free flight

Issue 4/78

July/August 1978

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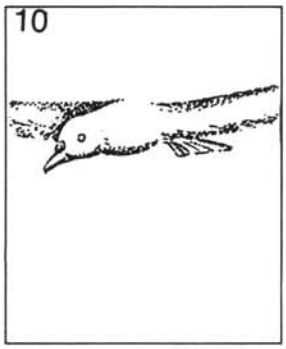

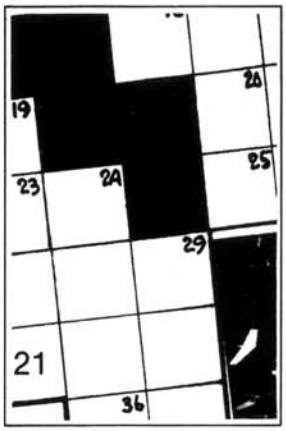

Cover photo by Lloyd Bungey Ka6Cr at Hope, B.C.

AGM '78

Report and photos by Mark Perry

For the first time in its history the Soaring Association of Canada held its Annual General Meeting west of the "Golden Triangle" and for the second time it finished the business meeting on time, according to some.

The Winnipeg Gliding Club, aided by the Manitoba Soaring Council and the Provincial Government were host to SAC members and club delegates from across the country. The tight schedule fitted in Friday night, March 17, Saturday March 18 and the following Sunday morning for a contest seminar and executive meeting, all at the Marlborough Inn in downtown Winnipeg.

Most of the out-of-towners showed up for the pre-registration and President's reception Friday night where everybody crammed into the executive suite and after registering, ignoring mountains of printed matter, agendas and copies of FREE FLIGHT, made for the bar where conversation was lubricated suitably.

Saturday's meeting was underway at nine a.m. and began with the acceptance of various committee and executive reports. The areas that generated the most interest and comment were SAC/government relations, insurance and the role and format of FREE FLIGHT.

The afternoon's business was preceded by a slide lecture by Dr. Charles J. Fisher Jr. an active competition pilot from California currently living in Winnipeg and flying out of WGC's Pigeon Lake. His topic was the physiological considerations of high-altitude flying, illustrating the needs of high flying glider pilots to prevent deadly hypoxia, and the means of providing sufficient oxygen in an unpressurized aircraft. Dr. Fisher is also team doctor for the U.S. National Team going to the World Championships at Chateauroux, France.

Following this, Karl Koetsch, SAC Director, presented a prospectus of SAC activity for the future with emphasis on

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1. S.A.C. Exec. at work Saturday morning- l to r: Paul Thompson, Christine Timm, Terry Beasly, Al Shreiter, Terry Tucker, Karl Doetsch.

2. Voting by representatives at the meeting -collecting the ballots.

3. Karl Doetsch speaks to AGM on S.A.C. objectives.

3

Letters

Dear Bob:

GO CROSS COUNTRY! It is regrettable that in 1977 only one pilot submitted notice of cross country flights for the BAIC, Canadair and 200 Trophies.

The rules for these flights can be seen below. The idea is to encourage friendly competition across the country.

It is well known that the documentation required for FAI badges, Silver C, Gold C, etc., has of necessity to be strict. As well, if a record is claimed, this requires a barograph trace and verification of start and finish lines. But rules for the Canadian trophies are much less formal; all you need is written varification by an Official Observer.

While it has been agreed by the SAC directors that claims can be accepted at any time during any one year, it is desireable to send in claims as soon as possible after the flight to the SAC Trophy Flights Recorder. These flights can then be written up in FREE FLIGHT to give other pilots a chance to beat them!

This year let us hear from you, the SAC Trophy Flights Recorder for 1978 is Tony Sawatzky, Box 137, Pinawa, Manitoba, R0E 1L0.

Trophy Flight Rules:

1. All flights to originate in Canada.
2. All goals and turn points must be declared before take-off.
3. Turn points for the prescribed area distance task must be declared before take-off but may be visited and revisited in any order subject to the requirement that consecutive turn points shall not be less than 50 km apart.
4. Evidence of take-off, landing, turnpoints and height gains shall comply with FAI rules. (In practice, this means that an Official Observer has to verify and sign any flight claim submitted. Barograph traces are not mandatory, except for height claims, and photographs of turn points need only be submitted to the local Official Observer.

AGM '78

achieving a greater degree of support from official bodies as part of SAC's objectives in promoting soaring.

Amendments to the SAC by-laws were ratified afterwards with debate reaching a climax over whether to insert a comma or a semicolon in a clause.

The balance of the meeting, including new business, went rapidly and the meeting was concluded before scheduled time. A couple of hours later SAC members were enjoying drinks and conversation before dinner. SAC was welcomed to Winnipeg and Manitoba by MLA George Minaker, who remarked that even in times of fiscal restraint the energy efficient nature of soaring might be justified for funding in support of a future National Contest in the Province. Transport Canada was represented at the dinner by Mike Bradley of Air Regulations

SAC President Al Schreiter addressed members with the theme that there is still plenty of room for growth in soaring in Canada, citing comparative statistics on soaring activity in Germany and Sweden. He also said the continual improvement, with better funding and organization of the national team was a sign of healthy growth in Canadian soaring.

The absence of some of the recipients of awards (and some of the awards) did not deter John Agnew from wittily presiding over the presentations, with some historical asides that gave a glimpse of the tradition of motorless flight in Canada that goes back almost as far as flight.

The Canadair Trophy, for the five best flights in Canada for the year was won by John Firth, as was the B.A.I.C. Trophy for the single best flight of the year (his record setting 750 km triangle). Both awards were accepted by Jim Scannel on behalf of John Firth.

The 200 Trophy, which was to have been presented for the best flight by an under-200 hour pilot, had not been located in time for presentation. John Agnew hopes whoever has it remembers and returns it to SAC. The honour went to Ian Oldaker.

Gordon Bruce of Montreal Soaring Council was on hard to receive the SAC Instructor of the Year Award. Dick Moore presented the Roden Trophy to Walter Chmela of York Soaring, winners last year, and previous years although according to Dick the rules had, he implied, been revised to prevent just such an occurrence; which shows you can't keep a good club down.

Air Cadet Andre Beaulieu of New Brunswick was named recipient of the Jonathon Livingston Seagull Award for being the top Air Cadet glider pilot.

Following the dinner, the Winnipeggers presented two short films, one of aviation activities at Harbour Grace, Newfoundland in the thirties (Harbour Grace is present home of the Newfoundland Soaring Society). The other feature was silent colour footage of the 1948 World Contest in Switzerland obtained from the SSA Soaring Museum.

This year SAC continued its scheduled activities on Sunday morning with a meeting and seminar which concluded the weekend's activities.

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Some SAC members hoped the location of the year's AGM had set a precedent for holding the meetings in different regions on a formal basis.

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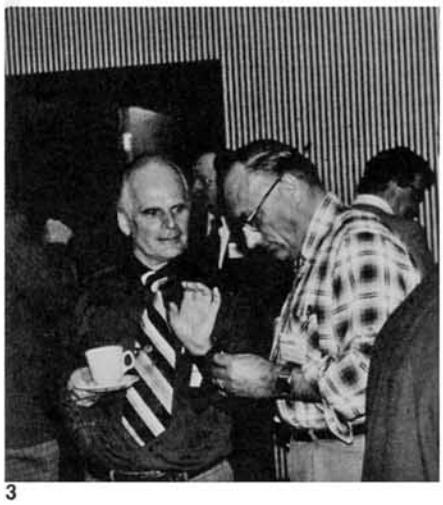

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1. President A. O. Scheiter addresses the meeting.

2. Dr. Charles J. Fisher Jr. speaks on high-altitude soaring to S.A.C. AGM after lunch

3. Oscar Boesch and Walter Chmela converse during coffee break.

4. Meeting in progress.

4

AGM '78

1.

1. John Agnew and Dick Moore.

2. Gorden Bruce accepts instructor year award.

3. S.A.C. Members having drinks and conversation before dinner.

4. Walter Chmela describing circuit technique at York Soaring.

5. MLA George Minaker addresses S.A.C. banquet.

6. "M.C." Russell Flint — Prairie Zone Director.

7. Al Schreiter gets "Special Award" for his work as President - presented by Walter Chmela.

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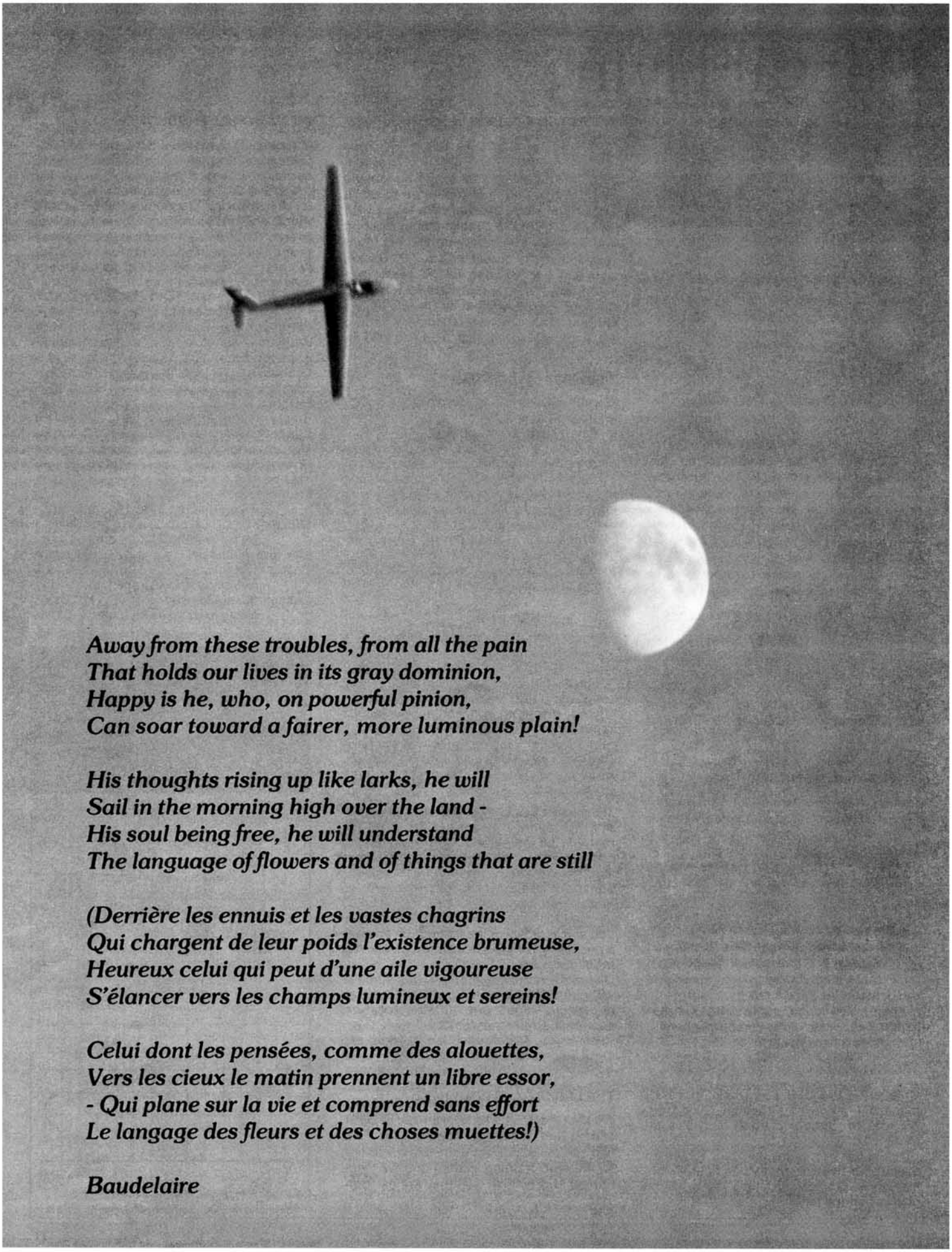


Away from these troubles, from all the pain
That holds our lives in its gray dominion,
Happy is he, who, on powerful pinion,
Can soar toward a fairer, more luminous plain!

His thoughts rising up like larks, he will
Sail in the morning high over the land -
His soul being free, he will understand
The language of flowers and of things that are still

(Derrière les ennuis et les vastes chagrins
Qui chargent de leur poids l'existence brumeuse,
Heureux celui qui peut d'une aile vigoureuse
S'élancer vers les champs lumineux et sereins!

Celui dont les pensées, comme des alouettes,
Vers les cieux le matin prennent un libre essor,
- Qui plane sur la vie et comprend sans effort
Le langage des fleurs et des choses muettes!)

Baudelaire

Hangar Flying

Aerosport agent appointed

Pierre Rochette of Quebec has been appointed Canadian agent for Aerosport Inc. of Long Beach, California. Aerosport is distributor of Pilatus B-4, Blanik, Jantar and DG-200 sailplanes. Pierre Rochette is well known in Canadian soaring circles having been distributor for Pilatus sailplanes for several years.

A European Smirnoff?

George Moffat reports that the Smirnoff cross-country race idea has taken European gliding by storm. Apparently both Helmut Reichmann and Ingo Renner, last year's winner, have talked so enthusiastically about it that the whole of Europe can hardly wait to have one. Jean-Claude Penaud, son-in-law of the fabled Monsieur Hersen, longtime Chef de l'Aerodrome at Angers and organizer of the Huit Jours back in the fifties, seems to be the chief organizer in France. The European plan is to start at Angers, swing north through Belgium and Holland and then on into Germany. Heading south the competitors would hit Austria and then cut west along the Alps by way of Northern Italy, finally finishing up at Angers after some 5000 km of flying.

TRANSPORT CANADA SAFETY LETTER

Transport Canada Aviation Safety Bureau publish a Safety Letter which will be of interest to glider pilots as well as power pilots. To receive a copy of this letter on a regular basis write directly to Transport Canada, SLPP, Ottawa, KIA ON8 and request your name be added to their mailing list.

GLIDER PILOT CONQUERS EAGLE

TURIN, Italy — An Italian glider pilot Wednesday described a desperate midair battle with an angry eagle which attacked his sailplane.

Antonio Beozzi, 28, said he was soaring 4,600 feet above mountains near this northern Italian city Tuesday when the eagle dived at his aircraft, attacked the windshield and broke into the cockpit.

'I was real scared,' Beozzi said. 'It snapped at my arms. We had a real tough fight until I grabbed its neck and strangled the beast.'

Holding the dead eagle with his left hand, Beozzi brought the single-person glider safely back to earth.

TROPHY FLIGHT

On May 6, 1978, J. E. Bachynski, in a 1-35, made a flight from Chipman Gliderport, Alberta to Stettler Airport for a total distance of 314 km.

This is the first flight this year for which a claim for the 200 trophy has been made, so come on fellows, let's have those claims coming in!

40000 FT. IN A GLIDER IN SOUTH AFRICA

Durban glider pilot Dick Becke, 61, rode a 'standing wave' high over the Drakensberg in August last year to set a probable South African altitude record of 40000 ft. The former WWII bomber pilot was winch launched from the Drankensberg Soaring Club's base near Underberg and his flight lasted two and a half hours. Mr. Becke, who has been gliding for 14 years, has submitted a barograph trace to the Aero Club of South Africa as proof of his altitude. The previous allcomers record set in South Africa was about 33000 ft.

THE FIRST CFI SEMINAR

Something new has happened in the S.A.C., a Chief Flying Instructors' Seminar held in May, 1978 in Toronto.

Although the weather was less than cooperative resulting in cancelling of SOSA's active flying training session, and the virtual house arrest of all participants in the Ramada Inn, the session was of indisputable value.

The papers presented covered every conceivable soaring subject, sometimes more than once, resulting in heated discussions, which after all is what the seminar is all about.

Highlights included:

- An arrival party in which some people flew higher than others.
- A talk by Dr. O.J. Skjenna of D.O.T. that proved that the pilot, mentally, is undoubtedly the "weak link" of the whole flying machine concept, - marvellous speaker.
- Terry Tucker, playing the role of supreme diplomat while being an untiring hostess, and Ian Oldaker, still smiling through discussions.

There was ample evidence at this seminar of a tremendous amount of effort on the part of the organizers, the high quality and sincerity of all participating members and the necessity for inter communications, pro and con, afforded by meetings of this type.

A result of the seminar is the modification and approval of the Instruction Manual, a necessity for standardization of training procedures.

Certainly none could attend this seminar without appreciating the problems suffered by various clubs due to size, location, economics and other factors.

Thank you, Al Schreiter, Ian Oldaker, and Terry Tucker for everything.

THE LARKS HAVE COME!!

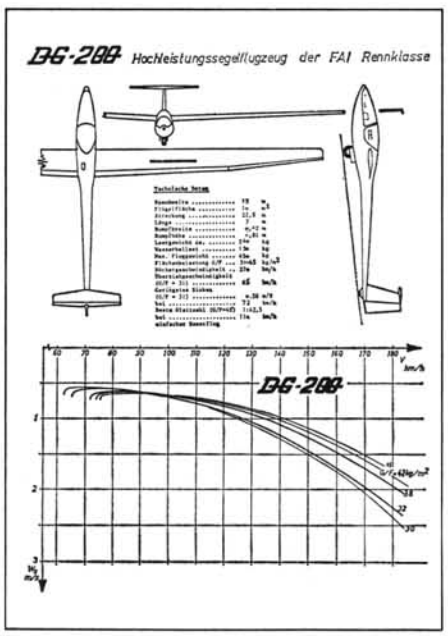
We hear that the Larks have arrived at SOSA and at the Winnipeg Gliding Club. The two seater IS-28B2's are the latest addition to the club training gliders and we hope to hear shortly how well they are performing.

DG 200 IN FULL PRODUCTION

It took only 7 months from the time the prototype first flew until the German authorities issued the type approval for the DG 200. The glider, which is known for its superior manoeuvreability, stable flight and safe landing characteristics, proved itself many times over during last year's European competition season. The factory is producing 4 to 5 sailplanes a month at the present time.

Technical data:

Wingspan	15 m
Wingarea	10 sq.m.
Aspect ratio	22.5
Length	7 m
Width	0.62 m
Height	0.81 m
Empty weight, Approx.	240 kg
Water ballast	130 kg
Max. weight	450 kg
Wing loading	31-45 kg/sq.m.
Max. speed	270 km/h
Stall speed	62 km/h
(Wing loading 31 kg/sq.m)	
Min. sink	0.56 m/s
(Wing loading 31 kg/sq.m)	
Min. sink speed	72 km/h
Best glide angle	1:42.5
(Wing loading 45 kg/sq.m)	
Best glide angle speed	110 km/h
(Wing loading 45 kg/sq.m)	

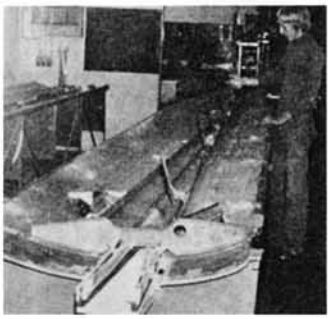


October 1977

The Alkaflieg group at the University of Braunschweig, W.-Germany, is completing the construction of a new 15m sailplane with variable wing geometry, designated the "SB11". The carbon fibre sailplane is being built using the ASW 19 fuselage mold and the Janus tail mold. The wing employs a newly developed profile specially suited to the enormous fowler flaps which increase the wing area by 25% when fully extended. First flight of the new ship is expected in the spring of 1978.

"SB11" wing construction

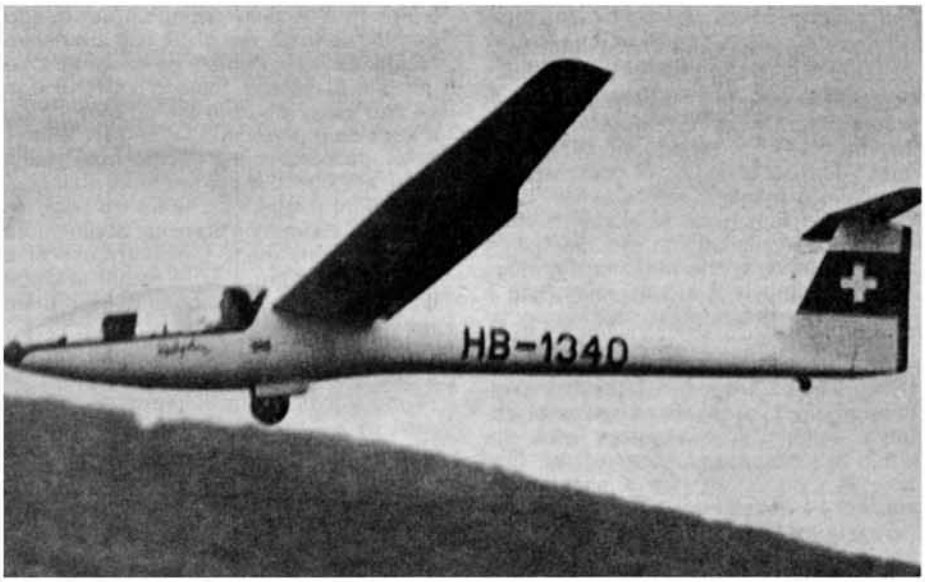
"SB11" fuselage, a combination of ASW19 fuselage and Janus empennage.



"Delphin" First sailplane with stepless variable wingprofile.

January 1978

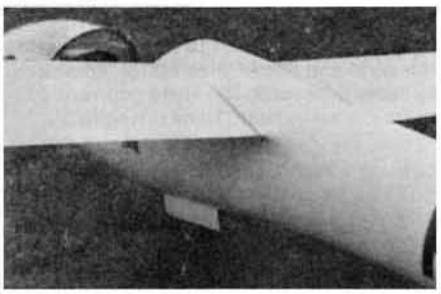
Fritz Mahrer, of Switzerland, has successfully test flown his new sailplane, the "Delphin". The 15m wing uses a stepless variable profile whereby a wingprofile extension is stored internally in the wing. When extended it increases the wing area by 1.5 sq. m. and gives the sailplane excellent slow flight performance. Retracted, the wing becomes a high speed racing profile. The well known Prof. Eppler, who developed the profile, has been involved in the flight tests and feels that only relatively minor changes are needed to bring the ship up to expectations. The fuselage is basically that of the "Elfe" built by A. Neukom several years ago. It is hoped that this new flap design will overcome most of the drawbacks of conventional flap construction and will result in a sailplane with superior flight characteristics at both the low and high speed end of the flight range. The builder has offered his ship to be flown at the upcoming world contest and interest shown by competing pilots is high.



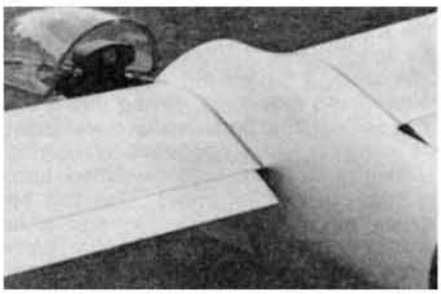
February 1978

On Feb. 17, 1978, Hans-Werner Grosse of W.-Germany, took off from Alice Springs, Australia, to try and better his world speed record around a 1000 km triangle of 88.6 km/h. When he returned to Alice Springs he had established a new world record with the incredible speed of 109.5 km/h. During January he also tried to improve on his triangle distance record of 1042 km. He declared a 1102 km triangle but had to land 4 km short of his goal.

Flap retracted for high speed flight



"Delphin" with slowflight profile and increased wing area.



NEW WORLD GOAL RECORD

When New Zealanders S. H. (Dick) Georgesen (age 56), David Speight (age 36) and Bruce Drake (age 36) flew three Nimbus II sailplanes 1254.9 km from Tower Peak Station near Lake Te Anau on the south of New Zealand to Te Araroa in the north on Saturday 14th January 1978 to claim the World single seat goal record, it was the 27th attempt that Georgesen had made at this record. The following are his comments (reprinted from Gliding Kiwi) on the earlier efforts.

THE FIRST TWENTY-SIX ATTEMPTS

After having obtained a world gain-of-height record in December, 1960, and a world out-and-return record in 1962, I thought a world straight line distance record crossing Cook Strait should be tried.

Many attempts were made, but without success, although two further world out-and-return records were obtained, one in 1964 and the other in 1972.

Gerald Westenra and myself spent a month in Southland in 1969, but were only able to fly as far as Blenheim. In January, 1976, Dave Speight, Gerald Westenra and myself decided that if this record was not broken soon, it would be put beyond the reach of New Zealand, as the country is too small for great distances. We thought if a team of three set off on such a flight, one person may get through and break the record.

A total of 14 trips were made to Tower Peak Station. On 7 occasions Gerald and I drove the 650 kilometres from Christchurch to Dave Speight's property. On the other 7 we flew down, Bruce Drake flying us south on five occasions.

Out of the 14 trips to Tower Peak, we got airborne on eight occasions, the cold fronts having come through in the night bringing south-west changes and so eliminating the chances on six occasions.

On the last attempt we were able to get Bruce Drake's Nimbus to Tower Peak and so enable him to join us on the actual attempt.

TO SOAR LIKE AN ALBATROSS

by Dr. A. E. Slater

The albatross's dynamic soaring technique has always looked impossible for man-made gliders. Now Australia's Ingo Renner is showing that it may be feasible after all.

Dynamic soaring flight means keeping up a motorless flying machine — live or man-made — by taking energy from a non-uniform wind instead of from the more familiar upcurrents. It seems to have been the choice of several would-be aviation inventors, particularly in the nineteenth century, after attempts with flapping wings had been largely given up and while a light enough power unit had yet to be invented.

There are two kinds of dynamic soaring; taking energy from gusts, or flying alternately in adjacent windstreams of different velocity. The albatross uses the latter technique, and now, for the first time in history, so has a glider pilot, albeit at a different level in the atmosphere.

Would-be inventors seem to have had peculiar difficulty in understanding the use of upcurrents. Both Leonardo da Vinci and Octave Chanute understood soaring in an upslope wind, yet both thought that circling birds can only climb when facing the wind (see the latter's article in *Flight* for July 3, 1909).

Sir George Cayley did not believe that birds could soar at all, saying that if one was seen gliding horizontally, it was using up energy previously acquired by flapping. Evidently he had never watched birds gliding upwards in circles. Was this because, as an English country squire, he was only interested in birds that came within shooting distance?

"Chanute, in the 1909 article referred to, claimed to be the first to prove that birds could soar in upcurrents; he did so by working out the energy in foot-pounds per second of a sinking bird, the foot-pounds per second of an equal area of rising air in an upcurrent he had heard of and finding that the latter exceeded the former. Yet in 1903 Wilbur Wright said simply that the rate of ascent of the air had to equal the rate of descent of the bird."

Gust energy has actually been used for human soaring, on the principle that you gain more height by pulling up in a gust than you lose in the subsequent lull. Only two such flights of any considerable duration seem to have been recorded. On September 13, 1921, Friedrich Harth set a world soaring record of 21.5 min over the Heidelstein mountain near the Wasserkuppe in a wind averaging 25 m.p.h. and gusting up to 40. His glider had a variable-incidence wing which enabled him to climb in successive gusts to 500 ft, though he had some lift from a wind blowing up a 6° slope. Then in 1937 Albert Slatter flew upwind over the Pacific from Hollywood at 2,000 ft. above sea level, maintaining height in gusts till he turned back for fear of overstraining his wing. Glider pilots have regularly made temporary use of a gust to win a bit of extra height in slope winds barely strong enough to keep them up.

Finally, there is the technique of the albatross. Chanute, in his *Progress in Flying Machines* (1899), reprinted a paper read by a Thomas Moy to The Balloon Society in 1884. Moy observed that when an albatross is away from the ship, the bird keeps up by alternately rising against the wind behind it. But he thought the initial push which propelled it to the top of its climb was given by spray and air flung up by the wind violently striking the windward or rear slope of a wave. In so believing he made a mistake still perpetrated by many scientists. In fact, a fully grown wave moves nearly as fast as the wind and sometimes faster, according to recent research. So the upcurrent over the wave's windward flank is negligible.

The first correct explanation of the albatross's technique appears to have been given in *Nature* for 1889 by A. C. Baines, a New Zealander. When it climbs against the wind, the airspeed which a bird would normally lose by gliding upwards is more than counteracted by the stronger headwind blowing against it at higher levels. It then turns and its normal gliding airspeed is increased by the push it receives from the upper wind. If it chooses, it can then use up this excess speed in gliding low over the water looking for fish.

Now comes the breakthrough. The first pilot ever to use the albatross's technique successfully appears to be Ingo Renner, a German-born glider pilot who emigrated to Australia and nearly won the World Gliding Championships held there in 1974. Since then he has distinguished himself on visits to the Northern Hemisphere, especially by winning this year's Smirnoff long-distance multi-day race in the U.S.A.

Astonishingly, he performs this long-prophesied feat not at sea level as expected, but higher in the atmosphere, where no albatross flies and where no one had ever before entertained the possibility of this type of soaring. Instead of exploiting the wind gradient close to sea surface, he uses the differing winds above and below an inversion. This is a layer of the atmosphere in which the top is warmer than the bottom—an "inversion" of the normal condition, in which temperature decreases with increasing height up to the tropopause. Since the warm top of the layer does not want, so to speak, to descend into the colder air below, and neither does the cold air want to ascend into the warm, there is no mixing and the layers slip past each other without exchanging momentum. It is thus possible to have different winds at the two levels.

Renner's technique is to descend at high speed into the lower layer, helped by a push from the upper one, then make a steep turn and climb back into the upper stratum like an albatross. This is followed by another turn and dive. He has tried flightpaths of oval, zigzag and figure-of-eight shape, but finds no difference between them. The most important manoeuvre is a lower turn made as quickly as possible, in which he reckons he has pulled as much as 4g. Renner has been attempting dynamic soaring for about four years, and the difficulties can be gauged from the fact that he has achieved only four really successful flights in that time. The first, in an H-301 Libelle, was marginal. Renner found more success with a Pik-20, logging a total of over an hour, with a longest individual flight of 40 min.

He has found that a gradient of 200 ft/min (1m/sec) over about 300 ft. (100m) is the minimum needed for this type of dynamic soaring, and he usually soars through an inversion boundary in a belt about 500 ft. (150m) thick.

Renner confirms that dynamic soaring is only a means of maintaining height, not climbing, but it looks as though something of an historic breakthrough has been achieved.

Published in Flight International, 22 October 1977 - Reprinted with permission. Dr. Slater is a consultant editor for Sailplane & Gliding, the magazine of the British Gliding Association.

New Instruction Manuals

Student's notes now include new checklist SWAFTS, sections on thermalling, etc.

The Instructors' Committee have finalized the new version of the "Student's Notes", or Part III of the manual, and booklets are now available from the SAC through Terry Tucker. The revised manual was discussed at the CFIs' Seminar in Toronto in May (see Hangar Flying Section - CFIs' Seminar) and a number of changes were made as a result of reviews at the Seminar.

The Manual now includes sections on Ground Operations and Signals, and expanded sections on Pre-Flight, cockpit and pre-landing checks. "CISTRSC" is slightly modified to make the first S = Straps and the second S = Spoilers (dive brakes etc.) plus Flaps. A pre-landing checklist "SWAFTS" is introduced and this is

S Straps
W Wheel (and water)
A Airspeed (see section below)
F Flaps
T Traffic
S Spoilers

Both these checklists are now available from Terry Tucker as metal stick-on labels, and all clubs and pilots are urged to fit them in their aircraft and to use them!

Other new sections are Thermalling and Collision Avoidance; Ridge Flying will be added before the next printing.

New formula for approach speed to fly

We have changed the recommended approach speed to 1.3Vs + Vw where Vs is the stall speed and Vw is the full wind speed. In addition, it is recommended that in any situation the minimum approach speed for training aircraft should be 50 mph (90 km/h). This is a simpler formula than the old one and results in higher approach speeds. It is an attempt to prevent slow final turns and the attendant danger of stall/spin accidents.

In general the downwind leg of the circuit will be flown at best L/D speed and the speed increased to the calculated approach speed as the turn onto base leg is made. The approach speed of 1.3Vs + Vw may appear a bit fast, but instructors should note that for training ab-initio pilots it is safer, and on airfields with surrounding trees, etc., which generate large wind gradients it is safer for all of us. If properly held-off landings are taught, then touchdown speeds will be no higher than before.

New Air Instruction Notes and "Air Exercise Check List"

Part II of the Manual has been rewritten, to reflect changes to Part III. A new version of the student progress sheet, called "Air Exercise Check List", for insertion in the student's log book is available. This lists the air exercises to be covered and follows the sequence in the Instructors' Air Instruction Notes.

Current instructors should note these changes. You are urged to obtain copies of these revisions as soon as possible. In addition the Instructors' Committee (Ian Oldaker, Gordon Macdonald, Eric Newsome, Tom Bell, Walter Piercy and Garnet Thomas) would like to receive comments on these manuals and your suggestions for improvements. If you feel you don't like something or want an item added, please write to any member, your CFI or the Chairman, Ian Oldaker, at Pinawa, Manitoba, R0E 1L0 at any time.

Part I of the Manual, Instructor's Guide is currently being revised and will be available early next year.

In summary, the following new items are available now from Terry Tucker, 786 Chapman Blvd., Ottawa, Ontario, K1G 1T9.

SAC Instruction Manual
- Part II Air Instruction Notes
- Part III Student Notes

Air Exercise Check List
(for student's log book)
Stick-on labels for instrument panels
- CISTRSC (pre take-off)
- SWAFTS (pre landing)

ALONE WITH THE MOUNTAIN

by Bert Small

The tow-plane was a perfect white shape silhouetted against the dark ominous mass of Pikes Peak. Above the peak the clear ice-blue Colorado sky was interrupted only by the sculptured lenticular clouds, indicating an excellent wave soaring day.

Stretched taut behind the labouring Super-Cub the tow rope joined the sailplane directly under the feet of the pilot, who was now concentrating intensely as they were about to enter the rotor where alertness and anticipation were essential.

The pilot looking ahead, saw the tow-plane suddenly lose altitude and just as suddenly climb back into position, only to be tilted immediately into a 35° bank and just as quickly back to a level position again. As if raised by a giant invisible hand the Super-Cub now forced its image up the canopy of the sailplane which was by now struggling desperately to maintain some semblance of relative position behind the lurching, rolling machine ahead.

The oxygen blinker was activated many more times per minute than before, as the physical and mental effort to stay in position took its toll on the pilot's normally steady slow breathing.

Now an extremely sudden rise, followed immediately by a sharp drop, produced that momentary feeling of weightlessness and all loose objects in the cockpit floated around the pilot. The mike switch, the oxygen emergency knob, a mitten left to one side and the surplus oxygen hose were all suspended eerily in the crowded confines of the cockpit, coming to rest in slow-motion, followed without warning by another quick up and down movement, more floating objects, now some mild turbulance and suddenly, except for the drone of the tow-plane and the whistle of the wind, the air became steady, quiet and smooth seemingly more fluid than water and reminicent of a canoe carving through the glass smooth surface of a calm lake.

Now a voice from the radio speaker, "This is it 912 ... looks good."

Inside the cockpit, the pilot had a fleeting feeling that he would like to stay attached, but a quick realization that the whole purpose was to pull the release and experience that pure freedom he wants to feel once again, and to fly high above this peak which is now completely filling the canopy in front and on both sides, showing only small glimpses of blue sky above. The altimeter shows 13,900' as the pilots mittened hand reaches out for the release knob, a slight pause to check position, a last look around to clear the area and ... CHHUUUNNG!!! Whistling silence and freedom mixed with the excitement of the challenge ahead.

As the tow-plane banks steeply left and down, the radio speaker blares "912-don't forget to notch your barograph!"

Now he is gone and the sailplane is alone ... with the mountain ...

We arrived on January 1st, 1978 at Black Forest Gliderport, Colorado to join the Canadian Wave Camp, efficiently planned, organized and actively conducted by Walter Chmela, President of York Soaring Association. This was a smaller camp than usual, only 9 of us as compared to 20 last year. We made up in enthusiasm and good humour what we lacked in numbers.

Black Forest Gliderport, home of Wave Flights Inc., is situated about 6 miles outside of Colorado Springs, which is 75 miles south of Denver, Colorado. The facilities include a dormitory to sleep 12, complete with kitchen, comfortable lounge and recreation room, a small motel (Lennie Inn), three hangars and a flight office which contains a briefing room for Wave Orientation instruction, a working oxygen set-up for the fitting of masks and practice in its use. This same building contains the "Book Nook" with a good supply of all soaring books and souvenirs, also a room with vending machines for food and hot and cold drinks. There is also a change room with a supply of warm flying clothes and boots for your use in case you didn't bring your own.

The sailplanes available for rental are many and varied and include, 2-33, 1-26, 1-34, 1-35, 2-32. All are equipped with radio and oxygen for wave flying, except the 2-33's which are used only for student and local flying.

The Black Forest staff are pleasant, courteous, knowledgable, efficient and conduct themselves with an extremely high degree of professionalism. Safety and following the airport rules are stressed at all times.

Once you have been assigned to a ship, you take full responsibility for D.I., preparation, barograph installed and ticking, seat adjustments, checking of all equipment and replacement if necessary (i.e.: change of batteries or fill up of oxygen.) When everything is in order to your satisfaction and you are ready to go, willing hands will assist you to get your craft to the flight line and help you to get settled in the cockpit, which is no easy task by yourself due to the bulky clothes and the many items requiring attachment. Now in the cockpit, with seat and rudder pedals adjusted, you buckle up as normal, making sure you are very snug and secure as the the ride through the rotor can bump you around considerably. Attach the oxygen tube to the hose in the ship and hook up the emergency bottle, which gives you 8 minutes of oxygen if the main system should fail. You now go through the P.R.I.C.E. check for the oxygen system which is ... PRESSURE-REGULATOR-INDICATOR-CONNECTIONS-EMERGENCY. Plug in the mike switch, turn on the radio, set to 123.3 and ask for a radio check. Position the mike switch and green knob for emergency oxygen in an easily accessible location and after a normal cockpit check you're ready to go.

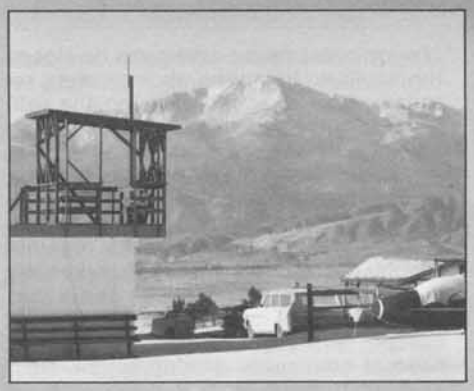
Before attaching the tow rope the line boy will hold it up for your approval or rejection. When you O.K. its use he will reach under the nose for the release and give you the open signal with an open palm, then a closed fist to close it, this is repeated again and on every flight as a means of checking the release. With a pleasant, "Have a good flight." he then helps you to close the canopy which is an automatic signal for the tow pilot to take up the slack. The wing is held down until you give the thumbs up signal and with the wings now level you only need to waggle your rudder back and forth in a definite manner and the tow-plane will proceed with the take-off.

The peak is 20 miles away, so minimum altitudes at different locations have been set up based on the performance of a 1-26. The tow-pilot will always keep you at these minimums in case of a preliminary release or rope break.

You are now on your way to that moment when you say to yourself ...

Now he is gone and I am alone ... with the mountain ... after release the altimeter showed 13,900' with a steady 300 F.P.M. rate of climb, indicating a solid connection with the wave, and an immediate climb to 15,000'. Now the moment was here ... the right hand eased the stick forward as the left slid the spoiler handle back. This was the notch for the barograph, necessary to establish a low point after release to prove that you were no longer being towed. Now in a steep dive and a gradual build up of speed and the entire canopy, in front, above and on both sides was completely filled with the all too real picture of the brown rocks speckled with snow and the black Colorado pine trees, increasing in size and rushing upwards towards the sailplane.

A roving eye quickly checks the airspeed and the altimeter now winding down past 14,800' ... 14,700' ... 14,600' and a pull out



at the low point of 14,500' with a steep climb back up as the mountain disappears and only the sky remains until the momentum is lost and he levels out to meet the imaginary horizon, the mountain returns to sight and the altimeter indicates 14,900'.

From the low point of 14,500' it will be necessary to get an indicated altitude of 31,000' to ensure a diamond gain.

Now he feels the wave again; verified by the vario reading 200 F.P.M. up. A check of the ground below shows Tooth Lake slightly to the south of his position. The nose of the sailplane points to a distant mountain, now slowly appearing above the top of Pikes Peak, giving him two reference points to maintain this location in the wave. After gaining a thousand feet, the pilot now searches for better lift to the left and then to the right. Nothing better on the left as the vario slowly goes down to 50 F.P.M. up, but as he moves to the right there is a definite improvement and the vario moves through 300-400-450 F.P.M. up. New reference points are made and as he holds in this position, the altimeter needle climbs at a remarkably steady rate, as Pikes Peak visually recedes and begins to diminish in immensity and gradually blends with the hills below.

The climb to 17,000' is a series of good lift, losing it by moving too far forward or back in the wave, circling to regain it, adjusting airspeed to maintain position and a heady feeling that this is powerful stuff to deal with.

At 17,000' the pilot keys the mike and says, "Black Forest, sailplane 912 ... 2 miles north of Tooth Lake ... 250 F.P.M. up ... altitude 17,000' ... request High Altitude area be opened please." The speaker behind his head crackles to life ... "Stand by 912 ... will inform you when area is opened."

Five minutes later and at 18,000' the maximum altitude allowed without clearance to go higher, the pilot cracks open the spoilers and makes continual adjustments to stay under that height. As he waits he notices that Pikes Peak is no longer a prominent landmark but has been reduced to just another one of the hills in the range of brown and white mountains below. Looking above, jet trails lit by the sun, glisten like neon tubes in the deep blue sky, and clouds on the distant horizon line up and advance slowly toward the sailplane.

The moment of waiting gives him a chance to reflect on this awe-inspiring panorama into which he has placed himself. The surging wave, the heady heights, the view for hundreds of miles in all directions, the eerie but beautiful loneliness. These few brief minutes of peaceful splendour are enough justification for the entire trip.

The radio squawks, interrupting his wandering thoughts. "The high altitude area will be open to 31,000' in two minutes." ... repeat ... clearance to 31,000' in two minutes. Two clicks on the mike switch acknowledges the message was received and understood.

Now the climb for diamond can begin.

Two minutes have passed and he closes the spoilers, triggering an immediate response from the vario allowing the sailplane to surge upwards. 19,000' ... 20,000' ... and he notices what were distant clouds are now moving into the area directly below. There are sufficiently large enough holes between them to keep a landmark in sight and he quickly checks over his shoulder back to the airport, to make sure it is still visible and open. The cloud cover does not present any immediate concern so he goes back to the job at hand of continually gaining height. Now at 21,000' there is a sudden drop in temperature, as though breaking through one zone of cold air and into another even colder layer. The very top of the canopy shows a very light dusting of frost.

His toes and fingers now indicate the first signs of numbness for the cold and even though thoroughly covered at all times the cold seeps through and now requires him to move them in order to keep the circulation going. Gradually he climbs, now at 23,500' ... 24,000' ... and as he passes through 25,000' there is another immediate drop in temperature, necessitating more wriggling of toes and fingers and an awareness that the canopy is slowly getting whiter but still affording sufficient visibility.

The climb is slower now and the cold is his major concern. Checking below, the holes in the clouds now seem to be much smaller than before, but he realizes they aren't closing up, but his higher altitude is causing the illusion. A check to the

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Son of Final Glide Computer

by Tony Burton

This article is written to all those who read George Adams' description of how to build your own final glide computer in the Jan. - Feb. 1978 issue of Free Flight. If you are going to give it a try, read on.

Following his directions, I found that there were some minor typographical errors in the article. I also wish to use a kilometre distance scale rather than one in nautical miles. This article will give the reader the table of values and other changes required to construct the computer having a kilometre distance scale. Other tables are also given which help to make the computer that is described in George's article. All the directions given here directly refer to steps and figures in his instructions.

A. First, correct the following items:

1. Step 4. The glide slope equation is
   $A = 231.32 (\log S - 1)$
2. Step 4 Table.
   For S = 11, A = 9.6 degrees
   For S = 12, A = 18.3 degrees

B. Refer to the diagram of the Slider (Fig. 3). The L/D Pointer is located 119 degrees counter-clockwise from the bottom of the computer scale. Substituting this value into the logarithmic equation of Step 4 gives a Glide Slope value of 32.7. Save this value for now.

C. The Distance values are plotted on the Slider using the same equation given for the Glide Slope in the Step 4 table, but plotted in a clockwise sense. This table is repeated here with minor corrections and 1/10th degree accuracy throughout.

slope & distance	angle	S, D	A	S, D	A
5	-69.6	18	59.0	36	128.7
6	-51.3	20	69.6	38	134.1
7	-35.8	22	79.2	40	139.3
8	-22.4	24	87.9	42	144.2
9	-10.6	26	96.0	44	148.8
10	0.0	28	103.4	46	153.3
12	18.3	30	110.4	48	157.6
14	33.8	32	116.8	50	161.7
16	47.2	34	122.9	55	171.3
				60	180.0

D. Now that a Glide Slope value (32.7) and distances are known, a couple of heights can be calculated and the height scale derived.

In 10 miles (angle = 0),

$$H = \frac{10 \times 6076}{32.7} = 1858 \text{ feet}$$

In 40 miles (angle = 139.3),

$$H = \frac{40 \times 6076}{32.7} = 7432.4 \text{ feet}$$

Using these height values in the log equation in Step 4:

$$\frac{A}{139.3} = \frac{\log H - \log 1858}{\log 7432 - \log 1858} \text{ or}$$

$A = 231.32 (\log H - 3.269)$

The following table of height (altitude) vs angle may be used to draw the altitude scale on the front of the calculator base (Fig. 2):

altitude (H)	angle	H	A	H	A
1000	-62.2	3200	54.6	5400	107.2
1200	-43.9	3400	60.7	5600	110.8
1400	-28.4	3600	66.4	5800	114.3
1600	-15.0	3800	71.9	6000	117.7
1800	- 3.2	4000	77.0	6500	125.8
2000	7.4	4200	81.9	7000	133.2
2200	17.0	4400	86.6	7500	140.2
2400	25.7	4600	91.1	8000	146.7
2600	33.7	4800	95.3	8500	152.7
2800	41.2	5000	99.4	9000	158.5
3000	48.1	5200	103.4		

E. If you wish to use a kilometre scale for distance, a simple doubling of the nautical mile scale is convenient. With 20 km at the bottom (angle = 0) and 120 km at the top (180), the log equation becomes:

$A = 231.32 (\log D - 1.301)$

Distance (km)	angle	H	A	H	A
10	-69.6	35	56.2	75	132.8
12	-51.3	40	69.6	80	139.3
14	-35.8	45	81.5	85	145.4
16	-22.4	50	92.1	90	151.1
18	-10.6	55	101.6	95	156.5
20	0.0	60	110.4	100	161.7
25	22.4	65	118.4	110	171.3
30	40.7	70	125.9	120	180.0

F. The same height scale given above may be used with the kilometre scale provided that the L/D Pointer is shifted slightly to compensate for the difference between 1.0 nautical mile and 2.0 kilometres. For the same value of height lost for the same angular distance used in paragraph D above:

$$\frac{80 \times 3281}{\text{slope}} = 7432.4 \text{ feet}$$

Slope = L/D Pointer position
= 35.3

The pointer is drawn in the 35.3 slope position which corresponds to a value of 126.7 degrees counter-clockwise from the bottom of the calculator.

Soaring the Mountains of the West

by L. M. Bungey

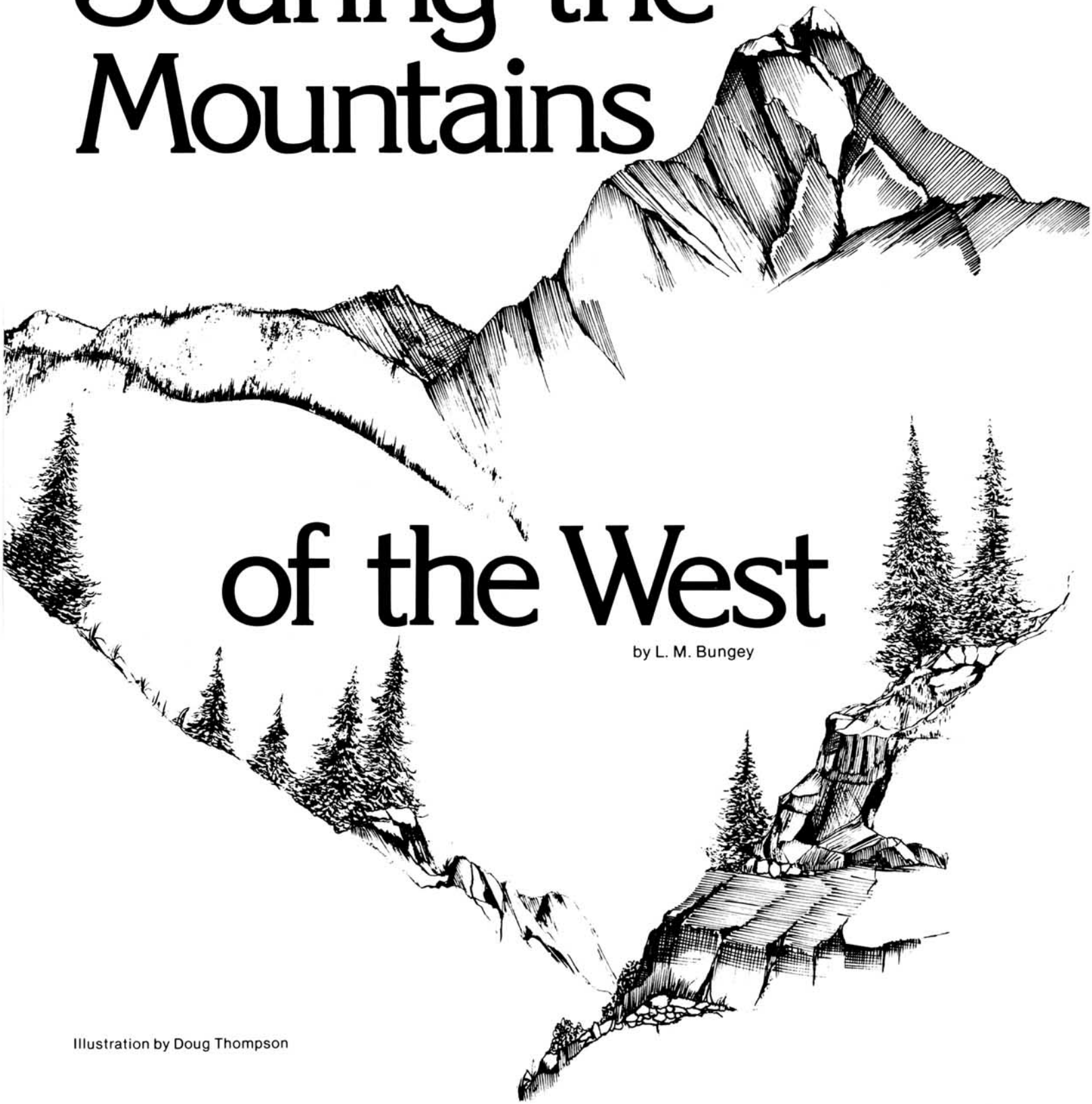

Illustration by Doug Thompson

Soaring in the mountains can be a most exhilarating experience. It offers the opportunity to utilise practically every known form of lift - thermal, ridge, rotor, wave, wind shear, and dynamic - and also to experience forms of lift that appear to defy current theory.

The main requirement for successful soaring in the mountains is the ability to recognise lift, identify whether it is moving over the ground or not, and then to stay in the area of lift. The practices of wave and thermal soaring are amply covered in many publications, while rotor and shearline flying are best learned by flying in them. The use of ridge, especially mountain ridges, is not particularly well covered in any English language source so it is with ridge soaring I particularly wish to deal.

Ridge soaring is the key to fully utilising

the mountains. Even in thermal conditions, there is very little lift to be found below the mountain tops except along the sides of the mountains. The sun, beating on the rocky faces, heats the slopes which in turn heat the air masses in contact with them resulting in a steady movement up the slopes until the higher elevations are reached. At the higher elevations the moving airmass will finally break away from the slope as a thermal. Unless one is capable of working this narrow band of lift close to the slope then, once below the mountain top, one is soon compelled to land.

In conditions of suitable winds, it is more likely that the thermals never form and the only lift available to lift one up from the valley floor to a suitable altitude to transition into the wave lift above is ridge lift. Thus the ability to work ridges is of the greatest importance in the mountains.

Unlike the slope lift to be found in the smoother mountain chains of the east, in truly mountainous regions, the lift is to be found at the lower levels of the slopes, since as the mountain narrows toward the top the air moves past the sides of the peak rather than over the top. Of course, in thermal conditions, as mentioned before, the lift breaks away from the slope towards the peak.

To find a section of ridge that is producing lift may not be as easy as it would at first appear. If you are familiar with an area there is no problem, but on a strange section of range things are different. Wind direction is never consistent in the mountains but is influenced by the local geography. So you must assess the likely wind direction on the slope by considering the influence of the upper winds, the general direction of the valley and the local spurs and depressions. It is not at all unusual to have a local westerly wind flow when the general flow over a much larger area is anywhere from south through west to north. Once having decided on the probable wind direction, it is necessary to consider the shape of the mountain and decide the most likely areas of lift. These will be the places where the local wind will be hitting the mountain almost square on with little chance of being deflected aside.

Flying Techniques for Ridge Soaring

Having decided upon the area of lift, the test is to fly to it and find the lift. It may not be where you thought it would be but if it's there, a carefully flown search will find it; but don't be too convinced it must be there and research sections you have already checked until you fly yourself onto the ground. Be prepared to admit you made a mistake and leave while you still have the altitude to explore other areas.

Having found an area of lift, it is now necessary to work that lift both safely and effectively. Don't believe those tales about working so close to the slopes that the wings were brushing the leaves. Most times the lift is quite a way out. Close in, the lift drops off due to the friction between the moving air and the ground resulting in a slower airflow close to the

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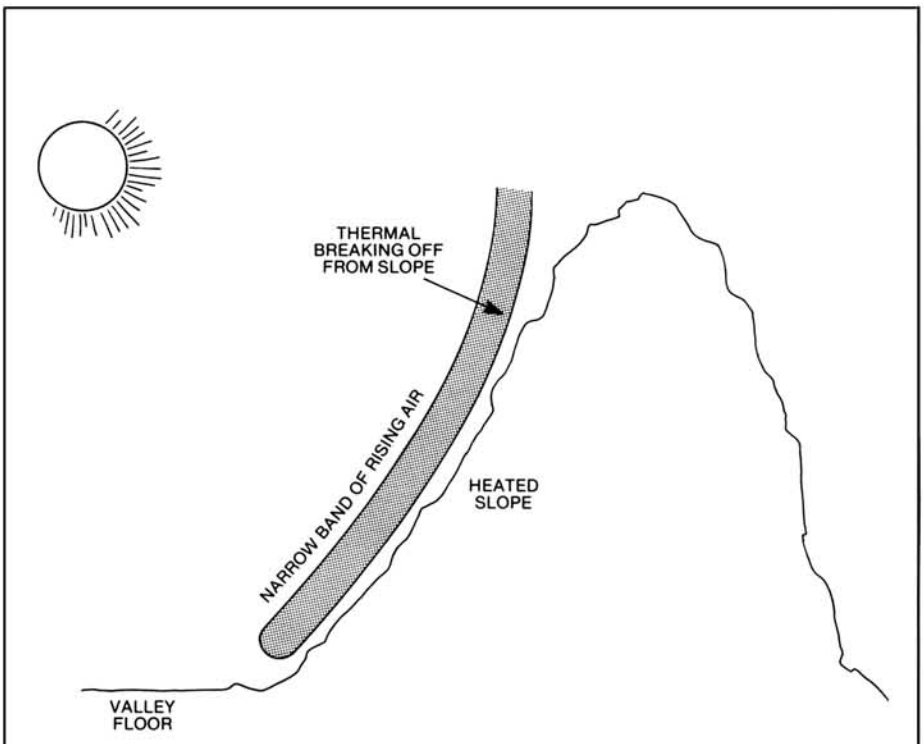


FIGURE 1. LIFT TO BE FOUND ON MOUNTAIN SLOPES UNDER THERMAL CONDITIONS.

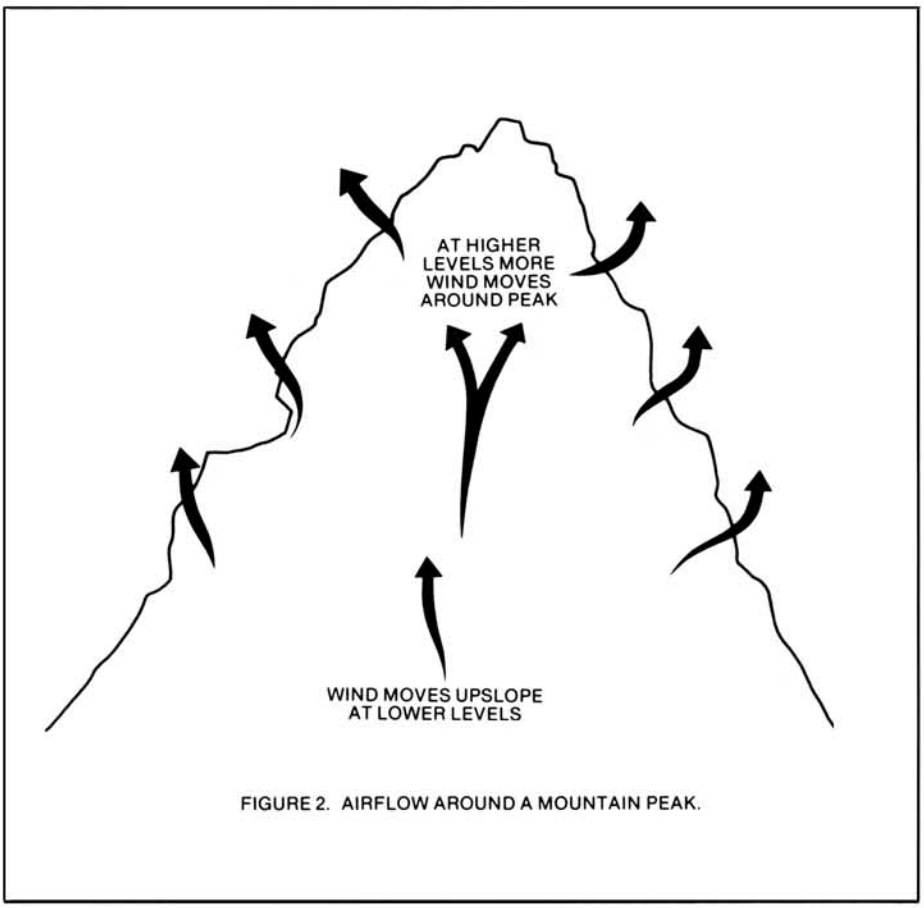


FIGURE 2. AIRFLOW AROUND A MOUNTAIN PEAK.

slope. As wind strengths increase, the further out the lift will generally be. Find the best lift, note the distance out from the slope, then maintain it.

As the section of lift will probably fairly short, it will be necessary to make beats up and down along the slope. At each end of the beat it will be necessary to turn through at least 180°. Always make this turn away from the mountain. The turn towards the mountain is doubly dangerous, not only is it a turn towards an obstacle but it is a turn downwind into a wind shear. The lower upslope velocity of the air closer to the slope can have the same effect as flying into heavy sink. You may also stall out.

Another fault, but not so serious, when working ridge is to turn through 180° when reversing the beat. This is inefficient since it places you exactly the diameter of the turn further out from the slope than when you started. (see figure 4.a) It is much better to finish the same distance out as when you started by doing a series of turns as shown in figure 4.b. Here we have 2 turns shown, one started by turning away from the slope while in the area of best lift, which places part of the turn outside the band of lift. The other shows a turn made by edging in before starting the turn so that the whole turn can be made in lift.

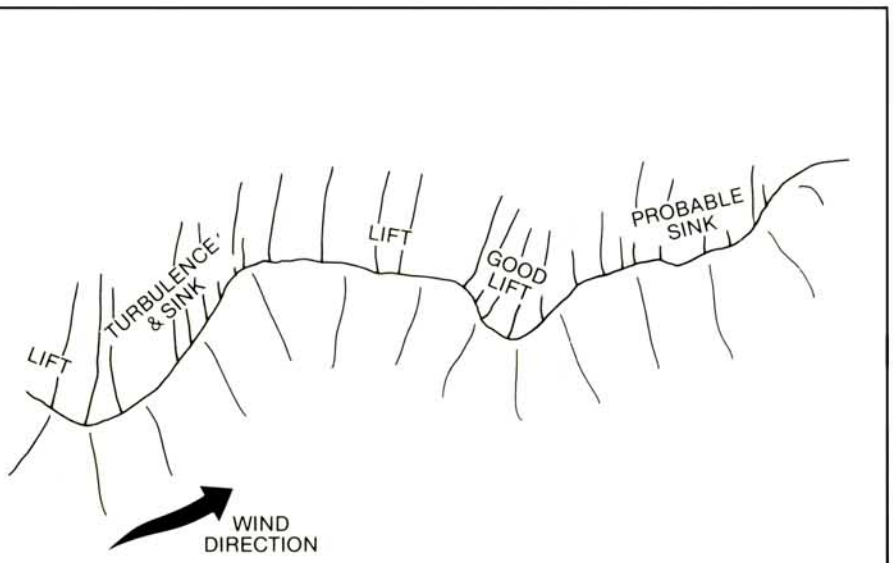


FIGURE 3. LIFT AND SINK VISUALISATION IN THE MOUNTAINS. BY RELATING THE SLOPE TO THE WIND DIRECTION IT IS POSSIBLE TO PREDICT THE AREAS OF LIFT AND SINK.

by
Walter Chmela

RIDGE SOARING

The only area in the eastern part of this continent that has been fully explored and has rewarded a number of pilots with outstanding flights is a series of ridges, mountains and hills reaching from Williamsport, Pennsylvania to Knoxville, Tennessee. A lot has be written about the successful flights of Karl Striedeck and others so that it appears that this area may offer an excellent and easy way to get your 300 or 500 km. The first step is usually to write to Tom Knauff of Ridge Soaring Inc. at Julian PA. to obtain a copy of his handbook on ridge soaring and, after having studied it, the whole undertaking seems as easy as a local flight in booming thermals. The purpose of this paper is not to discourage anybody from enjoying this experience but to point out some of the facts.

Julian is located at a section of the ridge where almost ideal conditions exist. A relatively wide valley, a 900 to 1,200 ft. high, well shaped mountain range, landing fields at fairly regular intervals etc. As long as you stay on this ridge between Milesburg and the Hydro Lines before Altoona and follow the basic rules you were told during the check ride and briefing, you should be able to enjoy a pleasant flight. The problem begins when pilots of any experience level, having read Tom's book, set out on long flights without having built up the proper local experience. The results are that within the first year or two over half a dozen gliders were written off or severely damaged and the odd one even with a local instructor on board during a local flight. Quite a few private owners with high performance glass ships, after a few attempts, came to the conclusion that it is easier, less nerve wracking and an awful lot safer to try for the distance in the flatlands.

Let's look at some of the situations one will encounter during a typical flight. A front has passed through, the wind is from 310° to 320° at 25 kts. The air is clear, promising thermals, you get launched, pick up the ridge lift and off you go at 100 mph, almost down at tree top level and you are sure the 500 is in the bag. You jump some of the small gaps with no sweat. After twenty minutes you pass Peterson Memorial A/P and Bellwood where the ridge turns a bit more to the south and find the lift decreasing. You come to the Hydro wires and can't get over them because the ridge lift does not take you high enough and you can't immediately find a good thermal. You were careful, turned around, found a little lift worked your way to the top of the ridge again and wait for a decent thermal. Karl with his fully loaded ASW 17 comes along at 130 kts. zooms up to 700 or 800 ft. above the ridge because he knows what to expect, flies to the end of the ridge at the Altoona Gap, zooms 700 ft. up again and coasts across the gap at 50:1.

By the time you finally managed to work your way up in 2 or 3 thermals Karl is most likely 70 miles ahead of you. Twenty minutes after crossing Altoona you reach the Bedford gap. After you worked your way up in thermals again, you see the continuation 10 miles away but you are now fighting a 30 mph crosswind. You picked up the right ridge again and continue towards Cumberland. A few miles before Cumberland things are beginning to get interesting. You are in a narrow valley 900 feet above valley bottom and no place to land. The ridge upwind is higher than the one you are on and wave action frequently converts the ridge lift into awful sink. You make it to the Hospital on top at the end of the ridge. You are now maybe 200 feet above the hospital. After failing to find a good thermal you have to cross downwind 2 miles of mainly built up area. Did you ever fly over a city at 600 feet AGL with no landing field in sight, looking for shallow spots in the river where you can possibly dump it in? After this you have a stretch of about 45 miles of what Tom calls "A non descript jumble of small hills" with very few suitable fields to land in. Tom Knauff to our knowledge does not allow any of his ships to proceed beyond Cumberland any more.

The hazards of this kind of flying are obvious. You are almost continuously flying at circuit heights with the nearest

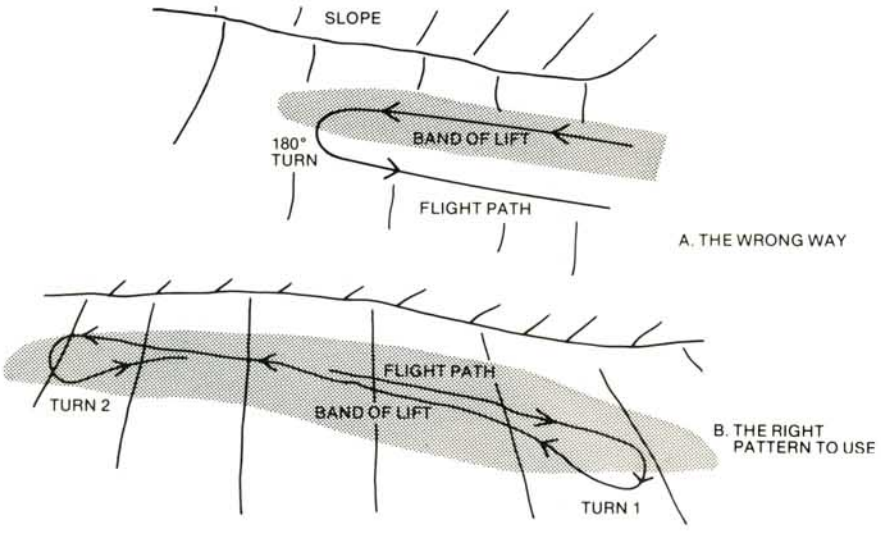


FIGURE 4. RIDGE SOARING PATTERNS

Safe Speeds and Practices on the Ridge

As for speeds to maintain when ridge soaring, remember the mountains are noted for producing gusts. Due to your proximity to the ground a stall is likely to result in you becoming a permanent part of the scenery. Therefore allow a good safety margin on your initial passes along a slope. Feel out the conditions and if safe to do so, then reduce the speed on future passes. Never fly too slowly. Always fly at a speed at which you have good control surface effectiveness. It is not necessary to fly as slowly as in a thermal since most of your flying is essentially straight. You are not trying for a minimum diameter circle. A 5 mph increase in speed will probably cost you no more than 10 feet per minute but adds one heck of a lot to your safety.

An added safety precaution which does not cost anything significant is to speed up slightly for the turns. As the stalling speed increases in a turn, by speeding up you are retaining your safety margin throughout the turn and, by converting the excess speed to altitude by a slight pull-up after the turn is completed, you regain most of the altitude you lost to increase your speed.

One of the biggest traps in mountain flying, and one that has resulted in many

FOR EASTERNERS

landing field possibly a few miles away. If you can spot it in time and get there it may turn out to be only 500 feet long, have 50 feet trees at the approach, may have a 15 or 20° slope downhill, may have hydro wires crossing it and be full of boulders. This combined with turbulent up and down drafts can give even an experienced cross country pilot gray hair.

How should you therefore assess possible activities at the ridge. First of all, if you don't have a Silver "C" and some reasonable amount of cross country experience forget the whole thing unless you are 100% prepared to:

1.) Undergo a rigorous self imposed training program.
2.) Not attempt any Distance tasks until you have acquired some feel for and knowledge of this particular ridge.
3.) Extend your excursions only by one gap or obstacle per flight.
4.) Be 100% familiar with the capabilities of yourself and the type of ship you are going to be flying.

A) Training

The training program must beside good thermalling techniques in strong winds (and still progressing upwind) concentrate mainly on short field landings and odd approach situations such as from simulated rope breaks at 300'. Don't do this on your own to start with but discuss it with your CFI and take several duals. Practice downwind and crosswind landings (short ones with steep approaches). By short landings I mean that you should be able to bring your PIK to a full stop about 200 feet past the beginning of your runway from a steep full flap approach, without coming too close to your stall speed during the descent. Consider the problems of uphill or downhill landings. Talk to some of the experts on how to groundloop your aircraft intentionally to avoid hitting obstacles and without breaking off your tail. How do you handle your flaps if you come in low, slow and short of the landing spot. How do you put it down at higher speeds without porpoising. How do you land on top of trees without killing yourself. (At one point the glide angle of a 1—26 is steeper than the slope of the ridge).

B) Before you start flying the Ridge

a) Get yourself a copy of Tom's book and any other articles you can lay your hands on. Then read this material and read between the lines. If Tom says; "stay a little higher" he really means "forget about the ridge at this location and get up high until you know what you are doing".

b) Take a check and familiarization ride in a ship somehow related in performance to your own or the one you are going to fly (i.e. 2-33 for 1-26, Lark for higher performance).

c) When you and Tom Knauff think that you are familiar enough with the local ridge take a ride in his 172 to get some idea what the ridge looks like further on and get some useful hints. Even navigation will handicap your flying during the early stages. It is easy to wind up in the wrong valley.

d) Karl grew up in this area, has his home and runway right on the top of the ridge and has been flying it for many years. What makes him the "Master"? He did not become the expert over night. He started with local flying and then very gradually extended his range as he gained experience. Familiarize yourself with the area on the maps and discuss with Tom or other experienced pilots each new section you are going to explore.

e) If you do not fly your own ship keep also in mind (and check this out with the owner) that some U.S. insurance policies cover airplane and compensate the owner but have the right to go after you to recover damages. Also read very carefully the agreement you sign before you rent a glider.

Ridge soaring can be really beautiful provided you treat it with respect. Thermals are very good in Pennsylvania and the ridge works best during the fall and spring. There are however very few days in the year where ridge **and** thermals are good and you must have both for any successful distance flight. So if you think you are ready, go and have fun carefully!

accidents, is flying the contours too closely and flying into a region of stagnant air. This may occur by flying too close to the ridge, as mentioned earlier, but the real trap is the terrace midway up a slope. When the upward moving air flows past a terraced area of the slope it cannot change direction rapidly enough to flow over the terrace; the actual flow must be somewhat like that shown in the figure 5.

If a pilot, soaring up the slope, does not visualise this airflow and instead tries to maintain the same separation from the slope that he used lower down as he flies just above the terrace, then he will be far too close to the slope and will fly into the zone of stagnant air. This may cause a drastic loss of airspeed, especially if the wind is at an angle to the slope such that the entry into the stagnant layer is out of a quartering headwind. In any case, there will be a loss of airspeed due to leaving a zone of lift. At low initial airspeeds, there is a very real danger of stalling and spinning into the trees. All these problems can be avoided if one visualises the slope as represented by the dotted line on figure 5 and flies it accordingly.

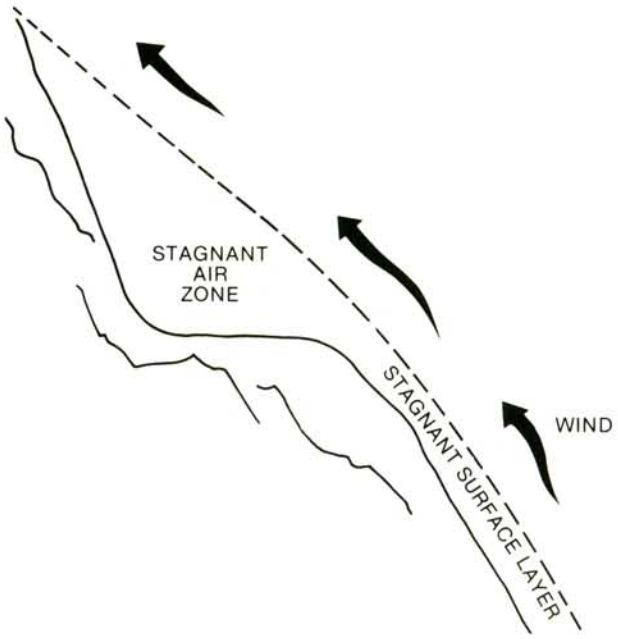


FIGURE 5. AIRFLOW PAST A TERRACE

Flying the Mountains Under Cloudy Conditions

One of the greatest thrills of mountain flying can be soaring around the slopes in cloudy conditions. The faces of low lying clouds can sometimes be ascended and one may be able to contact wave to carry on for thousands of feet above the cloud tops. However, in an unfamiliar area, this may be near suicide. The clouds in mountains are not the same as cu's over the prairies, they are apt to build up very rapidly, trapping you above them; and they conceal large hunks of rock.

Low level cloud may be of two main types; the rotor cloud of a wave system, with an extremely rough area of lift on the upwind side, and cap cloud formed as moist air rises up the side of mountains to its condensation level. Lift is often to be found on the leading edge of this cloud. The thing to remember about both these clouds is that they are dynamic systems, moisture in the air rises to its condensation level, condenses out as cloud but continues with the air and as the air sinks to a lower level it warms up and the moisture may evaporate again. Thus although the cloud may appear stationary it is actually forming at the leading edge and dissipating at the trailing edge. Therein lies the hazard.

Any change in moisture content of the airmass flowing through the cloud will result in a change in the cloud. An increase in moisture will cause the cloud to grow, a decrease may cause it to dissipate. A growth of the cloud may trap you in it as it increases, whereas a dissipating cloud may draw you onto a slope as you soar its leading edge. If you soar in cloudy conditions, know the ground underneath you, and constantly check your location relative to the adjacent slopes by reference to the ground below. Also use the ground below to keep check of the movements of the clouds. If you are soaring in a hole and it looks like it is starting to fill in then get down fast! Clouds with rocks in them can be deadly if they are occupying the same airspace as you.

Special Note:

The author considers this paper a very bare introduction to this topic and recommends anyone considering flying in the mountains to seek further advice from an experienced mountain flier.

Further Reading

Safe Ridge Soaring
by Tom Knauff
1-26 Newsletter April 1977

Some Thoughts on Ridge Soaring, with Special Reference to the Torrey Pines Cliff. by Don Wemple
1-26 Newsletter May 1977

10 Tactical Air Group, Standard Operating Procedures, part xii Mountain Flying techniques

Club News

York Soaring Association

On Saturday evening, April 1st about 100 members and friends of York Soaring got together for their annual dinner at the Valhalla Inn in Toronto. The evening got underway with cocktails, then dinner followed by a short talk by Doug Murray, producer of the film "Silent Sky" which ran all last summer at Ontario Place. Both Doug Murray and Oscar Boesch who was also a special guest were presented with awards for their outstanding contribution to soaring in 1977 for their part in making "Silent Sky".

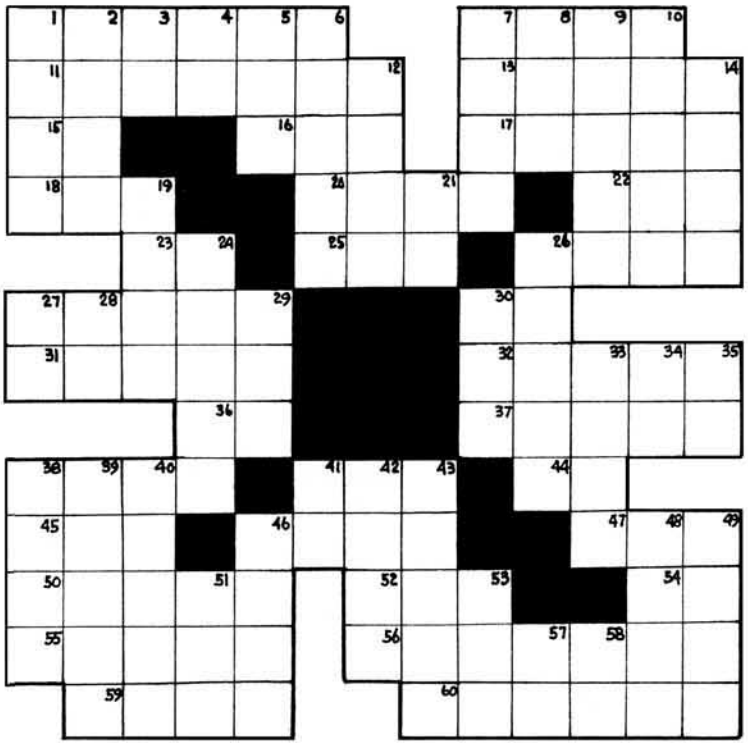
York President, Walter Chmela, announced that the club again won the Roden Trophy for best utilization of club equipment during 1977. During last season York had 5036 flights in club ships with 168 additional flights in private gliders and 30 by visitor's gliders. The club flights totaled 1936 hours. In 1977 35 students went solo with 20 obtaining their licence. There were 23 Silver Badge legs attained with six completed Silver Badges; also 15 members obtained new instructor's ratings.

Instructor's Awards were presented by Walter Chmela to Ivor David, John Kollar and Don Bell for their outstanding contribution to the club last season. Dave Harper and Blain Grills were also presented with awards for their special contributions. Peter Masak made and donated the Pundit Trophy to Fred Mueller for the best flight of 1977; this is decided by a handicap system that only Peter really understands and if your club has access to a computer Peter will give you the formula.

Lead "A" Awards were made to Dave Holland and Oscar Boesch for outlandings of distinction. Later all new solo pilots received a copy of the book "After Solo".

Following the presentations we watched a soaring movie and an unusual "wide screen" slide presentation by Willem Sikma.

Crossword



DOWN
1. Proboscis
2. Toward the Inside
3. Mountain (Abbrev.)
4. Barium (Chem. Symbol)
5. Combining Form - Kidney Waste
6. A Skull Cavity
7. Legislative Rules
8. Fuss
9. Claudius was one
10. Indian Snake
12. Aware of (Slang)
14. Limiting Parts, Conclusions
19. Necessity
21. Prefix Meaning: To put into or on
24. Metal Pegs
26. Sailplane - GROB
27. Gallium (Chem. Symbol)
28. Ruthenium (Chem. Symbol)
29. Also
30. To Point, Direct
33. Engrave with Acid
34. Pronoun
35. Oldest (Abbrev.)
38. Girl (Scot.)
39. Mouth Open, in Wonder
40. Distributed
41. Could be a Derisive sound
42. First Man
43. Enchantress who helped Jason
46. Wooden Wonder from Poland
48. Ireland (Gaelic)
49. Head Motions
51. Boy (Colloq.)
53. Append
57. Flying Officer (Abbrev.)
58. Before (O.E. Conjunction)

ACROSS
1. Pictured - Schempp-Hirth
7. I.S. 28-B2
11. Province
13. Idolize
15. Saint (Abbrev.)
16. A Lodging Place
17. Adult Female
18. Time Period
20. Shoshonean Indians
22. Help
23. Half an Em
25. Male Progeny
26. Social Insect
27. Impressive
30. Same Amount or Degree
31. Portion of a Telecast
32. Articles
36. Look! See!
37. Bishop's Hat
38. Young Men
41. One Who Overacts (Slang)
44. A Religion (Abbrev.)
45. Gone By
46. Die Out
47. Female Fowl
50. Start + Flug Sailplane
52. Girl's Name
54. Large Moth
55. Talk
56. City near Boston
59. Norse Poetry
60. Worships as Divine

The woman member, how she differs from the men.

1. She is pushy, he is aggressive.
2. She is picky, he is good on details.
3. She is bitchy, he loses temper because he's so involved.
4. She doesn't know when to quit, he pushes on regardless of obstacles.
5. She is conceited, he is confident.
6. She is hard, he stands firm.
7. She is prejudiced, he has judgement.
8. She's been around, he's a man of the world.
9. She's a lush, he drinks.
10. She's mouthy, he isn't afraid to say what he thinks.
11. She's power hungry, he has drive and perserverance.
12. She's secretive, he's close-mouthed.
13. She is hard to work with, he is a stern taskmaster.
14. She is a total incompetent, he is a slow student.
15. She is terrified of flying, he is nervous in the air.
16. She's a dangerous flier, he is a little slipshod in his airwork.
17. She doesn't know a woman's place, he is a super pilot.

ALONE WITH THE MOUNTAIN

Cont'd from p14

east to verify that the airport has not closed in and he is now inching up to 27,000'. The peak is completely hidden by clouds now, but Lake Moraine and the Reservoir can still be seen through the holes in order to maintain position in the wave.

The cold is relentless, ever present and of great concern to him. Hands and feet now continuously moving makes it impossible to fly efficiently and the canopy is noticably whiter.

Directly overhead another jet goes by bracketed by two others spaced apart but on the same heading. The vapour trails can be seen as churning white clouds, not merely smooth lines of white as seen from the ground and the details of the jet such as engine pods, windows and wing panels present a clear image against the ultramarine blue sky.

Now the rate of climb is very slow and the altimeter reads 28,300', gradually jumping up in short bursts as the lag is overcome. At 28,800' there doesn't seem to be anymore lift. He just sits there hoping for a pulse to put him over the top, but it does not come. Monitoring the instruments, his position, the clouds below and at the airport, trying to keep his feet and hands warm and watching the canopy get whiter and whiter. No more lift, no pulse and the final culmination of his attempt, when the radio speaker informs him, "The high altitude area closes in 5 minutes."

That's it - it will take five minutes to get down to the 18,000' level which is now the highest allowable altitude.

Without further hesitation - nose down - spoilers out, burning off 10,000' of altitude he descends to the whistling sound of the increased airspeed and the canopy slowly clears of frost. At 18,000' he holds, checks his position, the clouds still 2,000' below and he decides on his course of action. Now decending through a hole in the clouds to 15,500' he heads back in the direction of the airport, across the "Rampart Range" and the "Garden of the Gods" the clouds now about 1,000' above his head.

The attempt for diamond failed, but the flight was a success nevertheless. Just to make the attempt and experience the sights and sounds and feelings throughout the four hour flight was enough of a prize for him.

The diamond can wait, and sometime in the future he will have the pleasure of trying for it again.

That evening, as he sat in a quiet corner of the lounge and watched as the golden sun set fire to the sky behind Pikes Peak, he realized that he had experienced a great adventure that day, and from that point on for the rest of his life, he would always be able to look back, remember, and say,

Now he is gone and I am alone ... with the mountain.

Club Supplies

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ITEM NO.	DESCRIPTION	PRICE (ADD POSTAGE)
1.	F.A.I. Soaring Badges, "A" & "B"	
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4.	F.A.I. Sporting Code (English or French)	1.50
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	b) Part II - Air Instruction Notes	.50
	c) Park III - Students Notes	1.00
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8.	Weather Briefing Form N-052 (8 1/2 x 11 sheet)	N/C
9.	Application for Official Observer	N/C
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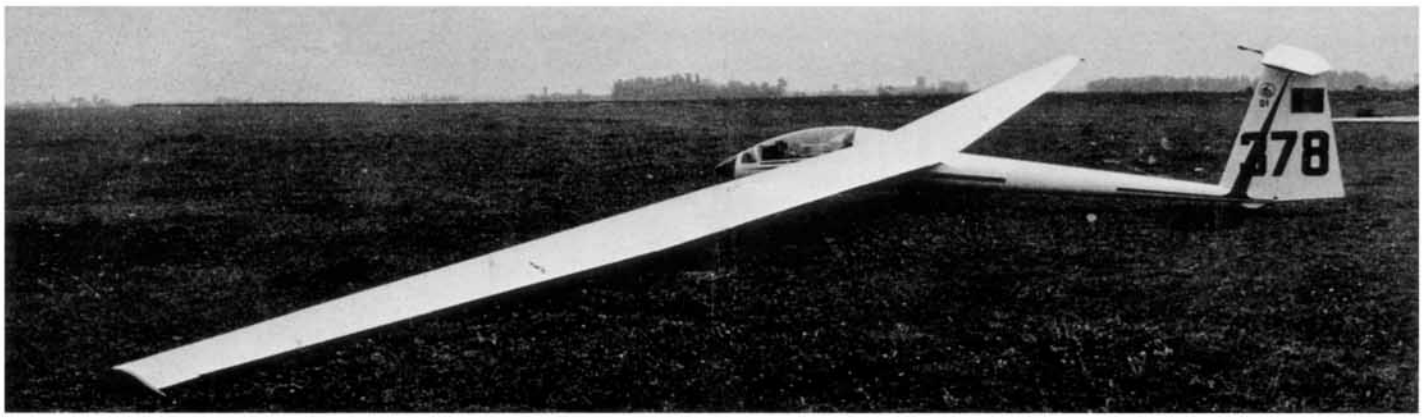

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