reasonable to me).
- In Calgary, pilots and passengers shan't play checkers aboard an aircraft "lest they acquire a taste of gambling".
- In Lethbridge, only officers of the law are allowed to carry a slingshot in an airplane without a special permit.
- In Regina, it is forbidden to read a Sunday paper at the airport while any concurrent church service is being conducted.
- A Moncton law says that you can't fly while wearing pants with hip pockets, because the city fathers figured a hip pocket was an ideal place in which to hide a pint of liquor.
- Lingerie cannot be hung on a clothesline at the airport at Powell River BC unless they are carefully hidden from prying eyes by a "suitable screen".
- Quesnel BC lawmakers would have "no female appear in a bathing suit at the airport unless she be armed with a club" (this was later amended to exclude females weighing less than 90 lbs or more than 200 lbs).
- In North Bay ON, a husband isn't allowed to fly without the company of his wife within the first 12 months of wedlock.
- Single, widowed, or divorced women are banned from taking flying lessons on Sunday in Winnipeg.
- In Saint John there is a special law regulating gargling while flying — you can't — and there is to be no loud belching at the Fredericton airport.
- Beware the laws concerning female flying students in BC — in Prince George, no flying instructor "may place his arm around a woman without a good and proper reason" and, in Gold River, a pilot is forbidden to tickle a female flying student with a feather duster to get her attention.

It's against the law, honest.

Robert Pelton, from Aviation Today
thanks to the Red Deer Flying Club newsletter

CORRECTING YOUR ALTIMETER

Does your altimeter read 100 feet or so off? Did you know that you can fix this on your own? Yes, and it's just an adjustment.

Look for a screw located by the altimeter setting knob. Remove this screw and you will find a brass bar with a hole in it. If you use a pick to move the bar away from the knob, you will find that the altitude indicator needles will no longer move if the knob is adjusted. So, move the knob until your altitude is correct, then lift the brass bar and adjust the millibar reading until it agrees with the value given by the local tower or FSS, move the brass bar back into place and replace the screw.

from the R.A.A.C. Recreational Flyer

STEINWAY GLIDERS

I grew up in Astoria NY, the home of the Steinway Piano Company. Although I was quite young at the time I do recall that Steinway built gliders during the war. Our piano tuner worked at Steinway and he told us about the big troop carrying gliders they were building (the CG4A). When the wood they were supplied for the glider would run short, they used the fine woods intended for pianos. Needless to say, these gliders were built by some highly skilled craftsmen!

Some time ago, while discussing this glider (a friend) quoted the old expression "she was built like a grand piano ... and flew like one." It was then I told him about Steinway.

Byron Nilsson
from Seattle Glider Council Towline

Club news

photo unavailable

CHAMPLAIN PILOTS VISIT AUSSIE VINTAGE RALLY

Bob Bell and Carol King of CVV Champlain were in Australia last winter on a tour of gliding clubs, and gaining experience in winch launching as their club is considering using this launch method in the future. In January they attended the annual regatta of the Vintage Glider Association of Australia in Nyah, Victoria. They had the opportunity to fly several old gliders and are shown in the photo above with a Kookaburra (the chap on the right is a visiting pilot from England).

The Kookaburra is a side–by–side trainer designed and built in Australia by Edmund Schneider Ltd. It was first flown in 1954, and has been a popular trainer. There are still about 30 of them flying.

thanks to **Allan Ash**
editor, Australian Gliding

WINNIPEG NEWS

Our ground school for the winter months ended in April with over 20 new students registering for the 12 week course. With our returning students from last year we are expecting a very busy season and hopefully we will see many of them reach licence stage.

As the ground school was ending, our flying season began in mid–April with equipment checkouts and some instructors receiving their pre–season flights. With the new regulation that all pilots must have 5 flights in the last 6 months before carrying passengers, we found that we really had to do a lot of extra flying in order to satisfy this rule. To speed up the flying we allowed the instructors free flying with 1000 foot tows. All was going well until a late April snowstorm put a damper on the activities. We managed to complete the checkouts by early May and began our student training. With the number of students we have we were again required to train on 4 weekday nights as well as on the weekend mornings.

There is a considerable amount of interest in group ownership at the club and one member seems to have a share of several different gliders all at the same time. For assistance in helping to overhaul a Bergfalke II he was allowed flying privileges and also has a stake in a BG–12. In addition he is re–building a Ka6 and is helping to complete a Tern which was started many years ago. There are several other members who are looking for glass. Several inquiries have all come up short and anything that is for sale is usually gone by the time it is advertised in free flight. If anybody is contemplating selling anything from a 1–26 up to a Twin Grob please contact me directly (see ad in Trading Post). Mike Maskell and his wife Susan travelled to the Montreal club in Hawkesbury recently to look at a Blanik for sale for their own use. As of this writing their offer had not yet been accepted.

An interesting coincidence came out of their travels — as Mike was going over the logbooks he came across an entry from 1964 that listed an M. Maskell as the pilot. Not the same person. A few entries later he came across another entry that again listed M. Maskell as P1 and a passenger as P2. The passenger's name?.. S. Maskell. Talk about an eerie feeling. If anyone knows who this other Maskell is I would appreciate hearing about them. Perhaps a long lost uncle.

The club recently acquired an ASW–15 to replace their Jantar damaged last year. It was located in Orlando, Florida and after several dozen phone calls and faxes a deal was struck to purchase. One of our members, an Air Canada pilot, managed to travel down to Orlando to inspect it and deemed it airworthy

continued on page 22

Book Review — A Bach Trilogy

Douglas K. Jardine
from Canadian Aviation News

RICHARD BACH is one of my favourite writers of any kind. Depending on the mood I am in there is no better aviation reading than Richard Bach's first three books. I think of these first three books as the Bach trilogy. Since then he has gone on to write others such as Jonathan Livingston Seagull, Illusions, The Bridge Across Forever, and One. But these later books are not aviation books. These are not books aviation buffs can sit down with and renew their spirits. No, if you want to remind yourself that there is a difference between living and life, you want to read, or re–read, the Bach trilogy. If you don't have a copy of these three books, I'm sure you can find them in your bookstore thanks to Dell Publishing. They re–published one in each of May, June and July of 1990.

The earliest of the trilogy is Stranger to the Ground, first published in 1963. Bach's flight from Wethersfield, England, to Chaumont, France, in a Republic F–84 Thunderstreak is the basis for his questioning look at life. Re–reading it recently, I couldn't help thinking how current it is. Bach was in Europe because his unit of the Air National Guard was called there "to become part of a War that Could Be", in case it changed into a "War That is". Then it was the Russians; yesterday it was the Iraqis for those of the National Guard who were called to Saudi Arabia.

At another level, the book is a fascinating look at the mechanics of dropping a nuclear device, at basic training, at formation flying, at the drudgery of being ready for war, at being at war with a thunderstorm. The effect of his writing is that you are there with him in the cockpit. And, at the end of the flight, you can say as he did, "My airplane is quiet, and for a moment still an alien, still a stranger to the ground, I am home."

The second book in the trilogy, Biplane, is also about a flight. This time, Bach flies a 1929 Detroit–Ryan Speedster, model Parks P–2A. He took the Speedster in trade for his 1946 Fairchild 24 and flew it coast to coast, east to west. From time to time, he wracks it up; and then he learns that there are many strangers who will be friends if the reason is flying. He writes about the cold of an open cockpit, the heat of the desert, of being soaked in rain and beaten about by mountain winds. Along the way, he has wondered about the worth of such a journey, about what he has learned about himself and about "man".

Nothing by Chance, is the third book. It's about barnstorming in the 1960s with the Parks of biplane fame and a Luscombe monoplane. Two pilots, married, leave their wives behind for a summer of hunting down hayfields close enough to town that the folk would come out to buy a ride in a wing–and–wire flying machine. With them is a nineteen–year–old parachute jumper because no aerial circus ever flew without a parachute jumper. The book is about flying old planes back into the future. It is about flying enough rides to make just enough money for hamburgers and fuel and oil to get you to the next town. The '60s may have been the decade of the "flower children" but this book is about a different slice of America, and you'll want to read with maps of Illinois, Iowa and Wisconsin handy.

I first read these books some twenty years ago soon after I had learned to fly. They helped me understand the difference between aviation and flying. And twenty years later, when I want to remind myself of the differences between living and life, I go back to them.

Buy them for your own personal library if you don't have them. Buy them for friends who fly. But, be sure to give them to your son or daughter who's now learning to fly and likely learning about life. •

Coming Events

Jun 14-16, **Ontario Provincials**, Hawkesbury, ON. Practice day Jun 13. Sport and Competition classes — both handicapped. Contact: Robert DiPietro, 14 Place de Bohème, Candiac, PQ (514) 638-2264 (B), 659-9991(H).

Jun 23-29, **Eastern SAC Basic Instructor Course**, York Soaring.

Jun 24-July 5, **Canadian Nationals,** Pendleton, ON. Contact: Bob Mercer (514) 458-4627.

Jul 19-Aug 11, **World Soaring Championships**, at Uvalde, Texas.

Jul 27-Aug 5, **Cowley Summer Camp**, Cowley airstrip, AB. Canada's largest soaring festivity. Contact: Tony Burton (403) 625-4563.

Aug 18-24, **Western SAC Basic Instructor Course**, Winnipeg Gliding Club.

"Y' wanna git this lot inta that l'il ol' box, right?"

FAI badges

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

As a result of a proposal from Mike Thompson of the Vancouver Soaring Association, the procedure for use of electronic barographs during the trial period is revised. Sample rates from 1–10 seconds are acceptable. This is a change from a rate of 1–6 seconds published previously.

Only a handful of claims were processed in for the March–April period — they will be included in the next issue.

CLUB NEWS continued from page 20

with some cosmetic work being required. A couple of unemployed members started the long journey down and arrived back in Winnipeg eight days later. They managed to miss all the violent weather that crossed the mid–West and encountered no problems on their 8000 km out and return. The aircraft was said to have been owned by the author Richard Bach and the logbook seems to verify that, although American logbooks leave a bit to be desired. The latest owner found that he did not have enough time to fly. For anyone contemplating buying an aircraft from the States let me give you one piece of advice. Get a customs broker to assist in crossing the border! Fortunately we did have one — without a broker you may be tied up for several frustrating hours sorting through all the paperwork and forms. Our guys arrived at the Manitoba/North Dakota border and within 15 minutes were on their way. For the fee that was charged it was money well spent.

Mike Maskell

CANADIAN UVALDE TEAM

The Canadian Team is ready for the World Championship to be held at Uvalde, Texas from 19 July to 11 August and will consist of the following persons:

15 metre	Kevin Bennett	Ventus	Cu Nim
	Ed Hollestelle	Ventus	SOSA
	Peter Masak	Ventus	SAC
	Heri Pölzl	LS–6	SOSA
Standard	Ian Spence	LS–4	SOSA
	Jörg Stieber	LS–4	SOSA
	Dave Webb	DG–300	SOSA
Manager	George Dunbar		Cu Nim

As in every Worlds, there is a considerable financial burden on the participants. We would therefore remind each SAC club and each SAC member that tax–receipt donations to the SAC World Contest Fund would be of great assistance.

Al Schreiter
chairman, World contest committee

Foot-launched soaring news

PARAGLIDER PERFORMANCE NOW MATCHING THE EARLY HANG GLIDERS

Paraglider technology is moving along very quickly, matching early hang gliders (just as the new hang gliders are as good as the old sailplanes) — progress moves ever on.

As an example of current performance, the "Hilite" paraglider has the following flight characteristics:

Min sink	282 ft/min @ 21 km/h
V_{max}	32 km/h
Sink @ V_{max}	328 ft/min
V_{stall}	15 km/h
L/D_{max}	5.75 @ 31 km/h

A reviewer of this paraglider stated that its only "weak point" is the moderate top speed, but to get it higher would require a trade–off in safety. He was unable to report on how the Hilite recovered from a sail collapse because he was unable to induce one, even when flying in thermals of up to 800 ft/min. (Paragliders maintain their airfoil by ram air pressure in the open cells at the leading edge of the canopy, and turbulence and other factors can cause variable degrees of wing tucking or collapse requiring some loss of height to reinflate the "wing". I understand that paragliding pilots do wear emergency chutes. Tony)

Good mid–April soaring in the Alberta foothills (but with high winds) gave paraglider pilots some interesting X–C flights that required a lot of care. For example, one pilot launched and hit a boomer and was soon at 7000 feet and 9 km downwind. He then headed for a plowed field which gave him another climb, but soon found himself dealing with convergence "cloud–suck" as NE winds over the southern prairies met the NW winds nearer the mountains. In increasingly ugly turbulence and wind the pilot covered another 20 km in about 10 minutes, finally landing 49 km from takeoff (an unofficial prairie paragliding distance record). Facing 50 km/h ground winds, he was dragged a short distance after touchdown until stopped by a fence. This flight illustrates the narrower limits of paragliders and the extra caution required launching in "strong" conditions that are more safely used by hang gliders.

from Alberta Hang Gliding Ass'n "flypaper"
and **Stewart Midwinter** in the "Wednesday Club News"

Trading Post

SINGLE SEAT

KW-45, CF–SNZ, 880h, Cirrus wings, excellent condition, ILEC vario system, radio, O2, ballast, encl. aluminum trailer. Fred Wollrad (403) 479-2886 (H).

DUSTER, C–GBLO, 25h TT, standard equipment, very good condition. $5000. Alain Franck (418) 839-4477

PIK-20B, C–GEST, 850h, complete package with O2. For info call Nick Bonnière (613) 592-0657.

KESTREL 19, best L/D/$, tested 44:1. Climbs and runs better than the ASW–20. Past holder of most Canadian records. A well-mannered ship easy to fly and land even in small fields. Large cockpit, many improvements and 10 minute assembly. Only 1100h, instruments and radio optional. John Firth (613) 731-6997.

COMMERCIAL ADVERTISING

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

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

35% reduction in commercial ad rates until further notice.

TWO PLACE

LARK WANTED, if you are considering selling your Lark, call Bill Drury (615) 745-9214 (B), 745-3622 (H) in Tennessee. Trailer must be included.

MISCELLANEOUS

TWO TOWPLANES — CITABRIA 7GCBC 1250TT, engine 920h, 180hp, Navcom, Xpdr — $45,000 CITABRIA 7GCBC 1750TT, engine 875h, 150hp, Navcom — $25,000; both based at SOSA. Call Fred Hunkeler (416) 470-2612.

K7, out of service because of old glue. Canopy and instruments not included. Elevators serviced in 1990. Wings and trailer need repair. Good for restoration project or parts, $2000 or offer. Cold Lake Soaring Club, c/o Marek (403) 594-7862 (B), 594-5525 (H).

USED SAILPLANES WANTED

If you are considering selling, call *FREE FLIGHT* immediately, don't wait for magazine to appear!

The sailplane market is really tight, the editor is regularly getting calls to see if anything has become available (note the Lark request above).

We're looking for a glider. Are you selling? A Winnipeg syndicate is looking for 1-26, 1-35 to Libelle, ASW-15, or Cirrus. Call Mike Maskell anytime collect with details, (204) 831-8746.

Parachutes, club chutes, 26 foot in sport type container. Current inspection and repack, $300 each. Cu Nim Gliding Club, contact Dave Fowlow (403) 289-9477 (H), 296-6889 (B)

Parachute, 24 ft Phantom canopy in "Slimline" container (see "Flying High" ad in 2/90). Very thin, light, flexible. Leftover from the Alcor project. Tested acid-free and repacked. $900 (that's 33% off new price). Tony Burton (403) 625-4563.

Vario, Cambridge dual range in kts, $250. **Compass**, $30. **Speaker** 8Ω, $10. **TE probe**, $20. **Thermoflask** IL $15. **Headrest**, adjustable, leather. Roman Levicek (403) 284-3187.

Pioneer II, flying wing kit plans, 80% parts, Marske-built glass fuselage shell & canopy. Ribs cut, flight controls made. Welded C/S, some hardware, no instruments. $2000 obo. Lloyd Davies (204) 837-7280.

Radair 10s, 10 chan with 123.3,121.5, and most used tower & unicom frequencies. Rigged as a base station in self-contained case and plugs into car cigarette lighter. Telex mike and mag mount whip antenna, asking $300 obo. Mike Maskell (204) 831-8746.

MAGAZINES

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

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

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

SAILPLANE & GLIDING — the only authoritative British magazine devoted entirely to gliding. 52 pp, bi-monthly, and plenty of colour. Cdn. agent: T.R. Beasley, Box 169, L'Orignal, ON K0B 1K0 or to BGA, Kimberly House, Vaughan Way, Leicester, LE1 4SG, England. £12.40 per annum (US$20) or US$30 air.

AUSTRALIAN GLIDING — the journal of the Gliding Federation of Australia. Published monthly. $A38.50 surface mail, $A52 airmail per annum. Payable by international money order, Visa, Mastercard. Box 1650, GPO, Adelaide, South Australia 5001.

SUPPLIERS

REPAIRS & MAINT.

Sunaero Aviation. Glider repairs in fibreglass, wood, & metal. Jerry Vesely, Box 1928, Claresholm, AB T0l 0T0 (403) 625-3155 (B), 625-3871 (H).

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

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

INSTRUMENTS & OTHER STUFF

Barograph Calibrations, most makes and models. Walter Chmela, (416) 221-3888 (B), 223-6487 (H), #203, 4750 Yonge Street, Willowdale ON M2N 5M6

Bug Wipers. Mechanical device for in-flight wing LE cleaning, newly developed in Europe after ten years of R&D. Widely used at world contests. Cdn$690. **Mylar seals**, Cdn$190. Peter Masak (Performance Enhancement Inc.) (713) 579-2254.

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

Firmal Electronics. Cambridge vario systems and flight computers, TE probes, gust filters, and nettos. Barograph calib. Warranty service and repairs. 542 Coronation Ave, Ottawa K1G 0M4 (613) 731-6997

PROVINCIAL ASSOCIATIONS

NOVA SCOTIA SOARING ASSOCIATION
5546 Sentinel Square
Halifax, NS B3K 4A9
President: Gordon Waugh

FEDERATION DE VOL A VOILE DU QUEBEC
1034 St–Denis
Montréal, PQ H2X 3J2
President: Robert Binette

ONTARIO SOARING ASSOCIATION
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Dorchester, ON N0L 1G3
President: Sue Eaves

MANITOBA SOARING COUNCIL
43 Tunis Bay
Winnipeg, MB R3T 2X2
President: Dick Metcalfe

SOARING ASSOCIATION OF SASKATCHEWAN
2969 Elphinstone Street
Regina, SK S4S 2A4
Treasurer: Harry Hoiland

ALBERTA SOARING COUNCIL
Box 1916
Claresholm, AB T0L 0T0
President: Garnet Thomas

BC SOARING SOCIETY
9280 – 168 Street, RR 10
Surrey, BC V3S 5X7
Secretary: Christine Timm

MARITIME ZONE

BLUENOSE SOARING CLUB
Box 843, Station M
Halifax, NS B3J 2V2

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AERO CLUB DES OUTARDES CLUB DE VOL A VOILE
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Montréal, PQ H3M 2N9

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

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

ARIADNE SOARING INC.
735 Rivière aux Pins
Boucherville, PQ J4B 3A8

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

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

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

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

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AIR SAILING CLUB
c/o 100 - 1446 Don Mills Road
Don Mills, ON M3B 3N6

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

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

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

BONNECHERE SOARING
Box 1081
Deep River, ON K0J 1P0

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

ERIN SOARING SOCIETY
Box 2155
Bramalea, ON L6T 3S4

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

GUELPH GLIDING & SOARING ASSOCIATION
c/o Box 1747
Guelph, ON N1H 7A1

KAWARTHA SOARING CLUB
Box 168
Omemee, ON K0L 2W0

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

RIDEAU GLIDING CLUB
Box 307
Kingston, ON K7L 4W2

RIDEAU VALLEY SOARING SCHOOL
Box 1164
Manotick, ON K0A 2N0

SOSA GLIDING CLUB
Box 654, Station Q
Toronto, ON M4T 2N5

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

WINDSOR GLIDING CLUB
Box 2172
Walkerville, ON N8Y 4R8

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10 Courtwood Place
North York, ON M2K 1Z9

PRAIRIE ZONE

PRINCE ALBERT GLIDING & SOARING CLUB
219 Sissons Court
Prince Albert, SK S7S 1B7

REGINA GLIDING & SOARING CLUB
Box 4093
Regina, SK S7S 1B7

SASKATOON SOARING CLUB
1415 Main St
Saskatoon, SK S7H 0L5

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

WINNIPEG GLIDING CLUB
Box 1255
Winnipeg, MB R3C 2Y4

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BLUE THERMAL SOARING ASSOCIATION
73 Cypress Way SE
Medicine Hat, AB T1B 1H1

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

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4309 Grandview Blvd
Red Deer, AB T4N 3E7

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

EDMONTON SOARING CLUB
Box 472
Edmonton, AB T5J 2K1

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

PACIFIC ZONE

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

ASTRA
c/o Christine Timm
9280 - 168 Street, RR 10
Surrey, BC V3S 5X7

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

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

VANCOUVER SOARING ASSOCIATION
Box 3251
Vancouver, BC V6B 3X9

	FAI SUPPLIES FOR CERTIFICATES AND BADGES		ARTICLES FAI POUR CERTIFICATS ET INSIGNES
1	FAI ‘A‘ badge, silver plate pin	$ 5.00	Insigne FAI ’A’, plaqué argent
2	FAI ‘B’ badge, silver plate pin	$ 5.00	Insigne FAI ‘B’, plaqué argent
3	SAC BRONZE badge pin *(available from your club)*	$ 5.00	Insigne ACVV BRONZE *(disponible au club)*
4	FAI ‘C’ badge, cloth, 3" dia.	$ 4.50	Insigne FAI ‘C’, écusson de tissu
5	FAI SILVER badge, cloth 3" dia.	$ 4.50	Insigne FAI ARGENT, écusson de tissu
6	FAI GOLD badge, cloth 3" dia.	$ 4.50	Insigne FAI OR, écusson de tissu
	Items 7–12 ordered through chairman FAI awards		*Les articles 7–12 sont disponibles au président des prix de la FAI*
7	FAI ’C’ badge, silver plate pin	$ 5.00	Insigne FAI ‘C’, plaqué argent
8	FAI SILVER badge, pin	$39.00	Insigne FAI ARGENT
9	FAI GOLD badge, gold plate pin	$35.00	Insigne FAI OR, plaqué or
	Items 10, 11 not stocked, external purchase approval given		*Les articles 10, 11 ne sont pas en stock, permis d’achat externe*
10	FAI GOLD badge 10k or 14k pin		Insigne FAI OR, 10k ou 14k
11	FAI DIAMOND badge, 10k or 14k pin and diamonds		Insigne FAI DIAMOND, 10k ou 14k et diamands
12	FAI Gliding Certificate (record of badge achievements)	$10.00	Certificat FAI de vol à voile (receuil des insignes)
	Processing fee for each FAI application form submitted	$10.00	**Frais de services** pour chaque formulaire de demande soumis
13	FAI badge application form, rev. 6 *(stocked by club)*	n/c	Formulaire de demande pour insignes *(disponible au club)*
14	Official Observer application *(stocked by club)*	n/c	Formulaire de demande pour observateur officiel *(disponible au club)*
15	FAI Sporting Code, Gliders, 1990 *(payable to **ACC**)*	$ 5.00	FAI Code Sportif, Planeurs, 1988 *(cheque payable à l’**ACC**)*
16	FAI Sporting Code, General, 1989 *(payable to **ACC**)*	$ 5.00	FAI Code Sportif, Général, 1986 *(cheque payable à l’**ACC**)*
17	SAC guide “Badge and Records Procedures” ed. 5	$ 5.00	ACVV guide des procédures pour FAI certificats et insignes (éd.5)

Please enclose payment with order; price includes postage. GST not required. Ontario residents, add 8% sales tax (items 15–17 tax exempt). Items 1–6 and 13–17 available from SAC national office.

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

SAC National Office, 306 — 1355 Bank Street, Ottawa, ON K1H 8K7 tel (613) 739-1063 fax (613) 739-1826