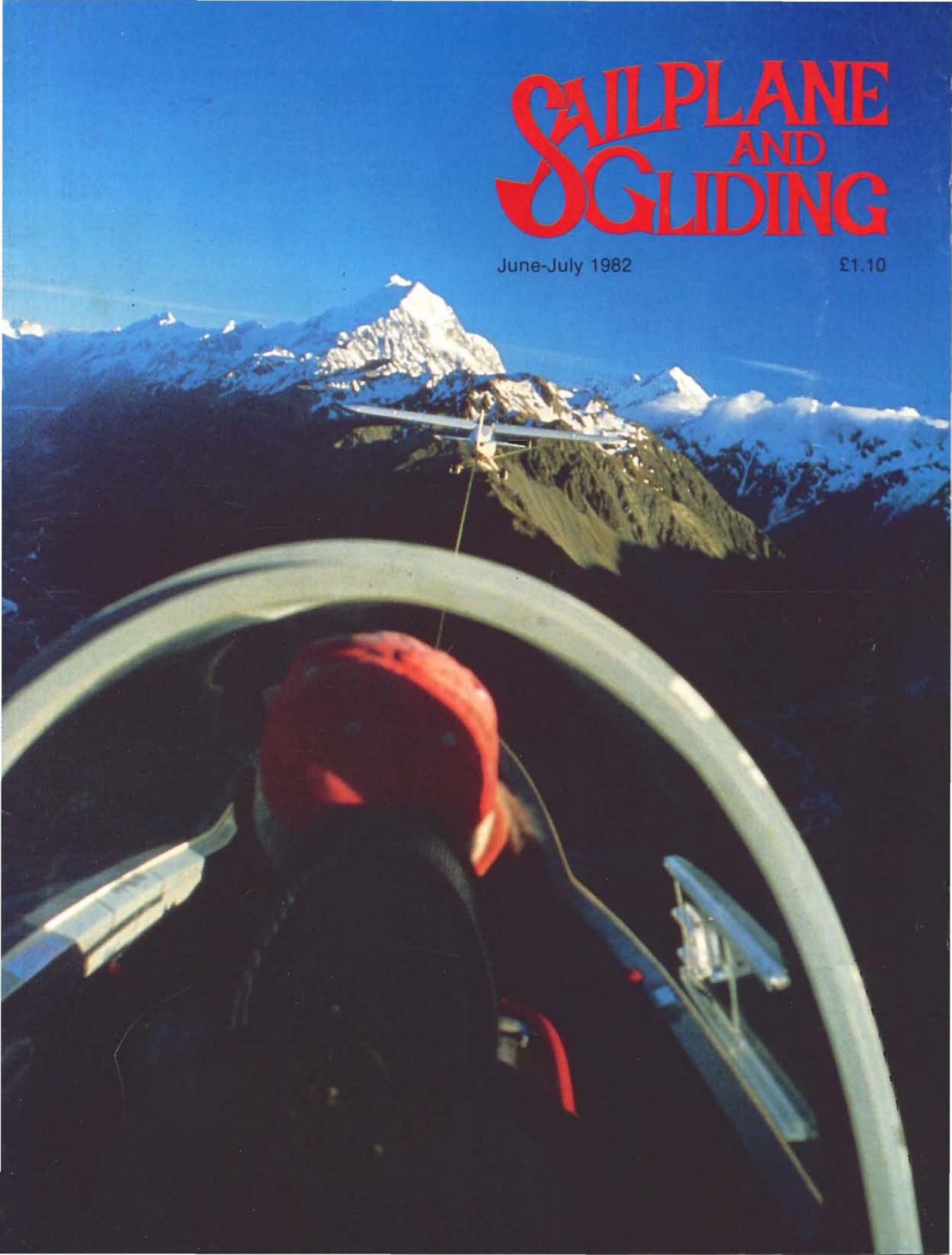

SAILPLANE AND GLIDING

June-July 1982 £1.10

SAILPLANE & GLIDING

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Editor:
Gillian Bryce-Smith, 281 Queen Edith's Way, Cambridge, CB1 4NH. Tel. Cambridge 247725.

Consultant Editors:
Alan E. Slater
Rika Harwood, 66 Maisemore Gardens, Emsworth, Hants. Tel. 024-34 4580.

Subscriptions:
Jenny Rolfe. Tel. Market Harborough 67084.

Committee:
A. W. F. Edwards (Chairman), R. Q. Barrett, M. Bird, F. G. Irving, B. Rolfe.

Advertisement Manager:
Peggy Mieville, Cheiron Press Ltd., 7 Amersham Hill, High Wycombe, Bucks. HP13 6Q. Tel. 0494-442423.

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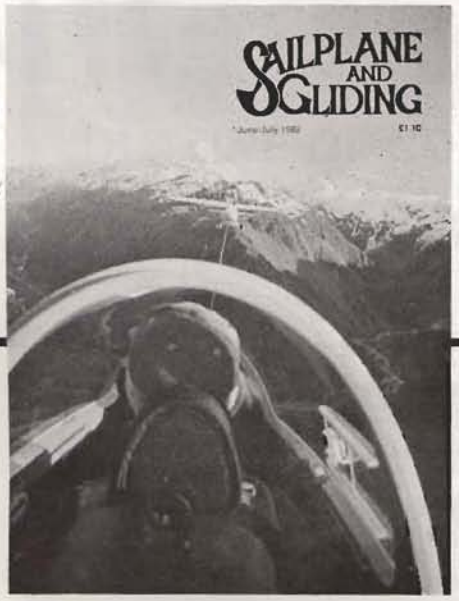

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A Picture is Worth a Thousand Vario Squeeeeels

ALAN PURNELL describes a fascinating device he will soon have in his cockpit — as if he needs any help to clock up even more cross-country kilometres!

The main purposes of a soaring flight apart from enjoying the view and handling the sailplane perfectly are to anticipate the whereabouts of rising air, utilise that lift effectively and then to choose a flight-path and airspeed to achieve the desired task.

At present the first point — locating rising air — has been entirely at the judgment and experience of the pilot and is probably the single most important reason why some pilots can achieve apparently astronomic speeds on their tasks. Until someone invents the remote ranging laser air density indicator this state of affairs may not change.

Can be expensive

The third point — choosing speed — is aided by all sorts of devices ranging from a simple ring mounted on a vario to a microprocessor controlled speed-to-fly indicator costing several hundred pounds. I do not see the point of spending so much on sophistication when an engraved ring together with a piece of cardboard with a few wiggly lines will do the job nearly as well. Notice I am hedging my bets by using the word "nearly".

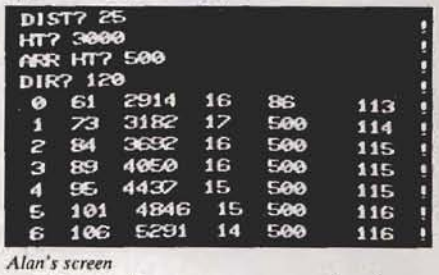
The latest devices will tot up distances flown along a course, give an average climb over the whole flight, give speed to fly, average speeds, correct total energy for altitude, give flight time, show battery voltage and a few more relatively unimportant features. It is certainly useful to have these calculations done but in reality they have only a second or even third order effect on your average speed. For instance a 10% mis-estimation on inter-thermal speed may only have a 1% effect on average speed. It seems to me more important to expend more effort on improving climb effectiveness or staying in a line of lift along a street. This will have much more influence on average speed. An improvement in 10% on climb can have a 7% effect on average speed and the ability to stay along a line of lift or reduced sink can easily double the length of a glide.

So how can we achieve such an improvement. Need I say that the ubiquitous microprocessor could be the answer. The use of efficient chippery promises solutions to many problems in the world today so it should come as no surprise that I am advocating one here. Please note I am a great believer in seat of the pants flying so do not think I will disown the good old fashioned methods — I feel the more advice I can get the better.

Now it's possible

Until quite recently the whole thing would have been out of the question. Any computer man enough to do the job would have occupied nearly the whole clubhouse rather than fitting in the cockpit. Also it took a power station to run it, an air-conditioning unit to keep it cool and the earth to pay for it. Now we can hold it in our hand and run it from batteries — so let's have a go.

Let's imagine a flight using such a device. Let's call it an ADP (Air Data Processor) — the fact that my middle initial is a D is pure coincidence. (Patent application pending.)



Alan's screen

What confronts us as we recline in our comfortable cockpit? In the centre top of the panel sits a five inch rectangular screen set back from the rest of the instruments in a black tunnel to allow us to read the screen in bright sunlight. This screen is a video unit similar to a small TV set and indeed could be a TV set except they are all odd shapes unsuitable for instrument panels. Sitting on a swivelling bracket in front of the adjacent horizon and T/S sits a miniature keyboard laid out like a typewriter. We can swing it out of the way when we are cloud flying. This keyboard is our means of communicating with the computer either by entering numbers (*eg* wind direction) or giving it commands so it can take the required action or offer advice. The computer itself sits on the shelf behind the cockpit out of the way.

Before take-off we must tell the device a few things it cannot possibly know. These are the sailplane configuration and wind conditions. The sailplane configuration means factors such as ballast, extra tips and spoil factor which affect the polar. The spoil factor is an all-embracing percentage factor which combines the anticipated effect of bugs, rain and safety factor relative to the published polar. The wind conditions are the expected speed and direction. All the above settings can be changed during flight to suit the prevailing conditions. It is a moot point whether such items should be set by rotating knobs or setting multiposition switches, or *via* such a keyboard. I believe it is more versatile to actually enter a value on a keyboard since if we want to add extra features later we do not have to rebuild the whole instrument to accommodate more switches and knobs.

All done by buttons

Back to our imaginary flight — coming off aerotow we press the T ti-er button (for thermal) to start the display plotting the climb rate and position every second. What you are presented with is a plan view of your path through the sky as if you are looking down on it from above. The numbers 1, 2, 3 etc at each position represent the climb rate at those points (see Fig 1). After a few seconds the indicator R appears in the top left hand corner of the screen indicating that the thermal is probably to the right so we stop weaving and turn right and settle into a steady turn. At the same time an X appears towards the edge of the screen indicating that the centre of the thermal is probably there and that we should adjust our circle to put the X in the centre of our turn. The J button will recentre the picture for us if required. While all this is going on we can also display the average rate of climb since starting the climb and also the average over the last ten seconds or so. Thus we can monitor the climb and take action to leave if the current average drops below the overall average, or indeed drops below our estimation of the day, or if stronger lift is anticipated elsewhere.

A decent cloud starts building up a few miles away and we can calculate the height required to reach it based on various climb rates and MacCready settings by pressing the G(glide) button. Since

the computer doesn't know how far away the next cloud is or what your chosen arrival height is it has to ask for them and you tell it. It then displays a table of possible MacCready settings, appropriate speeds to fly, height to climb to (if necessary), arrival height and time taken (including climb time) (see Fig 2). We can choose which setting is appropriate in our judgment of the prevailing and expected conditions on track and set off when the time is right. Note we are being advised not directed. This article will not go into details on the G mode or final glide mode (F).

Once you have digested the information you can get the updated lift distribution plot back on the screen by pressing 0, 1, 2 etc to set your MacCready. The missing points will have been plotted while you were perusing the table, so you have not missed anything! Equally, later in the climb, you can recall that

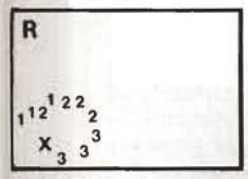


Fig 1. T (thermal) mode with centre indicator.

0	56	2980	19	20
1	67	3142	17	500
2	73	3312	16	500
3	78	3550	15	500
4	84	3832	15	500
5	89	4148	14	500
6	95	4504	13	500

Fig 2. F (final glide) mode (no wind component).

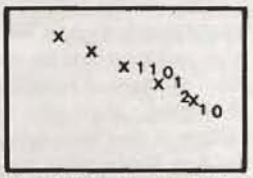


Fig 3. S (street) mode with line (line at 320°).

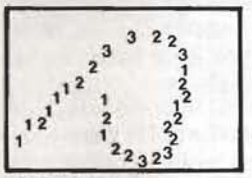


Fig 4. Staying in sausage shape thermal.

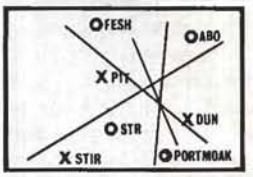


Fig 5. Position plot in Highlands.

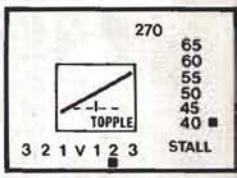


Fig 6. Cloud flying test with ASI, HZ, T&S and compass.

table of settings by pressing the R button (recall) or if necessary recalculate again with the G button based on updated conditions. Also you can change the MacCready setting whenever you like.

Now we set off towards our cloud. We press the S(street) button to draw a line along the wind direction from our present position so that we'll find it easier to fly exactly along the wind direction when we find what we think may be a street (see Fig 3). Naturally we may not want to fly along this line at this stage so we ignore it. If we do find such lift we press J to redraw the line from our current position at the edge of the screen. Each time we go off the screen it automatically does its own J, redrawing the line and repositioning the current point to the appropriate part of the screen for the current flight direction.

Has flexibility

Should we wish to hold the current line drawn and explore round it we can enter H (hold) to hold the line fixed in space. This enables us to come back to it if our exploration fails to improve the situation. Equally we can cancel the H by entering M (moving) and *vice versa*. This way we can get to our next thermal effectively using any street lift we find on the way.

Later in the flight we find we are lower than we like but fortunately find some weak lift and feel it is worthwhile exploring it to find a core. We switch to T (thermal) mode and wander around searching for strong stuff. The computer will reluctantly produce an X if it can but it is pretty obvious that the thermal is not really consistent enough. However two areas of lift look stronger than the rest so we adjust our path to pass through both. This path is not a circle but a sort of sausage shape, though it is easy to follow it on the display and is the best we can do (see Fig 4). At least the display kept a record of what was happening over the whole area so we could adjust our "circle" to suit.

As our cross-country proceeds across the Cotswolds we find strangely smooth air while gliding between thermals. Here we press the W (wave) button and turn across wind to try to stay in the lift. A line is drawn on the screen showing a possible lift line across the wind direction together with the courses necessary to keep to this line based on the wind speed and direction. As we fly off the screen the display automatically readjusts itself and either keeps the same line (relative to the ground) if the H button was chosen or redraws the line across the wind direction at the current position.

After climbing slowly for a while we find the lift is not really along this line at all. This is to be expected if the wave is formed by a ridge aligned at an angle to the wind. We choose a suitable direction based on the line of the Cotswolds and set it using the L button. The new courses to fly to keep to this new line are noted eagerly since they are notoriously difficult to estimate when the lift line is not at right angles to the wind. Also unless there is a cloud edge close by it is extremely difficult to hold such a line when so far above the ground.

After breezing up and down our line for a while slowly gaining height we fancy a better look at Nympsfield and the Severn estuary and want to see if there is a primary wave upwind so we set off into wind enjoying the view of the sea breeze over the Welsh coast in the distance. No more lift is found so we reluctantly turn back towards our lift line which is still faithfully held in the computer but off screen. Eventually it tracks back on to the screen and we fly along it again to gain a little height before venturing back toward Lasham. We can use the F (final glide) calculation to help us choose our final glide when we get close to Lasham.

After landing we can play Space Invaders while waiting for the crew to arrive to tow us to the trailer.

Further potential

I hope the foregoing example of a cross-country flight with the device has given you a foretaste of the usefulness of it. What I have described is only a subset of the many features the device could have — I am sure the experienced pilot has thought of several already — for instance it could calculate the actual wind speed and direction. It could show the lift distribution in colour. It could beep at you when it guesses which side of you it thinks the thermal is. The audio could say "three point two" — "three point seven" at you in an ever-increasing pitched voice as the lift increases. Sorry — that last one is meant to be a joke — but perfectly feasible all the same, I call it the "ultimate" audio vario. If you are lost over the Scottish Highlands you can either automatically or manually feed in the bearings from the appropriate VOR stations and get a fix on your screen consisting of the bearing lines superimposed on a map of suitable known locations together with a course to steer for Portmoak (illegal for competitions), (see Fig 5). You can keep a record of the whole flight and play it back later to demonstrate how you did it or how well you centred each time you climbed. Its usefulness is not confined to the cockpit because it can be used by pupils to improve their thermal centring ability with playback to show how well they did. Pupils can also learn to cloud fly using a miniature joystick and watching a simulated panel on the screen (see Fig 6).

The possibilities are seeming endless and are only limited by the ingenuity of the programmer designing the system inside the computer. Such is the power of the micro-processor and visual display — and we have only just begun to scratch the surface. I am looking forward immensely to flying with mine this season — together with the seat of my pants of course — let's not forget that.

THIS TIME LAST YEAR...

By MENTOR

Task Week

Dick had enjoyed it immensely! From early January when it had been first planned he had looked forward to the Whitsun task week. His Silver badge, earned at the end of his first full season in gliding, qualified him to take part and he had bought new maps and pored over them, day dreaming, through the snows of February and the gales of March. A neat triangle in April had reinforced his confidence so that, when they had all assembled for the first task briefing, Dick was rarin' to go!

The CFI set the tasks and emphasised from the beginning that it was **not** a competition. No one need feel he had to beat anyone else. The object was to extend their experience, learn a little each day . . . etc, etc. Dick didn't hear the whole litany. He was busy marking his maps.

There was no formal marking or scoring but Dick had found a copy of last year's Competition Handbook lying around and had figured out how to work windicapping. At the end of the first task, after he had come home with a neat final glide, he set to and worked out what the scores **might** have been. To his delighted surprise his name was at the top!

He was sharing the club's Astir so he had to wait for his next chance, a fairly tricky crosswind out and return. He did it again — top of his private list! And that success really put Dick's tail up! His third and last day seemed a long time coming, especially as his sharing colleague landed out on both of **his** tasks. Dick had retrieved both times. The two fields had been large, with smooth grass surfaces and decent approaches, and Dick suspected that his co-pilot had spent a deal of height selecting such big fields, when he could perhaps have been giving more thought to staying up and getting on with the task. Dick wasn't likely to fall for **that** one! After all, with good brakes and the proper skill you should be able to get in almost anywhere!

* * * *

The last day was beginning to look a bit seedy. Two hours into the flight and half way down the second leg the sky had gloomed over and everything had slowed down. Dick had read about conditions "cycling" and knew that, if he could only hang on, the sun would probably show again and he would be able to get back on his bike! He flew tentatively across the pretty landscape towards a small village set in a valley. This was country new to him — after all, it was only his fifth cross-country. The transfer from open farming country to the rolling pasture lands now below him had been gradual, so gradual that he was unaware of the changed scale of things. On top of that the ground below was higher by some 300ft than his home base.

Dominant in Dick's mind was the need to stay airborne. His position as unofficial task week leader was precious to him and he wasn't easily going to let **that** slip from his grasp. **Please** let there be a thermal! To be fair he **was** a good "scratcher". He habitually got to the club early at weekends and usually headed the Astir soaring list. This would see him airborne by mid-morning, coping with the relatively scrappy, bitty thermals of that time of day and he felt he could hold his own with most pilots. All the more reason not to give up now!

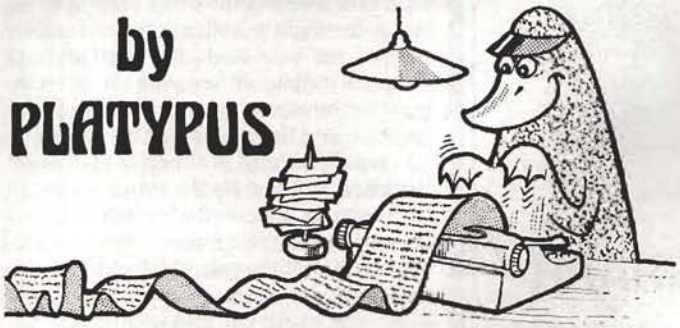
He drifted lower. The village **should** give something, but just in case it didn't he provisionally selected a field that he was sure he could get into. The field wasn't the biggest around but it looked flat enough and it would be possible to approach through a gap in the trees on the downwind edge.

The village passed beneath. There wasn't a ripple and he could see someone look up and wave. This brought it home to him just how low he was and suddenly the field landing was on him! He turned back hastily, into wind, towards the field, heart thumping. Now the view of his field was **very** different. So different that he could scarcely believe that it was the same one he had flown over so confidently only thirty seconds earlier. The trees looked so much taller, the gap so much narrower, and the new perspective made it look ridiculously short. In near panic he looked left and right for an alternative but there was none. Hand on brakes he approached the field, across the village, the trees looming ominously close to his maximum glide path. The gap **was** too narrow to risk — he **had** to go over the trees! Some turbulence, the tree tops swaying gently just beneath his keel and his field lay below. Full brakes, quickly down to flare above the ridged, undulating pasture, the far hedge coming too rapidly towards him. He realised he would have to ground loop to avoid the hedge but then was aware at the same moment of a horrid extra sinking feeling as the glider sank the last ten inches and the bottom of the fuselage met the first of the ridges! He had forgotten the wheel! Crashing from ridge to ridge the situation was quite beyond him now. Dick felt a final spine-shaking jolt, and then silence. What price top place now?

* * * *

At This Time Last Year a late decision to land was the primary cause of nearly a quarter of all field landing accidents.

TAIL FEATHERS by PLATYPUS



How to get a Diamond in 60 Seconds

Last night three friends of mine attempted several 300km triangles, with very varying success. *Last night?* That's what I said. There was Fearless Fred, a real gung-ho damn-the-torpedoes press-on type, who would never circle in anything less than 3kt. Then there was Nervous Neddie, who hung around in every little bit of lift until he reached the base of the airway, as if he was doing a Silver C. And there was Pragmatic Pete, who varied the rate of climb he was prepared to accept according to how much air he had below the keel, for example, accepting 1kt between 1000 and 2000ft but demanding 3kt over 3000ft.

Not surprisingly Fearless Fred kept on zonking into the deck before completing the task, while Nervous Neddie went so slowly that he frequently ran out of time and the day died on

Ran out of time.

him before he could get round. Pragmatic Pete usually got round, though from time to time he too was unlucky and fell to earth or ran out of sunshine.

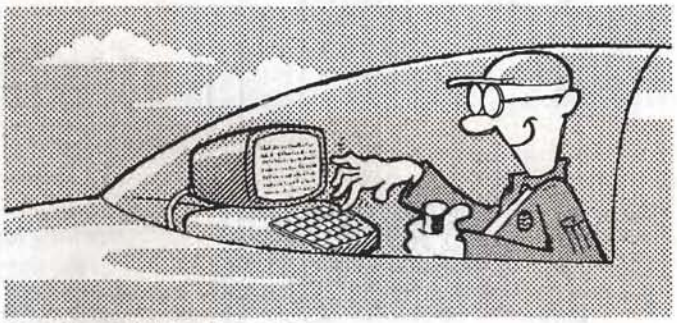
These three characters are, as you've doubtless guessed, the invention of Platyprog, our own home-grown gliding computer programme for the Sinclair ZX81. Come to think of it, the next BGA Conference could have a session for microcomputer freaks, since we are sure there must now be a mass of games, scoring systems and other applications of these addictive little monsters — and by the end of 1982 even more of them will have burgeoned.

The Platyprog isn't really a gliding game, but is a sort of serious attempt, which we began 20 years ago using graph paper and dice, to see what the ideal strategy is for a given set of pre-set conditions. The first key variable is the distance between thermals: the second is the distribution of thermal strengths including a generous allowance of "dud" thermals.

The assumption so far is that the only important decision is what rate of climb is acceptable at any given height. We assume a blue, unreadable sky ahead so that the pilot can only press on and hope. We also assume a fixed speed and glide angle between thermals, not unrealistic, since we know that speed-to-fly between thermals has very little effect on achieved speeds, though before long we will build in a range of inter-thermal speeds and glide angles to match the expected rate of climb. With a programming language like BASIC one can easily add on refinements by trial and error as one goes along. Platyprog is the result of six earlier models successively adapted and improved.

The key to the programme is the computer's ability to generate random numbers to vary the gap between thermals and to vary thermal strengths. It rolls the dice about a million times faster than we ever could in our youth.

So what have we learned that we didn't already know, namely that you must vary your expectations of future climb rates according to your height? Well we've learned a lot about computer-programming which is generally helpful to us in business (you didn't know we worked for a living, did you? You thought we lounged outside the bar all day in a deck-chair like a gliding bum, occasionally slouching into the air for a relaxed and effortless 500km and strolling back for a nonchalant Mar-



Can easily add refinements.

tini, nine-tenths Gordons and a twist, in a pre-chilled glass. Well yes, that's exactly how we do live, but now and again we bestir ourself to a little honest toil, providing it is sufficiently stimulating to the intellect and rewarding to the pocket).

We are hoping (what's all this royal *we* stuff? We is the only person around here entitled to call ourself *we* and don't you forget it: Ed) sorry, *I* am hoping to find the ideal strategy for a given stochastic (I hope that's right, it's a word I've borrowed from an old Anthony Edwards' article) distribution of thermals and thermal strengths. As each version of the model succeeds another, there should be increasing realism.

What I'm **not** doing at present is letting Fearless Fred *et al* change their strategy once they've set off, since it is not a gliding game. (In games the human participants have to make a fresh decision every minute.) This is because the object of Platyprog is to run through hundreds of simulated flights in a reasonably short time and draw some findings.

Of what use it will all be, I haven't the foggiest idea. But if you have a gliding programme for any commonly used micro such as ZX81, Apple, Pet or Tandy, do let Platypus know — especially if it has graphics! We might get our own corner in S&G where we can sneak off together and bore each other silly without getting in the way of those who still retain their sanity.

Our own corner.

If you are in the happy position of being a private owner with some cash to spare and a fortnight's holiday in the summer where can you find the best gliding? Originally Zell am See was the place to go to, however you need a 4000ft aerotow and the queues get very long — you get on the grid at 6am and maybe get launched at 3pm. So everyone migrated to Samaden where the weather is not always as good, then they went to Sisteron which got crowded out and now the latest place is Segovia.

Further south you end in the Med, but with Gibraltar opening up the ferry to N. Africa may be fairly cheap and once you get sufficiently inland to escape the sea breeze it should be good.

Wall-to-wall planting

In general south of the Alps you get a much drier summer, and south of the Pyrennees you get a much higher cloudbase, typically 8000ft above the ground. Furthermore in central Spain the three-field system of agriculture is practised with one field in three kept fallow so that gliders can land in it. SE. Spain has a very large area of desert but also regions with wall-to-wall planting of citrus trees and olives. Spain is still opening up for gliding and seems the most attractive place in Europe because you can cloud fly, the roads are good, the towns are pleasant and prices are very reasonable.

One of the best areas

Although cloud flying is not permitted for gliders in France, the golden triangle formed by Vinon, Briancon and Die is for me one of the best gliding areas in Europe. There are fields spaced around at twenty mile intervals at Vinon, St. Auban, Sisteron, Aspres, Gap-Tallard, St. Crepin, Barcellonette and Fayence, so you can draw circles around each if you want to play it safe.

At St. Auban the French have operated a National Centre for thirty years so the twenty professional instructors there have got the whole area thoroughly studied. (See "You'd think you were in paradise", S&G, February, p16.) At French gliding centres there is an extremely friendly and adventurous spirit which encourages everyone to make ambitious flights. On a good summer's day cloudbase is about 7000ft rising to 12 000ft over the mountains. When the mistral blows down the Rhône the wave soaring is excellent and 8km

The Golden Triangle of the Lower Alps

BRENNIG JAMES recommends some challenging flying in Europe

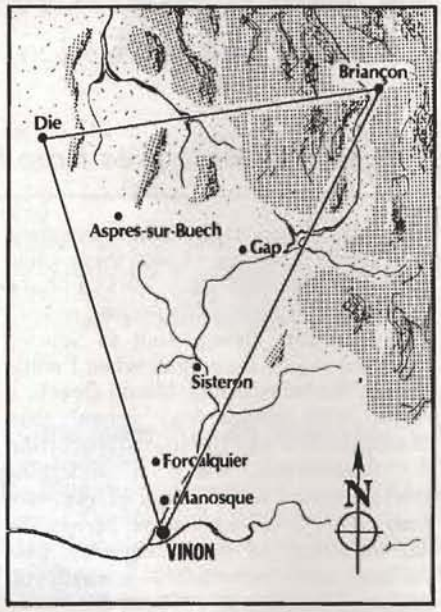
altitudes are pretty routine. If you tire of gliding, sailing, swimming and skiing are within easy reach. Many of the sites are land-locked so that you have to complete your final glide with 6000ft in hand because there is a mountain in the way.

Vinon is the exception, being a very large field with room for 500 gliders.

Gap is very pleasant having quite a large town nearby. St. Crepin and Aspres are smaller, even then there is adequate free hangarage if you want it. Barcellonette is not used for gliding as the valley is considered to be too narrow for safe general operation, but if you put down there you can get yourself towed out.

Sisteron is very agreeable but has become crowded so the queues to launch have become rather long.

Food and grog are universally excellent and to complete a 400km task, then have a swim and a first class dinner is my idea of heaven. The scope for giving yourself a scare is considerable — if you get low you will find that many valleys meet with a V at the bottom. There is very little controlled airspace to worry about since powered aircraft naturally steer clear of the mountains. To the east there is the famous Parcours which runs from north of Briancon to Moustiers. This can be very hairy because the lift is strong and turbulent and there is a big temptation to save time by jumping over bastions with marginal height in hand.



"Beat up its face . . ."

When the airmass rises over the mountains it pushes up the cloudbase with it, but the layer of unstable air also gets deeper because of the fall in pressure with altitude. On a good day you start off with conventional thermals to 7000ft then make for the highest mountain in the general direction you want to go, beat up its face and circle up to cloudbase. At 12 000ft you scream off to your first TP, then back to 12 000ft, then round the second TP and home.

At this point one should mention Ernst Gernot Peter, a fantastic German pilot who always beats everybody by a large margin, and I wish I knew how he did it. There are things which stick in the memory, notably the Pic de Bure 8888ft high, a rotten tooth of a mountain which gives marvellous lift just when you need it, and just when you find it thirty gliders join your thermal!

Where the soil is warmer the tree line is higher so sometimes you find better lift over the trees than the bare rock. You can carry on to the north and TPs near Lake Geneva are sometimes set. However, watch out because the cable cars and ski-lifts begin to proliferate north of Briancon.

A 1000km triangle has been flown from Grenoble to a point south of Moustiers using the Parcours then up north as far as Samaden and back. Under ideal conditions you bat along at VNE just beside the crest of the ridge. The weather can over-develop into cu-nims and tasks which would be easy become impossible because cloud flying is forbidden, and your blind flying instruments must be shown to be removed or inoperative before you can get a launch. When lift is marginal usually the best place to look is where the end of a ridge pokes out into valley and the prevailing wind up or down the valley hits it. In the evening the cut off of lift can be very sudden and one minute you have strong lift to cloudbase and from then on nothing. Creeping back to Vinon at the end of the day with just enough height in hand can be very exciting as that height can be 8000ft above the airfield and the visibility may be very poor from the haze and dust.

Visibility may be poor

In Italy and Austria many flights are along the valley and back. The virtue of the golden triangle is that the mountains are broken up in many directions and making the best use of them requires a good deal of thought. At St. Crepin the ridge can produce 6kt just 300ft above the site so one trick is to final glide into strong lift from a long way away. The locals have a lot of information to impart on techniques like this, and where to find force landing fields, however I don't like rote learning in gliding. If you rely on your own eye you will develop your instinctive judgment for where to look for lift which will stand you in good stead when you really need it. What at first surprises you considerably is the amount of press you require to cover ground fast. You feel that you have burnt boat after boat after boat then you hit a bit of lift which makes the whole range fall away below you.

Develop instinctive judgment

I hope the French will put aside The Golden Triangle as a nature reserve for that seriously endangered species, the glider pilot.

FLYING IN FLORIDA

Sebring Soaring Sussed Out for European Refugees from Miami by ROB RODWELL

The thermals were few and far between but those there were had *OOOMPH*. Soaring with me in close proximity as I approached 4000ft were a number of feathered friends which the locals call turkey vultures. On blue thermal days they're the only markers you get. Below me the landscape was immense — billiard-table flat to limitless horizons and studded with a few lakes, the area to the south an endless stretch of orange groves and that to the east, beyond a meandering river, a restricted zone. I'd been told of the zone on the check flight in a K-13 which had been the biennial revalidation of my FAA glider pilot's licence (sorry, license, for this is America) but I never did get around to consulting an airmap to see what the restrictions were.

British atmosphere

Below me were the bones of what had once been a huge B-17 training base — acres of apron and semi-circular camp roads from which the barracks had long since disappeared. In the centre a lonely, preserved, Constellation brought back memories of boyhood. Only the more arthritic soaring fans will remember these graceful, triple-finned, fish-fuselaged four-engine transports in their late-40s airline heyday. Also at Sebring, which doubles as a prime motor-racing track, are dozens of gently rotting, Customs-impounded, drug-smuggling aeroplanes and, with the authentic atmosphere, accents and spelling of a British gliding club, the Sebring Soaring Centre.

Readers of S&G may have noticed that for the past year or so Sebring, alone among US gliding operations, has been making a particular pitch on the UK gliding market, stressing (in its US ads) that its equipment is European — against the virtually 99 per cent saturation of the American commercial market by the various Schweizer *aloominum* lead sleds. What the ads don't state is that the SSC is British — the president and CFI is Derek Johnson who until three years ago owned and ran the Three Counties flying club at Blackbush, near Camberley. His wife Elsie sports a marvellous Florida tan and runs the launch point and the books while son Pete flies tows. He was mixing this task with re-covering their Super Cub when I was there while partner Robin Page-Blair worked on the engine at a neighbouring bench.

My fleeting, flying, visit to Sebring occurred in mid-December when I made a short business trip to Miami Beach, a resort with rather less appeal than Blackpool in a wet February (apart from the Seaquarium, which is something else). I added a few days of my own time, hired a car and drove across the flat monotony of the Everglades, past the huge Lake Okeechobee — which you can't see because it's behind a dyke — and on through the fruit-laden orange trees the 170 miles to Sebring. For those who've seen the ads and have toyed with the idea of a badge binge at Sebring, my impressions follow.

The SSC fleet comprises a Pik-20D, two K-6CRs, a K-6E, a K-13 and the Super Cub, for which a hired Citabria was standing in when I was there. The single-seaters are, without exception, immaculate and look as though they were delivered yesterday — a tribute to Robin Page-Blair's skill with a spraygun and Du Pont's breathtakingly expensive but superb Imron poly-something-or-other paint. All are well instrumented, with oxygen and neat dial-a-number multi-channel radios.

Mid-summer too hot

Derek Johnson is a strictly no-hassle man — if you're there to fly, you'll fly and if you want to chase badges, go ahead. Few, if any, other commercial operators in the USA are geared to visitors flying cross-country, as Sebring is, or have equipment to match the Pik-20D or even K-6E. The days are short in December and the peak Gold and Diamond-mining times are earlier and later in a season which runs from October to June. Mid-summer is just too damn hot; the Johnsons sometimes return to the UK then and last summer Derek was a seasonal instructor at Lasham.

I arrived in mid-afternoon and was quickly installed in the K-13 for my biennial flight review. It was just like any other site check save for remembering the American practice of pulling up right, rather than left, on release at 2000ft. A right-hand circuit is standard at Sebring but otherwise there's no insistence on the rigid "pattern" ("900ft over the woodyard, turn at 650ft over the mortician's and you must ignore the lift from the crematorium chimney on the crosswind leg") that one sometimes encounters at other US gliding sites.

End of day flight

A K-6CR was scratching in what was by Sebring's standards an indifferent soaring day. Flown by an old Thunderbolt pilot, it closed in limpet-tight in formation, followed me down round the circuit and landed just ahead. The sun was already sinking but I took up Derek's suggestion and grabbed it for half-an-hour.

The next day I sat with Derek and Elsie at the hangar doors doing nothing more exhausting than watching Pete and Robin work until a few turkey vultures signalled that something was going up in the blue aloft. A tentative request for the Pik-20D met immediate assent. Three minutes later we'd wheeled it out and I was strapping in for a thorough briefing as the type was new to me.

I made two flights, the first probably qualifying for a state record of some time as I almost beat the tug down. It felt longer than the 13min which Elsie logged but at $36 an hour I wasn't going to argue the point. Elsie hooked me up again and within 90sec I'd been relaunched. Derek, meanwhile, having no students for an hour or two, had taken off in a K-6CR just as some clouds were forming. After a few minutes abortive scratching south and west of the field near a lake I sped across to join him.

I soared for 2hr 10min in conditions that I would rate as a good, though not exceptional, English summer day. The locals — not the Johnsons — were complaining of the cold and thought I was mad ("Half naked" a waitress said) to be walking around in a short-sleeved shirt with the temperature only in the 60s, Fahrenheit. I topped out at 4300ft — in the States one can't soar in cloud — and after stooging locally up to about six miles away I landed purely in the interests of economy.

That said, you'll get good value at Sebring if badge hunting is your objec-

tive. What is most important in such a venture: you'll get the maximum of facilitation by a firm with the proprietors on the premises and one which is geared particularly to giving European visitors exactly what they want in the somewhat different conditions of America.

But I can't pretend that my short soaring visit to Florida gave me even a commensurate fraction of the challenge and enjoyment that I got in 30 hours of cross-country Vega flying at Minden, Nevada, in 1979. There aren't the same imposing mountains for a start. During the Gold and Diamond season the milk run is, apparently, a dash up the inter-state highway, perhaps as far as Georgia, a TP photo over Joe's Diner or whatever and then straight back down the highway again. Pete Johnson, who only recently started gliding but has flown more tows than he's had hot dinners, did his Diamond distance thus.

For a *family* holiday Sebring would not be my choice. In my very brief experience I found the town very dull. Some 30 or 40 miles north at Orlando there is Disneyworld, about which many people rave but which I did not see. There are probably lake-sailing and water-skiing opportunities at Sebring itself but I didn't investigate. On the edge of town there is a very fine state-run forest park with swamps, 'gators and all, in which you could happily spend a day or more.

My overnight stay in a two-bed self-catering poolside chalet at a huge and empty motor inn on the fringe of town cost $16. Having a stinking cold and being deterred by the posted prices of a seafood restaurant next door I went to a quick hamburger joint for dinner, the result being — truly — the archetypal Great American Disaster. My coffee-shop breakfast wasn't much better and I yearned for the excellent, gambling-subsidised, loss-leader food with which the casinos and slot parlours of Nevada lure the customers in. But if, all unknowing, you have taken the family to Florida and inflicted Miami on yourself, Sebring is a most attractive opt-out, only 3½hrs away by car and run by splendid people whose prime concern is to get you aloft without delay and soaring cross-country, if that's what you have in mind.

★ ★ ★

COSTS, (December 1981), Pik-20D $36/hr; K-13 dual $39/hr; K-6CR and -6E $24/hr. Tow to 2000ft $10. My three-day car hire including insurance, half a tankful and some hours' overtime was $97. I discovered only on settling up that I would have done better financially to have hired it for a week, even though I only wanted it for half that time. What price logic?

WAGGLING TO SAFETY

KEN STEWART

Have you ever been in a tug, doing an aerotow when the glider has its airbrakes open?
OR
Have you ever been standing on an airfield watching the saga of a tug and glider combination stagger around the sky with the glider's airbrakes wide open?

Little more than an observer

If you have done either, you will know what a painful time it can be, waiting to see if the glider pilot will discover his problem. Everyone watching is almost straining to become telepathic — and fast. The tug pilot can usually do no better than become an observer, as he tries to climb and fly a sensible pattern to meet the situation, unless of course the glider has a radio, which is more switched on than its pilot.

Let us compare two incidents, one in Britain and one in Australia. Our British pilot clambers into the club K-8, fumbles through his pre-take-off checks, closes his airbrakes, **but fails to lock them.** He is hooked up to the tug and the launch begins.

As the speed increases, his airbrakes are gently sucked open, and there they stay. Those on the ground can no longer help as the glider doesn't have radio. The tug pilot notes the longer ground run but as the ground is perhaps soft assumes that to be the problem. Once airborne the tug pilot realises that the climb rate is not all that it should be, **but the glider pilot doesn't!** Now that the tug pilot has worked out the problem (his mirror helped) he tows the glider as high as his aircraft safely can.

In this case the glider pilot pulled off tow at 2000ft after a protracted tow.

The tug pilot's problem was over, except (wait for it) for having to give way to a K-8 which was doing a short circuit after running out of height **with airbrakes open.** That's right, this guy never looked out either.

Our Australian pilot's problem was somewhat different. He was flying a Kestrel 19 when, on the ground run, his tail parachute deployed. The Pawnee 235 towing him got him airborne but as the tug pilot realised something was wrong with the climb, but not with his aircraft, **he waggled the tug's rudder.** The glider pilot checked his airbrakes and after a few seconds realised the problem and jettisoned the tail parachute. End of saga.

I have now done a reasonable amount of instructing in Australia over the last two years where it is standard practice to demonstrate this rudder signal to glider pilots before solo. In fact the signal is given the same priority as the wave-off signal (*ie* rocking of the tug's wings laterally).

Why not follow Australia?

In the UK there have been many incidents, and some accidents, as a result of airbrakes being open on tow, some by experienced pilots and instructors. Might it not be a good idea to adopt the Australian signal of waggling the tug aircraft's rudder, to get the glider pilot to check his airbrakes?

Obviously better training would be the answer, but until we have infallible pilots, surely a safeguard such as this one might save us some heartbeats or even a life.

Speeds-to-Fly — or Not?

Part 2

MIKE JEFFERYES

In the last issue, p74, we derived the speed-to-fly scale from the polar curve of the Pirat. We considered how to achieve a high cross-country speed and concluded that high climb rate is most important and that precise cruise speed selection is less critical. So how important is the speed-to-fly ring setting?

How much cross-country speed do we really lose by cruising slowly? These questions were worrying me a year ago when I was feeling guilty of cruising too slowly. What I was looking for was a way of putting the whole story in perspective on one chart, and eventually I found it.

If you'll bear with me while I explain I think you'll agree that the results are most informative.

The pilot has direct influence over two factors:

1. Average climb rate.
2. Speed-to-fly ring setting.

These two result in the third factor we need . . .

3. Achieved cross-country speed.

Showing these three variables on one graph is a little awkward. After trials with several presentations, Fig 7 was selected as the best.

Explanation of the graph — Fig 7. Drawn for the Pirat.

The horizontal axis represents actual climb rate and vertical axis shows speed-to-fly ring setting. Hence point A represents a 6kt climb rate and 6kt speed ring setting and point D is a 6kt climb and 3kt ring setting.

Calculations show that the achieved cross-country speeds for these two conditions in the Pirat are 82 and 77km/h respectively, which are not easy to show on the graph.

Further calculations give the following points all at 75km/h:

Point on graph	M	N	P	Q	R	S
Climb rate	5	4.9	5	5.4	6.5	8.5
Speed ring setting	8	6	3.8	3	2	1
Achieved speed	75	75	75	75	75	75

etc.

A line can therefore be drawn through MNPQRS, and any point on this line represents a condition of flight (average climb rate and speed ring setting) which gives a cross-country speed of 75km/h.

Similarly all the other curves on Fig 7 join together points of equal achieved cross-country speed — the speed being shown at the top of each curve.

Don't Panic

You don't need to understand how the graph was constructed — only what it shows. The method of calculations etc is shown in the appendix for anyone interested.

Hence from Fig 7 we can read off the achieved cross-country speed for any actual climb rate and speed ring setting. If the point in question does not fall directly on one of the curves (*eg* point A) we can deduce the speed by relating the point to the neighbouring curves. A=82km/h between the 80 and 85 curves.

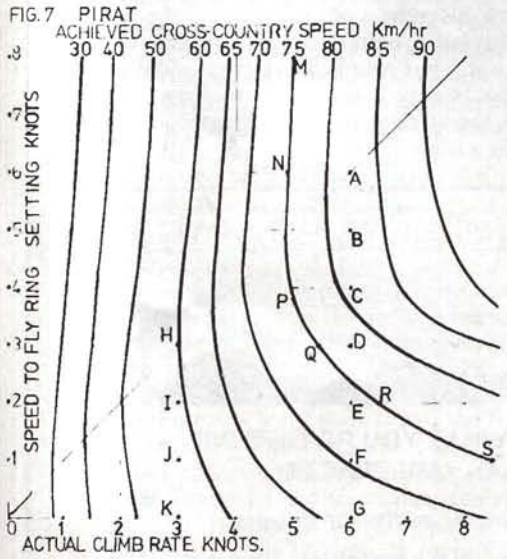
Conclusions from Fig 7

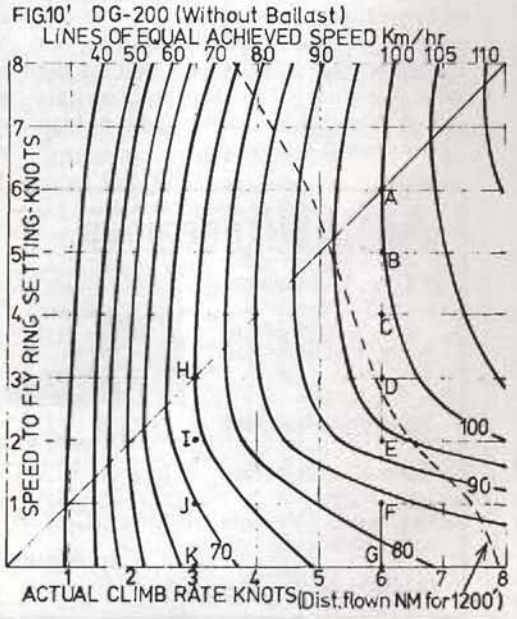
Point A represents a 6kt average climb rate and 6kt speed ring setting — achieved cross-country speed is 82km/h. Points B to G all maintain the 6kt climb rate but with more and more cautious speed ring settings, and the effects on achieved speed are shown in Table 8.

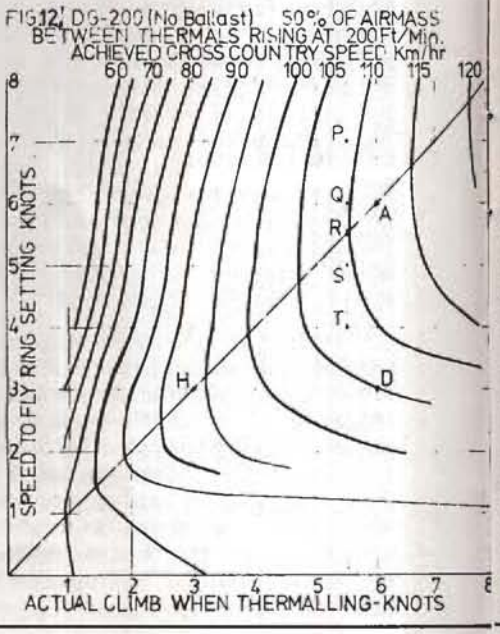
Table 8 (All at 6kt average climb rate)

Point	A	B	C	D	E	F	G
Speed ring setting	6	5	4	3	2	1	0
Achieved speed km/h	82	82	81	77	74	70	66
% below optimum	—	—	1	6	10	15	20

As expected small changes in speed ring setting from the "optimum" have little effect. However, for a 6kt climb rate a ring setting of 2kt or lower gives significant reduction in cross-country speed.







Now look at point H on Fig 7. This represents a 3kt climb rate and 3kt speed ring setting. Achieved speed is 60km/h, 27% *worse* than for the 6kt climb rate. The effects of a 3kt climb with reduced speed ring settings are shown in Table 9.

Table 9 (All at 3kt average climb rate)

Point	H	I	J	K
Speed ring setting	3	2	1	0
Achieved speed	60	59	57	55
% below optimum	—	2	5	8

We have now confirmed our first two rules for high cross-country speed (as in Part 1) and introduced a third:
Rule 1 — High average climb rate is the most important factor.
Rule 2 — Precise maintenance of the theoretically correct inter-thermal speed is not critical.
Rule 3 — When good average climb rates are expected — don't leave the speed ring on zero. However, a setting of half the anticipated climb rate will achieve most of the potential benefit. With the ring set for this condition we should use it as a guide only (in line with Rule 2) rather than follow its every twitch.
NB. Rule 3 should not be allowed to jeopardise our primary Rule 1. That is to say be alert to the occasion when increased cruise speed and consequent height loss will give an unacceptable risk that average climb rate in the sky ahead will suffer.

Increase in performance

Fig 10 is similar to Fig 7 but is drawn for a 15m flapped glider, the DG-200 (although the curves can be considered typical of the 15m Class most of which perform nearly as well!)

Point A shows that a 6kt average climb rate with 6kt speed ring setting gives a 100km/h achieved speed. Table 11 shows that the earlier conclusions still apply — we can see the small effect of using a slightly cautious speed ring setting, the larger effect of using a very pessimistic setting and the even greater effects of accepting a reduced climb rate.

Table 11

Average climb rate	6kt							3kt			
Point	A	B	C	D	E	F	G	H	I	J	K
Speed ring setting (kt)	6	5	4	3	2	1	0	3	2	1	0
Achieved speed (km/h)	100	100	99	97	93	83	78	75	74	70	67
% lost VS 6kt climb	—	—	1	3	7	17	22	25	26	30	33
% lost VS 3kt climb	—	—	—	—	—	—	—	—	2	8	12
% reduction in search area	39	34	30	25	18	5	—	25	18	5	—

Reduction in search area

We noted earlier that higher cruise speeds lead to greater height loss and consequent reduction in search area for the next thermal. Average climb rate may suffer (breaking Rule 1) owing to the smaller number of thermals sampled.

The reduction in search area as speed ring settings are increased is demonstrated by the line dotted onto Fig 10 at the suggestion of John Glossop. It shows the distance flown in nautical miles (horizontal axis) for any speed ring setting (vertical axis) for a 1200ft height loss in still air. (Percentage reductions from the Max glide distance are quoted in Table 11.)

A 1kt ring setting shows small reduction in search area, but 3kt or 4kt settings reduce the range by 25% and 30% for the DG-200 and are therefore only appropriate if . . .
a. We are confident of good lift ahead, and
b. We have sufficient height to reach it at the increased cruise speed, hopefully minimising height loss by careful route selection.

The graphs of achieved cross-country speed (Figs 7 and 10) are based on the two assumptions that the glider cruises through still air between thermals and does not deviate from the required track. Let's look at the reality.

Impossible speeds?

Over the last few years it has been suggested in high places that the speeds achieved by leading competition pilots have, for the day's conditions, exceeded those theoretically possible by the traditional MacCready climb and glide theory which we have considered so far; *ie* speeds over 100km/h in an unballasted 15m machine when conditions would not give average climb rates of 6kt (ref point A on Fig 10).

This has been put down to the effects of cruising not through still air but selecting a route partly through rising air.

Fig 12 shows the lines of achieved speed for the DG-200 (as Fig 10) but now flying between thermals through an airmass half of which is still and half rising at 200ft/min airmass movement (*ie* the glider would climb at ½kt if its sink rate in still air was 1½kt).

Point H again represents 3kt average climb when circling (quite a good British day) and speed ring setting of 3kt. The achieved speed of 93.5km/h is a staggering 25% better than the cruise through still air. The airmass rising at 200ft/min will be of benefit but to a lesser extent if the rate of climb in the thermals is higher. If the day permits an average climb rate of 6kt, the gain over cruising through still air will be 12% — 112km/h at point A.

Is MacCready still valid?

By cruising not through still air but rising air we have effectively raised the polar curve. The question was asked (Soaring Symposium, RAF Newton, February 1981) "Does this artificially raised polar require a re-calibrated speed-to-fly scale?"

The achieved speeds in Fig 12 have been calculated assuming diligent following of the MacCready ring for the cruise both through still air and rising air. Point R shows 110km/h achieved speed for a 5.5kt climb rate and speed ring set "correctly" to 5.5kt. Points P, Q, S and T all represent a 5.5kt climb rate but with revised speed ring settings (and therefore cruise speeds) and all with achieved speeds less than the 5.5kt ring setting. Similarly all other lines of equal achieved speed have their minimum points on the diagonal MacCready line (where speed ring setting = achieved climb rate).

This shows that any change in cruise speed from MacCready will result in a reduction in achieved cross-country speed; the speed-to-fly ring still shows the optimum cruise speeds in this advantageous airmass. Remember that in the rising air the vario needle will show reduced sink (or even lift) and the speed ring will indicate precisely the optimum reduction in cruise speed. Therefore no re-calibration is necessary — the standard MacCready ring gets it right.

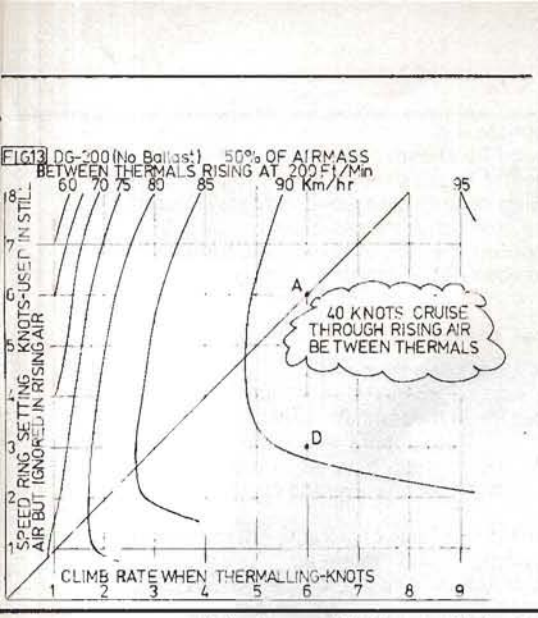
Don't slow down too much

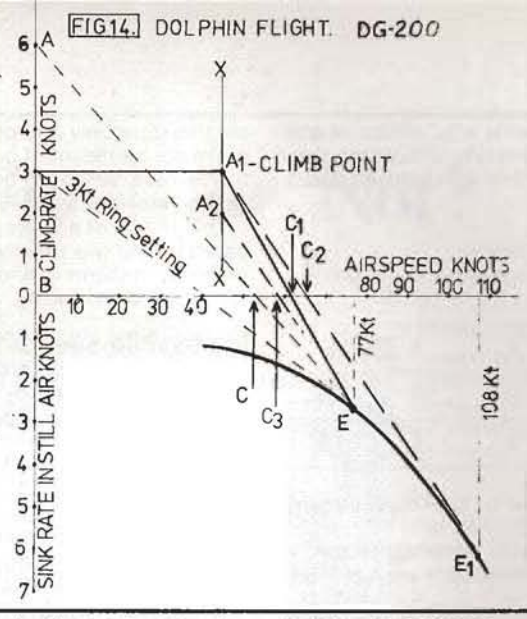
Let's just consider the temptation to slow down to Min sink speed in the air rising at 200ft/min. If the Min sink rate is 1.2kt this gives an actual climb rate of 0.8kt while cruising through this airmass. Fig 13 shows the dramatic loss of achieved speed on a *strong lift day* if we slow to 40kt in the weak lift even though not stopping to circle.

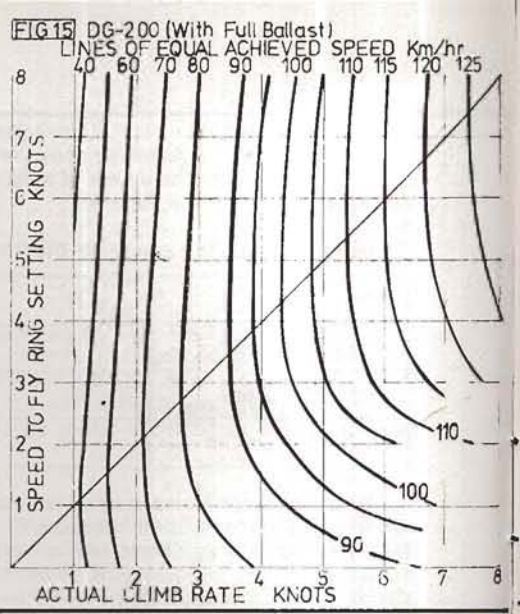
Point A gives 91km/h — we have been fooled by the rising air and lost 9% of the cross-country speed we would have achieved in *still* air (100km/h point A on Fig 10). Remember that rather than losing speed this rising air should have given us a gain of 12% (112km/h point A on Fig 12). Note: For this 6kt climb rate a 3kt ring setting would be more common — points D on Figs 10, 12 and 13. If you check the figures you'll see that the percentages reduce slightly but the above conclusions still apply — don't slow down too much in the weak lift if there is strong lift ahead.

Dolphin flying

Dolphin flight is achieved when sufficient height is gained while cruising through the rising air that it is not necessary to stop and circle. The construction of Fig 1 in Part 1, of this article (see p74)







now needs to be modified — we'll do so in Fig 14. Imagine the day is capable of giving an average rate of climb of 6kt (point A on Fig 14) and we choose a speed ring setting of 3kt and cruise at 75-80kt at point E. Achieved cross-country speed would be BC 53kt (97km/h). However we do not need to stop and circle because while cruising through the rising air we gain sufficient height at an average of 3kt climb rate and 45kt cruise speed.

Our climb point is no longer A (6kt at zero speed) but point A_1 (3kt climb at 45kt speed). If the cruise point remains at E then line A_1E gives an achieved cross-country speed BC_1 of 62kt (115km/h).

Maybe now we *do* have grounds for devising a new speed-to-fly scale for dolphin flight. Instead of drawing tangents onto the polar curve from the vertical (zero speed) axis as Fig 3 in Part 1, should we now draw tangents from different climb points on the vertical line XX on Fig 14 which represents the Min. sink cruise speed? The tangent from our climb point A_1 gives a cruise point E_1 of 108kt, and an achieved speed BC_2 of 65.5kt (121km/h). Perhaps this is why Mike Carlton claims that between South African thermals one cruises at VNE!

However this increased cruise speed will lead to much greater height loss which will probably not be recoverable in dolphin flight — *ie* there may be insufficient rising air along the flight path and it will therefore be necessary to revert to conventional thermal circling. This takes us back to point A (6kt climb at zero forward speed), and line AE_1 drops the achieved speed to about 97km/h at point C. Therefore in practice a compromise cruise speed between dolphin climbs is required with is dependent on the distribution of lift along the chosen flight path.

Above all avoid speeding up optimistically in the lift only to slow down cautiously in the sink. A pilot who has climbed too high by flying too slowly along a cloud street will find his efforts to remain clear of cloud also lead to this inefficient speeding up in lift and slowing in sink.

Waterballast

Waterballast moves the polar curve down and to the right at the low speed end, and up at the higher speeds (see back cover advertisement — thanks Ralph). We have established the objective of moving cruise point (E) up or to the right, ref Fig 1 and 2 in Part 1. Waterballast helps do this when cruise speeds are high, but not at slow speeds in weak conditions. Note that the revised polar will need a second calibration for the speed-to-fly ring.

Fig 15 shows the achieved speed graph for the DG-200 with full ballast. Point A (6kt climb, 6kt speed ring setting) now achieves 115km/h, 15% improvement over the 100km/h without ballast (Fig 10). However this comparison is not valid because with full ballast the climb rate must suffer.

Table 16 compares the achieved speeds without ballast and with full ballast. A third set of figures is added for the full ballast condition, but assuming a ½kt reduction in average climb rate. The reduction due to ballast will depend partly on the size and smoothness of the thermals, but the figures give an indication of how ballast helps in the strong conditions and hinders in weak/broken conditions.

Table 16 DG-200

Unballasted						
Climb rate (kt)	6	5	4	3	2	1
Achieved speed (km/h)	100	93	85	75	61	42
Full ballast						
Climb rate (kt)	6	5	4	3	2	1
Achieved speed (km/h)	115	107	97	84	68	46
Ballast improvement %	15	15	14	12	11½	9½
Reduced climb rate (kt)	5½	4½	3½	2½	1½	½
Achieved speed (km/h)	111	102	90	76½	59	—
% better (worse)	11	10	6	2	(3)	(—)

Deviation from track

We have now found some appreciable gains by cruising through particular airmasses. To take advantage of these it is frequently necessary to deviate from track, but how much detour is justified?

Let's start with the unballasted DG-200 flying on track achieving 3kt climb rate with 3kt speed ring setting — achieved speed is 75km/h from point H on Fig 10. Now consider the following four advantageous routes through the air:

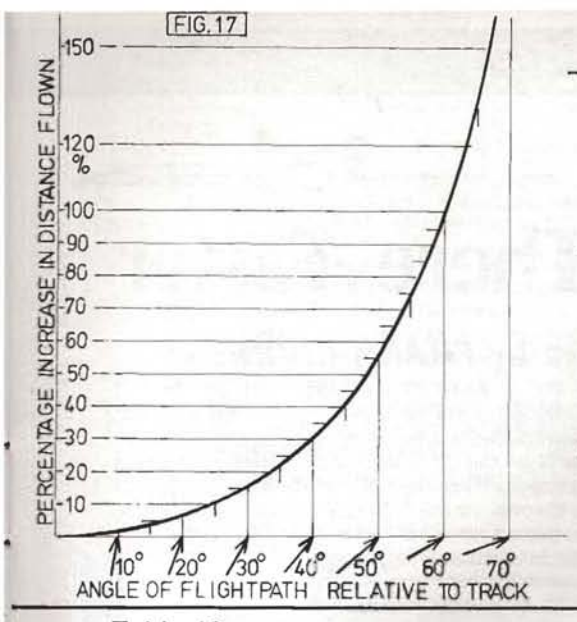
1. Our route gives a 6kt climb rate — point D on Fig 10. Achieved speed improves to 97km/h — 30% increase from 75km/h.
2. Climb rate remains 3kt, but now 50% of the air between thermals is rising at 200ft/min — point H Fig 12. Achieved speed is now 93.5 km/h — 24½% increase.
3. The route covers air 50% of which is rising at 200ft/min, and this better airmass contains bigger thermals giving 6kt climb rate. D on Fig 12. Achieved speed becomes 105km/h — 40% increase.
4. The route permits dolphin flight. Average climb rate is 2kt at 45kt airspeed, the cruise between climbs is at 75-80kt in still air, *ie* this flight is represented by line A_2E on Fig 14. Achieved speed C_3 is 59kt, 109km/h — 45% increase over 75km/h.

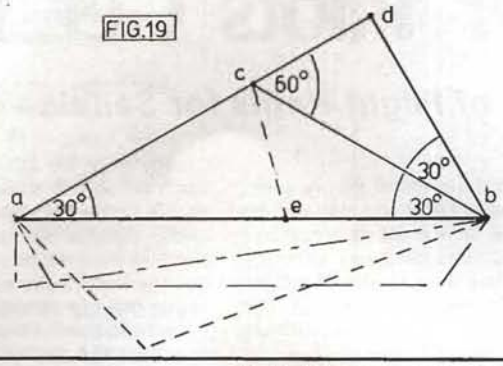
Deviating from track

The routes will prove to be advantageous provided the increase in achieved speed through the air exceeds the increase in distance flown deviating from track to find these airmasses.

Fig 17 shows the increase in distance for any angular detour from track, and gives the following maximum worthwhile deviations for the four cases we've considered:

Surprised? How often have you hesitated to deviate 30° to gain an airmass advantage?





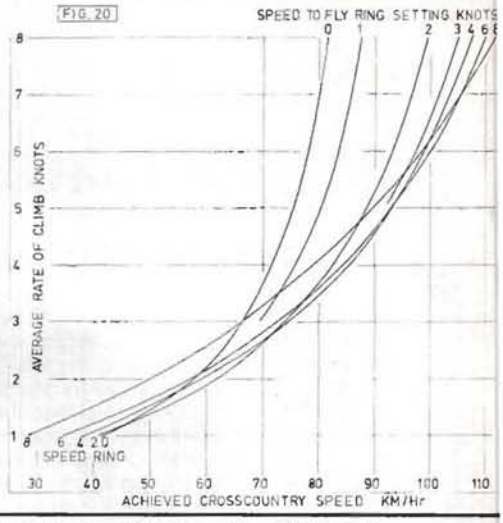


Table 18

	Increase in speed	Max worthwhile detour
1.	30%	40°
2.	24½%	36°
3.	40%	44°
4.	45%	46°

Final thoughts on detour from track

A 30° detour continued for half the distance to the next TP will be followed by a heading to the TP which is also at 30° to the original track. This is shown in Fig 19 by flying from a to b via c. As shown in Fig 17 actual distance flown acb is 15½% greater than the track ab. However if the detour is continued much beyond halfway (ad) then the return to the TP (dc) will be considerably greater than 30° to the original track. Actual distance adc for this example is 36½% greater than ab. Therefore having decided that a detour is worthwhile the situation should be re-assessed as the flight progresses, particularly nearing the TP.

Though obvious in theory it is frequently overlooked in flight that once a detour has been undertaken (*eg* ac) the shortest route to the TP is the straight line cb. Don't return to the old track line (distance aceb is 30% greater than ab, acb is only 15½% more than ab).

The new track line is cb, the straight line between our present position and the TP. All considerations of detour from track now relate to the deviation from cb. To continue to d can now be seen as a 60° deviation from the required track cb.

The air rarely permits such simple route planning. The three routes shown below line ab in Fig 19 give the same distance flown as acb, *ie* 15½% greater than the straight distance ab. These indicate that very large detours over short distances can be justified to reach a line of good lift even when there may be moderate lift ahead — how much more justified when conditions ahead are hopeless!

Conclusions

I hope the points covered in this article help you as they have helped me to put into perspective all the advice we were given by members of the British team squad at the end of Part 1. I would recommend you to read their comments again and I'm delighted to quote from several more whose responses missed the last S&G.

Bernard Fitchett: "The risk of landing out increases rapidly with inter thermal speeds greater than best L/D. So since the scoring system puts great premium on completing the task, prudence dictates that a speed slower than the theoretical optimum should be used."

"I set the 'speed-to-fly' computer to the average rate of climb I can reasonably expect if there is an obvious source of lift within reach at this speed, otherwise the setting will depend on one's height. Starting from a great height, you have more chance of finding a strong thermal. Consequently I reduce the setting as I lose height or foresee difficult circumstances. As for deviation from track, this depends on many factors but I frequently deviate up to 30° and have occasionally made a 180° to stay airborne."

"Having said all that, the whole thing really hinges on a correct judgment of the weather and without the necessary concentration and motivation to do this high speeds and competition success are unobtainable."

Justin Wills' policy is to "proceed at the speed suitable for my next anticipated thermal subject to reaching it at sufficient altitude. Since only too frequently I don't know exactly where that thermal will be, or its precise strength, I tend to use a cautious block speed leaving me free to devote my attention to peering out of the window and wondering what to do next."

Steve White tries to stick to a few general rules . . . "I divide the flight into two distinct modes:

a. Stopping (thermalling, hill soaring over one spot, wave climbing)

1. I stop when in the best, or above average lift I believe available for the day.
2. I stop when I get down to a height at which the average lift is only half the best.
3. I stop when I can't reach further lift (*ie* the ground would get in the way).

b. Going (flying on or within approximately 30° of track)

I will 'go' whenever the 'stopping' rules do not apply. When going I fly at speeds equivalent to a MacCready ring setting of approximately half the best lift down to the height in a. 2. of the Stopping rules. Below this height I fly at approximately best glide."

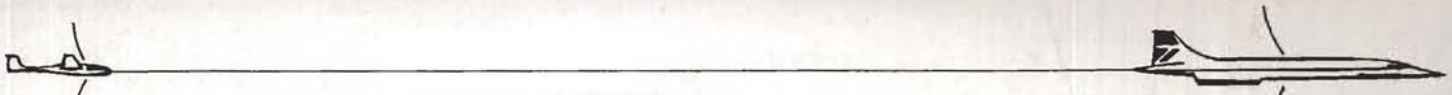
"Finally, the most important rules of all for success — never be satisfied with your rate of climb. If you can improve it DO IT."

Appendix

The derivation of the graphs of achieved cross-country speed was quite straightforward, though time consuming without a computer. A chart was drawn for each polar curve showing MacCready speeds-to-fly for average climb rates from 0 (*ie* best glide speed) to 8kt; the sink rate for each speed was included in the chart. The time taken to cruise a set distance at each speed was then tabled, together with the height lost in still air. The time taken to regain this height at any average climb rate can easily be determined, and when added to the cruise time to give the total time for the glide and climb leads to the achieved cross-country speed.

By this means a table was made up showing achieved cross-country speeds for any climb rate from 1 to 8 using any speed ring setting from 0 to 8 (*ie* an 8×9 matrix). A graph was then drawn of achieved cross-country speed against average climb rate made up of nine curves, each representing a different speed ring setting. These graphs were interesting and demonstrated well the speed lost by using a low ring setting on a strong lift day. (The curve for the DG-200 without ballast and with still air between thermals is shown in Fig 20.)

However these graphs were not thought to show the whole story to best effect. By re-plotting many points taken from these curves the graphs presented in this article were generated. This was done by plotting up to nine points, all with the same achieved cross-country speed and then joining them to form a curve.



How Glider Pilots Get There Faster

The Optimisation of Flight Paths for Sailplanes by FRANK IRVING

Introduction

Even if they are not entirely familiar with the original theory, most soaring pilots will know about the MacCready ring and may well be adept in its use. Both the theory and the device (or its electronic equivalents) relate to very circumscribed circumstances although they are both essential to the understanding and practice of techniques applicable to more general and more realistic situations. The object of this paper is to review recent theories relating to optimum flight paths and their influence on the pilot's actions.

"Classical" theory and the MacCready ring

The "classical" theory is based on the analysis of a single climb-glide sequence. The mean rate of climb is assumed to be known, as is the performance of the sailplane, expressed as a plot of the rate of sink against forward speed under steady conditions in still air. The net change of height is assumed to be zero. The analysis is concerned with finding the speed at which the sailplane should be flown during the glide, taking into account the effect of down-currents, in order to maximise the overall average speed. These considerations lead to the construction of Fig 1, on which is based the MacCready ring (Fig 2), which enables the pilot to regulate his speed appropriately. Anthony Edwards has given an excellent historical review of these matters[1] so there is no point in repeating them here. As a matter of interest, it is not obvious why the construction of Fig 1, which relies on the mean rate of climb, correctly gives the instantaneous optimum speed in the presence of a varying down-draught. In fact it does (provided one has a total-energy variometer and the load factor is always near unity) but some more refined analysis is required to show that this is so.

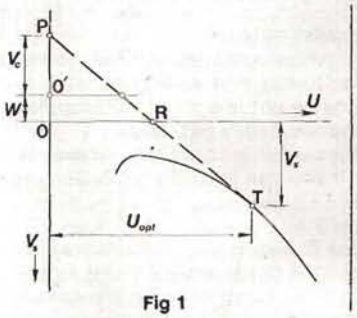


Fig 1

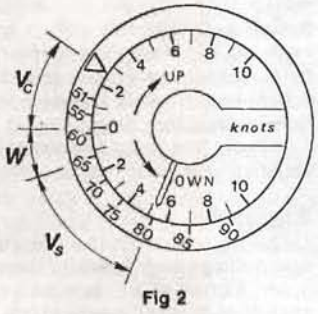


Fig 2

Fig 1. The classical construction for determining the optimum speed to fly, Uopt, after a climb at Vc and in the presence of a down-current W.

Fig 2. The MacCready ring. The datum is set to a climb of 2.5kt. The sailplane is being flown at the optimum speed of 80kt, sinking at 3.9kt through the air which is itself descending at 1.3kt.

I will assume that the reader is familiar with the MacCready ring (or corresponding electronic devices) and with the fact that a total-energy variometer is essential at all times. Its indications will then depend on the motions of the atmosphere and the instantaneous speed of the sailplane but will be unaffected by the rate of change of speed. Throughout this paper, rates of climb or sink are to be taken as rates of change of energy height. We will not concern ourselves with details of the instrumentation but we will suppose that with modern equipment, whether mechanical or electronic, the pilot is fairly easily able to regulate his speed in the MacCready fashion.

The "classical" theory is very idealised indeed. If one attempts to apply it to a reasonably realistic flight in which adjacent climbs and glides do not always involve equal height changes, it becomes somewhat ambiguous. Also, there will be occasions when MacCready must be abandoned if the next thermal is to be reached. Such considerations produced a great deal of debate until as late as 1981 on what should be the "rate of climb" setting of the ring under various circumstances[2]. Should it be the average rate of climb in the previous thermal, or the final rate of climb in the previous thermal, or the expected rate of climb in the next thermal, or a vague moving average for the day? Fortunately, quite large departures from the optimum inter-thermal speed have little effect on the final average speed[3] so even pilots suffering from misapprehensions perform quite well.

In real life, there are various constraints which do not appear in the simple climb/glide analysis. There will usually be a lower height limit applied to the flight: any lower and the pilot stops trying to soar and resigns himself to landing. Likewise, there is obviously an upper limit: either the rate of climb becomes unacceptably low or cloudbase or controlled airspace intervenes.

A comprehensive analysis would take into account such constraints together with varying thermal strengths and variable spacings, perhaps such that the pilot can only get to the next thermal by flying at less than the apparent MacCready speed.

Optimal flight strategy

Such a comprehensive analysis has been done by Litt and Sander[4] who regarded the problem as one in "discrete optimal control". Their assumptions are listed in Table 1.

Table 1

THE LITT AND SANDER ANALYSIS OF OPTIMAL FLIGHT STRATEGY: ASSUMPTIONS

1. **THERMALS ARE CONCENTRATED AT SOME GIVEN PLACES UNEQUALLY SPACED ALONG THE TRAJECTORY.**
2. **THEIR LOCATIONS AND CHARACTERISTICS DO NOT CHANGE WITH TIME.**
3. **THEIR STRENGTHS ARE GENERALLY UNEQUAL.**
4. **THE AIR BETWEEN THEM IS STILL.**
5. **THERE MAY BE UPPER AND LOWER BOUNDS TO THE OPERATING HEIGHTS.**
6. **THE SAILPLANE IS FLOWN AT CONSTANT SPEED BETWEEN THE THERMALS.**
7. **NO WIND.**
8. **THE FLIGHT BEGINS AND ENDS AT A GIVEN MINIMUM HEIGHT.**
9. **EACH GLIDE IS LINEAR BUT ALL GLIDES ARE NOT NECESSARILY IN THE SAME DIRECTION.**

The pilot has to decide how far to climb in the thermal he uses and the speed to fly between the thermals. Various sets of rules can be deduced, which depend on the assumed constraints. The authors considered four cases, of which the first two were not very relevant. The first assumes no height constraints at all, and leads to the simple MacCready result. The second assumes no maximum altitude constraint, which leads to some odd-looking rules. The MacCready speed is always based on the climb rate in the previous thermal.

Much more realistic is the third case, where there are both minimum and maximum altitude constraints, leading to the set of rules listed in Table 2. The overall aim is to do as much climbing as possible in the strongest thermals, since rate of climb has a first-order effect on the average speed. This is a fairly realistic set of circumstances and the rules appear to correspond with common sense, except that in some cases the MacCready speed is based on

Table 2

LITT AND SANDER OPTIMUM FLIGHT STRATEGY

RULES WHEN THE STRENGTH OF A THERMAL IS THE SAME AT ALL HEIGHTS AND THERE ARE CONSTRAINTS ON BOTH MAXIMUM AND MINIMUM ALTITUDES

1. AFTER A CLIMB, FLY AT THE MACCREADY SPEED CORRESPONDING TO THAT CLIMB UNLESS THE MAXIMUM HEIGHT HAS BEEN REACHED IN THAT THERMAL.
2. IN THE LATTER CASE, FLY AT THE MACCREADY SPEED CORRESPONDING TO THE CLIMB IN THE NEXT THERMAL.
3. IF THE NEXT THERMAL IS WEAK, CLIMB IN IT ONLY HIGH ENOUGH TO REACH A STRONGER THERMAL AT THE MINIMUM ALTITUDE BY FLYING AT THE SAME SPEED AS IN THE GLIDE BEFORE THE WEAK THERMAL.
4. IF THE NEXT THERMAL IS STRONG, CLIMB TO THE MAXIMUM ALTITUDE.
5. THEN PROCEED AS IN RULE 2.
6. HAVING CLIMBED TO THE MAXIMUM ALTITUDE, THE SPEED FOR THE NEXT GLIDE MAY BE DETERMINED BY THE NEED TO REACH THE NEXT THERMAL AT THE MINIMUM ALTITUDE. MACCREADY DOES NOT APPLY.
7. IF POSSIBLE, CLIMB TO SUCH A HEIGHT IN THE LAST THERMAL THAT THE FINISH CAN BE ATTAINED BY FLYING AT THE MACCREADY SPEED CORRESPONDING TO THE RATE OF CLIMB IN THAT THERMAL. OTHERWISE, PROCEED AS IN RULE 6.

the previous climb, in others on the next climb, and in some situations is irrelevant. Fig 3 shows a graphical interpretation of these rules.

MAXIMUM AND MINIMUM ALTITUDE CONSTRAINTS

There may be weaker thermals between those shown: These are ignored

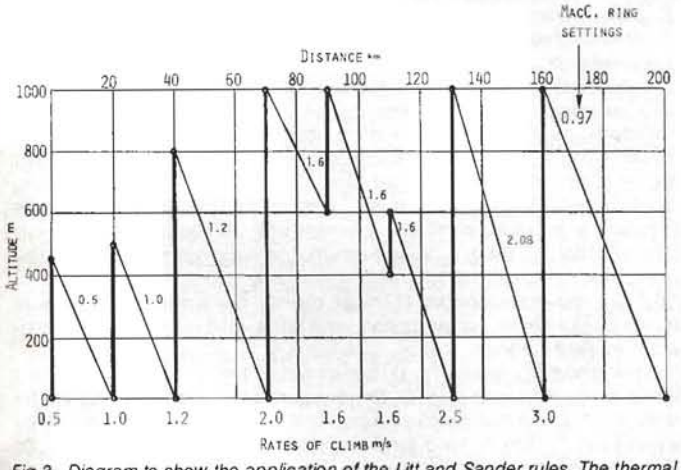


Fig 3. Diagram to show the application of the Litt and Sander rules. The thermal spacings are multiples of 10km, simply for convenience in drawing. This is a simplified version of a diagram from Ref 4.

In the fourth case, the strength of each thermal varies with altitude, initially increasing, then decreasing. Altitude constraints are implicit in such a distribution of climb rate. The rules are listed in Table 3.

Table 3

RULES WHEN THE STRENGTH OF EACH THERMAL VARIES WITH ALTITUDE, INITIALLY INCREASING, THEN DECREASING

NOTE: ALTITUDE CONSTRAINTS ARE IMPLICIT IN SUCH A DISTRIBUTION OF CLIMB RATE.

1. THE MACCREADY RING SETTING MUST CORRESPOND TO THE INSTANTANEOUS RATE OF CLIMB AT THE HEIGHT OF LEAVING THE THERMAL.
2. THE RATE OF CLIMB AT THE HEIGHT OF ENCOUNTERING THE NEXT THERMAL MUST BE THE SAME.
3. THE PREVIOUS RULES 6 AND 7 APPLY.

For a pair of thermals with given distributions of climb rates, at a certain distance apart, this rule leads to a unique solution which gives the height to leave the first thermal, the speed to glide, and the height to meet the second, as shown in Fig 4. These rules appear in Reichmann's book[5] and had been deduced some years earlier by Anthony Edwards[6].

RATE OF CLIMB VARIES WITH HEIGHT

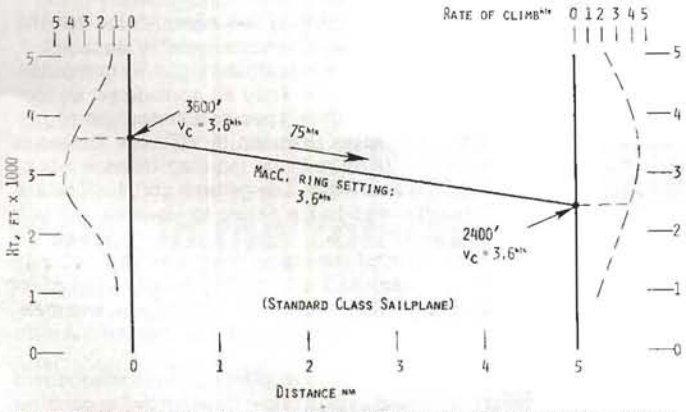


Fig 4. Diagram to show the application of the Edwards/Reichmann/Litt and Sander rules when the rate of climb varies with height. For the sailplane considered there is a unique trajectory, as shown.

Although Litt and Sanders assume still air between the thermals, it seems reasonable to suppose that in the presence of a downcurrent, one simply follows the MacCready ring, having set it in accordance with these rules. It is noteworthy that although the classical analysis was based on very restrictive assumptions, the result is still relevant.

None of the above rules can actually be used precisely as stated because they involve powers of prophecy. In particular, the most realistic requires an ability to forecast the location of the next thermal and the distribution of rate of climb with height. Some form of calculator would then be required to achieve a rapid solution.

Although formally impossible to apply, this result is very useful if only as a guide to more intuitive behaviour. It is clear that the good contest pilot must do something quite close to this in practice.

Dolphin flying

The "classical" theory is usually written as if any atmospheric motions between the thermals are down-currents. In fact it applies to vertical atmospheric motions both upwards and downwards so, when flying through a weak thermal, the pilot should reduce speed according to the indication of the MacCready ring (provided, of course, that the speed shown is not unrealistically slow). In doing so, he extracts some energy from the atmosphere. Flying straight through thermals, perhaps pausing to circle in the really strong ones is, of course, frequently practised under cloud streets and can result in very high speeds.

Taking the simple case of a cloud street, with some prescribed distribution of vertical velocities, the questions which arise are: is continuous flight possible subject to some condition like zero net loss of energy height? If it is, how should the machine be flown so as to maximise the speed?

By considering the case in which the cloud street lies along the desired track, I made a modest contribution to this matter by applying the calculus of variations[7]. The result showed that one should proceed in the MacCready fashion: set the ring datum to some climb figure and then fly according to its indications. But what climb setting? The setting now appears in the calculations as something much more abstruse than some perceived rate of climb: it is the reciprocal of a Lagrange multiplier whose value depends on the characteristics of the whole cloud street and the constraints. In practice, it would have to be determined by trial-and-error.

At that time some similar analyses appeared *eg*,[8 9] which assumed — as does the "classical" theory — that, from the point of view of the sailplane's performance, the lift is substantially equal to the weight. On the other hand, from the point of view of the pilot's action's, it was assumed that he could instantaneously change speed to correspond with the MacCready indications. It became fashionable to indulge in fairly abrupt pitching manoeuvres when adjusting the

speed so that the flight path became markedly undulatory (and emetic), like that of a dolphin. Another little analysis[10] showed that this was very reasonable: if properly conducted, the sharper such manoeuvres were, the less the energy loss due to the changes in induced drag. However, if significant portions of the flight path were to include flight at a load factor (the ratio lift/weight) other than unity, this represented a marked departure from the original assumptions.

Clearly, the whole matter was getting too complicated for the simple analytical approach so various persons, notably Gedeon[11 12], Pierson[13 14 15], de Jong[16 17] and Dickmans[18] indulged in computerised calculations of great complexity. They all considered an isolated portion of the flight path with a specific distribution of up- and down-currents. The distribution assumed by Gedeon, Dickmans and de Jong represented a fairly realistic isolated thermal whilst that of Pierson was a single sine wave. The general conclusions are similar and, since Pierson's results are easier to visualise, we will consider them in more detail.

He considered the problem of traversing such a vertical velocity distribution so as to minimise the total height loss, with specified initial and final conditions of flight and observing the stall and maximum speed limits[15]. Similar calculations were also carried out with maximum speed as the desired end[14].

In both cases, with fairly long wavelengths (1km), the manoeuvre is qualitatively what one would expect: slow down in the ascending air so as to spend more time gaining energy: speed up in the descending air to reduce the time in which energy is lost. If the wavelength is long and the vertical velocities not too great, the speed adjustments will all be quite gentle and the result will be substantially the same as MacCready's (Fig 5). But with short wavelengths and large vertical velocities, the optimum manoeuvres are fairly abrupt. For example, in one of de Jong's examples, where the up-current has a diameter of 200m and maximum strength of 5m/s, the maximum load factor was about 7½!

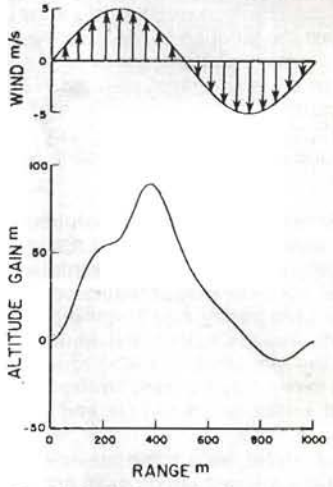


Fig 5. Optimal trajectory for free but equal boundary conditions: W_A = 5m/s, X_f = 1000m, h_f = 0.

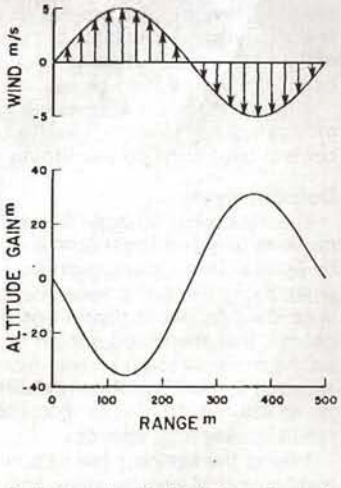


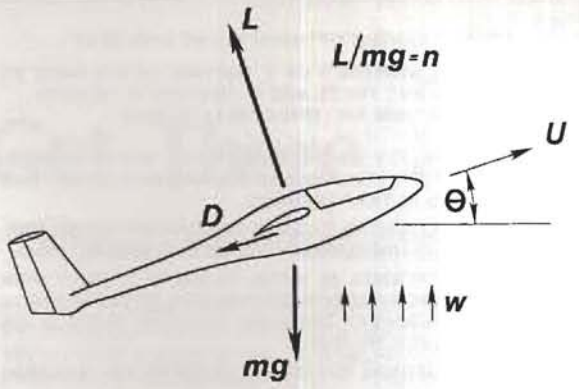
Fig 7. Type II optimal trajectory: free but equal boundary conditions, W_A = 5m/s, X_f = 500m, h_f = 0.

Fig 5. This is a maximum speed trajectory with zero overall loss of height. The pilot slows down and gains height in the lift and dives to gain speed through the sink generally in the MacCready fashion. (Reproduced from Ref 14.)

Fig 7. This is a maximum speed trajectory with zero overall loss of height. The wavelength of the vertical air motion is now 500m, compared with 1000m in Fig 5. The pilot dives first in order to perform a pull-out in the lift followed by a push-over in the sink: an "anti-MacCready" trajectory. (Reproduced from Ref 14.)

Not only are these conditions very far from the unity load factor assumed in MacCready flying but it turns out that the variations in load factor, quite apart from any accompanying speed changes, increase the extraction of energy from the atmosphere.

This explained elegantly in papers by Gorisch[19 20]. The results are as follows: If a sailplane is flying steadily, descending at some constant rate of sink relative to air which is ascending, then the rate of gain of energy height is simply the rate of ascent of the air less the rate of sink of the sailplane, as one would expect. But if the sailplane is indulging in a pitching manoeuvre with a load factor other



$$dh_e/dt = nw\cos\Theta - V_s(U,n)$$

Fig 6. Rate of gain of energy height at a load factor n when traversing air rising with a velocity w. The rate of sink V_s is appropriate to the forward speed U and the lift L which is n times the weight.

than unity, the situation becomes that shown in Fig 6. If the angle between the lift vector and the air motion is small, then the load factor acts as an amplifying factor on the air velocity. We can indeed increase the apparent thermal strength just by pulling the stick back. Moreover, it may still be possible to extract energy from descending air by applying a negative load factor. It all looks rather improbable but it is indeed correct provided that unsteady flow effects are neglected.

For a given sailplane, there will be a load factor, depending on the speed and the rate of ascent of the air, which maximises the rate of gain of energy height. The point is that the rate of sink term is really the effective rate of loss of energy height by the sailplane at the prevailing speed and load factor. Increasing the load factor increases this rate of loss: if the load factor is too high, this effect will outweigh the "amplification" of the thermal strength. The optimum values turn out to be quite high: for a Standard Class glider flying at 80kt and meeting air rising at 4kt, the optimum load factor is about 4.5. Such load factors can only be sustained very briefly: even at a load factor of 3 and an initial speed of 80kt, the machine is pointing vertically upwards after 2½ seconds. However, this interesting theory does explain the following results of the computer calculations:

(a) For long wavelengths (1km or more), the optimum trajectory requires MacCready-style speed variations with relatively little variation in load factor.

(b) For short wavelengths (½km or less), the optimum trajectory looks quite different (Fig 7). On encountering the up-current, the pilot should dive and perform a pull-out in the rising air, followed by a push-over in the sinking air. This is because the gains due to load factor variation now predominate. The consequential speed variation might be described as "anti-MacCready".

(c) There appear to be some intermediate conditions for which either type of trajectory is "optimum".

Tentative rules

Apart from the simplest application of the MacCready ring, all subsequent techniques require powers of foresight, perhaps even

Table 4

DOLPHIN FLYING

GORISCH'S TENTATIVE RULES

1. **ADJUST THE *AVERAGE SPEED* ACCORDING TO THE SPEED COMMAND OF THE MACCREADY RING FITTED TO AN *AVERAGING* TOTAL-ENERGY VARIOMETER.**
2. **PERFORM LOAD VARIATIONS ACCORDING TO THE *INSTANTANEOUS* VARIOMETER READING. THE SPEED VARIES, BUT ITS AVERAGE SHOULD BE MAINTAINED ACCORDING TO THE PREVIOUS RULE.**

of prophecy. The pilot only has limited powers of foresight: he can listen to pilots ahead of him on the radio and he can look at the clouds. But he certainly does not know the distribution of thermal strength in the detail required. Nevertheless such analyses are useful and may suggest rules which, although not exactly correct, may give something close to the ideal result without involving prophecy. Gorisch[19], for example, is suggesting the rules shown in Table 4.

Presumably one could add that the MacCready ring setting should comply with the Litt-Sander rules.

The Gorisch rules leave the time-constant for the averaging to be determined and here there is scope for further work.

Conclusion

During the last few years, considerable advances have been made in understanding optimal strategies for cross-country flying using atmospheric convection. The MacCready concept has been clarified and the dynamics of dolphin flying are well understood. There are indications that more satisfactory instruments together with rules for their use may emerge from these considerations. The optimisations considered here are not the only ones to have received recent attention. There is, for example, the whole matter of using cloud streets when they are at some angle to the desired mean track *eg*, [21].

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Note on OSTIV Publications. OSTIV Publications consist of summaries of the lectures held at OSTIV Congresses together with other selected papers originally printed in *Aero Revue* or in *Technical Soaring*. They can be obtained from OSTIV, c/o DFVLR, D-8031 Wessling, West Germany. The prices listed below include postage.

Details relating to the publications mentioned in this paper are as follows:

Publication		Prices, DM Members	Non-members
XII	XIII, Vrsac, 1972	24	30
XIII	XIV, Waikerie, 1974	24	30
XIV	XV, Räyskälä, 1976	30	39
XV	XVI, Chateauroux, 1978	35	45

Papers presented at the XVII Congress, Paderborn, 1981, will be published in OSTIV Publication XVI. Various other publications are also available.

Water in the Total Energy Plumbing

BRENNIG JAMES

You are flying along straight and level when you suddenly hit a bit of down. Before you can do anything about it it vanishes, but a few seconds later it happens again. And so it continues at steady intervals.

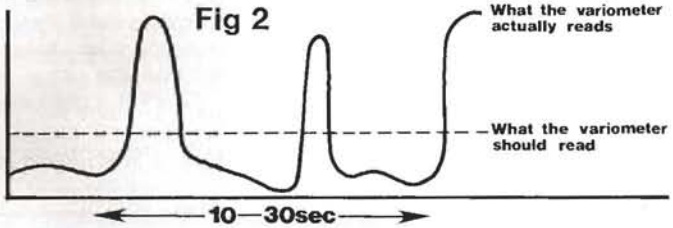
Similarly when you are circling the variometer reads low, but periodically you get a sudden surge of lift. Compared with what the variometer tells you the air feels remarkably smooth.

The cause of all this trouble is water in the plumbing of your total energy, probably picked up in the last cloud or rainstorm you encountered.

Fig 1

In the illustration you will see that at Stage 1 the air flow suffers resistance from the water it entrains, while at Stage 2 the air breaks through while the water runs back to reform as at Stage 1.

Fig 2



If we plot the air flow achieved for a constant rate of lift you will get the curve shown in Fig 2. If you are gliding between thermals you will find that the spikes point downwards. The system resembles the very early variometer systems which used the flow of bubbles through a U tube to indicate lift and sink.

The main solution to this problem in the air is to be able to diagnose it in flight so that you don't indulge in futile manoeuvres to centre on non existent cores of thermal.

Water traps are available which can be put into the plumbing, but the trouble is probably somewhere back in the tail, where you can't easily get at it. A tap which vents to cockpit static is the simplest answer, plus a few minutes spent to clear the water when you land, so that the plumbing works properly on the next flight.

An anxious looking Mike Bird, the organiser.

BGA WEEKEND March 13-14 Rugby Post House, Crick, Northants

PLATYPUS, who was one of the first to suggest a restyled BGA Weekend in "Tail Feathers" last June, p107, sums up, cogitates on next year and then adds his characteristic tuppence worth to a tribute in verse.

Peter Fuller illustrated the following extracts: "hang gliding", "building their own glider", "amazing live experiments" and "the rude song".

IMPRESSIONS BY ROGER BARRETT

This year's BGA Weekend was billed as a "Conference" with Gerhard Waibel, designer of the ASW-series of gliders, as the number one attraction. The programme, organised by Michael Bird, succeeded in attracting a younger audience than usual (who had each paid £5), and the conference room was packed with 200 delegates for most of the sessions. The Saturday night dinner and prize giving was also sold out well before the day.

Gerhard Waibel, a gentle German giant, has a distinctly British sense of humour. He showed how the ASW-22, the latest in the Schleicher stable, had evolved from the D36. He also told us in more guarded language what we may expect from the Poppenhausen factory in the next few years: improvements to the existing range of plastic gliders and a new K-a solo machine aimed at the club market.

Frank Irving brought us up-to-date on the latest thinking from OSTIV regarding optimising your flight path. Theory indicates we should be pulling up into thermals and pushing over to get out of them more vigorously — but not so violently that ancient sweet papers and the like hit the canopy.

George on cross-country tasks

Sunday included Chris Chapman and John Williamson on variometers, "Biggo" Berger and Ralph Jones on what is new from Schempp-Hirth (details of the Nimbus 3 and motorised versions of current gliders with quiet, fan-type, propellers and insufficient urge to launch you but enough to get you back home for supper), and George Lee on how to prepare for, and fly, cross-country tasks.

After lunch Brian Spreckley led a discussion for "the ambitious pilot". The panel of experts and the audience contributed to a lively session that ranged from: Whatever happened to the old, bold pilots? to what the German manufacturers think of Dick Johnson's flight test reports (and they *do* affect sales). Herr Waibel let slip that Helmut Reichmann's training plans for the next German team include inviting George Lee to their Easter training camp. Is this taking international co-operation too far we asked ourselves? But then we noticed George was reading a John le Carré paperback.

The Conference was voted a great success. The problem will be how to follow it next year.

PHOTOS: Naomi Christy

June Zealley and George Lee.

Maren Lee with Basil Meads, BGA president, and Doc Slater on the far left.

Tom Zealley, BGA chairman, on the left with Rika Harwood and Barry Rolfe, BGA administrator.

The Platypus Verdict

Where have all the young men gone?

Well, the first British Gliding Conference has been and gone. An extension of the BGA Weekends instituted by Roger Barrett when he was chairman, the idea was to attract younger pilots with a programme of informative talks about new developments in gliding and how-to-do-it instruction that would be helpful in the coming season. Who was the typical delegate? He (yes, predominantly male: as we've said before, most women appear not to have the money or the temperament to become deeply involved in gliding) is 42, has 700 hours and has done the 300km part of a Gold C; he has competition experience. He says he certainly or probably will come to another such conference. He thought the location Very Good, the accommodation Good and the food Fair. Forty-two years is an improvement on previous Weekends, but the proportion of under-25s is still tiny — only 2%. Is this typical of the gliding movement as a whole? If so, where do the adventurous air-minded young go? If it's to hang gliding, as I suspect, then the long term picture for gliding would not be a happy one. What does *your* club do to attract the under-20s and under-25s? How about a BGA award for the club which develops (and makes effective) the best scheme for encouraging such people?

If there is another such conference, as seems pretty certain, then we need to decide how general or technical the sessions should be. Maybe on one day we should have several parallel sessions for groups who are keenly interested in minority subjects like the mathematics of aerofoils, renovating an artificial horizon or building their own glider. One thing we need is a really good general session on *weather* — a practical "how to know in good time if it is going to be the Great Day" teach-in, with a hand-out that you can tape to your wall and refer to every day. Talking about weather, we had better not start the conference on a cracking soaring day or we'll again have the delegates staring out of the window and groaning. November to February, snow permitting, looks like the best period.

Not so much a pome, more a paean in the neck (or a crick in the neck?)

To describe verses penned in one's own praise as doggerel may be ungracious, but the following lines from Liz and Tony Segal make William McGonagall, bard of Dundee ("O Great Bridge Over The River Tay" etc) sound like Keats:

Tune — "Oh, Mister Porter"
Oh, Mr Platypus, what have you done,
We spent the weekend at Crick and had lots and lots of fun,
My husband has decided to get his Golden C,
So now he is down at Lasham, instead of flying me.
Gerhard[1], the blacksmith, forges the Twenty Two,
While Champion George shows us how to fly into the blue.
Frank[2] discusses negative thermals, Chris's[3] experiments all go wrong.
Now all join in singing Rika's[4] rude Argentinian song.

A few essential points of fact by way of textual illumination for those not present (not to mention avoidance of libel):

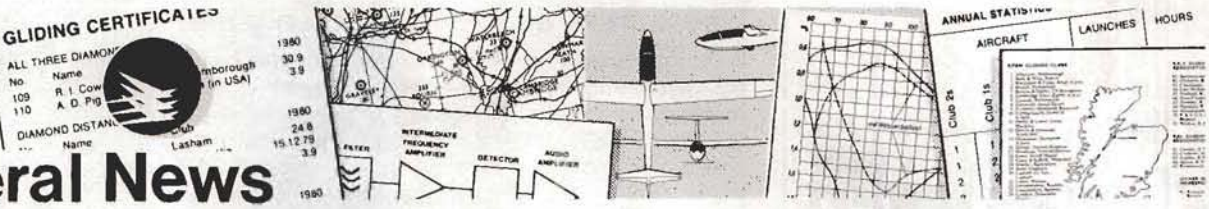
1. Gerhard Waibel comes from a long line of Bavarian blacksmiths; the most delicate tool of their trade was the 2-kilo (4½lb) hammer. I don't think he *forges* ASW-22s; I hope he makes real ones.

2. Frank Irving did utter some interesting, not to say weird, ideas, including one that to the lay ear, *ie* a fairly thick one, seemed to say that you frequently got more energy (*ie* lift) out of the ambient air if you hauled smartly back on the stick. Coarse pilots like Platypus have believed that for years, only to be put down by staid instructors for heresy and bad airmanship. Thanks, Frank. (See Frank's condensed version of the paper on p138.) Right of reply comes automatically with the first writ.

3. Chris Chapman's amazing live experiments did *not* go wrong, though like Ken Livingstone he got his tubes in a twist for a while. A real high-wire walker, he managed to give the impression of being about to fall off at any moment. Showbiz at its best. Also some useful advice about finding some scrubbers and stuffing them in your flask. We've never trusted any variometer since we discovered that the Italian for flask was *fiasco*, and Chris showed why we are right to be suspicious.

4. The rude song, not printable here, or anywhere else for that matter, was *not* Rika's. If we needed something worse than the Falkland Islands, that song of Mike Carlton's and Mike Pope's (why are all the pests called Mike?) should do the trick nicely. Think of the worst taste your fetid imagination can conjure up, then double it and you're getting warm. Enjoyed it very much, boys.

BGA and General News



BRIAN SPRECKLEY

As most of you will know by now, Brian Spreckley has left the Association after exactly eight years of employment as a national gliding coach.

When Brian was interviewed for a job with the BGA back in 1974, one of the interview panel made a note which said "great prospect — very, very enthusiastic". Brian's enthusiasm for gliding has remained with him throughout his many years of coaching and at the same time his personal gliding skills have taken him to become a National champion and a member of the British team at the World Gliding Championships.

We wish Brian every success in his new post as manager of the Booker Gliding Club and feel sure that his wholehearted commitment will be an enormous asset to them. We are very sorry to see him go but appreciate the need to face new challenges from time to time.

Barry Rolfe, *BGA Administrator.*

ANNUAL AWARDS

The annual awards are as follows: **Wakefield** trophy (longest flight originating in the UK): Tom Docherty (Scottish Gliding Union) for 621km from Portmoak to Challock in a Nimbus 2 on August 16; **Volk** trophy (longest declared flight by a pilot not holding Gold or Diamond legs on January 1, 1981): Gareth Cunningham (RAFGSA) for a 340.3km triangle, Lasham, Bath, Southam in a Kestrel 19 on August 2; **Frank Foster** trophy (fastest declared 500km triangle): Frank Pozerskis (Coventry) for a 538km triangle, Husbands Bosworth, Gainsborough, Salisbury in an ASW-17 on August 18; **De Havilland** trophy (maximum gain of height): Bruce Cooper (Deeside) for 27 800ft at Aboyne; **Rex Pilcher** trophy (earliest pre-declared 500km of the year by a pilot completing this task for the first time): Chris Starkey (Imperial College) for a 502.5km triangle, Lasham, Cooksbridge, Ludlow in an Astir on June 27 and the **Seager** cup (longest distance in a two-seater): Ted Lysakowski (Surrey & Hants), with Sue Hinder as P2, for a 340.3km triangle, Lasham, Bath, Southam in a Janus C on August 2.

National Ladder trophies: **L. du Garde Peach** (winner in club aircraft): Chris Starkey and the **Enigma** trophy (winner in private aircraft): Dave Watt (Airways).

BRITISH TEAM — 1983 WGC

The team will be chosen in early September by a voting panel comprising

★ the 1981 squad
★ the 1982 National Class Champions
★ the top five highest placed non-squad pilots in each of the three 1982 National Championships.

The return date for voting papers is September 20. Details of Class representation will be resolved by the squad in due time.

* * *

ANNUAL AWARDS AND TROPHIES

The annual awards and trophies have been reviewed to ensure they remain worthwhile and of interest to pilots. As a result the following new categories have been established:

★ Longest declared triangular flight (25/45% rule)
★ Longest declared O/R
★ Inter-Club League winners

Concurrently, the following categories have been abolished:

★ Maximum distance goal flight by a pilot not holding Gold or Diamond distance legs on January 1 of a given year
★ Cumulative distance achieved by three pilots from the same club
★ The greatest gain of full Cat instructors in a two-year period.

The remaining awards and trophies are unchanged. Full details are available from the BGA office.

It would be most helpful if you would kindly submit your claims as and when the achievements are made.

Ted Lysakowski, *chairman, BGA Competitions Committee*

PROGRESS WITH MOGAS

Following the dedicated efforts by Dick Stratton, BGA chief technical officer, in testing Mogas aviation fuel the UK CAA is likely to be the world's first authority to allow the use of motor fuel (Mogas) in standard light aircraft.

The CAA is thought to be soon sanctioning the use of 4-star fuel in named low-compression private-aircraft types, although eventual clearance in additional aircraft for training and other commercial work seems probable.

BARRON HILTON CUP 1982

The Hilton Hotels Corporation has sponsored, on a more international basis, the Barron Hilton Cup for 1982.

Flights may now be started from any gliding site in Europe between March 1 and September 15 and covers all three FAI Classes as well as the Club Class and two-seaters. Flights will be scored on the German index list (similar to our handicap index), and pilots may submit as many documented flights as he/she wishes in any of the five Classes.

The Classes will be scored separately (pts/km basis) and the best three in each Class will be awarded the Barron Hilton Medal. In addition to this the Gold Medal winners will be invited, together with one accompanying person each, to a gliding camp in Nevada, USA, during the summer of 1983.

Flight documentation (according to the Code Sportif) has to be submitted to the BGA not later than September 20. Competition rules and the German Index list are available from the BGA office.

Although somewhat late in announcing this scheme there is still sufficient time to have a go. It was created by Barron Hilton, of Hilton Hotels together with Professor Helmut Reichmann, who was the first pilot to win three World Championships. Helmut is the Competition Director and will check the winning entries before they are announced.

INSTRUCTORS LIABILITY INSURANCE

The Executive Committee have been concerned at the recent trend towards litigation over gliding accidents, particularly where a rated instructor is involved. I was tasked with investigating the provision of insurance cover for the BGA and/or its individual instructors (full and assistant categories) against such liabilities.

We have now been offered cover for "... any and all activities of BGA instructors whilst on duty including whilst flying in any glider or motor glider or glider tug aircraft", of up to £500 000. We consider the annual premium involved to be reasonable as it comes out at approximately £2.50 per instructor. However, this is payable as a "bulk" premium by the BGA for all registered instructors and there is no "contracting out" by individuals.

To recover the cost of the premium it has been suggested that we should invoice member clubs for their number of instructors *pro rata* when they register the names of the instructors with the BGA for annual renewal of ratings. Before taking any further action in this respect the Executive Committee would welcome your views on the need for this insurance, the premiums involved and the method of collecting the necessary funds.

Barry Rolfe, *BGA Administrator.*

INCORRECT MODIFICATION

A pilot of a Beech 23 Musketeer was severely injured during a forced landing last September at Chichester when he hit the instrument panel after the diagonal upper torso restraint had failed. The diagonal strap had been added by passing it through the airframe mounting fitting and then sewing it to the lap strap. The thread was weaker than normally used and the stitch pattern imprecise.

CAA comment: Any modifications of this sort are quite incorrect and if any other air-

craft have been altered in this way their owners/operators should obtain and fit the proper equipment — you may only need it once but it has got to be effective.

HAND-HELD TRANSCEIVER

The computer chip technology that revolutionised watches has now caught up with radios. REA International Ltd are marketing a new 720 channel hand-held transceiver weighing under 2lb which will pick up any frequency between 108-136MHz.

Manufactured by Terra Corporation, it includes rechargeable Ni-Cad batteries which last for up to eight hours.

NOT A GHOST AFTER ALL!

The "phantom glider pilot" spotted over Lake Muick on October 22, 1979 by two Bath & Wilts GC members and mentioned in their club news contribution in the last issue, p84, has been identified by Julian West.

He says it was Peter James of Lasham soaring his Libelle, which he uses as though it were a Nimbus 2, from Portmoak. Peter reached Aboyne but as he couldn't raise them on the radio he returned to Portmoak.

OBITUARIES

C. H. Gibbs-Smith

Charles Gibbs-Smith, who died last December 3 aged 72, achieved world-wide fame as an aviation historian while holding down a job on quite a different subject at the Victoria and Albert Museum. He especially enlarged our knowledge of Sir George Cayley by disclosing fresh details of Sir George's work written for old Victorian magazines. He specially championed the claim of the Wright brothers to have produced the first successful aeroplane and was most assiduous in examining any claims to have forestalled them. Thus he found himself up against what may be called the pro-French lobby, who championed the claim of Clement Ader to have flown 300 metres in 1897, and went to the trouble of publishing a whole book exposing the claim. His greatest work is his biography of Cayley, but in addition he produced a number of smaller booklets for sale at the Science Museum, all of them well worth buying.

As an odd sideline, Gibbs-Smith examined with his usual assiduity all the alleged evidence for flying saucers that he could collect, and actually came to the conclusion that there were such things.

A. E. SLATER

Viscount Gage

Viscount Gage, who died on February 27 aged 85, was the owner, among other property, of the Firle-Itford ridge on the South Downs where the first British gliding contest was held in 1922. It was also here that Kronfeld and others gave demonstrations in 1930 and after the war it became the Southdown GC's site for some years.

He succeeded to the title in 1912. He was not only diligent all his life in public work for his native Sussex, but entertained a large collection of interesting people, including the "Bloomsbury set", one of whom, Edward Shanks, published a poem about the gliders, though it only said what they looked like, not what they were trying to do.

A. E. SLATER

Aviation Art. The Guild of Aviation Artists have their annual exhibition at The Qantas Gallery, Piccadilly from June 16 to July 9.

Correction, S&G, April issue, p73. UK Records Single-Seaters and Restricted Class, 100km triangle should read: 119.68km/h, T. J. Wills, LS-4, 18.4.1981.

GLIDING CERTIFICATES

ALL THREE DIAMONDS

No.	Name	Club	1982
124	K. Stewart	Lasham (in Australia)	14.1
125	C. J. Wingfield	Midland (in Australia)	13.2

DIAMOND DISTANCE

No.	Name	Club	1982
1/185	K. Stewart	Lasham (in Australia)	14.1
1/186	C. J. Wingfield	Midland (in Australia)	13.2

DIAMOND GOAL

No.	Name	Club	1981
2/1087	M. E. Edwards	623 GS	21.2

DIAMOND HEIGHT

No.	Name	Club	1982
3/516	D. E. Findon	Coventry	30.1
3/517	E. R. Duffin	South Wales	30.9.81

GOLD C COMPLETE

No.	Name	Club	1982
863	G. A. Steel	Fenland	4.3
864	M. A. Clarke	London	31.10

GOLD C DISTANCE

Name	Club	1981
M. E. Edwards	623 GS	21.2

GOLD C HEIGHT

Name	Club	1982
M. Morris	Doncaster	6.2
A. Fowles	Shropshire	30.1
W. Aspland	Airways	27.10.81
G. Ivey	Yorkshire	5.9.81
G. A. Steel	Fenland	4.3
R. Nichol	Northumbria	7.2
W. R. Brown	Yorkshire	22.11.81
M. A. Clarke	London	31.10.81
A. W. Gillett	Bristol & Glos	17.3
C. C. Littleton	Bristol & Glos	17.3
R. J. Millward	Doncaster	22.11.81

SILVER C

No.	Name	Club	1982
6088	B. Goodyear	Woodspring	17.8.81
6089	K. Robinson	Wyvern	16.8.81
6090	T. Wiseman	Pegasus	23.3
6091	M. C. Moulang	Kent	14.3

BEWARE!

The dangers associated with launch cables dropping over electricity cables were highlighted in the August, 1978, issue of S&G, p165. The notes which follow, prepared jointly by the Electricity Council and the BGA, give advice on minimising the risk and recommended action in the event of such an incident/accident occurring.

Arthur Doughty, *Chairman, BGA Safety Panel*

Notes on Guidance

1. Ensure members know the location of overhead electricity lines in the vicinity of the airfield/gliding site. A map displayed on the club notice board or in the briefing room will assist. It is not essential to know the voltage of the overhead electricity lines but this information may be useful, especially if there are overhead lines of several types of construction in the vicinity of the site.
2. Include the telephone number(s) of your local electricity board(s) in your list of emergency telephone numbers.
3. Position the winch and launch point so that take-off is as closely as possible into wind and thus minimise cable drift.
4. Earth the winch. Your local electricity board will be pleased to advise on suitable methods.
5. Ensure the launch cable is in good condition, free of broken strands, kinks, worn knots, etc, so as to minimise the risk of cable breaks. If a cable parachute is used ensure that it is of optimum size; too large a parachute can cause excessive drift in crosswinds.
6. Do not permit attempts at kiting in conditions where there is a risk of the launch cable falling across electricity lines.
7. If a cable should fall across electricity lines inform the electricity board immediately, giving the location and a brief description of the accident.
8. Pending arrival of the board's engineer, warn members that contact with the launch cable could be dangerous. Every endeavour should be made to keep members, the public and livestock well clear. In **no** circumstances should attempts be made to recover the launch cable either by hand or with sticks, hooks, etc. The line though apparently "dead", may be automatically re-energised at high voltage.
9. If the launch cable is still attached to the winch/towcar the driver should **jump** and remain clear. **Never** climb down making contact with the ground while still touching the winch/towcar.
10. If a person receives an electric shock and is still in contact with the live source, no attempt should be made to break the contact until the electricity board's engineer confirms that the current has been switched off. Remember that the voltages of overhead electricity lines are far in excess of the normal domestic supply.
11. Knowledge of resuscitation methods in the event of cardiac arrest and/or respiratory failure may prove invaluable in saving the life of a person who has been electrocuted. Instructions in the methods of artificial resuscitation are displayed in the clubhouse.
12. The dropping of a launch cable across electricity lines is clearly an accident/incident resulting from gliding operations. As such, a report must be made to the BGA without delay as is required by BGA Operational Regulations. The appropriate parts of a BGA Accident/Incident Report form should be completed.

1982 Meeting of the International Gliding Commission

Brief extracts from a report by Tom Zealley, BGA delegate to CIVV, who attended the Commission International de Vol à Voile (CIVV) meeting at the FAI HQ in Paris in March with Ted Lysakowski as an observer.

The meeting stood in silence for a minute as a mark of respect for Pirat Gehriger, a past CIVV president, who died recently.

Rules. Tor Johanneson proposed a verbal amendment to the Sporting Code Section 3 which was accepted. Under 1.3.2.1 Free Distance Flight is to read as follows after the existing wording, "Even though another course is declared a flight may always count as a free distance flight."

The help of OSTIV has been requested prior to considering approval of the clock camera aerograph for speed records.

Club Class. Per Oberg reported on this sub-committee and left an impression that the concept was not flourishing as strongly as hoped for by its original proponents. The 30 entries for the forthcoming European Championships were disappointing.

World Championships. The 1985 Championships will be at Rieti, Italy with the 1987 Championships in Australia.

European Gliding Championships 1982. Many countries were entering the maximum of six and a total entry of 85 seemed likely. After discussion it was agreed that the Bohli compass would be permitted and that blind-flying instruments could be rendered inoperable rather than removed.

SSA Soaring Convention 1983. Bernald Smith attended to outline plans for the 1983 Convention at Reno. The meeting agreed to accept his invitation to hold the 1983 spring CIVV meeting in Reno, subject to FAI approval.

Lilienthal Medal. There were seven nominations and on a secret ballot George Lee was the successful candidate.

Election of officers. Bill Ivans was re-elected president with the existing six vice-presidents.

NATIONALS FLAPS

To lock or not to lock

TED LYSAKOWSKI, chairman, BGA Competitions Committee

The purpose of this article is to seek your views on the various issues relating to a superficially simple question: Is it or is it not a good idea to allow 15 Metre ("Racing") Class gliders to compete, **flap locked,** in the Standard Class National Championships?

The point may at first sight appear somewhat obscure and of interest to competition pilots only. The latter is true in the near term; longer term the answer may have a more fundamental effect on the movement in the UK so, even if you are not currently a competition pilot, do not be discouraged but read on. There is a need to develop the BGA position on this matter later this year in good time for the 1983 season and that position will depend on the extent and substance of your response.

Same as World Champs

The present structure of British Nationals, as developed in late 1979, is that contests are held in the principal FAI Classes of Open, 15 Metre and Standard, *ie* along the same lines as World Championships. Standard Class gliders automatically meet the 15 Metre Class requirements and both Standard and 15 Metre Classes qualify for Open; both are therefore *ipso facto* eligible to fly in the respective competitions, albeit at some performance disadvantage.

Changes in the reverse direction are not acceptable and on the main issue which concerns us at present the FAI Sporting Code (Section 3, dated 1981) declares that in the Standard Class the "lift increasing devices are prohibited, even if unusable". There is no question of any gliders not meeting that requirement being accepted for the Standard Class World Championships.

We are not obliged to align UK Championships with the FAI Class structure and are free to develop local practice which reflects our requirements. Due to successive relaxations of the original FAI Standard Class rules (initially more akin to Club Class) a situation has arisen where ostensibly the only difference between 15 Metre and Standard Classes is in the presence of flaps, and some glider types of one Class have been derived from their counterparts in another. Also, the complete division of UK Nationals into entirely separate events promotes interchange of pilots and gliders between Classes. Consequently there is a school of thought that believes that a "mixed" contest comprising Standard and 15 Metre gliders, the latter with flaps locked, would be a logical and beneficial development.

In deference to the FAI Sporting Code the "mixed" contest outlined above could no longer be named Standard Class Championships: it would therefore amount to replacing that event with an "Unflapped 15" Championship.

So what is the best course of action? The choice appears to be a political one because technical considerations do not give any useful clues. The 15m gliders intended for flying in the locked flap configuration would require new type C's of A but — subject to some confirmatory flight tests — it is most unlikely that this would present any problems. From the performance standpoint the optimum L/Ds of Standard Class are somewhat lower than those of 15 Metre, but there is some overlap and in any case the climbing ability of the latter would undoubtedly be impaired with the flaps locked in zero or near zero position.

At the first approximation it therefore seems unlikely that one or the other Class would have any inherent performance advantage. However it is true that first generation Standard Class gliders would encounter an influx of predominately modern opposition and would therefore find it increasingly difficult to compete on equal terms.

Help raise standards

Other considerations are perhaps less clear-cut. If we opt for a UK local "Unflapped 15" category the Standard Class pilots would have greater opportunity to fly against high calibre opposition from other Classes. Given the generally good availability of 15m gliders, the "Unflapped 15" would become very highly competitive, thereby helping to raise the general standards of competitions and cross-country flying performance. Furthermore the 15m pilots could maximise competition utilisation of these gliders by flying on approximately equal terms in two Nationals.

On the other side of the coin is a question whether that kind of a helping hand would be beneficial or detrimental to the development of Standard Class in the UK. In the formal sense the Standard Class would be deprived of its own National Championships on the somewhat nebulous grounds of *pro bono publico*. The present competition structure allows each FAI Class to stand on its own merit and to flourish if the pilots vote for it with their own feet. The move to "Unflapped 15" could be seen as being unfair to the Standard Class or, more specifically, as an attempt to artificially promote the 15 Metre Class. With the increased competition scope the clubs and private owners might be more readily induced to invest the additional 15% or so of capital in the complete outfit (glider, trailer, instruments etc) and buy 15m gliders for their greater versatility. The true strength of the UK interest in the Standard Class would become more difficult to assess. This line of reasoning says leave the Standard Class alone. If there is a need to provide more competitions in the 15 Metre Class let us look at that problem without interfering with other Classes.

Increase in span

Assuming you are still with me let us throw something else into the equation. Another school of thought raises a much broader issue. It postulates that the present distinction between the 15 Metre and Standard Classes is very largely artificial and therefore it matters little what we do in the near term: the principal fault is in the span limit of the 15 Metre Class. Thus, regardless of our stance in the locked flaps issue, we should advocate an extension of that limit to around 16 to 17m. This would lead to better optimisation of the performance, cost and ground handling factors than is available at present in the 15 Metre Class; it would also result in clear and natural performance gaps between the three Classes.

In a typical year this committee gets lobbied on many issues; the individual inputs, together with formal and informal feedback from competitions, are taken into consideration when developing the comps/awards related rules and practices. In this case we are turning to you to invite your views and ensure the broadest possible consultation on the problems involved. The main issues are set out in this article; there will no doubt be other related facets which will occur to you on reading this. I also trust that you will be moved to put pen to paper and write to the BGA office for my attention, giving the following information—

★ Whether on balance you are in favour or against the idea of a mixed 15 Metre (locked flap) Standard Class Nationals.
★ Your views on the span issue.
★ Your Class affiliation if any.

We look forward to hearing from you!

BOOK REVIEW

Civil Aircraft Markings 1982, edited by Alan J. Wright and published by Ian Allan at £1.25.

Aviation enthusiasts will be interested to know that this comprehensive and well established annual has several new features including radio frequencies of British airfields and airline codes.

50 YEARS AGO — Doubtful Meteorology

A. E. SLATER

In mid-1932 British gliding seemed to genuine soaring enthusiasts to be in the doldrums, under a BGA chairman whose only interest was to collect money for a gliding school so as to pose as "The man who got Britain's youth into the air," and his incompetent stooge, the secretary, of whom people were heard to say "he couldn't run a fried fish shop".

S&G was being edited by Frank Entwistle, who had been official meteorologist at the 1922 Itford contest. So we were all looking forward to lots of helpful meteorology; but alas, as official meteorologist to the RAF he had the cautious civil servant's outlook that prevented him committing himself to any statement not to be found in standard textbooks.

Take clouds: every "cloud atlas" said of cumulus clouds that they formed in the morning, grew big in the afternoon and "flattened out" in the evening, as if every cumulus had a membrane round it like a giant amoeba, so that if you squashed it vertically it had to expand laterally. I once watched evening cumulus forming over the Clee Hills above Ludlow: each formed anew as a flat cloud and vanished in about two minutes. Another evening a congested cumulus near Gravesend disintegrated at all heights simultaneously without a trace of "flattening".

From Ireland to England

A professional lecturer in meteorology said that "The air in a cumulus cloud over England in the afternoon must have left the ground in Ireland in the morning." So at least he knew what level the air came from.

Not so a bacteriologist who, learning that there were more bacteria in clouds than outside them, concluded that they deliberately chose to live in clouds because the moisture was good for them.

As to professors of meteorology, Dr Walter Georgii, head of the German gliding organisation, had already written in 1923 that thermals were too weak to sustain a glider and anyway gliders were not nimble enough to keep within them. Then in 1935 Dr David Brunt, then the only professor of meteorology in the British Empire, was lecturing at the Imperial College GC, of which he was president, and mentioned slopes, thermals, cumulus, cu-nim and cold fronts, then stopped. A student plucked up courage to ask about soaring in lee waves and was told, to the accompaniment of a noise that sounded very like "pooh-pooh", that the feat was quite impossible. The student felt too cowed to say that it had already been done two years before and reported in S&G.

BGA ACCIDENT SUMMARY — Compiled by ARTHUR DOUGHTY, Chairman, BGA Safety Panel

Ref. No.	Glider Type	BGA No.	Damage	Date Time	Place	Pilot/Crew Age	Injury	P/Hrs	SUMMARY
1	Capstan	1118	S	04.10.81 17.00	Culdrose	40	N	385	On fifth circuit P1 was monitoring pupil's approach which apparently was progressing satisfactorily until just before touchdown when P2 opened airbrakes a little more resulting in undershoot and touchdown in vicinity of graded lip of runway threshold and soft undershoot breaking fuselage in two.
					P2	36	N	? 28 Flts	
2	K-13	2471	M	17.10.81 13.29	Duxford	44	N	18	Towards end of ground run glider ran over perimeter track which pilot claims caused glider to veer and the port wingtip struck trailing edge of other glider parked at launch point.
	K-6CR	1323	M						
3	K-13	1536	W/O	21.11.81	Cwm ddu Valley Nr Talgarth	35	M	830	After a period of hill soaring with a lowering cloudbase, P1 found he was low and unable to gain height for return to site. Attempted field landing in valley briefed as unsafe because of effects from hill upwind. Substantially undershot, striking tree, rolling and hitting ground inverted.
					P2	36	S	50	
4	Astir CS	RAFGSA 507	M	06.09.81 13.19	Syerston	?	N	114	At about 20-30ft the winch launch slowed and the pilot was seen to level out and release the cable. Almost immediately the airbrakes were opened fully and the glider struck the ground heavily on the mainwheel.
5	K-2B	2110	M	01.11.81 16.00	Sunderland A/F	?	N	?	On aerotow at about 300ft when some turbulence was encountered and the side hinged front canopy opened and rear canopy flipped back. Aborted tow and landed in stubble field without further damage. Pilot believes 3 ring main canopy release of his sport parachute rig caught canopy release.
6	Std Cirrus	1621	S	12.09.81 17.00	Nympsfield	35	N	154	On last stage of final glide into wind at 700ft one mile out ran into rain, turbulence and strong sink associated with Cb. Down to ground level 400yds out approaching trees and stone wall. Tried to convert speed to height to clear but tail hit ground and glider collided with obstructions.
7	IS-28M2A	G-BHRS	M	01.11.81 16.38	Woodford A/F	40	N	90 pwr 360 gliders	Motor glider waited on cross runway for winch launch to proceed and the cable broke and fell on operational runway. Motor glider taxied on to active runway to backtrack to launch point and the propeller caught in the unobserved tangled cable.
					P2	25	N	40 gliders	
8	ASW-20L	?	M	01.06.81 13.00	Booker	50	N	2400	Glider became airborne at start of aerotow but port wingtip caught in long grass inducing a ground loop.
9	Vega	2578	S	24.08.81 16.00	Newport Pagnell	43	S	2000	Competition cross-country. Selected partially burnt stubble field with National Grid pylons and cables about 150yds from threshold. Cleared these at about 150ft and collided with 11kV cables along boundary of field supported on posts which were not observed against black background.
10	K-8	1563	S	16.01.82 14.00	Dallachy	47	N	46	Due to turbulence and crosswind overshot centre line when turning from base leg to finals. Flew into wind to regain approach path, cleared adjacent low fence, then turned to line up. Bounced and drifted sideways striking the boundary fence with tailplane.
11	Sport Vega	2758	N	24.01.82 12.45	Parham	32	N	57	Over-ran aerotow cable so aborted launch but did not open canopy prior to preparing for another tow. States pre-flight checks were repeated including canopy locked. At 250ft canopy opened. Pilot held it closed, aborted tow and landed safely.
12	K-21	2764	M	23.01.82 11.53	Long Mynd	36	N	373	After difficulty in locking the rear canopy, P1 states he closed and locked it a second time, checking by pushing up on side handles. At about 20ft on winch launch the rear canopy flew open and shattered. Launch aborted and landing made without further incident.
					P2	?	N	25 P1	
13	K-8B	2332	N	03.01.82 10.50	Ringmer	22	N	240	A crosswind winch launch with fluctuating speed during which the glider drifted. The winch stalled when the glider was at 750-800ft and pilot released. The end of the cable with parachute fell on a car in the club car park causing damage to the car.
14	K-7	2665	S	27.01.82 13.10	Parham	63	M	1460	After hill soaring with early *ab-initio* pupil P1 positioned on base leg between hill and site. Airbrakes were opened to reduce excess height and the tug was seen to the right approaching from the hill. P1 concentrated on tug until it passed and failed to adequately monitor his own height and position. On turning finals he found he was undershooting to a landing in trees on downwind boundary with insufficient height, time or space to take alternative action.
					P2	29	S	45min P2	
15	Libelle	1935	M	13.08.81 16.00	Basingstoke	41	N	408	Competition cross-country. Approach into wind into long grass field over a low building. Overshoot developed and as upwind boundary hedge was approached a ground loop was induced resulting in failure of one U/C leg and collapse of undercarriage.
16	Janus	?	S	31.01.82 14.30	Lasham	29	N	246	After normal aerotow take-off the airbrakes were seen to open. Tug pilot noticed poor climb and saw brakes open and tried to draw attention unsuccessfully. Slow climb maintained until glider released at 350-400ft and commenced 360° turn. Wingtip touched ground while still turning.
					P2	37	N	?	

Overseas News

The static display at the SSA's Convention photographed by Marjorie Hobby.

Please send news and exchange copies of journals to the Overseas Editor: A. E. Slater, 7 Highworth Avenue, Cambridge, CB4 2BQ, England.

Argentina

Gonzales Chavez — 1982. An international contest designed to give the organisers of the 1983 World Championships a chance to put their arrangements to the test was held at Gonzales Chavez, Argentina from January 10-23. Unfortunately only eight foreign countries participated (France, Germany, Chile, USA, Spain, Austria, Switzerland and Poland) giving a total of 16 pilots in the Standard Class and 11 in a combined Open and 15m Class (handicapped). Some of the leading visiting pilots were only able to stay for part of the contest, so that the final results were distorted.

There were ten contest days. Karl Striedieck (USA) won on six days and Alvaro d' Orleans-Borbon won four of the five days he flew. Jacques Rantet was the most successful French pilot. The leading results were Open/15m Class: 1. Rizzi (ASW-20); 2. Urbancic (ASW-20) and 3. Mattano (Jantar 2B) — all from Argentina; Standard Class: 1. Riera, Argentina (Jantar); 2. Schramme, W. Germany (Std Cirrus) and 3. Striedieck, USA (Jantar).

Some indication of the potential of the contest area is given by the fact that on Day 4 all pilots completed the tasks — a 759km quadrilateral with a winning speed of 96km/h and a 540km triangle at 101km/h. The Open/15m Class had three other tasks in excess of 500km and three over 300km. Two days were scrubbed, one because of 8/8 cloud cover and the other through strong winds.

The French team manager was optimistic about the prospects for a successful World Championships. The airfield is spacious and the accommodation, although 30 miles away, of a high standard. The Met forecasts were very accurate and the task setting good. Less encouraging were the overzealous military men who sometimes prevented crews from approaching close enough to identify gliders finishing. There was also some laxity in the startline radio procedures.

The risk of strong winds means that gliders had to be de-rigged each evening instead of simply being picketed. Teams going to the Championships are advised to take as many spare parts and repair materials as they can muster as they may not be available on the spot.

France

Junior Championships. The French Junior Championships will be at Brienne-le-Château from August 15-27. Although intended for young pilots new to contest flying, there is also room for the more experienced and foreign entrants are welcome. The organiser is Jacques Pradié, BP 912X, 54044 Nancy Cedex.

600km in December. Louis Abeille flew a 600km triangle in his LS-3 on December 5, entirely in wave. Starting from Vinon he turned Ancelle, just north of Gap and Chatillon (15 miles east of Aosta) in a flight lasting 7½hrs. It was a trial run for a hoped for 1000km triangle starting from Vinon, and was carried out under a cloudless sky with a strong mistral blowing down the Rhône valley.
(All these items were translated from *Aviasport.)*

New Zealand

New Zealand Championships. Leading results of the 16th New Zealand Nationals, which had 11 contest days out of a possible 14, were: Open Class, 1 Tony Timmermans (ASW-20) 9999; 2 Lindsay Stevens (ASW-20) 9741 and 3 Ian Finlayson (ASW-17) 9198pts. Standard Class, 1 Peter Lyons (LS-4) 8956; 2 Max Stevens (Std Cirrus) 8441 and 3 Heiri Berchtold (Std Jantar) 7889pts. The task setter was Ross Carmichael.

Incidents: Landings on Kaimai ridge in extreme turbulence included two in trees; one of these pilots had to wait seven hours for rescue. A pilot complained about his rough tow, but it turned out that the tug pilot had an angry bee keeping him company in the cockpit. Ian Finlayson was circuiting a paddock for landing when the shadow of his 20m wing "spooked" a herd of cattle in the next paddock and sent them galloping around, thereby setting off a 5kt thermal — he completed the task.

USA

Impressions of the Soaring Society of America's National Golden Convention, held at Houston, Texas from March 3-7. Day one: The first session was at the Albert Thomas convention centre where a rigged glider on the forecourt was a nice touch. Sandor Aldott presented a soaring photographic extravaganza; Raouf Ismail spoke on "microprocessors in the cockpit" and Wally Scott on "record and cross-country flying records". There was a marvellous static display of 21 gliders in the central hall surrounded by booths representing 32 firms.

Day two: Klaus Holighaus spoke on "New engine systems for high performance sailplanes"; Martin Hansen on "reduction of drag through laminar bubble blowing"; Bill Scull and Tom Knauff did friendly battle over contrasting techniques of instructing in the UK and USA and Dick Johnson, Tom Smith and Carl Herold were amongst others giving papers. Usually there were two or three sessions going on all the time which often made the choice very hard.

Day three: At the old timers "breakfast" (there were different ones each morning) it was good fun hearing the stories from the old days — some had been gliding for 50 years. There were many more speakers during the day with 28 papers presented over the three days. At the banquet on the Saturday night for 450 delegates there was an enthralling speech by the guest of honour, Dr Story Musgrave, the astronaut and glider pilot.

In all a fantastic four days — one I would urge anyone in our sport to attend. Reno, Nevada is the next one (March 21-27, 1983). Wave camp flying plus superb local skiing makes it an exciting venue. *(Extracts from an account by Marjorie Hobby.)*

Airmail Postal Card. At the SSA's annual convention in Houston there was a special ceremony (on March 5) to mark the issue of an airmail postal card to mark the 50th anniversary of founding the Soaring Society of America. The designer of the card is

Robert E. Cunningham who has previous aeronautical designs to his credit. Much of the effort which led to the eventual production of a gliding "stamp" was due to the perseverance of Simone Short whose husband Jim was, until recently, Schweizer's sales manager.

The card should be significant in terms of helping to increase general awareness of the sport. — **W. G. Scull.**

Triumphant Eagle GC members photographed with George Lee. Full details under their club contribution on p142.

CLUB NEWS

Copy and photographs for the August-September issue of S&G should be sent to the Editor, 281 Queen Edith's Way, Cambridge CB1 4NH, tel 0223 247725, to arrive not later than June 8 and for the October-November issue to arrive not later than August 10.

April 14, 1982 GILLIAN BRYCE-SMITH

AVON SOARING CENTRE (Bidford Airfield)

February and March gave several good soaring days when there were more conversions to glass single-seaters. Two Std Cirrus head our fleet with a second two-seater due in May.

Membership continues to grow as does the number of visitors from other clubs. During three days over Easter we logged 65hrs of soaring. Ralph Jones has been flying his Nimbus 3. Our congratulations to Phil Jones on going solo soon after his 16th birthday and on his Bronze legs and a 5 400ft climb for Silver height.

D.J.C

BLACKPOOL & FYLDE (Chipping)

Three major changes have taken place recently. Thanks to our healthy financial state we have bought a second K-13, though had hopes of a Sports Council grant. The hangar extension from 60 x 60ft to 60 x 90ft is being finished off and half the extra space will be for gliders and the rest as a MT workshop. Costs have been minimised by doing the work ourselves.

The piece of land protruding into the middle of our strip has been exchanged for an unwanted part of the site and we have doubled the effective width. This will permit four-cable launching after many months of culverting, levelling, ditch filling and so on.

J.C.G.

BOOKER (Wycombe Air Park)

There is a new name on the gliding scene though it has a familiar ring. After months of speculation Airways and Thames Valley GCs merged on April 1 to form Booker GC, a completely autonomous gliding operation under new management. Brian Spreckley has taken on the job of manager (see BGA News) while Chris Rollings and Sally King stay on as CFI and deputy CFI respectively, creating a formidable team giving the club the greatest possible chance of success.

The club, which is being run by the members through an elected committee, has its own lease on the airfield and employs its own staff (who will have "new" office accommodation). The presence of a manager should take the burden of administration from the flying staff.

In anticipation of a greater number of courses, lecturing facilities and sleeping accommodation on site will be an advantage (once we've finished the decorating).

So Booker has taken on a new face and other club members are welcome to visit us.

A.C.

BRISTOL & GLOUCESTERSHIRE (Nympsfield Airfield)

The clubhouse has been redecorated for the coming season with the near completion of preparatory work on the new field extension and levelling of the car park, as well as the usual C of A work.

The BGA ASW-19 has been with us, giving many a first chance to fly a Standard Class machine.

The treasurer reported a poor year financially at the AGM with a demanding programme for the coming year to meet heavy financial commitments. Awards were presented to Dave Hodsman, Tom Bobbin and Richard Smith for flying achievements, while the Rex Young award for a novice went jointly to "The Modellers". A new trophy for the most deserving instructor went to John Patchett and Graham Morris. This is a beautiful silver salver to be presented annually in memory of Jim Webster, donated by his wife Barbara. Doug Jones was appointed vice-president.

We hope to attract new members at our open day on May 23. The Western Regionals, at Nympsfield from June 19-27, are well subscribed.

J.R.B.

BUCKMINSTER (Saltby Airfield)

Our annual dinner-dance on March 13 was well attended and much enjoyed. Steve West collected the CFI's trophy for his Gold C; Mick Jordy the Webster trophy; Trevor Murphy the Chairman's trophy for the longest flight (he doubled up on this with the best competition position); Bill Munns the Frank Eaton memorial trophy for services to the club; Mick Willet the Top of the Ladder award; Pete Goodwin the Longest Silver C award and Kevin Tarrant the Dave Davenport memorial trophy for the first 100km of the year.

Our K-13 has had its wings recovered and a new canopy bubble fitted.

T.C.M.

CAMBRIDGE UNIVERSITY (Cambridge and Duxford)

Our annual dinner was again at Jesus College when trophies were awarded to Sigfrid Neumann, Tim Press, Ashley Birkbeck, Peter Baker and John Glossop. Considerably less formal was the "warming" of our new Duxford clubhouse when curry and cakes were greatly appreciated after the day's flying.

Pilots visiting Duxford are welcome but please land on the south side of the runway and if you know you are coming, ring the clubhouse on 0223 832197.

P.E.B.

COVENTRY (Husbands Bosworth)

March 26 saw the last of the winter dinner parties enjoyed so much by members. We have a very active social scene during the winter with dinner parties every two weeks when about five or six couples plan, shop for and cook excellent four-course meals, sharing the expense, to which other members and friends are invited. These and other social functions help promote a very friendly atmosphere when little or no gliding is possible.

There has been a very good start to the season. Graham Smith will be our tug pilot. Our CFI, Peter Walker, unfortunately had to resign due to injuries received in a motoring accident. Thank you for a job well done Peter, and our best wishes for a rapid recovery. The new CFI is Les Johnson. Also, our thanks to Harry Middleton for his three years as chairman. Chris Thomas will take over.

The club's four Bocians have been refurbished by our engineer, Lou Glover. We are looking forward to joining with Dunstable, Saltby and North Weald for the Inter-Club League on May 1-3.

Finally, congratulations to Roger Goodman who has been invited to train with the Junior Squad.

N.B.

DEESIDE (Aboyne Airfield)
The year started badly with heavy falls of snow and no tugs. But things have improved recently. Our new Sport Vega I is flying and our Rallye has a nice smooth new engine, which matches our nice big overdraft!

Spring wave and the early visitors arrived together and produced seven Diamonds for March alone.

J.R.B

DEVON & SOMERSET (North Hill)
After countless launches, many thousand flying hours, a change of name and acquisition of desirable and secluded freehold premises with semi-detached ridges, the erstwhile Taunton Vale GC at last completed its Silver. Congratulations and gratitude to all those, past and present, whose boundless efforts, enthusiasm and enterprise have created the North Hill we love. Best wishes and hopes for eventual achievement of Gold and Diamonds. Long may we soar silent and free in south-western skies.

Although relatively late on the gliding scene, the club has numbered some pioneers of gliding in the south-west as members. A celebration dinner is planned in the autumn — interested past members please contact Andrew Blackburn, "Eastlands", Lyddons Mead, Chard, Somerset, enclosing a sae.

The club fleet now consists of two K-13s, K-8s, K-6cR, and a Club Astir with the Capstan having been sold after 33 309 launches.

After a patchy start to the season, we had a 4000ft cloudbase on Easter Sunday. In early April we welcomed officials and CFIs of various SW clubs for an airing of queries and problems with BGA personnel.

Congratulations to Gordon Peters, Tony Stockwell, Simon Minson and Chris Dobbs on joining our instructors, Chris celebrating with a duration.

I.D.K.

DONCASTER (Doncaster Airfield)
February and March were quite eventful. Mel Morris, CFI, gained a Gold height in wave on February 6 and nine members went solo during the two months, special mention being given to Richard Stirk who managed it on his 16th birthday and Garry Senior who missed his by a few days.

The club Bocian has gone to the North Wales GC to be replaced soon by a K-7 and we have been enjoying the T-21 loaned to us for the summer. Both our winches are in regular use giving a four-cable system which has improved our launch rate considerably. The next project is to construct a cable welder to eliminate the problems caused by knots.

We were at home at Easter to Kirton Lindsey, Camp Hill and Winthorpe for the first leg of the Northern Inter-Club League.

V.F.F.

HAMBLETONS (RAF Dishforth)
We are now flying again. We are sorry our CFI, Kevin Kiely, has been unable to continue, and thank him for all his hard work over the past year, for the example he has set (whether in the air or in the most menial task at the launch point) and for the interest he has shown in each member's progress.

At the AGM, awards were presented to John Gao (best *ab-initio*) and Martin Cummins (best cross-country). Our chairman, John Jones, also received a "thank you" award, a picture of his tug CUBI.

Congratulations to Gareth Morgan on going solo, and also to Sarah and John Wrigley — I believe our first brother and sister to solo on the same day!

J.P.

HEREFORDSHIRE (Shobdon Airfield)
Tony Greatrix organised our dinner-dance which was voted an even greater success than his efforts last year. Alice Maitland won a Flymo which she hopes Anthony will make good use of during the summer.

March 13 brought a 20kt north-westerly with astonishing "6 all round". Thermals and streeting into the distance. Rhoda Partridge (304) blundered into wave off the top of a thermal and got to 8000ft. The new club Vega flew for the first time that day. Pilots are delighted with her.

R.P.

HUMBER (RAF Scampton)
As you can see from the heading, we have moved to our new home. We are getting sorted out gradually and have started work on the clubhouse. Our thanks to Paul Goddard, Dick Gibbs, Steve and David Wilson, Tony Smith, Trina Jennings and the many others who helped, also the TA who moved the heavy gear, not forgetting Paul Jenkins.

We have already had some good soaring; Andy Ratcliffe has returned from an instructors' course at Bicester to which Paul Jenkins is going in June and three members have entered the Inter-Services Regionals.

K.M.G.

INKPEN (Thruxton)
Tony Gordon has taken over from Ray Hunt as CFI and Peter Payne from John Francklow as chairman. The club owes an enormous debt to Ray and John for the time and energy they have devoted to the club.

Congratulations to Andrew Hunt on passing his instructors' course and to Robert Edgson on his field landing at Old Sarum. We now have three IS-28Bs, fly every day except Mondays and Tuesdays and aerotows are available. We welcome visitors and are running three-day courses with no more than four per course to give maximum flying.

P.P.

KENT (Challock)
March brought the butterflies out of the woodwork to queue for check flights, tempted by 5100ft asl cloudbases and several blue thermal days. Congratulations to Geoff Johnson, Ron Buckland and Philip Holliday on going solo and to Mike Moulang on gaining his duration on our ridge.

Dick Verity and Peter Dunlop's PIK 20 has arrived and we are drooling over Dave Selwyn's ASW-17. Tim Gardiner's Vega will soon be back from its winter at Portmoak to join his Kestrel and Astir.

Our very vocal AGM in March was attended by some 70 members. John Reeves takes Jo Janzso's place on the committee, Jo retiring after many years of hard work.

Our holiday courses started well with members on the first one getting some ten hours' soaring each. Now that we have a resident tug pilot we can ensure seven-day launch availability.

J.H.

LONDON (Dunstable)
Our cross-country efforts have been given an impetus this year by the institution of a standard 100km triangle, Thame Airfield, Silverstone. Robin May and Simon Carr were the first to complete the task in March. Cross-country efforts then seemed to degenerate into a competition between Robin and Warren Kay until the Easter Comp when almost everybody flew; Sunday and Monday being particularly good.

There has been much effort devoted to replacing aircraft letters with competition numbers in accordance with the whims of the BGA Competition Committee.

Among the subjects discussed at our annual forum on April 3 was the possibility of euthanasia for members over 65; but it was decided we were not that awful so some other explanation must be found for the fortifications Colin Cruse has built at the club entrance.

F.R.

MARCHINGTON (Marchington)
All efforts are now being directed to raising cash before the site auction in September. Just about everything movable is being sold including a K-6cR and a K-13 trailer. However flying is continuing and we welcome another privately owned Libelle bringing the total private owner fleet to 11.

S.D.B.

MENDIP (Weston-Super-Mare)
We welcome Jon Toy to our band of instructors. Congratulations to John Hocking and David Bagshaw on going solo and to Doug and Jon Massey on their Bronze legs. John Bridge and Angelos Yorkas came back from the French National Centre at St Auban with ripping yarns and Diamond heights.

Gary Humphreys is well into a sponsored slim — the proceeds will go to buy an audio vario for the club Skylark 4.

The club K-8 has been recovered during the winter and we are indebted to Thoby Fisher for the loan of his Meise during this period.

C.B.H.

MIDLAND (Long Mynd)
Congratulations to Charles Wingfield. He gained his Diamond distance at Waikerie — his third Diamond in two years.

Note to Club News contributors. As space is so limited we regret there just isn't room for engagement, wedding and birth announcements.

Our second K-21 has been delivered and will no doubt be competing in our new weekend task series. Barbara Reed is our capable second winch driver for the season and congratulations to Vanessa Taylor on going solo.

Our task week is August 21-30; entry forms and details from Jancis Scarborough, 15 Burway Road, Church Stretton, Shropshire.

M.A.

NORTHUMBRIA (Currock Hill)

Alan Scott gained his second Bronze leg, Silver height and duration in the same wave flight and Rob Thompson completed his Silver C with a duration — both at Portmoak.

We have sold the Swallow to an internal syndicate and replaced it with a Skylark 2 from within the club. We are hoping our strip will be widened this summer for us to land and take-off at the west end without moving aircraft.

Our instructors should soon total 16 if three members are successful on their courses.

Mike Charlton and Alan Crowley are most grateful to members of the Coventry GC, especially Harry Middleton and Ian Bar, when their glider trainer was struck and they were stranded on the M6. Without their help they would never have made it home with their Skylark.

J.W.

PETERBOROUGH & SPALDING (Crowland Airfield)

Our AGM, in April elected three new committee members. Thanks go to Derek Thorpe, Tony Fidler and Geoff Carrington for all their past efforts. Our membership and flying fees have had to be increased, but at £40pa and no joining fee we must be the cheapest in the country. Our finances and facilities continue to improve, and it was suggested that a single-seat Astir be added to the club fleet if a loan is available from the Sports Council.

To encourage more cross-country flying, a Met and taskboard has been set up in the clubhouse, with UK maps to help with task planning and briefing. Also, weather permitting, a task will be set each flying day for club ladder entries.

Easter gave four flying days, two very good, with several cross-countries. Passenger flights were not without excitement with Geoff Carrington in the Capstan being waved off at 200ft over the river when the tug developed engine trouble!

M.C.

RATTLESDEN (Rattlesden Airfield)

Our thanks to Andrea Arnold for organising the marvellous club dinner-dance. Awards presented by the CFI were: the President's cup, Mike Arnold for his contribution to keeping us flying (congratulations on his Bronze C); the Landlord's trophy, Paul Steggles for being the most improved pilot, also the Grunau trophy for his epic flight, with the award for most points on the club ladder going to Humphrey Chamberlain.

Bob White successfully completed his instructors' course and our very own micro person Murray Hurlock, suitably ballasted, went solo — congratulations to them both.

Some members took our K-7 and Grunau Baby to the Mynd on April 2 for a wave weekend. Although the wind was wrong, they enjoyed it and were made very welcome.

We are sprouting syndicates with the latest newcomers being a Skylark 4 and a K-6CR.

D.H.

SCOTTISH GLIDING UNION (Portmoak)

Strong northerly winds set up classic Portmoak wave conditions over Easter with dozens of visitors and members enjoying memorable flights. Club pundits did regular 200/300km milk runs in wave and over 20 badge climbs were made, mainly for Gold and Diamond heights.

Peter Roubaud, Roy Howse and Ann Shaw completed their Silver Cs with distance legs, there were several flights in excess of 20 000ft and Dave Benton broke off at just under 26 000ft through lack of oxygen and inadequate clothing. Meanwhile a Portmoak expedition to Aboyne over Easter had flying restricted because of cloud cover.

We have started the Monday flying of visitors from local clubs and organisations, thanks to the hard work of Jim Wales and Peter Copland. These evenings are very popular and help club funds.

Winch driver and aircraft engineer Phil Marks has just qualified as an instructor.

A.S.

Please note that the next club news deadline is June 8.

SHROPSHIRE SOARING GROUP (Sleap)

We have had some good wave with one lad getting Gold height, reaching the 14 000ft level. Others with jewelled crowns got higher, but it's easier then.

Our complement of 12 gliders in the group is now full with the entry of Mike Costin's ex-Nimbus.

At our AGM in March Arthur Jones took over from Ron Rutherford as chairman, Ron having finished a ten year stint. Flying fees have gone up and 1981 statistics were 568 launches, 805hrs, 9500 cross-country kilometres and an average flight time of 85min.

We celebrated our tenth anniversary at the annual dinner in March when very good models of syndicate and other gliders decorated the tables and interesting and relevant photographs were displayed.

P.L.U.M.

SOUTHDOWN (Parham Airfield)

Our president and chairman, Les Allard, gives up half his job after 21yrs. He has seen the club move from Friston to Firle and from Firle to Parham and grow from a struggling hill site operation (with an annual deficit of £100) to a successful soaring club. Les remains as president of a financially sound organisation with five sailplanes, tug, fine hangarage, clubhouse and a secure site. We are pleased Joan Cloke, in addition to all her valuable work for the BGA and gliding movement, is our new chairman.

Naomi Collier, Jim Taylor and Rod Walker have their five hours. Our K-7, star of local and national press, radio and all television channels, has returned after repairs following its incredible electric high-wire balancing act. Gwen Brown, the pupil on this flight, was discharged from hospital after a short stay and is now receiving dental treatment as an outpatient which we hope will soon lead to her full recovery.

Our CFI, Keith Mitchell, retired gracefully (but with an armful of cups) at the AGM and we welcome Don Irving as successor.

A.V.S.

SOUTH WALES (Usk)

There was only a short break due to a water-logged field. Xenaphon Symenodise has his Bronze C and Dave Jobbins flew to the Long Mynd for Silver distance. Steven

Reed and Graham Bailey are going on instructors' courses.

A super Easter weekend with wave, ridge and thermals saw the end of the first course run by Keith Richards. Our new winch has been tested and will be in use for the forthcoming courses. Many thanks to the builders.

P.A.C.

STAFFORDSHIRE (Morridge)

Once again Easter has been kind. On the Saturday that celebrated pair, Colin Ratcliffe and Peter Foster, had a 50min flight in a cloud street after 5.00pm. At the AGM the subscription was raised to £60 plus a £10 joining fee; launch fees increased to £1.20 and flying time put up to 8p/min. Jim Clarke won the Ken Sheriff cross-country trophy and Peter Foster was awarded the Chairman's cup.

Our 100 Club is still contributing to club funds to finance the new flying retrieve winch. Mid-week flying commenced early April for the first time in an effort to extend our soaring season. Ken Fern gained his A and B certificates plus two Bronze legs in his first year with us.

P.F.

STRATFORD ON AVON (Long Marston Airfield)

The following were awarded pots at the AGM on April 1. Peter Gaunt (best flight in a club aircraft); Trevor Tibbetts (most progress); Chris Roberts (club ladder) and Lyndon "Taffy" Thorne and Bill Bugh jointly won the John Simonite trophy.

The highlight of the year is the arrival of our new 230 horse Perkins diesel engined towcar, built by "Taffy" Thorne, Bill Bugh and Tom Smith. Early trials are very successful.

John Dutton has retired after seven years' committee work. New members elected are Stan MacDonald, Reg Stokes and Andy Coffee. Congratulations to Maureen Telfer on going solo and to John Blakemore on gaining his full Cat rating.

H.G.W.

STRATHCLYDE (Strathaven Airfield)

Congratulations to Laurance Ward on gaining his Bronze C and to Paul Aspin and Arthur Hughes on Silver and Gold height respectively. Des Tait, CFI, went to 5500ft in wave during a check flight in the K-7, but poor visibility and the Scottish TMA ended the climb.

We hope to run an evening course and a task weekend.

Best wishes to ex-member Douglas Wylie for a quick recovery after his accident in the Diamant at Portmoak.

P.A.

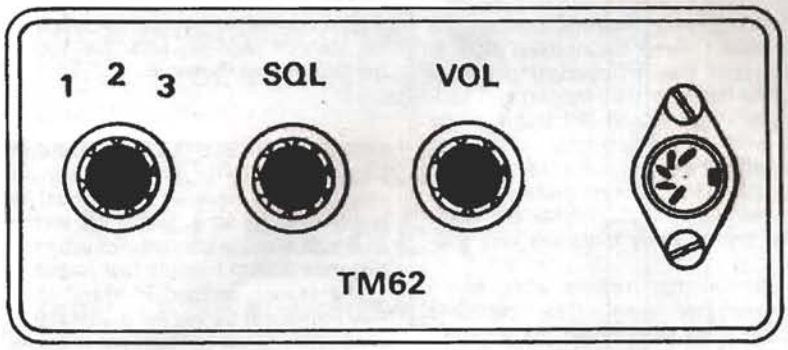
SURREY & HANTS (Lasham Airfield)

Congratulations to Chris Starkey on winning two BGA trophies (see Annual Awards p126) and to John Bastin on winning the club's Dukinfield-Jones trophy for his Gold distance 300km triangle last August.

The season opened in grand style with Roy Pentecost taking the club Kestrel (355) on a 300km O/R to Hereford in under four hours on March 13. Two days' later Chris Coles flew 355 on a 300km O/R to Leicester for his Gold distance and Diamond goal.

After 18 years flying club machines Chris Lovell has succumbed to the temptations of private ownership and taken over Pam Davis' Mosquito.

At the AGM Mike Wilson retired as chairman, having presided over the remarkable transition from the Pilatus, K-6 and Dart era of the mid-seventies to the Sport Vegas, Astirs and Mosquito of the



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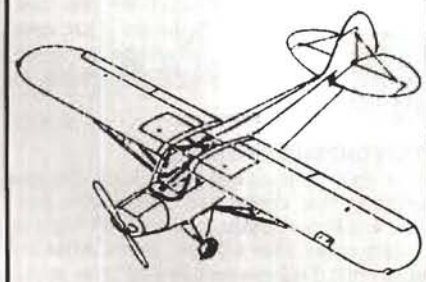

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Michael Erdman photographed the K-21 landing at Bicester when he visited the club recently and was made most welcome.

eighties. Let's hope that our new chairman, Ray Partridge, sees more such progress.

R.P.

SWINDON (South Marston Airfield)
Members redecorated the clubhouse during the winter and the new entrance means we no longer have to go through the workshop.

Phil Martin has gained his Bronze C and a K-18 has replaced our elderly K-8 and Skylark 4.

R.L.

TRENT VALLEY (Kirton Lindsey)
Our operations are more restricted this year. We now have two 150m wide grass runways which seem a little short compared with the almost limitless expanses previously. However, we have permission to erect our new clubhouse and work has started.

Our first two Silver distances were flown on Easter Monday by Nev Holmes and Tom Kelly, Tom gaining his Silver height on the same flight. We have three new instructors, Pete Housley, Paul Hesseltine and Richard Hannigan.

The results of the first Inter-Club competition were a little disappointing but watch out, Mick Ward has traded in his Oly 2B for a Pirat!

R.H.

YORKSHIRE (Sutton Bank)
A final comment on last winter — one group were snowed in for a complete weekend, finally digging themselves out by Monday afternoon.

In response to the low number of *abinitios*, we are experimenting with one-day courses at the weekends to introduce gliding to the public. A Blanik and one instructor will be allocated to six people.

The annual dinner-dance was well attended with much amusement provided by our guest speaker, John Williamson.

The holiday courses again show promise of being well attended, including the October self-catering courses.

We are fortunate to continue to benefit from the capable services of Jean, Christine, Carol, Mike and our CFI, Henryk.

W.R.B and J.R.

SERVICE NEWS

BICESTER (RAFGSA Centre)
Our new Nimbus 3 was collected from Munich in February and first flew on April 3. Nicky Caunt went solo and gained her A certificate less than three weeks after her 16th birthday.

Congratulations also to our new assistant Cats, Dave Campbell and Gary Buckner, who qualified from No. 4 Joint Services Adventurous Training course in March. Thirteen members of other clubs successfully completed the course, one gaining Silver height and another Silver distance.

The extra hour of daylight was celebrated at the end of March with an enjoyable impromptu barbecue.

C.B.

CRANWELL (RAFGSA)
The soaring season got off to a good start over Easter with most pilots having their first good soaring flights of the year. Mick Baker converted to the K-8 and gained Silver height and a Bronze leg on his first

trip, having gone solo two weeks previously. Martin Bedford and Andy Ivory also went solo recently and Rachel Whittingham, Steve Benn and Ian Tapson have their Bronze Cs.

Ray Hutchings and Simon Hall are now assistant Cats and Steve Huit has joined us as an assistant Cat and brought along his Kestrel 19.

George Foster has his tug rating and Mark "Wilbur" Wilson gained his Silver C at Portmoak. The complete fleet is now active.

G.A.B.

EAGLE (Detmold)

The year started well with us carrying off all the prizes at the RAFGGS's AGM. They were presented by George Lee as follows: the Nato cup (for the RAFGGA club with the greatest increase in hours, cross-country kilometres and badges), received on our behalf by Alan Thompson, chairman, and John Mitchell, CFI; the Pete Dawson trophy (best flight), Ray Pye for a 300km triangle in the K-6E and the Pete Lane trophy (fastest closed circuit), Robbie Knight for a 300km triangle in the LS-3A.

We went to Aosta in early March and enjoyed some interesting mountain flying although the wave wasn't good enough for any really high climbs. Whilst there a tragic mid-air tug collision occurred resulting in the death of both pilots, one of which was the Italian CFI. Our deepest regrets and sympathies go to both bereaved families and to the Aero Club Vallee D'Aosta.

Spring flying has started well at Detmold with lots of soaring. Jeff McVey did 98km for his Silver distance on April 4 and Aden Williams and Flip Fritz, one of our American members, went solo, Aden converting to the K-8. We are looking forward to running three summer courses and hosting the BFG Championships in July.

A.A.T.

FULMAR (RAF Kinloss)

February and March brought wave and thermals with Keith Tegg achieving the first hour off the winch and Rich Arnall the first cross-country with a landing at the Highland GC site at Dallachy.

After many years' hard and productive work as CFI, Bob Lloyd has handed over to Mick Orr, though stays on as deputy chairman.

A course at Bicester has given us three new instructors, Dave Dawe, Rich Arnall and Dave Stewart. Dave also completed his Silver C with a distance flight.

Well done Dave Hopkins and Tony Rex on going solo and Keith Tegg on gaining his Bronze C. Finally, farewell to Steve Partridge, bar officer, who has been posted south.

P.G

PHOENIX (RAF Brüggen)

Congratulations to "Crazy Dutch" on getting a Bronze leg, to Pims and Bob Free on gaining two legs, to John Gee for converting to the K-18, Chris Bagley and Ian Gorton to the K-6E and Ron Lamb to the ASW-20. Not to be overshadowed by Dad, Gee junior soloed the recently majored K-13.

Dick Murray, Norman Danby and Ron Lamb, plus the Astir, went to Northern Italy in a vain search for Diamonds, though they had many flying hours. Membership increases and the club is in good spirits.

A.F.M.D.

TWO RIVERS (RAF Laarbruch)

Our membership has increased dramatically with both *ab-initio* and experienced pilots joining. Al Thompson, from Fulmar, is already doing great things in our aircraft workshop and Bob and Sue Dall arrived with their own Vega. We have said goodbye to Phil Gunn, Mick Lee and his wife Jayne.

The Easter weekend, after a poor start, brought excellent soaring conditions. There were Bronze legs for Dave Cherryman (who also gained his Silver height), Phil Buckley, Mick Cooper, Angus Murray and Steve Tape (who soloed only the week before) and 300km O/Rs to Melle, near Osnabruck, for Al Thompson and Bob Dall; Mick Taylor almost managed his 300km but missed his TP.

We had our first visit of the year from a Brüggen pilot who flew in to claim the "Pot"; their triumph was short-lived as we reclaimed it the next day.

D.R.M.

"Yippee — solo already?" Michael Spencer.

Your Letters

PRIVATE OWNER INSURANCE — BE AWARE

Dear Editor,

Last August my Std Cirrus was involved in an accident in which my syndicate partner was very seriously injured and the Cirrus written-off. Our insurance claim was eventually settled in February and a few difficulties arose which I think other private owners should be made aware of.

Originally we shopped around for the most competitive quotation, placed the insurance, and a little while afterwards received a fairly lengthy policy document. This was fine as previously with another insurance broker we did not receive such detailed paperwork. The glider with instruments was insured for £7500, although the small print on the policy document said that in the event of a complete loss the insurance company could, at their option, replace the glider with another of the same make and similar condition. We were not aware of this when we took out the insurance (possibly our fault) and anyway when the policy arrived detailing this it seemed fair enough, after all — serious accidents always happen to someone else!

The broken Cirrus was declared a write-off and with our agreement the wreck was sold by the insurance company to a rebuilder to be rebuilt at leisure. A letter arrived from a Lloyd's assessor (not our insurance broker) informing us that they had found a replacement Cirrus, valued at £6500 and that the insurance company would like to exercise their option to replace the original machine, thereby saving themselves £1000. This seemed fair enough, after all one would expect them to protect the interests of the insurance company and it could possibly be argued that the value of the glider had fallen since the £7500 valuation was made at Easter, 1981. However there is a catch and it is a big one. The machine offered was a rebuilt one (possibly another insurance write-off!) — is this a fair replacement for the original which was in very good condition and had flown few hours?

There is no doubt that our best repairers make a first class job and the machine looked, and probably was, perfect. The catch is of course that in a small and fairly depressed market the rebuilt machine is worth less than a prang free one. Psychological maybe but a fact of life!

On this basis we refused it and the insurance company responded by offering us its value — £6500. We felt this to be unfair. After bringing in a solicitor and some months later this offer was raised to £7000 — still £500 below the insured value, which we accepted.

I would not like anyone to think that I am casting asperations on the insurance company or on the rebuilder, as everyone has to make a living. However, as the customer on the end of the line, one would not expect it to be necessary to bring in a solicitor in order to get a decent settlement.

To all private owners I would recommend that you check the small print in your policy, assuming you have a full policy document. If anyone finds himself in a similar position get a solicitor involved immediately, and finally, fix yourself up with a personal insurance policy — unless you can afford not to be earning while spending six months recovering from the accident.

JOHN CLIFFORD, **Swindon, Wilts.**

A CASE FOR FITTING SPRINGS

Dear Editor,

Dive brakes should tend to stay closed and wheels should tend to stay down.

Accidents rarely come out of the blue but are surrounded by a cloud of near misses. Murphy's law will catch you in the end but if you heed the warning of the near misses it is likely you will fend off the evil day a little bit longer.

Enough of such generalities! I have seen a sufficient number of dive brakes sucking out of their own accord without the pilot's knowledge to feel sure that they should be biased to closure like the spoilers of yore.

I have written this letter so that the BGA Technical Committee will see the light in ten years' time. In the meantime designers and manufacturers please take note and everyone else fit springs.

BRENNIG JAMES, **Marlow, Bucks.**

Dick Stratton, BGA chief technical officer, replies: There is nothing in the recently published Joint Airworthiness Requirements Part 22 (JAR22) which represents the combined aeronautical brain power of the EEC to require either speed brakes to snap shut, or wheels to automatically lock down. Neither do JAR's require canopies to snap shut on the occupant's fingers! However, some such systems are more "goon resistant" (never proof) than others, and some such systems are better engineered than others, so the purchaser has the option to seek out the best bargain. The BGA Technical Committee have no wish to deny British subjects the option to purchase gliders conforming to JAR22 certification standards by imposing UK special conditions on certification. Likewise, in no way will it discourage people with engineering initiative and competence from improving the product. Hereafter we all depend on good airmanship.

GET THEM WHEN THEY ARE YOUNG

Dear Editor,

The glider pilot's wife isn't always a very happy one. It is a selfish sport, demanding a great sacrifice of time and few airfields have much to offer families beyond the first fascination of aircraft spotting.

But with just a little bit of imagination nearly all our clubs could include a few activities to amuse children. There are usually unused and safe corners on most gliding fields where there could be an adventure playground (a few tree stumps sunk in the ground, a roughly built cabin or even an old glider cockpit plus ropes and tyres), a small putting area (plastic containers buried in the grass make fine holes) and a sandpit.

Once the little ones are happy, the wives can relax, make friends and discover the gliding field isn't such a bleak place after all.

And there is a beneficial spin off. The noisy under fives soon become useful youngsters, capable of countless gliding club chores. Their interest is soon caught when they are given a little responsibility and they quickly develop into our next generation of solo pilots.

"PETER PAN", **London.**

SARTORIAL CLEAN-UP

Dear Editor,

Whatever is it about gliding that makes people want to dig out their worst, most worn clothes and parade themselves on the airfield? I doubt they would be seen doing their gardens in some of the tatty, dirty looking old gear they think fit for gliding. No wonder the press shun us. I should think they are afraid to come near.

The time has definitely come to take stock of ourselves and for the BGA to step in with a properly designed uniform for all respecting glider pilots. It needn't be elaborate or expensive — just clean and neat.

I suggest a basic flying suit, deprived of all those expensive-to-make and totally unnecessary pockets and flaps, and costing no more than the price of two aerotows. For the ambitious, there could even be silver coloured ones for the Silver C pilot and a gold cloth for the higher qualification, though I'm more set on a regulation airforce blue with wings for the solo pilot.

Yes, it makes sense and I hope the BGA will take me up on this point and get started straight away in tidying up the gliding field.

"ALWAYS IMMACULATE", **Bognor Regis.**

classified section

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Like singing with angels or songbirds that fly
Part of the summer and distances vast
Of cornfields and heat haze and long days that last.

Ragged Circles in an angry sky,
No time for regrets or doubting why,
Icing in cloud tops at ten thousand feet,
Or high in a wave at heights not yet beat.

Gentle Circles in a wintry sky,
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Tethered to base by invisible rope.

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D. CARTER

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CAA comment: We have also heard of another aircraft owner who found that squirrels had stored many pounds of acorns inside the wings of his aircraft. It required removal of fabric and a partial re-cover to get them all out. It would seem that in some circumstances it may be necessary to obtain the services of a cat — CAA approved, of course!

Recession hits French gliding. Nineteen more French pilots became holders of the "Brevet F" (All Three Diamonds) in 1981, despite a marked overall reduction in cross-countries (1 156 699km as against 1 457 369km in 1980). The statistics in general show a downward trend, although four new clubs were formed and the number of winch launches increased from 5576 to 6039 (several French clubs have returned to winch launching). Economic factors are blamed for the decline, which is a source of great concern to the French Federation. Whilst pilots over 25 flew only 3% less than in 1980, those under 25 (the least able to meet increasing costs) flew 25% less. There was also a startling 38% fall in military gliding activity, caused by the partial withdrawal of subsidy. Sixty-eight of the 118 French clubs registered a reduction in activity. There was even a 56% drop in the number of hours flown at Angers. We are not the only country in recession . . .

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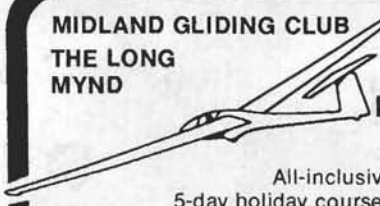

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