

SAILPLANE AND GLIDING

June-July 1988

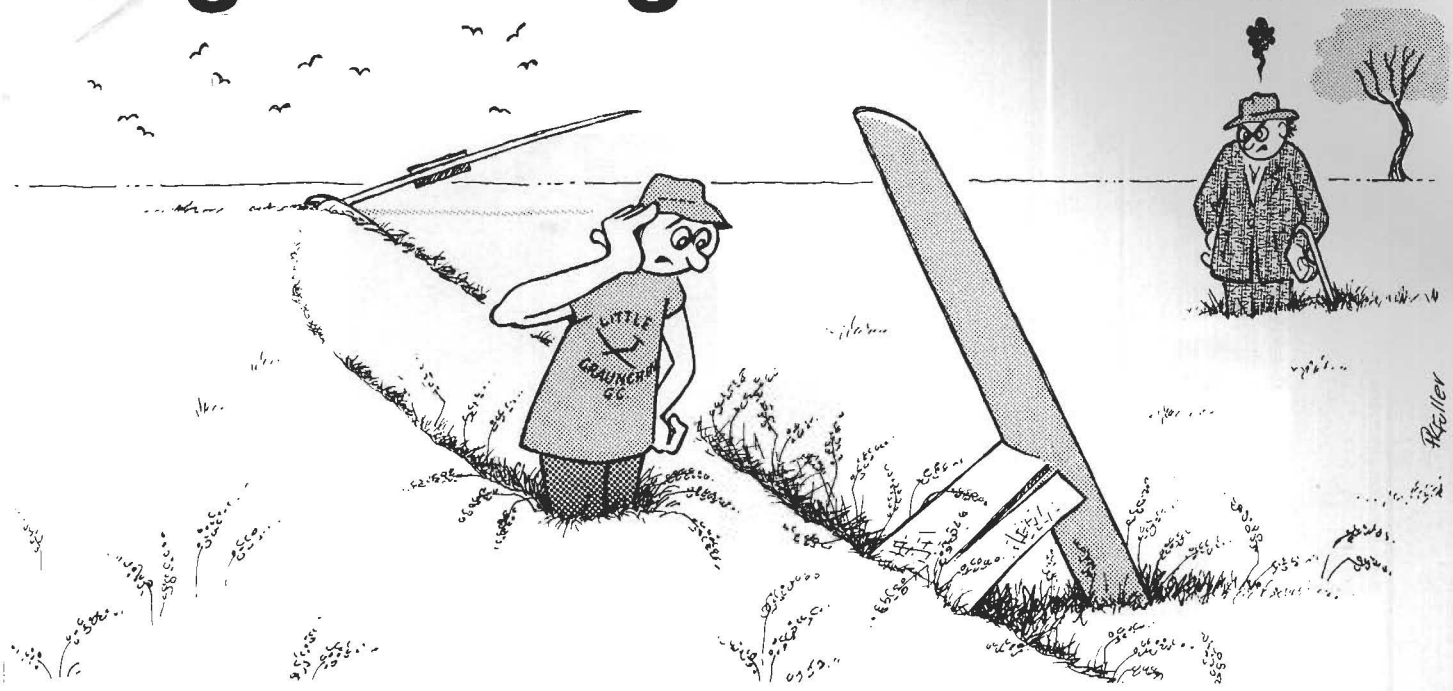
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June-July 1988
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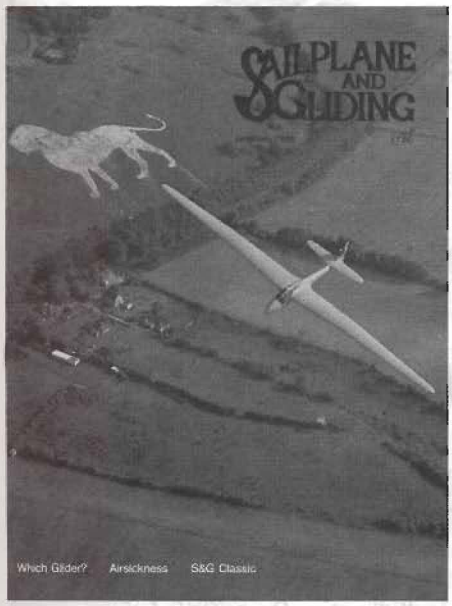
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Cover: Ted Hull's Moswey 4A flying over Whipsnade Zoo's lion, photographed by Keith Thomas, the well-known radio modeller who had just completed a quarter scale version of the glider.

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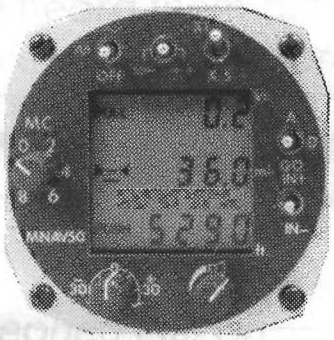
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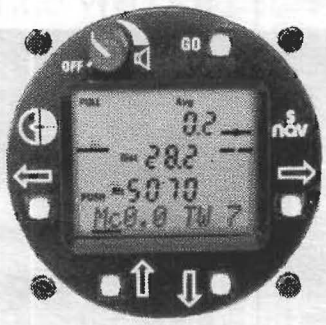
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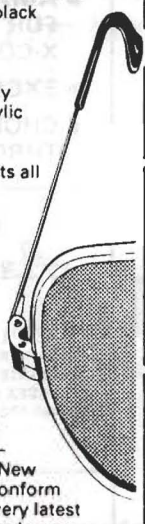
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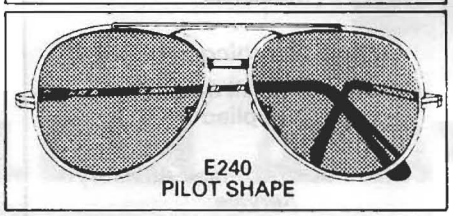
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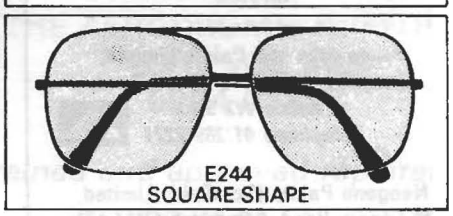


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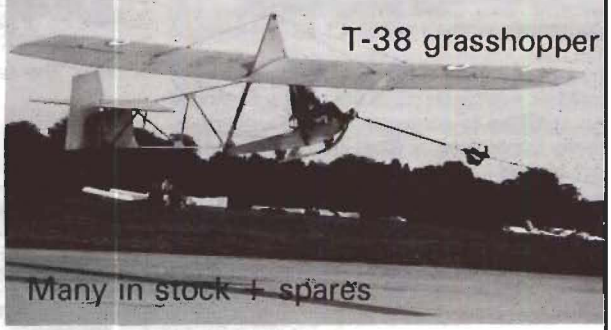
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TAIL FEATHERS

O Tempora, O Mores!

I'm sorry, but it's time for a limp down memory lane again. It was going to be a *jog* down memory lane, but for the third occasion in a row I've injured myself skiing and can barely walk: the



Can barely walk.

thought of putting myself out of action for what could be a large chunk of the gliding season is too appalling to contemplate, so it's goodbye, snowy slopes, forever. (Did I just hear an audible sigh of relief from the snowy slopes and all who slide on them – and the Norwich Union?) May 12, 1988, is the 30th anniversary of my arrival as an *anfanger* at the London Gliding Club. There is supposed to be a commemorative plaque somewhere, but I've never seen it, so it must be in the ladies' loo.

I didn't have a car, so like a lot of young members at that time I first used Green Line buses that meandered endlessly through leafy lanes to serve every damn village between Muswell Hill and Dunstable. When the bus drivers went on strike I hitch-hiked or scrounged lifts with rich



Routine only broken if Christmas Day fell on a weekend.

members who had wheels. The following year, for £3 a week I shared a flat next door to Harrods with a gliding crowd, one of whom had a car[1], so we pooled petrol costs and went up to the club every Friday evening regardless of rain, hail, snow, earthquake or landslide, and came back to London every Sunday evening. This was a rigid routine, which was only broken if Christmas Day fell on a weekend. In 1959 I bought a quarter-share in a Kite 1 for £50; in 1960 a fifth of a K-7 for



My first car.

£200; finally, half of a brand new, state-of-the-art Skylark 3 in 1961 for £675. it was in that year that I decided I could afford to learn to drive, and eventually in 1962 I got round to buying my first car, a four year-old Volkswagen Beetle, acquired primarily, if not exclusively, for retrieving. It was a matter of getting one's priorities right, and no one thought it the slightest bit eccentric to own a top of the range glider but no car. However I can't imagine that order of priorities being applied nowadays.

On every single weekend day in 1958 there was ferocious early morning competition to get on the list for the T-21, so as to have a remote chance of getting more than the basic ration of three launches and creep a mite closer to going solo. The same dawn battle, coming close to



Jammed with bodies.

blows, took place amongst the arrogant - Mr Three Hours despised or at least patronised Mr Two Hours – solo pilots on the Tutor. This appalling machine[2] (my fingers typed *Totur* in a Freudian slip just now: torture well describes the ordeal of trying to get 10 hours in one's logbook, so as to escape on to the high performance Grunau Baby), to think about which still makes me angry today because of the frustration and high drop out rate it produced, was unable to stay airborne in less than a 20kt breeze smack on the hill, and was grounded as unsafe in a 21-knotter. In the squalor of the bunkhouse nobody used an alarm clock, since that would have alerted everyone else and started a stampede, giving an advantage of two launches to the chap nearest the exit. However even one pair of eyelids cautiously opening would resound like a pistol shot, and the doorway would suddenly be jammed with bodies fighting to get to the bar where the list was kept. It was a Darwinian struggle for survival amongst a group motivated to the point of mania. Most people only got two weeks' holiday then, so there was no hope of escaping from the weekend treadmill to speed the date of going solo. It took a whole season and exactly 69 launches for me to go solo, and I wasn't a great deal worse than the average trainee.



Getting and keeping members.

What is the point about all this maundering on about the past? (That's a good question: I hope it isn't just rhetorical. ED.) Well, apart from the perennial need to fill this column with something, there are one or two reflections about the state of many clubs today and the problems of getting and keeping members.

"The drop-out rate was massive, especially as the flying got worse . . .

I'd like to say all this poverty stricken struggle was character forming for everyone who joined, but I'm not at all sure about that. The drop-out rate was massive, especially as the flying got worse, rather than better, once we went solo, the Tutor being vastly inferior to the T-21 as a soaring machine. (T-21s have done 100km triangles and height records; Tutors haven't, so far as I know.) However the fact that those that were prepared to stick it out *lived* every leisure hour at the club, not being able to afford time or money to be in any alternative place or indulge in any other pastimes, created a quite different climate from that which we have any right to expect today. We uprooted hedges to enlarge the field, we drove winches

[1] *He still glides and pays for his flying by breeding pigs near Cirencester.*

[2] *To Tutor owners I must say that an aerotowable Tutor, with a good chance of releasing in lift, can be a lot of fun, but that was not allowed in 1958.*



Basic repairs.

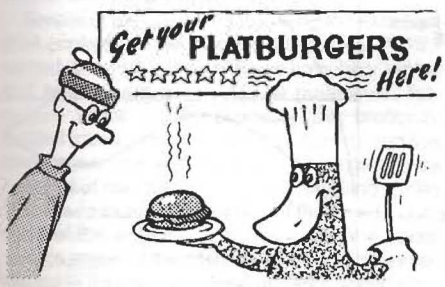
and did basic repairs (*very* basic in my case) on club gliders and equipment. When we were pooped at the end of the day we went to the members' kitchen and made our own meals: on the strength of having lived in North America I was voted the hamburger king, and my fellow members would not allow even women to interfere when Platypus was tackling the chopped steak.

"... reflects people's ability in 1988 to pay for professionals to do everything for them ...

(The story of how I was formally stripped of my chef's hat, after blowing up the member's kitchen with a vast steak and kidney pudding while I was oblivious at 3000ft in the Kite in my first real thermal, will have to wait till another day.) The fact that the members' kitchen is no more – *not* as a result of the pudding disaster – reflects people's ability in 1988 to pay for professionals to do everything for them, whether it is hamburgers or winch launches. And if you want home cooking – or any other domestic comforts – London today is only 45 minutes away by a motorway that didn't exist in 1958. The moment things look a bit boring we can take off – not into the air, but for the other pleasures that beckon.

A friend has pointed out to me that these awful discomforts were tolerated partly because all of the male recruits to the club had done National Service for two years, and living in a cold hut with damp blankets and other people's smelly socks was something we were all used to. (They say the reason British officers seem, according to the films, to have had such a whale of a time as prisoners in Colditz is that Colditz was just like a typical English boarding school, only with better food and nicer guards.)

So there is not a lot of use in bewailing the loss of *esprit de corps*, sterling virtues, moral qualities etc etc in the modern generation; such considerations are irrelevant. The context in which we live is simply different, that's all. Leisure is a vast multi-national money-making industry, highly competitive and very professional. What was the alternative to gliding courses in the 1950s? Bicycle tours or Butlins, not much else.



Home cooking.



Bicycle tours.

Now look in any travel agents, or the weekend colour supplements, for an idea of what the choices are. It's frightening.

TINSFOP

I have no solutions to offer. This isn't supposed to be a responsible column. However, here is a new acronym to chew on. **There is no substitute for professionalism . . .**

SOMETHING SPECIAL

Mike describes a flight from Portmoak on one of the few classic days of last season

An entry in the club log on Sunday, September 26, caught my eye – "easy 20 000ft, again" (A. Pickles, visiting from Lasham, with a Nimbus). This was the day that Colin McAlpine did his Diamond goal with a camera lent by his partner who unfortunately omitted to mention that it was without film; two pilots flew Silver distance to Portmoak from Gold or Diamond height starts at Aboyne and I flew higher and farther, apart from my Silver distance, than I had before.

The forecast was for a north-westerly; at mid-morning it was one of those awkward winds, with enough north in it to make it difficult to get from the winch to the part of Bishop Hill which might be working, and not enough north for Benarty to be easy. All launches but the last had gone to the Bishop and had not soared. The K-8 before me had gone to Benarty and had hung on for a while but was unhappy and came home.

I got a good launch in the Olympia 460 and managed to stay on Benarty at between 1400-1600ft for about an hour before some thermals passing through could be used to get higher. At about 2500ft I had enough to investigate a small wave which had appeared to the west of the motorway. I flew in lift all the way to it and beyond, slowly gaining height in what I assumed was the first bounce of the air after crossing the Ochil hills. I was able to watch the car racing on the Knockhill circuit below, and finally made 9000ft over Dollar and then Ben Cleuch.



Mike, secretary of SGU and a plant pathologist, started gliding on an ATC course in 1954, resoloed in 1981 and has a Silver badge, an AEI rating and shares in an Oly 460 and an L-Spatz.

There was little temptation to try to go higher (my explanation for not being able to) – no barograph - so I headed back towards Loch Leven, but without losing much height, even with fast flying. Some more rising air was found over Kinross. Several aircraft were high above and the temptation was too great, so I soon found myself at 8000ft over Dunning without really trying. Again, thoughts of going home were set aside when I was found by strong lift again over Kinross and I climbed around the clouds to 10 500ft. With more exploration and skill, and oxygen, I might have got closer to A. Pickles, but the afternoon was wearing on and I landed after 4½hrs.

Two things continue to intrigue me. One is the frequent and rapid changes in cloud formation, from almost blue to very complex patterns of cloudiness – and not always the classic bars one reads about. But then, why should they be? The wave patterns in a stream are not fixed, and the analogy is the same.

The other is the barrier which often seems to exist between struggling to maintain 1500ft on the hill and the almost universally rising air 1-2000ft higher. It seemed unkind to comment to the fellow member who came to help me after landing, and who had not got away, that it was difficult to descend to circuit height.

If you have had a special flight and would like to tell us about it in not more than 750 words, please send it with a head and shoulders photograph and a few details about your gliding experience.

BOUNDARY LAYERS

Should We Suck or Blow?

With the possible exception of "Stability and Control" (a subject so recondite that even the pundits skirt round it) there appears to be no technical topic more misunderstood and argued about than the boundary layer which surrounds an aircraft. Indeed, the subject of boundary layers may be said to generate quite some turbulence in gliding circles! In this article I seek neither to attack nor defend the poor old boundary layer, but rather to explain it away. The concepts and figures I offer are largely cribbed from standard texts; the errors and omissions are, however, entirely my own doing.

The first point to make is that the viscosity or stickiness of the air causes it to be slowed down as it slides along a surface, as we may already know from our Bronze C studies. In fact, the air molecules actually touching the surface (say, a wing) remain stationary on that surface; these stationary molecules then retard the next molecules out, and so on. This is usually illustrated by a picture which looks something like Fig 1, from which we are expected to see that there is a wind gradient close to the surface. In principle, this gradient continues until we are infinitely far away from the surface concerned; in practice, 99% of all airspeed changes occur very close in. This practical point conveniently allows us to think of a boundary "layer" and a separate "outer" airflow and yet still get a good picture of what is actually going on. The boundary layer grows as we move downstream along the surface and so we can see that the absolute size of the boundary layer will depend upon the length of the surface giving rise to it. The layer will typically be ¼ or ½in thick at the trailing edge of a sailplane wing, but 6 or 7ft thick at the rear of an airship – and dozens of feet thick over the ground.

Boundary layers may exist in either of two forms: **laminar** or **turbulent**. In a laminar boundary layer the flow is smooth, the thickness of the layer grows only slowly and the drag due to skin friction is low. By contrast, the flow within a turbulent boundary layer is, as the name sugggests, a chaotic jumble of eddies – leading to more rapid growth and significantly higher skin friction drag.

A laminar boundary layer can exist only for a short distance, however, so it is usual to find that the laminar boundary layer at the front of a body degenerates to a turbulent form some way downstream. This change from laminar to turbulent is called **transition** and is not reversible – like many other good things, once you've lost it, you can't get it back! Predicting the exact spot at which transition will take place is one of the oldest black arts in aerodynamics; it depends upon a great many variables and – even with today's (1988) powerful computers – the sums involved can still be solved only approximately. On older gliders (and most powered aircraft) it is common for transition to occur fairly far forward on the wing – around 10% or 20% of the way aft from leading edge to trailing edge, while modern sailplanes manage to delay it perhaps as far back as 70% of the chord on the wing, and almost as far aft as the wheel on the fuselage.

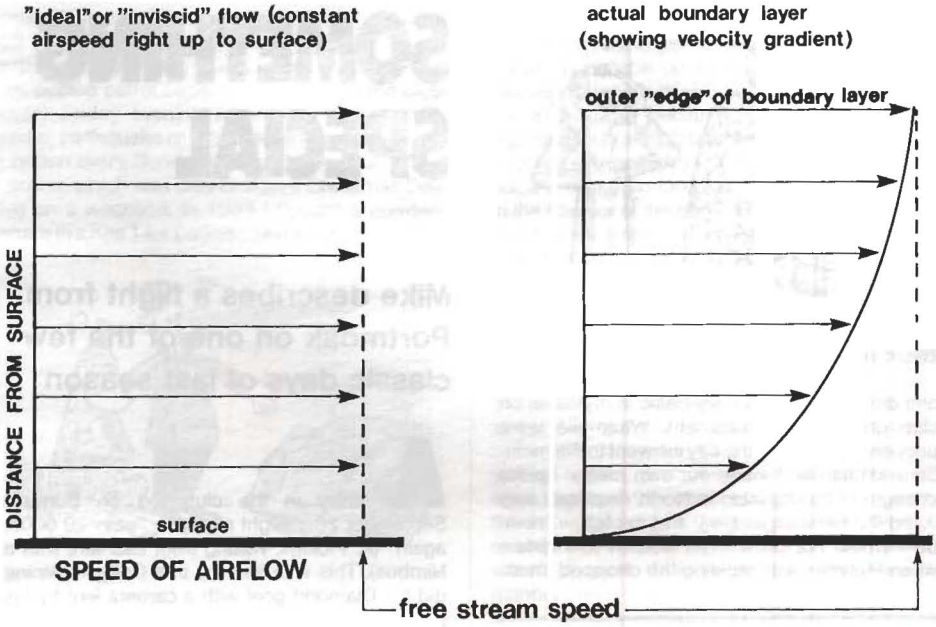


Fig 1. How speed varies inside the boundary layer.

Note that "turbulence" as in atmospheric gusts, or the airflow behind a bluff body (*eg* a truck, or a stalled wing) is not the same as a turbulent boundary layer. The only thing the two have in common is the word "turbulent" – implying the presence of eddies, large or small.

Transition is prompted by roughness on the surface (including dead flies and water droplets), by small-scale turbulence in the oncoming air, and particularly by any sudden rise on local pressure – such as exists behind a step, or near the front on the upper surface of an old-style aerofoil section (see Fig 2 for an illustration of this). A rise in local pressure (known in the trade as an "adverse" pressure gradient) occurs whenever the air slows down, and it is inevitable that there must be some point on each aerofoil surface where, after having accelerated to get past the thickest bit, the air must begin to slow again. This is where the adverse pressure gradient begins. Too much adverse pressure gradient and

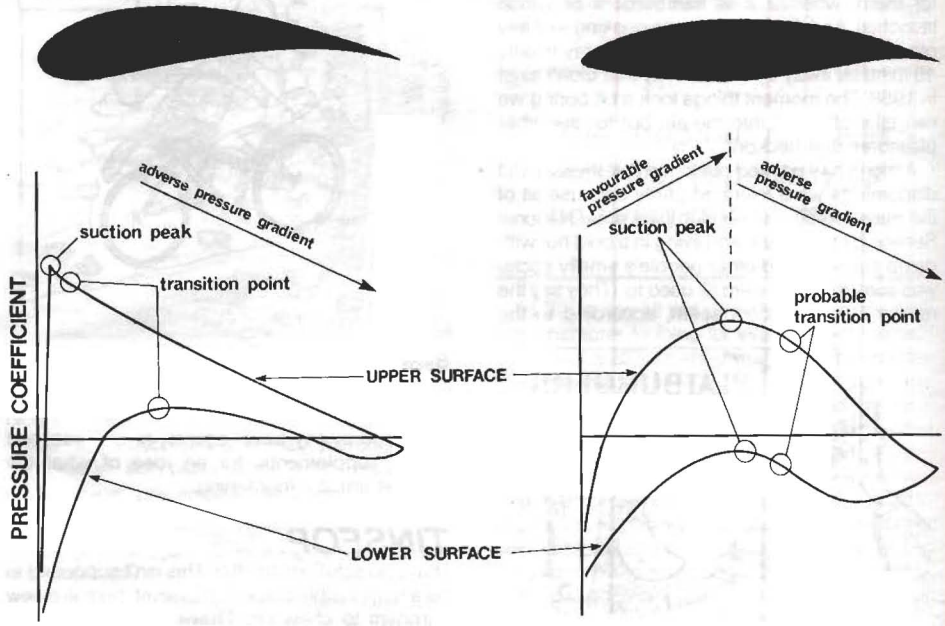


Fig 2. "Traditional" and "laminar" aerofoils and their pressure distributions.

the boundary layer can no longer cope and goes turbulent. Even more adverse pressure gradient (such as behind an open airbrake or in the lee of a steep hill) and the boundary layer gives up altogether and **separates** entirely from the surface. When the boundary layer separates due to too much angle of attack, we say that the flow has stalled. More about separation later: at the moment we're still looking at normal common-or-garden "attached" flow.

From a practical gliding point of view, what is important about laminar and turbulent boundary layers is that turbulent boundary layers make much more drag. This is because of all the energy they consume in stirring up the turbulence that exists within the turbulent layer. A stretch of turbulent boundary layer will be ten or 20 times as draggy as the same stretch of laminar flow. There is therefore a strong urge to keep the boundary laminar for as long as possible – on the wings, on the fuselage and even on the tailplane and fin. Every little helps. We find, therefore, that the designers of tomorrow's sailplanes use every means at their disposal to save that laminar flow; by using super-smooth glass and carbon fibre finishes to minimise the surface roughness and cut out any steps or notches, and by careful aerofoil selection to delay transition as long as possible.

Fig 2 shows, for comparison, a typical old-style aerofoil section (such as on a T-21) along with its characteristic pressure distribution, and also a newer "laminar" section with its rather different form of pressure distribution.

From this we see that the crafty designer has pushed the position of peak suction a long way aft (especially on the upper surface) in recent years – with a correspondingly large reduction in skin-friction drag from the now predominantly laminar boundary layer.

There are snags, however, for although the laminar boundary layer is vastly preferable to a turbulent one, yet laminar layers are more prone to complete separation — which is even worse than a turbulent layer. If this is discovered to be a problem with a particular aerofoil then it is now common to "trip" transition just ahead of the point where the laminar boundary layer would otherwise separate – giving rise to a turbulent layer which does at least have a better grip. Common devices for tripping transition are tiny air jets or, more simply, roughened patches on the skin: all these are generically referred to as turbulators. Turbulator tape ("zig-zig" or "bumpy" tape) has the advantage that it can be applied to the problem area – assuming that a problem has been found to exist, and that the exact location of the problem is known – and of course it can be moved around for testing purposes.

Several of the questions following the excellent BGA conference talks on new glider design concerned the applicability of these turbulator tapes, and so here are a few simple guidelines. Turbulator tapes could probably be profitably applied immediately ahead of all control surface hinge lines: this will not give any performance benefit, but may just improve the handling a trifle (this would include both sides of the fin and both sides of the tailplane, and really only the upper surface ahead of the ailerons (to try and delay tip-stalling in tight turns). These remarks apply more or less equally to all gliders. Of relevance really only to plastic gliders, the random application of turbulator tapes to the entire wing lower surface is more likely to cause a worsening of performance than anything else, while the random application of such tapes to the upper surface may offer a small reduction in stalling speed, at a probable small glide angle penalty. Any application without systematic testing is random. This "taping" is not the same as sealing control surface gaps – which should be done on all control surfaces (taking care of course to ensure the continued free and uninterrupted use of those controls). Sealing of ailerons in particular can be expected to improve the stalling/slow speed handling, while sealing of the elevator or flaps ought to help in the climb.

The fact that roughness can be used deliberately to provoke transition reminds us, however, that unintentional (and unwanted) roughness may have precisely the same effect. Thus a poorly finished wing, or one with a lot of bugs or ice on it, will lose out significantly on performance owing to premature transition and higher skin-friction drag – assuming the wing was designed to be "laminar" in the first place. Clearly the effect of surface roughness will be much less on older style wing sections, which have little laminar flow to lose.

Now let's look at what happens to the pressure distribution and to the transition point as we vary the angle of attack. This corresponds to flying faster (lower angle of attack) or to flying slower, pulling *g*, or just turning (all requiring higher angle of attack) – as shown in Fig 3.

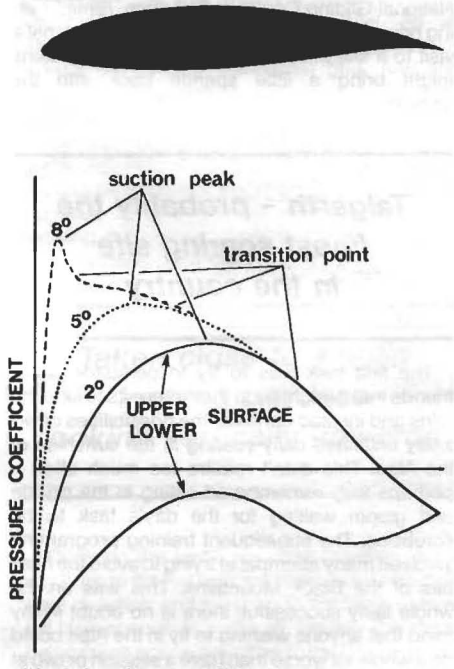


Fig 3. Laminar aerofoils – how upper surface pressure distribution varies with the angle of attack at low airspeed (or high *g*).

We can see from Fig 3 that, as we increase the angle of attack, the upper surface suction increases and the point of maximum suction moves forward. The rising pressure area thus begins steadily further forward, and so more and more of the laminar boundary layer is lost as transition creeps forward on the upper surface. On the other hand, the transition point moves forward on the *lower* surface when we go to lower angles of attack, such as on the high speed dash to the next thermal, with a corresponding loss of lower surface laminar flow as we accelerate. It follows that the special laminar properties of "laminar-flow" aerofoils are available only for a certain range of angles of attack (or range of speed).

As we continue to increase (or decrease) the angle of attack, not only does the drag rise as a consequence of earlier transition, but also the boundary layer downstream of the transition point gets a rougher and rougher ride on its way to the trailing edge because it has to negotiate a progressively greater and greater pressure rise on its way there. Finally, of course, we reach a point where – even with the added grip of a turbulent boundary layer – the flow separates entirely from the surface, the drag rises even more rapidly and the lift starts to fall off. The wing has begun to stall. The onset of this condition can be detected very early by pressure probes (so-called drag monitors) just behind the trailing edge or just off the wing surface: if extreme, the buffeting of the turbulent flow in the region of separation gives the game away.

The average pilot commonly waits until he can actually feel the buffeting of the turbulent separated flow (either on the wings, in the wing/fuselage junction, or when the wake hits the tailplane in some gliders) but this is always too late in terms of efficient flying. Aside from the considerations of staying within the best bit of any thermal – which override all else – the pilot ought therefore (all other things being equal) to keep the glider flying at such an angle of attack that the laminar flow is preserved as much as possible. This almost always means flying faster than instinct dictates.

On the subject of flying fast, let's look at an actual example of a production glider which has been modified to provide better high-speed performance with no loss (and a probable slight improvement) at slower speeds. The example I have chosen is the ASW-20, whose designer Gerhard Waibel decided to thicken the section aft of the middle by using a new lower skin and so obtain longer laminar flow there. Fig 4 shows how

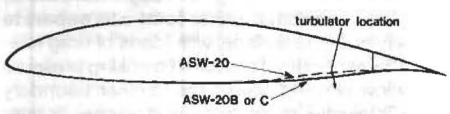


Fig 4. Example of the change from an ASW-20 to an ASW-20B.

the later wing section compares with the early version, and the extended "flat" portion of the lower skin did indeed have the effect of preserving the laminar flow – an improvement from transition at about 55% to later transition at around 70%. Having thickened the middle/aft of the section, however, he was obliged to increase the curvature of the lower skin ahead of the flap, in order to use the same flap for both ASW-20 and ASW-20B. This was fine at most conditions, but whenever the wing worked at very low angles of attack the combination of unfavourable pressure gradient and low-grip boundary layer caused complete separation just ahead of the flap on the lower surface. This wasn't catastrophic, since the

flow subsequently "re-attached" (in turbulent form of course) when it ran into the flap a little further downstream. There was, however, a region of separated laminar flow in that little hollow which gave a worse drag penalty than the original saving had been! The solution was to install a small pitot tube to collect air in a chamber within the wing and then blow it out of a row of tiny holes in the lower surface at about 68% chord - just ahead of the point where separation was occurring. The result: laminar flow all the way up to the turbulators, no separation bubble and very satisfactory drag characteristics even at quite high speeds. Note therefore that if you fly an ASW-20B/C or DG-300 etc with "blown" wings, that these wings have been deliberately designed to operate by living dangerously and then relying on their row of tiny turbulator jets to stave off separation. If you don't keep all those little pinholes clean (and they *do* fill with lesonal - if you ever polish the lower surface!) then you would be better off with the earlier model!

Sucking? Given that rising pressure is one of the causes of transition, it follows that applying suction to critical areas may just help delay the inevitable. Indeed, a number of just such experiments have been performed (mostly on airliners - which suffer transition very far forward anyway as a consequence of their very high speeds). The likelihood of vacuum cleaner devices appearing on sailplanes is, however, small. Why does transition occur far forward at high speed? Well, it's the **Reynold's No.** that does it, and Reynold's Nos. are pretty big business in the world of boundary layers. For the moment I shall confine my remarks to saying that the Reynold's No. is a measure of **size**, **speed** and something called kinematic viscosity which varies with **temperature** (honestly, it is: when the size or the speed or the temperature go up, the Reynold's No. goes up), and that higher Reynold's Nos. tend to give rise to earlier transition. On the other hand, higher values of "R" mean that the turbulent boundary layer you have got gives less drag than the same turbulent boundary layer would at a lower Reynold's No.

Summary

Boundary layers may be either smooth (**laminar**) with low drag, or rough (**turbulent**) with lots more drag. Either form can **separate** entirely from the surface, with loads of drag (disaster!) - especially if provoked by rising pressure *ie* airflow slowing down. The laminar boundary layer is always at the front, and sooner or later makes an irreversible change to turbulent form (**transition**). We may choose deliberately to provoke this transition (using **turbulators**) by roughing up the air flow (either with air jets, roughness or tapes) or we may try and delay transition by sucking. In any event we want to keep the overall surface roughness to a minimum (to minimise skin-friction drag from both laminar and turbulent parts of the boundary layer) and to avoid unduly early transition. Boundary layers exist on all the glider's surfaces, and indeed on the earth's surface - where they are almost always turbulent.

Summary of the Summary

Your sailplane comes equipped with boundary layers, whether you like it or not: so you may as well take care of them. By polishing, mostly.

JOHN BRIDGE

A GUIDE TO MOUNTAIN CLIMBING

Following the article on flying in the Alps by William Malpas in the last issue, p66, John tells of his experience last summer when he and some friends took three gliders to France

If you have a spare moment or two, dive into some back issues of *S&G* and try to find the last season during which the frustrations of the weather were not of major significance. Tough, isn't it? As not much slips past Bruce Sprinkler these days, it's hardly surprising that he decided to pack his bags and open up a soaring centre in France. The rest of us are still left with a choice; either we wait for the weather in this country to improve or we follow his example, if only for a fortnight a year. Many years ago I had the good fortune to attend the world famous French National Gliding Centre at St Auban; remembering how good the flying was then, I decided that a visit to a site in the same area of the mountains might bring a little sparkle back into the season.

Talgarth - probably the finest soaring site in the country

The first task was to try to persuade some friends that it might be in their interests to skip the rains and instead consider the possibilities of virtually unlimited daily soaring in the sunshine of the Alps. This didn't require too much effort - perhaps they remembered sitting in the drizzle and gloom waiting for the day's task to be scrubbed. The subsequent training programme involved many attempts at trying to avoid the hard bits of the Black Mountains. This was on the whole fairly successful; there is no doubt in my mind that anyone wishing to fly in the Alps could do a whole lot worse than have a session or two at Talgarth - probably the finest soaring site in the country.

Thus it was that one damp June morning found three pilots, three cars and three trailers thrashing along the wastelands of the French motorway network. We were bound for Sisteron, a small gliding club in the mountains south of Gap with my Jantar and their Libelles. Having elected to use the autoroutes, we made good progress past Paris, Dijon and Grenoble, pausing only for the occasional bite to eat. Our Scottish representative came into his own with canny unpredictability, displaying his navigational expertise to the full by leading us through small town market places having little enough space for a 2CV, let alone three 30ft trailers. However, realising how crucial it was that every member should feel part of a team, we each made the effort to stick together. It was obvious from the inimicable Gallic gesticulations of the local market traders that they appreciated our characteristic British spirit, as they waved us through towards the nearest route out of town.

We were, however, less than ecstatic with the weather, which seemed to be making great efforts to follow us all the way from Essex. As we approached late evening and the climb up the north-west toehills of the Alps, we began to resign ourselves to the possibility that the entire fortnight may be spent under a thick cloudbase at roughly head-height above the ground. About half an hour after entering cloud, we crossed over the pass at the Col De La Croix Haute and saw across the valley house lights and above us an ink-black sky rich with diamonds. Now progressing merrily under VMC, we quickly completed our journey to reach the airfield by midnight. After dropping our trailers, we found our villa and cracked open a celebratory bottle of duty-free. Things were beginning to look up.

The Site

The following morning we followed the old British habits; as soon as we saw blue sky, we gulped down breakfast and hit the road, desperate to get to the airfield, get briefed and checked out before the day died. Arriving at the site, we were immediately impressed by the lack of activity during the morning of what was obvious to an idiot was a cracking good day.

We tracked down the CFI who having already been notified of our impending arrival, made us feel extremely welcome and then proceeded in pidgin *Franglais* to inform us of the standard operating practices we ought to follow during our stay at Sisteron. The language level proved to be a not insurmountable barrier, as we did our best with O-level French and he did rather better with his English. Nevertheless, after one hour and much head-slapping he had clearly had enough



John took this photograph of a Janus on his earlier visit to St Auban.

and decided that it would be safer all round if he terminated the briefing there and then. Our only responsibility was to mark on our maps **all** the landable fields in the area - which doesn't take long in this terrain. We were a little concerned that he had not demanded any form of check flight - after all, we'd spotted that this place was stuffed with mountains. His reaction was one of stunned amazement: *"Mais, non, monsieur. Vous avez mille heures - Ce n'est pas necessaire. Allez-y et bonne journee."* Knockout, we thought and disappeared to stick our gliders together.

During the following days we came to appreciate the wisdom of this approach. The rationale behind the French argument goes a little like this:

"You are a competent pilot - your logbook says so. With your experience you should be able to 'ack (or whatever the French equivalent is) the launching and landing phases of your circuit. As far as the flying in between is concerned, you will come to appreciate that mountains suffer very little during a collision with a glider, and that your instinct for self-preservation will on its own provide sufficient regulation to govern the safety of your flight."

And it works, chaps - only a complete nutcase (no names - but everyone knows someone who qualifies) would attempt to take any risks in this terrain without considering fully the possible outcomes. Safety is a high priority amongst Alpine flying centres, despite their apparently relaxed attitudes. The CFI is the guy responsible for the numbers of gliders that fly out and those that return and any difference between the two is a matter of concern to him. Although they request that pilots try to keep in touch by radio, they are also aware that this poses a problem if the pilot happens to be 100km away behind a range of mountains.

The sinister thought did consider crossing my mind that there may be one or two clubs in England which could benefit from this liberal approach. After all, is there really any sound reason why experienced soaring pilots should effectively be grounded from flying their Venti or 20s until their circuit procedure has been examined in the club two-seater? (Perhaps this is why we see so many Lasham pilots at Sisteron.)

The Flying

The reason for relaxed mornings in the Alps became clear once we realised how cold the air gets at nights. Thermals began to get going in the valley at around 1.30pm, long after evidence of their apparent activity was sighted off the local mountain peaks. We could tell when it was time to go when we saw the German gliders appear on the end of the runway. As no one ever saw the pilots until they requested the tug, we could never be certain that this wasn't a mysterious side effect of the incredible Alpine heat. As we watched the mirage launch, the rest of us formed a neat (by French standards) grid. Any final checks or adjustments appeared to be done whilst waiting for the tow. We noticed for example a new approach to the ticklish problem of on-line glider repairs; a French pilot anxious to restore the gap between the aileron and trailing edge of a Pegasus wing solved his problem merely by locating the nearest available hacksaw. Ralphy would indeed have been proud.

Taken close to a solid looking cliff face poking vertically upwards

Once on the *piste*, standard practice was to say hello to the tug over the radio, point him in the right direction and hang on to the back until we felt high enough to come off. Usually this meant being taken noticeably close to the Gache, a solid looking cliff face poking vertically upwards from the valley, about 1350m amsl. Once there, the tug pilot wished you a "Good day, monsieur" and left you to your own devices.

The flying thereafter was remarkably pleasant. After taking a first (blue) thermal to 7500ft, tapping the altimeter a few times to make sure, it would be possible to press on (slowly) to the higher stuff beyond Gap. The further one flew from base, the better conditions got. Those pilots lacking the aircraft, experience or drive to push on towards the lake, St Crepin, Briancon and beyond were truly denied the greatest experience of their soaring lives. Admittedly, taking a launch from the oppressive heat of the valley is found immediately to be a good move - shirt sleeves at 9000ft under a piece of cloud is infinitely more comfortable. But in the really high mountains it is possible to become intoxicated by visions of beautiful desolation still laced with virgin snow. It was nevertheless still sobering to reach 13 000ft under cloud while at the same time having to take extreme care not to hit the rock.

The bottle-factor played a great part in my attitude in flying close to the mountains. As expert pilots you will of course appreciate that we have something of a conflict here; of having a low enough airspeed to keep the circle within the narrow confines of rising air near a mountain and a high enough airspeed to counter the turbulence which will be met at the same time as doing a tight turn. After having a few goes at it, you learn quickly that there is nothing that concentrates the mind as much as the final 90° of a turn into a rockface.

After six or seven hours of this, a discovery is made that the flight is not over merely because the thermals have quit for the day. There is ridge soaring to be had, or gentle soaring over the centres of the valleys in the slowly rising evening air. Summer wave to a respectable 6000m is not uncommon and caters well for those who like a bit of space between them and the ground. Our soaring day was ended usually by impending nightfall - there was no question of being shot down by other weather conditions. After 9pm touchdown, the main problem to be faced after stacking the glider was to decide which establishment would be able to satisfy any remaining appetites of the flesh.

The Lesson

So what did we gain from this adventure? Well, by the end of the fortnight we cheerfully began to appreciate how little we knew about this form of soaring. I felt like a complete beginner again when having thought I'd done pretty well to fly a 200km O/R into the mountains to be told afterwards that several 500km had been done that day. It was clear merely by watching the other gliders on the mountain that we were being over cautious at the wrong times. Consistently being outclimbed on the rock face, staying for too long in thermals above the ridge, not tucking in close or low enough on to the face while ridge running. We found it difficult to comprehend just how experienced the local pilots were; one Swiss pilot successfully managed to wind us up by telling us that unfortunately he didn't do much flying in the mountains - he only had 4000hrs there.

As we drove back at the end of our fortnight, it became clear to me that this sort of holiday was sufficiently different from English cross-country flying to make it unquestionably worth the time and expense in getting there. The real problem for those fortunate enough to have a financial choice is in assessing the value which can be placed on the sheer quality of soaring to be had in the Alps. It is more expensive than two weeks' worth of Regionals - but not that much more. Can anyone really afford not to try it?

J. R. COOPER

CONDITIONED AIRSICKNESS

Or, what have Pavlov's dogs got to do with flying gliders?

Sufferers of motion sickness can take some consolation from the knowledge that, with rare exceptions, nobody is totally immune and it has affected some very famous people. Lord Nelson, for example, was a chronic sufferer and films showing him strutting the deck prior to the Battle of Trafalgar are pure fantasy - he was almost certainly leaning over the rail.

Research into the disorder increased during the Second World War when it was realised that large numbers of troops in airborne and amphibious operations could be seriously incapacitated by motion sickness. Interest in the subject declined after the war until the start of manned space flights.

Motion sickness is characterised by skin pallor, cold sweating, nausea and vomiting. It is induced by situations that produce sensory rearrangement in which the motion signals transmitted by the eyes, the vestibular system (organs in the inner ear which detect acceleration) and the non-vestibular proprioceptors (receptors which detect the position and movement of limbs etc) are at variance with each other, and also with what is expected on the basis of past experience.

Possible to become motion sick while watching a film

Thus it is possible to become motion sick when completely stationary - *eg* while watching a film which gives a subjective view of rapid motion. The sickness is induced by the discord between the visual signal and the lack of the vestibular signals which would be expected if really in the situation depicted.

Almost everyone has experienced motion sickness - only those who have lost their vestibular system due to injury or illness are immune. About 90% of respondents to surveys report at least one occurrence, but this doesn't mean that the other 10% are immune. Research using actual exposure to situations which induce motion sickness indicates that everyone with an intact vestibular system can be made motion sick, although there are wide differences in the degree of susceptibility.

Most studies examining sex differences have found women more susceptible than men. However, given rather subjective reporting and the fact that males in our society are conditioned to act tough, it could be that females simply give in earlier[1].

With repeated exposure to motion, most people adapt but some fail and if the circumstances surrounding the first occurrence are repeated it can actually evoke further sickness.

Sixty years ago the Russian physiologist Pavlov discovered that if he rang a bell whenever he fed his laboratory dogs after a while merely ringing the bell would make them salivate in the absence of food. The salivation was termed "a conditioned response" and the bell a "conditioned stimulus."

It was found that other physiological responses could be conditioned in this manner, including nausea and vomiting, and psychologists used this information to design treatments for alcoholics and cigarette smokers who badly wanted to quit. For example, alcoholics are given a drug which induces nausea and just prior to the onset of nausea and vomiting, the patient is given alcoholic drinks so that the sight, smell and taste of alcohol are associated with the nausea. Repeated applications lead to feelings of nausea whenever alcohol is consumed in future. The success rate is about 50%. Cigarette smoking is being treated similarly (although much less successfully) with nausea being induced by rapid smoking.

For obvious reasons neither treatments are very popular, but the key feature is the association of the sensations of vomiting and illness (the conditioned response) with the particular event that the physician wants the patient to avoid, *ie* drinking or smoking (the conditioned stimulus).

So what's all this got to do with gliding? First, it's a fact that many people are put off gliding after a bout or two of airsickness. Gliding would have to be one of the most reliable methods available for inducing motion sickness- probably second only to fairground rides. The combination of heat, unexpected vertical and lateral accelerations, continuous rapid circling and angular movements of the head and eyes to spot other aircraft are exactly what one would prescribe to induce motion sickness in most people. The second point to note is that if the pilot does become ill, **the illness occurs in association with exactly the same sights, sounds and sensations on each occasion** - usually the cockpit of the club trainer. In such cases people could develop what I call "conditioned airsickness" - a situation where climbing into the seat of the club trainer and shutting the canopy (the conditioned stimulus) is enough to induce the first symptoms of airsickness (the conditioned response) - even before the glider has started moving.



John, an Australian, has a masters degree in psychology. He started gliding in 1970, has 650hrs, a Diamond and a Kestrel 17 and is particularly interested in wave flying.

I became aware of the possibility of conditioned airsickness as a result of my own experience. I managed to complete all my training with only the occasional bout of queasiness on the longer flights. It was when I attempted cross-country flying that my stomach rebelled. As it turned out, allowing myself to throw up in the cockpit was a major mistake. My initial reaction was "press on regardless". In other words, I tried to put up with the problem until it went away of its own accord. However, subsequent cross-country flights were frequently marred by bouts of vomiting and many flights were cut short, or terminated in outlandings, because I was simply too ill to go on. It began to look as if I simply wasn't going to be able to indulge in cross-country flying.

Eventually I began to notice that I was beginning to feel a little queasy even before the aircraft had left the ground - and that's when the penny dropped. I concluded that I had conditioned myself into becoming ill by letting myself throw up in flight while attempting to press on.

I landed immediately there were any signs of airsickness

How did I treat the problem? The method I used is termed "systematic desensitisation" in the psychological literature - it involves progressively increasing the exposure to the "conditioned stimulus" (being in the cockpit) while maintaining a state of relaxation and avoiding the conditioned response (vomiting). The first thing I did was to cease all cross-country flying in order to eliminate any pressure so that I could remain relatively relaxed in the air. To cut down the chances of airsickness (and to reduce the consequences if I was airsick), I stopped eating before flying, and drank only water. I concentrated on remaining relaxed and landed immediately there were any signs of airsickness. This meant fairly brief flights at first - no more than about 20 minutes on average - although the length of time that I could stay airborne without feeling ill increased fairly

[1] *For more details on the history and early research into motion sickness see* **Motion Sickness** *by J. T. Reason and J. J. Brand, Academic Press, 1975.*

quickly to an hour or two.

After that, improvement was relatively slow but progressive. During the next 18 months or so I found that I could fly for longer and longer periods before I began to experience symptoms. Eventually, I was able to fly for up to four or five hours, and I began to wonder if the vague symptoms I was experiencing then were nausea or hunger! So I re-introduced eating before flying, but only small amounts of relatively bland food (toasted cheese sandwiches, usually). I also began to introduce short cross-country flights, where I would be able to return to the field quickly and land should any symptoms occur, and I began to do aerobatics again whenever I felt like it. The big test came when I finally set off on a 300km Gold badge flight. Half-way down the first leg I realised that I hadn't turned my barograph on, so I knew the flight wouldn't count. This took all the performance pressure off (it didn't matter if I didn't make it) and I happily waltzed around the triangle in about five hours with only one low spot to provide any excitement for the day. A few weeks later I repeated the exercise with the barograph turned on, and after that I knew I had the problem beaten.

Am I completely cured? I would not go as far as to say that I will never be airsick again – but my resistance is now pretty strong. I have flown in the rear seat of a two-seater with the front seat pilot being ill for half an hour or so and not suffered any symptoms myself. I think that's a pretty stiff test for anyone.

I am wondering how widespread the problem is. I personally know of two other people who have had similar experiences, and in one case the problem was cured in a similar manner. However, I guess most people who experience conditioned airsickness give up flying and move on to something less traumatic.

In my opinion, the moral of the story for the average club pilot is clear – never, ever, let your passengers or pupils get ill in a glider. If they show the signs of pallour or cold sweat, or go quiet, get them down as soon as you can. Even if they protest that everything is all right (the macho factor is very pervasive) make some excuse and get them down – if you allow them to get ill it is possible that you could spoil their chances of enjoying their gliding for good. I would hate to have that on my conscience.

!! Magpie is pressing on down-under !!

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DOUG EDWARDS

FUN EXPERIMENTS WITH AERODYNAMICS

Doug, who flies an ASW-17 from Booker and is a flight simulator engineer at British Airways, recommends some exercises to check the various stabilities of your glider, but take note of his warning not to exceed the aircraft's limitations

The mere mention of aerodynamics and the theory of flight is usually enough to make the average glider pilot shrivel up and slink away, but hold on just a moment it can be fun. Aerodynamicists have a long name for a title and use lengthy equations scattered full of more hieroglyphics than a dead Pharoah's curse. Aerodynamics can be described in less than four words. "Lift is drag".

Having accepted that why not try a few experiments in the air which will give you an extensive insight into flight without any resort to long equations or vector diagrams. The next time you are local soaring because conditions are not quite good enough to leave the site explore the stabilities of the aircraft you are flying.

Pitch stability

When the aircraft is deflected from its trimmed pitch attitude it should, for a fixed speed, tend to return to its original attitude. To see just what happens in flight carefully trim out the aircraft at a noted speed and raise or lower the nose 5 or 10° or so. With the stick returned to the trimmed position observe what happens to the attitude and speed whilst giving the odd tweak to keep the wings level.

When it begins to return to the original attitude it is demonstrating its static stability, however, the speed will have changed and it may overdo the correction and overshoot. If the overshoots damp out under these dynamic conditions the glider shows a damped dynamic pitch stability. On all the gliders I have tried this experiment on the excursions have built up until VNE or hammerhead stall have ended the fun. Therefore the gliders have proved to be statically stable but dynamically unstable.

What you will be exploring is what the aerodynamicists call the longitudinal pitch phugoid. The term "phugoid" is an amalgam of two Greek words which can be translated as "flylike". Unfortunately the "fly" is as in flee or run away. If you try the last test but release the stick to position as it will fore and aft the word may prove a totally correct one.

This experiment in a glider with a fully flying tailplane can be illuminating. Watching the stick move fore and aft by itself is eerie and the pitch and speed variations quite spectacular so if you do try it remember to grab the stick before you leave the flight envelope in tatters. The frequency of the oscillations should substantially remain the same as they are mainly dependant on true airspeed.

Lateral and directional stability

We all know lateral stability is the tendency for the wings to return to level and is caused in the main by the action of the wings' dihedral angle. Have you ever seen it happen? Why not go and have a look? You may be surprised. Fly level and wait for some turbulence to upset the aircraft a little, resist the now instinctive corrective action, note the heading and watch the yaw string. It may be some time before the string moves across to show that you are slipping towards the lower wing. The slip will then level the wings but the heading will have changed because of the directional stability swinging the nose during the slip. The amount of heading change is a measure of the directional stability and you have some knowledge of both stabilities with one simple test. QED.

Spiral stability

This can be checked by turning, trimming out fore and aft, and releasing the stick laterally. Does the bank angle increase or decrease? Invariably it will increase but the rate will vary with speed because ... Well why not experiment yourself then think of a reason?

Not generally appreciated is that stabilities change with height because you are travelling faster for a given indicated airspeed but the restoring force for a given deflection remains the same. Those pilots who spin down from great heights have my admiration.

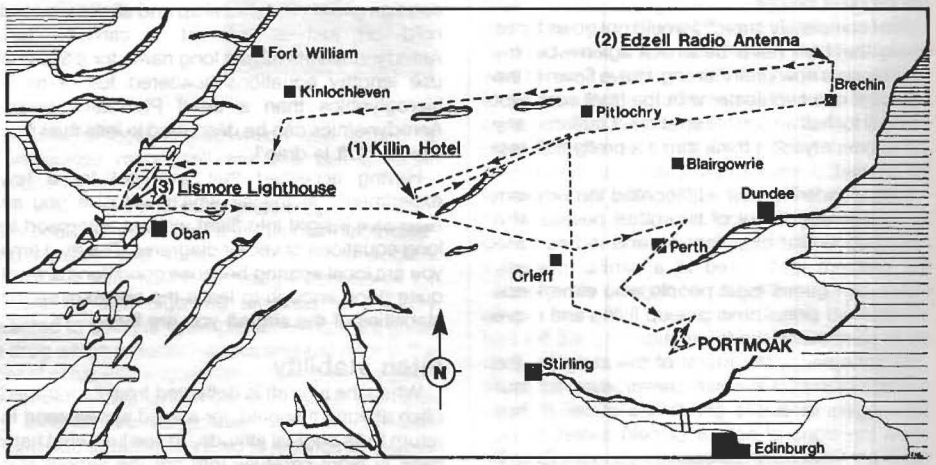
If you do try any of these experiments please ensure that you are clear and remain clear of other aircraft as some of your manoeuvres may be unexpected if not spectacular.

Footnote from Bill Scull, BGA director of operations: The longitudinal stability test should be stopped well short of VNE. Flying to the corners of the flight envelope are the province of the test pilot.

TONY SHELTON

LOCAL SOARING THE 500KM WAY

To maintain the wave flying impetus in *S&G* following two good articles in recent issues by Lemmy Tanner and Tom Bradbury, I have contributed an account of my flight in 1986 (believed to be the first 500km flown in Scotland) with a pilot's eye view of some of the problems and possible solutions



The Scottish summer of 1986 gave northern glider pilots few good days but the new rule 500km zig-zag prompted a couple of forays into the mountains. The first failed from lack of ground sightings (and navigator's nerve) west of Loch Lomond, the second from a rather foolish arrival overhead Killin with only one shot left in the camera. It became clear that my navigation had to be given a heavy rethink.

At Portmoak on Sunday, September 1, the wind at ground level was brisk and NNW, suggesting Lismore lighthouse, Edzell radio masts and Killin Hotel might be the best 500km declaration. At 1120hrs the winch lofted me in my Kestrel 22 to 1200ft where I discovered all the local air was apparently rushing vertically towards Loch Leven. The wave must be good, I thought, abandoning Bishop's bowl in favour of a 500ft scrape along Vane "not-working-very-well" hill.

An hour of rather difficult scratching took me to the top of a slow climb over Kinross to be rewarded with a vista of very wet wave covering my declared track to the west. Logical reasoning suggested abandoning the task; so I did. (However, read on.)

Having worked fairly hard at the first 12 000ft, there was an obligation to make something of the day. With 90kt indicated and the compass reading N, I pushed over the cloud tops to the next upwind wave trough to make a more accurate assessment of the conditions. I discovered:- cloudbase 5000ft; cloud top 10 000ft (mean); cumuli form at 14 000ft; wind 350°/35kt at 10 000ft; wave length 7nm; mean lift 2.5kt (measured best 8kt); wave alignment E to W and expected into wind height loss between waves 2000ft at 90kt.

Wave pattern was produced by a simple and unusually regular system

Cloud cover to the east didn't appear unmanageable. The Forth Clyde valley was relatively open also, allowing Howard Fox to take a Diamond climb and Alistair Dodds to fly a very creditable 240km in the club K-8. It also became clear that the wave pattern in the cloud tops was produced by a simple and unusually regular system with little interference from the weak secondary upper system.

These conditions are typical if wanting to seriously attempt a declared 300km triangle, but cloud cover to the north and west would inevitably make navigation difficult for anything ambitious. The stronger areas of lift didn't guarantee a gap in the cloud layer and the cover along the westerly track to Lismore appeared to be total.

A good day to practise a little navigation I thought as I pressed northwards to a confirmatory "fix" slot a couple of miles west of Aberfeldy.

Note: Navigation over cloud can be a little daunting but given an accumulation of local knowledge and the use of a stopwatch and simple chartwork, it is possible to fly around with enough information to let down in a safe area when the wave system collapses. This sort of thing requires an apprenticeship and the underlying principle is if you are not amused, go home!

Killin was a straight glide along the wave from Aberfeldy. With the ASI at 80kt and the compass reading W, I drove along the upwind face of the wave cloud, slowing down at the Ben Lawers gap to climb in 6kt to assess the possibilities. Cloud cover in a wave trough to the north of Killin looked thin so I pushed on.

The ground around the west end of Loch Tay and parts of the village if Killin were just visible and photographable. "Three six three do you read? Please confirm that the new rules allow us to fly around a declared task backwards." The "affirmative" set the task to "go" again.

The run across to the east was relatively uneventful, producing the long glide at 80kt, the compass pointing 060° and consuming height at a comfortable rate; 14 000ft over Killin, 10 500ft overhead Brechin. At this point it appeared that the task was off again as cloud cover to the north looked total, however as the wave was 7nm I slowly climbed to 11 000ft and pushed into wind over the cloud top into the next wave, where I sat for a while, gently winding upwards in the weak lift above what seemed to be total cloud cover.

The options were to descend, or give up and go home, so, with the necessary levers pulled for a descent through cloud the Kestrel was rolled into a steep turn. Again luck was with me. Looking vertically down at the cloud, I was amazed to see, through the thin bottom of the trough, Edzell radar "golf-balls".

With two TPs in the camera and only 350km to go, I moved across the wave in a westerly direction to a lumpy cloud with its attendant area of stronger lift, there to take a climb and time off to work out the next step.

From 14 600ft, the wave could be seen as a regular pattern in the cloud tops, stretching away into the west as far as could be seen. The clear upper air reassuringly indicated at 1511hrs that the existing wave system was set for the rest of the day.

With stopwatch in hand, note-pad strapped to right leg and the special 3/4/ million **Touring Map of Scotland** across my lap, I turned to 270° on the compass and trimmed the cruise speed to 85kt indicated. This course produced a nicely spaced set of ground sightings very close to the required track: Glen Clova, the A9 road south of Killiecrankie, Tummel Bridge, a fleeting glimpse of Loch Tay to the south and a large gap showing Loch Ericht at its south-west end. The time at the



Tony, who started gliding in 1959 at Camphill, also flew the first wave 300km triangle in Scotland. His Silver and Gold badges were achieved in Scotland.

west end of the Tummel Valley, 1542hrs.

The wave track I followed ran a few degrees to the north of the third leg. This was all to the good, as the country below is not quite as lumpy as that further south, a fact that increased the confidence level in my backout/let-down planning.

From Loch Rannoch, the cloud cover, as far as could be seen to the west, appeared to be total. This generated something of a crisis and induced me to stop and climb after crossing Rannoch Moor above a very tenuous gap in the cloud. The estimated position at 1600hrs was the north end of Glen Etive at 13 000ft.

Clear skies were to be seen over the Firth of Lourn

At about this time the chatter between Connel and various light aircraft became very clear on 130.1, so the radio was used again to confirm that clear skies were to be seen over the Firth of Lourn. With this gem of information, I was able to turn with some degree of confidence on to a 240° heading and drop downwind to the front of a large hump of cloud estimated to be 2nm north of Cruachan. A fast climb to 14 000ft gave a good view through a cloud gap of the south shoreline of Loch Etive.

This last fix allowed a confident flight over the remaining cloud into the relatively clear air over the north end of Lismore which gave me a fleeting view of my TP at the south end of this long thin island.

Clouds to the south-west and over the Sound of Mull were beautifuly fashioned by the wave and it was possible without great difficulty to manoeuvre into the turning sector as the Lismore Light appeared from below a superb lenticular sitting over the south end of the island.

Having flown around and photographed the three TPs, all that was left was to fly home, a relatively easy glide of 140km.

Taking time off to admire the cloud formations over the Firth of Lorne, I had great difficulty in restraining myself from consuming the remaining film, but having learned the hard way about film shortages, set out for home.

The track from Lismore ran east-west in clear air directly over Connel Bridge, and it was found possible to fly at an indicated 100kt while assending at 4kt. Cloud cover again became total some 4nm west of Cruachan, from where, at 14 000ft J. W. recommended a final glide of 80kt, but as my genes are shot through with survival factor, and the instrument gell-cell had powered the radio for the previous five hours, I compromised to crawl across the tops to the Ben Lawers gap before running downwind to clearer air to the east of Crieff.

The flight was not yet over. The not-flying-through-cloud syndrome, and the necessity to descend to below cloudbase within reasonable gliding distance of Portmoak, forced a diversion to the north of Perth and a final zig-zag around cloud to find clear airspace and a let down over Dunning. Arrival overhead Portmoak at 4000ft was followed by a slow acclimatising let down to land at 1750 and that final photograph.

The culmination of all this was the usual (cliff hanging) bringing together all the 00 evidence and to successfully claim the (I think) first ever 500km Diamond distance to be undertaken within the boundaries of Scotland. It was also the realisation of an ambition to complete all the Gold and Diamond legs in wave within Scotland. (Two firsts in a single day; beat that)

It must be said that there has been a large element of luck in all this. The first 300km triangle in Scotland's wave was claimed in 1974 after a change in the 28% rule regarding the minimum length of triangle legs. This reduced the difficulty of 300km tasks by a large order of magnitude. Few, if any, recorded 28% rule triangle flights are officially declared and observed. The revision of the rules allowing three TPs also dramatically reduced the difficulty of the 500km Diamond distance in Scottish wave.

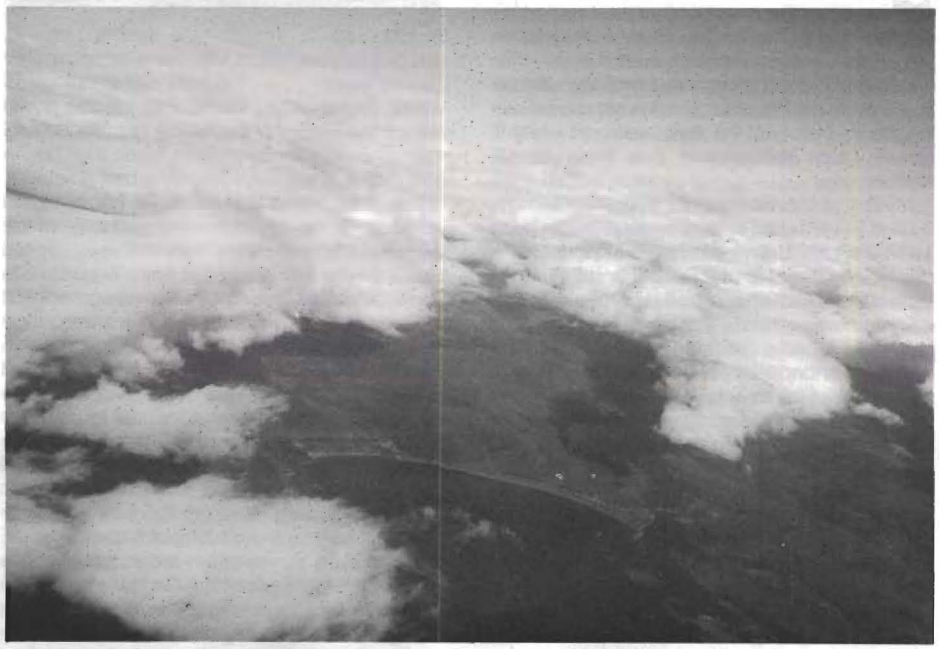
In the years folowing the first 1974 300km triangle, I worked away at the 500km triangle and planned in detail a number of O/R alternatives. However, after a few failures and some very interesting retrieves I deduced that to stay within territorial Scotland gave very little chance of success in the Diamond market, and relaxed with the realisation that no one was going to be first even if they wanted to be.

When the rules changed it became clear that 500km distance was simply going to be an extension of the flat 300km triangle task, but with the extra distance accrued around the third TP. And this is what subsequently happened.

Notwithstanding all this, the number of days when conditions allow this sort of distance to be flown are few in a given year, and the problems of designing tasks with TPs that are reliably photographable is constraining. What tends to happen when long east-west flights in wave are undertaken, is that the TPs are beyond the ends of the wave system generated by the central mountain ranges, and the slots in the cloud layer do not expose the TP to the camera.

The trick is to chose TPs that are known to be below those extra strong wave generating hills with their associated holes in the cloud, and develop navigational techniques for getting to them safely (what I really mean is getting away from them safely when the wave system leaves you stranded and above the *cumulo granitus*). This idea will in principle give the pilot more possible days in a given year.

Fortunately (for me that is) by the time they changed the rules I had accumulated a lot of local knowledge and had made some attempts at navigating with (the then glider limited) radio navigation aids. The conclusion I drew was that local knowledge is reliable, radio nav aids in gliders were not. The time honoured map, compass, stopwatch technology is still good even today, given a little rationalisation of instruments and what one does in the cockpit. (Subject of a further article perhaps.) Having said this, I wouldn't mind a chance at assessing some of the modern trick-radios but I know of people running into difficulties with these guidance systems



Going home with Connel Airfield below.

A couple of declared attempts have now been made at the Scottish 750 and the plans are laid for an attempt at the 1000km goal into England (I will have to change my rules for this one). If anyone would like to read an account of these 750km debacles let me know before they take my word processor away from me.

This article was first printed in SGU's *Portmoak Press*.

S and G Classics

CHOSEN BY THE ARM-CHAIR PILOT

SAGA OF A SAILPLANE

Philip Wills was not merely the leading pilot of his age; he was the doyen of gliding writers. His descriptive powers were a match for his astonishing succession of pioneering flights in all quarters of the world, and his trilogy of books are a lasting memorial to a remarkable man. The first, *On Being a Bird,* came out in 1953, and was immediately recognised as a classic.

Philip wrote frequently for *S&G* (he was chairman of the Magazine Committee for many years), and some of his pieces, including this one, found their way into his books. "Saga of a Sailplane" is not the story of a flight, but of his Weihe sailplane. Read on . . .



Philip and Kitty Wills with the Weihe in the background.

Someone asked me the other day how long a sailplane lasts. I believe the official answer is, as long as the ply doesn't dry out, and I suppose this means that it depends very much on the climate in which it is kept; but the question set me reviewing the life history of the various aircraft which I myself have owned, and one thing let to another.

My first glider was the Scud 2, built for Mungo Buxton in 1931, and shared by me with him from 1932 onwards. Unfortunately, the identity of this machine has been lost. A Scud 2 is still flying at Dunstable, but whether or no it is my original one I do not know.

In 1934, Hjordis, designed by Buxton, was the first high performance sailplane proper of British design to take the air. She was a prototype, heir to the imperfections of prototypes, but in her I learnt a great deal. After three years I sold her, rather unwillingly, to André Brink in Johannesburg. Unwillingly because, with no airbrakes or spoilers and with rather poor and sluggish controls, she was unsuited to conditions on the high veldt of South Africa. I saw her last year, a rather sad and dilapidated wreck, in the roof of a hangar at Germiston airport. Her days are over.

Minimoa, 1938. A beautiful, birdlike machine, with exaggerated stability characteristics, a very suitable machine to enable one to explore the difficulties of blind-flying in unstable clouds before the days of limiting brakes. Taken over by the RAF in 1940, used for various moderately warlike purposes, including a tour of fighter stations to give fighter pilots experience in the difficulties of getting their gun-sights on to such slow moving aircraft (I believe no one ever succeeded). Then transferred to the nascent ATC, crashed in 1944, repaired after the war, owned by Sproule, Prince Bira, Lawrence Wright, and sold to Iceland, where I believe she is still flying after 19 chequered years.

The Weihe . . . ah, the Weihe. Let me try to record the history of the Weihe in more detail.

* * *

The actual time and place of her birth are shrouded in the fog of the war years. From the evidence of some of the materials used, Bolton had a theory that she might have been built in Czechoslovakia around 1942. In any case, I first set eyes on her, in sad disrepair, in a hangar on top of the Wasserkuppe in 1944, about the month of July. Little did I imagine her as the shining and graceful sailplane from whose cockpit, on December 29, 1954, ten years later and 12000 miles away, I was to survey the astounding panorama of the New Zealand Southern Alps from a height of over 30000ft.

I was in a party, of whom Fred Slingsby was one, sent over by the Ministry of Aircraft Production to make a survey of any technical advances in glider design made by the Germans during the war, and we had authority to label any aircraft we thought merited investigation at home: the theory being that any machines so labelled would then be duly transported back for examination and flight testing.

As I went round, one of the developments which seemed to me of great importance was in the field of stability and control. So rapidly does the science of aircraft design advance that many people may not realise that, up to 1939 at any rate, practically nothing was known about this all important subject. Designers simply went on their previous experience; they had built a reasonably controllable aircraft with, say, a particularly shaped tail, so repeated the same general shape next time, scaled up if necessary. There were no design requirements covering the subject, and no measureable flight tests laid down, since no one knew what to measure.

My first flight in an Olympia was therefore a revelation to me; here was a machine that seemed to fly itself in all circumstances, a machine in which blind-flying in all types of cloud assumed a new aspect. I had always shared the belief that Hans Jacobs was probably the world's most gifted sailplane designer, and here was proof of it.

So I decided that one machine to try and get over to England was Jacobs' latest design, and this meant the Reiher. Unfortunately we were only able to locate one of these machines (only three had been built) and we found it had been adopted as a pet by a certain Typhoon station in Northern Germany. Alas, our officially impeccable authority proved of little avail against the ancient right of possession. We pulled all our strings – they were made only of paper. The Typhoon boys couldn't actually fly the thing, but one day they intended to come round to it. In the meantime our beautiful Reiher lay out in the sun and rain for day after day, month after month. At last our slowly grinding wheels brought it, over two years later, to Kenley, and when we inspected it, it was ruined beyond repair by mishandling and exposure.

In the meantime we had proceeded on our journey, and one day reached the Wasserkuppe. As we drove up its beautiful green and rounded slopes to the group of buildings on the top, I was remembering the last time I had visited this lovely place, the Mecca of all glider pilots, for the International Championships in 1937. What pos-

sessed this extraordinary people, with so beautiful a homeland, to go mad once again and destroy the world, themselves with it?

The group of buildings at the summit seemed much as I remembered, except for a large new permanent building with a splendid swimming pool in front of it. Evidently this had been the main block for whatever unit had been stationed there during the war. We started to wander through it, and in the centre came on a large chapel. Along both walls were yellow pine pews, but the middle of the floor was taken up with a raised concrete platform, on which was reclining the more-than-life-sized concrete recumbent figure of - a dead pilot. His arms were folded on his chest, he was clothed in full concrete flying gear, with an unopened concrete parachute on his chest. Wreaths of brown-gold artificial oak leaves were propped around his plinth. At the far end of the chapel a stained glass window, lit by the outside sun, representing the Angel of Death, complete with well developed sun-bronzed private parts, lowered down on the absent congregation. It seemed, to put it mildly, an un-British way of stimulating the right outlook in a congregation of pupil glider pilots.

The Wasserkuppe was in the American sector, and hence occupied by a US Army unit, but embedded in this was a small RAF unit operating a radar station, and we were accordingly accommodated by our compatriots. As we walked round, we found ourselves in a veritable Golconda of gliders. Hangar after hangar was stuffed full of gliders of all types: if we could only have transported the lot back to England, our home clubs would have been in full operation two years earlier than they actually were. Alas, our terms of reference were more limited. But in one hangar I found several Weihes, which had been Jabobs' last design before the Reiher. As I had already an uneasy feeling about the possible future of that machine, and apart from that I was struck with the brilliant simplicity of the Weihe's rigging features, I decided to label two of these aircraft.

But now I started making inquiries of our RAF friends as to the likelihood of our system working, and once more doubts began to creep in. It appeared that when the Americans first arrived at the Wasserkuppe, they had seen sailplanes for the first time in their lives. As might have been expected, they had joyfully accepted them as toys with which to while away the time. A sailplane - a Weihe of course, only the best would do - was dragged out, an American major strapped in, and catapulted off. The Weihe is a gentleman. It did its best. The major was in bed with a cracked spine; he was expected to recover. In the meantime a ukase had gone forth - no further glider flying for the occupying troops, and to make absolutely certain of no more trouble, all gliders on the field to be broken up and burnt next week...

I went and saw the Commanding Officer. I pleaded with him, I told him there were people in England who would give their right arms for his field full of gliders. In any case, I said, I wanted two Weihes, and had authority to arrange for their transport to Farnborough. I hoped, therefore, he would withdraw his order for their destruction, would think again; but I could see where his thoughts were leading him. If we wanted two Weihes in England, might not they also like them in the United States? I thought that just possibly I had saved the Weihes, but not for Farnborough. But there seemed nothing more I could do. Our trip came to an end, and we flew back to England.

* * *

Some months went by. We had made our report, and parts of it had been approved for action. But the official machinery of recovery had, as expected, failed to work, and no machines appeared in England. Ken Wilkinson at Farnborough had confirmed that they would like certain aircraft, including the Reiher, Weihes, and a Horten 4 tailless sailplane which we had discovered. This latter machine was on a proper airfield, and at last Farnborough, in despair, sent over a Halifax and carried it away in triumph. But the grass field on top of the Wasserkuppe was much too small for a Halifax, or even a Dakota, so the Weihes seemed doomed, the Reiher unobtainable, and my ideas about getting a jump ahead on stability and control doomed to failure.

Then one day my Air Transport Auxiliary freight section at White Waltham got a job to carry supplies to Prague. The route lay almost over the



Philip flying the Weihe.

Wasserkuppe, so I decided to take one Anson load myself, and call in on the return journey; the Anson light could easily make the landing.

Nothing had changed since our last visit. The same troops were still there, the same small British unit, the same gliders, undestroyed; so I had managed to achieve something in a negative sort of way. My two Weihes, with my dusty labels attached, were still in their hangar, where it seemed probable they would stay till Doomsday.

Other German pilots I had interrogated had confirmed their excellence, and I felt more than ever sure that, if Farnborough could test them and put the results at our disposal at home, we should be able to use them as a basis on which to lay down our post-war requirements and ensure a new generation of British aircraft of the first quality. (I was not to know that, a little later, Dudley Hiscox was to ensure a great step forward in the same direction by arranging for Chilton Aircraft to build him an Olympia from the pre-war German plans. The EoN Olympia, which resulted from this, ensured that once for all we at home came to know what constituted a first class sailplane from the handling point of view.) I resolved on desperate measures.

I had a long talk with the RAF Flight Lieutenant in charge and told him my problem and he assured me that if I could get a Queen Mary trailer to the Wasserkuppe he would ensure somehow that the Weihes would be put on it. I had a friend in the shape of a Group Captain in charge of an aerodrome in Belgium where we used to refuel our freight Ansons, and I determined to put my case before him and see if he would play. After all, if Farnborough had sent a Halifax, what was a Queen Mary? Calculation showed that a trailer of this size should be able to accommodate not only the two complete aircraft, but also a spare pair of wings, so I labelled a pair for luck. then I took my courage and a saw in both hands, and set about one of the worst tasks of my gliding life. I sawed up a beautiful Weihe. I sawed off the wing-roots and the centre-section fittings, and put them in the back of my empty Anson, together with a complete tailplane. At least we should be able to examine the brilliant detail design of the rigging features, and if I left the machine there it would do no one any good. But it was a cruel job.

On the way home I called in to refuel, and found my Group Captain friend in his office. To my joy, he agreed to help. He would do his best, and send me a signal at White Waltham if and when the aircraft were ready to collect at his airfield. And so back to White Waltham, feeling that I had done what I could for the time being, but of course the chances were slight. The radar unit at Wasserkuppe, on whom all depended, might be moved at any minute, or any other link in the tenuous chain I had tried to lay down might vanish without warning.

In writing up a history like this, it is of course easy to give the impression that all my attention was focussed on getting hold of these Weihes at the time, but of course this was far from the case; in fact, I had almost forgotten about the whole thing when, a couple of months later, the signal arrived and I had to look twice before I understood it. *"Goods arrived, awaiting collection."*

By now, the war in Europe was nearly at an end. Aircraft were still flowing out of the factories and across the Atlantic, and all piling up in store. The storage units were by now only running a five-day week and, at weekends, many aircraft were ferried in by us to our home aerodromes, and on-flown the following Monday to their final destination. So I went up to Prestwick one Friday and brought a Dakota down to White Waltham which was allotted for storage in a nearby maintenance unit. I measured up its hold and the size of its door. It seemed fate when I discovered that, as far as I could see, the Weihe wing would just go through the door, and just fit in the hold with two inches to spare. And so it proved. Furthermore, the Dakota just took one complete Weihe and one wing over, and in two flights, by Sunday night, the job was done.

* * *

It was more than a year later when the next fortunate chapter opened. One of the Weihes brought over had proved to be fairly badly damaged, but the RAF had duly repaired and tested the other. The civil gliding clubs were slowly struggling back to life, and the BGA had started to function again. Dudley Hiscox was chairman, but I had taken on a more than full-time job in British European Airways, and had little time to spare for gliding affairs. However, I still managed to attend Council meetings, and at one of these it was reported that Farnborough had finished with the various sailplanes brought over from Germany, and it was proposed to transfer them to the BGA.

The damaged Weihe seemed to be a problem,

as no one knew what it would cost to repair it or even if it was repairable at all, whilst none of the clubs at that time had any spare funds to undertake such a doubtful project. I therefore proposed that, if the Council approved, I would purchase the remains from the BGA, and this was agreed. This was at a time when people were still thinking of high performance sailplanes in terms of £300 apiece, so when I got a bill for repairs of £250 I did not seem to have done so well. However, the work was done, and I never regretted it. For two years I had much joy from her, and did many flights, including a height record in a gigantic cu-nim near the Long Mynd.

Just after this flight she again went in for a renewal of C of A and my feelings were indeed mixed when it was found that previous inspections had not revealed what may have been a deliberate piece of sabotage by those who had been originally forced to build the aircraft for their German masters. The spar-booms and webs were hardly glued together at all, and when the wings were completely unskinned each spar peeled down to four almost undamaged pieces of wood! Yet in this condition she had uncomplainingly carried me through extreme turbulence and many hours of flying over a period of two years. This is the sort of thing that makes one believe in high safety factors.

As for the other aircraft, the second Weihe went to the Surrey Club, who have done excellent work with her ever since. The spare pair of wings and the sawn-off fittings and tailplane were rebuilt into a complete machine by Bolton and, as was the Horten 4, sold to the United States, contributing their small share to the dollar shortage. And the BGA Technical Committee co-opted Ken Wilkinson and with the knowledge acquired from these and other tests laid down the stability and handling requirements for gliders which were eventually incorporated by the Air Registration Board in Section E of their requirements and duly formed the basis of our existing pre-eminent aircraft.

A small grant from the Ministry enabled us, amongst other things, to finance the flight trials necessary to plot a polar curve for the Weihe, and everyone knew how good an advanced sailplane had to be to be good: it had to be better than the Weihe.

When eventually the Slingsby Sky appeared and proved to be the best 18 metre production sailplane the world had yet seen, my Weihe, from which so much benefit had been derived, went off to start a new life on the other side of the world. Painted a brilliant red, maintained by Dick and Helen Georgeson with loving care, I can see no reason why she should not continue to grace New Zealand skies with her slender beauty for another decade or more. Born in the dark days of war, under the tyranny of repressed Central Europe now with new worlds to conquer in the extraordinary air of free New Zealand, where we may well read one day, it has broken the world altitude record, what could be a more unlikely or a more romantic history?

NB. Dick broke all the New Zealand records with the Weihe before selling it to a syndicate in 1956 which included Chris Wills. It was badly damaged by a later owner and Harry Smith now has the bits with the hopes of it being restored.

R. P. SAUNDBY

MEDICAL STANDARDS FOR GLIDER PILOTS



Peter is an RAF medical officer who has spent most of his career in aviation and occupational medicine. Learning to fly in the University Air Squadron while a medical student at Bristol, he later completed his RAF Wings and has flown a range of military aircraft. Gliding since 1960, he has three Diamonds. A long standing member of the RAFGSA he has been club CFI, secretary and vice-chairman and, for periods, on the BGA Executive Council. By drafting the BGA medical declaration and establishing the principle of personal responsibility, he averted the imposition of medical examinations for glider pilots. Since then he has advised the BGA, clubs, and individuals on medical questions. He represents UK aeromedical sporting interests on the FAI. Serving as an Air Commodore in the Ministry of Defence, he is responsible for the training and management of medical personnel in the three Armed Services.

The present policy of the BGA dates from some twenty years ago following a very serious accident when an epileptic gliding instructor crashed, killing himself and his pupil. In the subsequent inquiry it was established that he had not only concealed his illness from his club, but that he also held a medical certificate for a PPL! After much consideration the BGA resolved on the present policy, which has further evolved in the light of experience since that date.

The policy is that gliding is a sport and fitness to fly is a personal responsibility of the pilot. In exercising this responsibility the pilot may require to seek medical advice, and independent endorsement is required for those responsible for the lives of others in the air.

The **Laws and Rules** of the BGA require glider pilots to sign a declaration of fitness before flying solo which brings to their notice those medical conditions which could be dangerous in flight. If the pilot suffers from any of the conditions listed, he may not fly unless his declaration of fitness has been endorsed by his regular GP or an authorised CAA medical examiner. There is a second list of medical conditions which could be aggravated by flight and for which the pilot is advised to seek medical opinion. To remind pilots of their responsibilities the declaration of fitness has to be repeated at intervals. These are related to age and follow, but are not identical to, the requirements of the CAA for the renewal of a Class 3 medical certificate. In cases where illness is suspected, but the pilot continues to fly, clubs may insist that a member takes medical advice. This is the reason behind para 14.5 (c) of the **Laws and Rules** for glider pilots. In difficult or borderline cases where a club is in dispute with a member on their fitness to fly, the BGA can obtain specialist medical opinion.

In club operations flying is the responsibility of the CFI, and dual flying, solo flying or instructing all require authorisation by the CFI or his deputy. They also represent different levels of risk, and can be used as a basis of medical limitations which are easily understood by the gliding club. For some medical conditions it might also be necessary to advise limitations of altitude, or flight duration. These should be explained to, and agreed by, the pilot. It would be usual to set altitude limits in steps of 5000ft and draw attention to the BGA recommendations on the use of oxygen in flight. Another useful limitation is local flying. This implies that the glider remains within gliding range and can land within about 15 minutes. Flight limitation can also be expressed by time; one hour will allow local flying, five hours limited cross-country flying and few glider flights exceed eight hours.

Medical conditions can be divided into four categories, those which are improving, those which are static, those deteriorating and a few for which the course is unpredictable. The management differs in each case. Conditions which improve are commonest, because they include all minor intercurrent illness. Usually the pilot simply avoids flying for a short period and all is well. However dangers exist during competition flying in which a lost day may lose all prospects of winning the contest. Competition officials, wives and support crew should be alert to the danger of flying when unfit. Following more serious illness the return should be staged, days on the ground attending the club, dual flying, and then solo following a satisfactory check of flying skills. A medical review is advisable before flying solo.

In chronic conditions, quite serious neurological or orthopaedic disability may be compatible with flying gliders. It is in keeping with modern views that disabled people are encouraged to take up a sport and gliding can be a useful opportunity. Disabled individuals should not be barred from a sport because the risk to themselves is higher than it would be to other participants, but any increased risk must be fully understood by the participant. For these static conditions the best judge of fitness to fly is a flying instructor. Where limb weakness exists, power over controls can be easily measured in a two-seater glider by putting a spring balance on the corresponding control in the other cockpit (this is not

applicable to the rudders of some tandem two-seaters). If the disabled pilot can exert the force required in the manuals of airworthiness, no problem can occur in flight. If the pilot has a weakness, flying instructor approval is required for each type conversion. In theory it is possible to modify the control systems of gliders to accommodate almost any disability. The requirement of the BGA is that all such modifications meet normal aircraft engineering standards and are approved by a BGA Inspector.

When an instructor checks a disabled pilot in a two-seater he should first estimate, or measure, for forces exercised by the pupil on all controls by attempting to overpower the pupil using the dual controls. A cable release check under tension is essential. If a disabled pilot can provide the design control forces, he may fly without restriction. If he is unable to provide the full forces, he should be cleared by flight test which should include entry and exit from steep turns to port and starboard. Side slipping in both directions should be demonstrated because failure to enter side slips will indicate potential problems with cross-wind landings.

The maximum control forces from a pilot are required to meet extreme conditions. The worst cases are likely to be the failure of the water-ballast tanks of one wing to jettison, or failure of the elevator trim with a forward C of G. Maximum rudder loads would occur in entry to steep turns or a crosswind landing. It is important that any disabled pilot fully understands the effect of his disability on the flight envelope of the aircraft, so that he may avoid areas of potential hazard, and accept crosswind or other limitations which may be lower than those to which the aircraft is cleared when flown by able bodied pilots.

Medical conditions which deteriorate are more difficult to manage. This includes normal old age. Often the gliding club will become aware of deteriorating skills before they could be apparent on a medical examination. Pilots will have to accept the loss of an instructor category and even the right to fly solo. Club officials may have the painful duty of grounding a member who in his time was a much respected mentor.

Sometimes pilots from other fields of aviation who have lost their medical licence think that they can continue flying with gliding clubs. They do not appreciate that gliding requires hard physical work and this move is almost always unsuccessful. The action recommended in such cases is to approve dual flying and require a medical review before flying solo. The most difficult problem is where the progress of the disease, or the possibility of a relapse, is unpredictable. In these cases the risk must be quantified against other risks, because the possibility of sudden illness exists for all individuals. An informed individual can accept risks on his own behalf, it is risks to third parties that are the responsibility of the club.

For dual flying there are almost no restrictions on who can be taken into the air. Some gliding clubs previously made a practice of flying very disabled and handicapped patients as a charitable endeavour. For solo flying, the pilot should not present a higher risk to third parties than he would driving a car on the public highway. Where a medical condition does induce a risk over and above that of a normal individual, it is important that the pilot fully understands both the nature of the risk and his responsibilities, or other measures to improve fitness to fly.

For instructional flying the risks are comparable with that of being a pilot in charge of a powered light aircraft. Glider pilots who suffer medical conditions which would debar them from holding a CAA Class 3 medical certificate should not be approved to instruct inexperienced pupils or carry passengers. This is not intended to mean regular medical examinations are required, it is to indicate what level of disease or disability should lead a doctor to advise a patient not to fly with passengers or pupils.

"They remain responsible for their own fitness to fly . . ."

Pilots who hold a medical certificate issued by the CAA, or are serving aircrew in the Armed Services and hold a flying medical category, are exempt from the BGA requirement to sign a declaration of fitness. They remain responsible for their own fitness to fly and are subject to the same requirement to obtain medical advice after illness as other glider pilots. Operational restrictions applied to professional licences should also apply to gliding, unless a waiver has been agreed by a medical practitioner.

Visual defects are the largest group of conditions for which applicants are rejected from professional flying careers. Young persons taking up gliding are best judged on flying performance. If they have difficulties, they will not progress. Modern contact lenses are compatible with gliding. Colour vision defects are unimportant because coloured light signals are not used to control gliding operations. Monocular pilots, once adapted to their one eyed state can fly satisfactorily. The most difficult problems arise with the older but experienced pilot with deteriorating visual acuity; they may have to be firmly advised to fly with a safety pilot because of the risk of mid air collision with their fellow glider pilots.

Pilots who wear spectacles should equip themselves with both clear and tinted spectacles of good quality, which give a good field of view. These are sold as "sports" patterns. Older presbyopic pilots should possess tinted spectacles with a bifocal window. Pilots who depend upon spectacles for refractive correction should carry a readily accessible spare pair in case their normal pair falls to the cockpit floor.

Coronary artery disease is a common cause of becoming unfit to fly and presents two problems. The recovery from a recent illness, and the risk of further attacks. Gliding can play a part in the recovery process and the prospect of return be used to encourage patients to give up smoking and reduce weight. Club activities should start with ground attendance and no one should fly until they can undertake the physical work associated with gliding. When normal function is established, and risk factors eliminated, a slow return to dual and solo flying can be authorised. Pilots should not be responsible for the safety of others in the air until after two years of normal function, because of the risk of further heart attacks.

Other diseases have to be considered on their merits, separately taking into account the effect of flight upon the progress of the disease, and any potential risk to third parties.

No system of medical examinations can entirely remove the possibility of sudden illness and incapacity. Few diseases are first discovered on a routine medical examination. All professional pilots have to be personally responsible for declaring short term acute illness. Experience over the last twenty years has shown that relying on the integrity of glider pilots to be responsible for their own fitness to fly has resulted in no higher an accident rate from medical causes than exists in general aviation as a whole; and as a bonus, flying accidents arising from alcohol consumed by pilots have been almost unknown in gliding clubs.

In summary, glider pilots are responsible for their own fitness to fly. It is their responsibility to obtain proper medical advice. The BGA Declaration of Fitness provides guidance on those medical conditions which are incompatible with flight, and those for which medical advice should be obtained before flying. More detailed guidance will shortly be issued by the BGA as part of the club management package. If necessary consultant advice can be obtained on individual cases throughout the BGA.

AIR LINES

Ron spoke quietly, seriously. His eyes were the colour of the sea in winter. "I was at about four thousand, holding my speed so that I stayed in zeroes a few feet beneath the base of a long, straggling cloud street, when I noticed a flight of ducks climbing just to my right. They came up fast and precise. I watched them carefully. They flew with their stubby serpent-headed necks extended, the neat wedge shaped wings a flickering blur, and the pattern across their backs was like half of an RAF roundel. They were a model of efficient and accurate team flying.

"As they reached my level they must have been well centred into the line of lift because the cloud drew the entire formation smoothly and inexorably into itself. For a few moments I flew on alone. Then, suddenly, ahead of me I saw ducks – falling, tumbling, spinning ducks that plummetted wildly out from the cloud, their formation totally destroyed, and in a condition where it was obviously every duck for itself."

He paused to blow on his tea, staring at each of us in turn, defying us to disbelieve him. In the solemn tones that indicated that he was now delivering himself of The Moral of the Story he said, "And if ducks can't fly in cloud without instruments, what chance do you have!".

TERRY HURLEY

LOOKING BACK

SIR GEORGE CAYLEY (1773-1857)

Historians have paid tribute to Sir George Cayley as the "father of aerial navigation". Excellent books have appeared telling his life story and analysing his many achievements. *S&G* described John Sproule's reconstruction of one of Cayley's gliders and its test flights with Derek Piggott as pilot in the February 1974 issue, p23.

In this article I have chosen to look back at his famous triple paper "On Aerial Navigation", published in Nicholson's *Journal of Natural Philosophy, Chemistry and the Arts*, 1809 and 1810, because it is by itself a veritable landmark in the history of aeronautics.



Sir George Cayley painted by H. P. Briggs and reproduced by kind permission of the National Portrait Gallery.

Array of new ideas. The original three-part article ran to only thirty-two small octavo pages but it is packed with a dazzling array of new ideas. For example, the paper reveals the first ever design of a fixed-wing powered aeroplane and its test flights as a glider; the first satisfactory explanation of bird propulsion; bench tests of lifting aerofoils at varying angles of incidence; the use of cambered aerofoils instead of flat plates to improve lift; the movement of the centre of pressure of an aerofoil; identification of an area of low pressure on the upper surface of an aerofoil; model gliders for aerodynamic research into longitudinal stability and tail surfaces; wing dihedral for lateral stability; bodies of minimum resistance for streamlining and, as if all that was not enough, the paper also included the first ever suggestion of internal combustion engines for aircraft propulsion!

Typically, Cayley did not stop at suggestions; he had already built an experimental hot-air engine and an internal combustion engine fuelled by gunpowder.

In short, Sir George invented the aeroplane 180 years ago, complete in every essential except ailerons. Here are extracts from the original text which illustrate some of these startling revelations.

Velocities of 20-100 mph. "I am induced to request your publication of this essay, because I conceive, that in stating the fundamental principles of this art, together with a considerable number of facts and practical observations, that have arisen in the course of much attention to this subject, I may be expediting the attainment of an object, that will in time be found of great importance to mankind; so much so, that a new era in society will commence, from the moment that aerial navigation is familiarly realised . . . I feel perfectly confident, that this noble art will soon be brought home to man's general convenience, and that we shall be able to transport ourselves and families, and their goods and chattels, more securely by air than by water, and with a velocity of from 20 to 100mph."

The whole problem. "Before it is possible to apply . . . the principle of flying in birds to the purposes of aerial navigation, it will be necessary to encumber it with a few practical observations. The whole problem is confined within these limits, viz. To make a surface support a given weight by the application of power to the resistance of air. Magnitude is the first question respecting the surface."

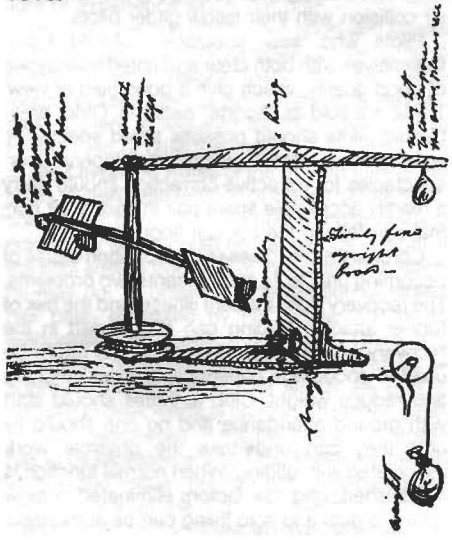
Noble white "bird". "Perfect steadiness, safety, and steerage, I have long since accomplished upon a considerable scale of magnitude; and I am engaged in making some further experiments upon a machine I constructed last summer, large enough for aerial navigation, but which I have not had an opportunity to try the effect of, excepting as to its proper balance and security. It was very beautiful to see this noble white *bird* sail majestically from the top of a hill to any given point of the plane below it, according to the set of its rudder, merely by its own weight, descending in an angle of about 18° with the horizon."

Rolling of the machine. "This angular form, with the apex downward, is the chief basis of stability in aerial navigation; but as the sheet which is to suspend the weight attached to it, in its horizontal path through the air, must present a slightly concave surface in a small angle with the current, this principle can ony be used in the lateral extension of the sheet; and this most effectually prevents any rolling of the machine from side to side."

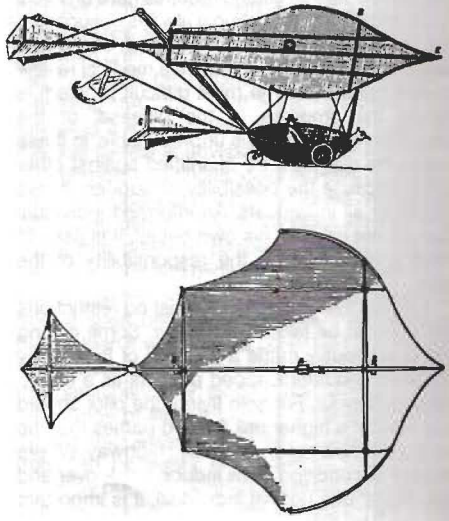
Add a rudder. "To render the machine perfectly steady, and likewise to enable it to ascend and descend in its path, it becomes necessary to add a rudder in a similar position to the tail in birds . . . The elevation and depression of the machine are not the only purposes, for which the rudder is designed. This appendage must be furnished with a vertical sail, and be capable of turning from side to side, in addition to its other movements, which effects complete steerage of the vessel.

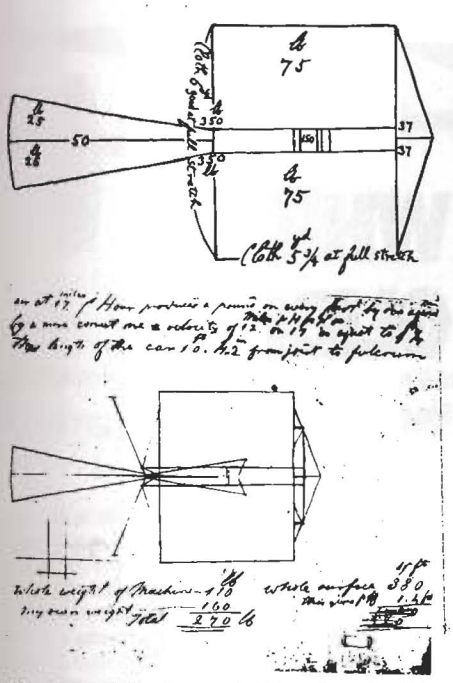
Steerage and steadiness. "All these principles, upon which the support, steadiness, elevation, depression, and steerage, of vessels for aerial navigation depend, have been abundantly verified by experiments both upon a small and a large scale. Last year I made a machine, having a surface of 300sq ft, which was accidentally broken before there was an opportunity of trying the effect of the propelling apparatus; but its

A whirling arm used for testing airfoils, 1818.



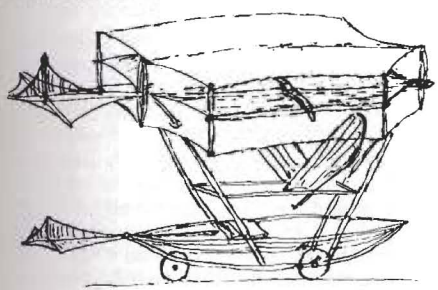
A monoplane glider, 1852.





Sketches of the type of glider described in the triple paper.

steerage and steadiness were perfectly proved, and it would sail obliquely downward in any direction, according to the set of the rudder. Even in this state, when any person ran forward in it,



A triplane machine with propulsive flappers, 1849.

with his full speed, taking advantage of a gentle breeze in front, it would bear upward so strongly as scarcely to allow him to touch the ground; and would frequently lift him up, and convey him several yards together."

A new science: Aerodynamics. In his triple paper Sir George Cayley not only invented the aeroplane, he also introduced a new science, aerodynamics. It was a long time before other aeronautical experimenters understood the paper's true significance. Eventually in 1876 an abridged version was reprinted in the "Annual Report" of the Aeronautical Society of Great Britain; in 1877 *L'Aeronaute* published a French translation; and in 1895 the American *Aeronautical Annual* reprinted the original text.

In 1842 it had a direct influence on the conception of Hensen's "Aerial Steam Carriage" (which was never built but created widespread interest) and also on the later gliding experiments of Wenham, Penaud, Lilienthal and others who had easy access to it *via* the reprints. However, they did not profit from it as much as they might have done. Chanute and the Wright brothers studied the triple paper carefully, but by then, 80 years later, better aerodynamic data was available from their own experiments and those of others.

Competing with the balloon. It is interesting to speculate why the triple paper of 1809-10 and later publications, particularly those of 1852-3 (one example is illustrated here) did not have more immediate impact, because if they had been properly exploited, controlled gliding flight might have been achieved much earlier.

First, in advocating the fixed-wing aeroplane, Cayley was competing with the balloon, which already existed, and the airship, which already had been extensively studied and promoted. Indeed, Cayley himself from 1816 to 1851 spent much time on airship designs. Secondly, what could have been an epoch making study was in 1809-10 pushed into the background, with public attention centred on the Napoleonic wars.

Determination and great intelligence. Cayley was not the first man to be inspired by bird-watching into trying to emulate their apparently effortless, graceful flight. However, he was born into a world that still thought of such men as cranks or worse. History had shown that they succeeded only in covering themselves in shame and derision. Their folly invariably ended in injury or death. That he approached the problem scientifically, with determination and great intelligence, made no difference. At worst he was going against religion; at best he was just a harmless eccentric.

Fortunately, he left a quantity of published and unpublished documents which have enabled us to recognise him as the most outstanding figure in nineteenth-century aeronautics. Among the documents are his notebooks, from which our illustrations are taken.

A TALE OF TWO CABLES

The tug made a spirited Gallic approach, trailing the end of the tow rope playfully through the tops of the young sunflower plants growing in the undershoot field. A peasant hoeing between the rows stood up and shook his fist.

I had landed after another twelve minute 300km attempt; my syndicate partner was now climbing away after his launch. As no one else was waiting for a launch, I went over to try my forty-years-on French on the tug pilot.

"You didn't stay up very long", he said, "but I would rather launch you Anglais than the Germans who always think that they are being launched by a "trolley".

"A trolley? What's that?"

Then he did something no British tug pilot could do, a perfectly comprehensible impression of a winch.

At this moment we were joined by the irate farmer from the undershoot and my French vocab was overwhelmed by a welter of non-schoolboy language. When the farmer had departed my friend shrugged his shoulders and told me that the sympatheticness of farmers varies in direct proportion to distance that they live from an airfield. He had clearly come off second best in the exchange, so to comfort him, I told him the following tale of my humiliation by a rustic.

Many years ago, I made a couple of five minute 300km attempts, like today's efforts but from autotows. I thought to regain my dignity by driving the towcar and showing just how efficient I could be.

The airfield had three runways in a triangle, they were fenced and the land in between them was farmed.

The farmers came straight out of **Cold Comfort Farm**. Of course, with the slightest crosswind our launching cable pulled down their fences at least twice a day. The farmers were allowed to drive their cars on the runways, the public were not – but often did. It was quite satisfying to send the Sunday afternoon drivers on their way –"Can't you read the notices?"

The towing operation was going well and my ego was recovering. I started another tow and towards the end of it saw a car driving up the middle of the runway in front of me. Here was a chance to catch him and deliver a really ego-boosting blast of sarcasm. The interloper turned off at the intersection and as the glider released, I turned off and gave chase. I overtook and stopped him and the driver got out. It was farmer Seth. He was a funny puce colour and pointing behind me with a trembling finger. I had forgotten to release my end of the cable and was pulling two hundred yards of his fence behind me. This expanded my English vocabulary somewhat!

JOHN KENNY

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ASK-23. Photo: R. May.

DEREK PIGGOT

WHICH GLIDER?

Part 2

This group of gliders consists of those glass-fibre machines deliberately designed for inexperienced pilots, and also those which, by small modifications, have been made more suitable for these pilots than their competition sister ships. Absolute performance has taken second place to good handling at low speeds and to avoid complication and expense they usually have a fixed undercarriage. In most cases the cost of these machines is kept to a minimum by reducing the use of carbon fibre and eliminating waterballast tanks etc.

They aim to have lower stalling and circling speeds and good, forgiving characteristics. The ideal intermediate "club" machine should have control forces more comparable with the average glass two-seater so that pilots can use it as a step between the two-seater and the top performance machines. Of course it must have powerful air-brakes to make it easy for initial field landings.

Actually the majority of the top Standard Class machines meet most of the requirements for a club glider except for the elevator control forces. However, the higher touchdown speeds make them less forgiving of a heavy landing and the higher circling speeds mean the radius of the turn is larger, making thermalling more difficult for the beginner.

For the lucky pilot who can afford any type of glider, there is also the possibility of buying a two-seater and using that for solo flying. This at first sight looks very attractive but there are a number of major disadvantages and I would not recommend it.

Once you have tasted the superb handling and ease of rigging of a modern single-seater, it becomes difficult to be enthusiastic about a two-seater.

The majority of modern two-seaters are heavy to rig and derig and also quite hard work to fly. This is a major drawback when it comes to cross-country flying and most privately owned two-seaters spend their lives staying within range of the gliding site because of the sheer effort involved in a possible retrieve.

Experience has shown that where soaring is concerned, other pilots and passengers find the constant circling both boring and sick making. After a short time two pilots become very disgruntled with each other because each is itching to take over and prove that the other is fumbling about and not making the most of the conditions. For the majority of pilots, soaring is a solo occupation and any criticism or distraction is unwanted and uncalled for. If the weather is soarable they all want to be doing the flying.

Below: IS-29D. Photo: T. Dickinson.



ASK-23

The ASK-23 was designed specifically as a follow on club glider to suit pilots trained on the ASK-21 two-seater. The performance is good with a best glide angle of 30 to 35:1 making it suitable for 300km flights on any good day.

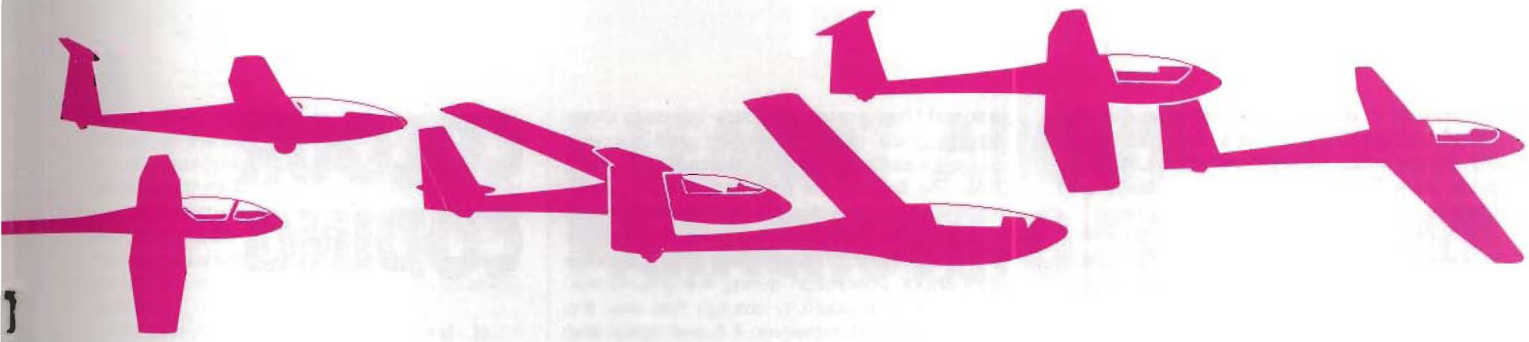
It is simple to fly, has no vices and good airbrakes.

The ASK-23 has the main wheel located just behind the loaded C of G and a nose wheel and tail wheel. This arrangement makes it very stable directionally on the ground and easy to make a smooth landing. Provided it is held off sufficiently to land on the main wheel it is unlikely to bounce. This arrangement is also good for ground handling because it is easy to raise the tail for turning by applying a little downward pressure on the nose. Like most modern machines it has no tail handle so that lifting the tail and moving it forward is not so easy.

However, it is very light on the elevator at low speeds and care must be taken to avoid pitching oscilations just after take-off on aerotow. For some unknown reason there seems to have been more trouble with pilots overcontrolling and flying into the ground just after lift off on aerotows than with most of the other machines which seem to have just as light or, in some cases, even lighter stick forces. It is difficult to analyse just why this is the case. It might be that the position of the main

Below: DG-100. Photo: T. Dickinson.





his issue Derek continues his popular series by giving advice to the inexperienced pilot
nking of buying a modern Club Class 15 metre glider

wheel is a little further back than on some of the other similar machines. This might make it seem necessary to bring the stick right back to lift the nose wheel, with the result that the glider tends to zoom up when it rotates and unsticks suddenly. This may worry the pilot so that the next correction to prevent the glider rising too high above the tug may be too vigorous. In this way it is easy to start a PIO (Pilot Induced Oscilation) so that the glider flies into the ground or very close to it.

As a stepping stone towards flying something with a retractable undercarriage, this type of undercarriage has the disadvantage of allowing sloppy habits to develop. No problems occur unless the glider is flown on to the nose wheel at high speed. The pilot who is not used to having to hold off fully during a landing may run into trouble flying the machines not fitted with a nose wheel.

Apart from the slightly twitchy elevator on take-off, the only other disadvantage of the ASK-23 is the cost of repair if the fuselage ever gets damaged badly. The construction is the usual Schleicher sandwich construction like the ASW-19 and 20. It is extremely strong but expensive to repair. I have known a fuselage damaged in the nose to cost less to replace than to repair.

Grob 102 or Club 111B

This is a club version of the Astir series and can be fitted with either a nose wheel or the normal main wheel ahead of the C of G type of under-carriage. In both types it has a sensibly sized tail wheel to make ground handling easier.

The Grob has proven a very popular glider with all the features desirable in a club glider. The handling is excellent and being a little lighter weight than the other versions, it seems to have slightly lower circling speeds than the normal Astir. The best gliding angle appears to be in the 33 to 35:1 range making it very suitable for early cross-country flying. Although the controls are much lighter than on the two-seater Grob 103 Twin Astir and Aerobat, it is an easy step from one to the other for early solo pilots.

SZD Junior

The Junior is perhaps the least known of all these club gliders but has many excellent design features and much the same best gliding angle as the ASK-23 and Grob 102.

The most striking feature is the huge main wheel fitted with a disc brake. This must be a good feature to reduce landing shock loads and prevent damage in rough fields.

With a claimed best glide angle of 35:1 at 69km/h, the Junior is nearly 16km/h slower than the other machines and this makes it particularly suited to thermalling in small, weak thermals. The lower speed is also an advantage for winch launching on a small site and ensures a really high launch.

This is much closer to my own idea of a good club glider. In my opinion the lower circling speeds are a great advantage to the inexperienced pilot and the chance of damage is always greatly reduced by lower landing speeds. This is why the K-8 and K-18 were so successful.

DG-100 and 101

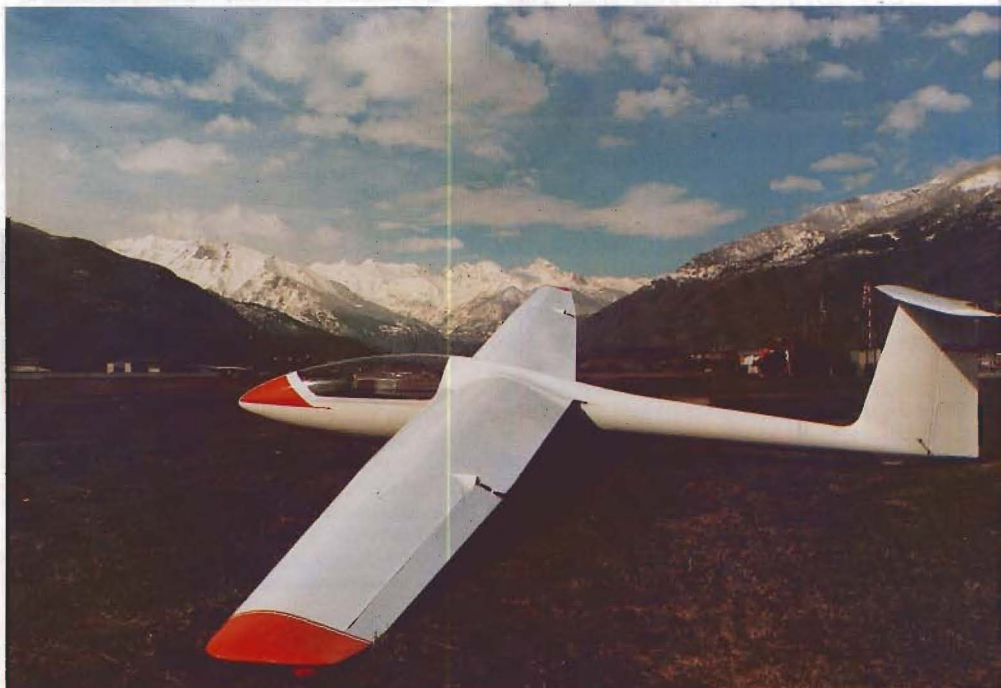
The DG-100 started life with an all moving stabiliser and consequently very low stick forces. The earlier versions had a rather narrow cockpit but wonderful visibility. The performance was



Grob 102.



Below: SZD Junior. Photo: N. Clarke.



comparable if not a little better than the Std Cirrus. Like the Cirrus, this is a nice machine for the slightly more experienced pilot. Later versions were fitted with a normal tailplane and elevator.

The DG-101 is a more recent version with a wider cockpit, a forward opening one piece canopy and the fixed tailplane and elevator in place of the all moving stabiliser. The cockpit seems to have become more or less standard with the DG-200 and DG-400 motor glider and is a definite improvement on the early model. The visibility is exceptional because the cockpit canopy continues much lower than in other designs. It can be fitted with a retractable main wheel and waterballast tanks as optional extras.

This is a really nice handling glider with a very good performance making it competitive with many of the Standard Class competition machines. Unfortunately, the elevator is very light and very different to any two-seater machine in use at present, so some caution is needed converting on to it.

"This could be disconcerting on your first field landing . . ."

Accurate circling is particularly easy and the only need for caution is to explore the sideslipping at height. With up to about three quarters of the rudder deflection the sideslip is perfectly normal, but with all the rudder applied suddenly, the yawing movement goes to an extreme angle and the nose drops as control is lost. This could be disconcerting on your first field landing but only means that the amount of rudder used in a sideslip should be limited to about three quarters of the available movement. In practice, sideslipping is seldom necessary as the airbrakes are very effective.

The sideslip characteristics of the Janus C are rather similar except that with the the Janus the rudder control loads are very high in the slip making it difficult to get back to normal flight. The rudder loads on the DG are light and the sideslip is easily kept under control once you have seen the problem.

I envy the pilots flying any of the DG series - they are all a joy to fly. But perhaps the 101 is for the pilot who has already done a few hours in a K-6E or another type of glass machine.

IS-29D and Club

I have included this particular design to warn beginners that in my opinion this is a machine for the experienced pilot and is not suitable for the average pilot with less than about 100hrs experience. Even then it must be treated with more than normal respect below 800ft or so.

This is an all metal design from Rumania and for the past few years has been built in the same factory as the BAC11 airliners. The standards of workmanship, corrosion proofing and inspection have been improved and there is much to be said for a metal glider if you have experience with metal work.

I was lucky enough to be lent one of the early flapped IS-29Ds for a Euroglide competition one year and I had a most enjoyable few days chasing the glass ships. It climbed well but was usually beaten by the Std Cirrus in any long fast glide. The flaps of the early model were disappointing and not an obvious advantage. The club version has no flaps fitted but has more effective airbrakes. They both have an air strut to provide extra shock absorbtion during the ground run. This gives a wonderfully smooth ride over the roughest ground. However, if it ever leaks and loses pressure, it needs special equipment and adaptors to reinflate. When this happens you will probably wish it had plain rubber blocks like the old wartime DH Mosquitos.

The IS-29D has an all moving stabiliser with anti-balance tabs which produce a reasonable stick force and stability. The general handling is excellent with very crisp control right down to the stall. But the stall warning is almost non-existent and it is a case of one moment you are flying and the next you are rolling over past the vertical and about to spin. This may be satisfactory for training jet jockeys but not for people of all walks of life learning to fly for fun.

The later version, the IS-29 Club, has additional washout and no flaps. Unfortunately although there is now a reasonable stall warning, the wing drop is violent compared with any other glider in production. It simply is not a club glider in the sense we mean and I would suggest that CFIs have a friendly word with any inexperienced pilots thinking of buying one.

One of my instructors had a few exciting moments doing simple aerobatics in the Club version. Pulling up into a loop it flicked into a very nose high position, tail slid and then fell out into a normal dive. After years of normal loops it came as quite a surprise for him to be left with no horizon in sight and nothing on the clock, wondering what would happen next.

I have not yet flown the Pegasus Club or the ASW-19 Club but as these, like the DG-101, appear to be fixed wheel versions of the standard model they really come into the last category of competitive machines suitable for the Bronze C pilot which will be my subject for the next issue.

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COLOUR CODING

Geoff explains how East Sussex get the right weak link every time

Ever since the BGA agreed the 1000lb weak link was no longer universal for winch launching, East Sussex GC at Ringmer had the same problem as any other club: how to utilise the stronger weak links for more efficient winch launches on some gliders, but also ensure an over-strength link was never used in error.

To simplify the problem, the club decided to use two strengths only, equivalent to Tost white (1100lbs) and red (1500lbs). Initially actual Tost weak links were used, but their colour coding was found effectively concealed by the Tost sheath. So next they were used without the sheath, but coding was often mistaken when covered by mud. Next the old and trusted "nail in shear" system was re-introduced, using different thickness nails for different strengths, with colour coding of the metal carrier: still not the answer, mud again rendering them often indistinguishable.

The solution was member proof

As advised by the BGA, the final 20 odd feet of cable between weak link/parachute and glider is enclosed in anti-whip plastic hose. Why not use hose coloured to show the weak link strength? Whereupon ESGC cablemaster Fred Bishop took the final step, to specify colour coded **cable chutes** as well. The problem seems solved, the solution member proof.

At the launch point there are four complete assemblies comprising quick release hook, weak link, cable chute and final cable in plastic hose, the **whole parachute and hose** being two in white, two in red, with appropriate weak links. The cables arrive from the winch with only a quick release ring on their end. A conscious decision must be made both by pilot and hooker-on to attach either white or red assembly for the launch.

Cost? Negligible. Our chute supplier will make any colour at the same price. With a bit of effort plastic hose can be found in a matching colour.

Problems? There must be a snag somewhere, but it hasn't been found yet at Ringmer. True there will be colour blind members on the field at times. But the odds against a colour blind pilot coinciding with a colour blind hooker-on **and** duty pilot must be fairly long!

PHIL HUTCHINSON

I LEARNT ABOUT PARACHUTING FROM THAT

When he realised the ASW-19 elevator was disconnected Phil faced the decision to bale out and is convinced his life was saved because he was mentally prepared and acted quickly

A recent fatal accident has once again brought up the subject of aircraft abandonment and all its associated survivability aspects. Many pilots never think it can happen to them but if they spent just a few moments thinking about it calmly and precisely on the ground it might just save them precious seconds if they were unfortunate enough to be faced with a life-threatening situation.

One cold January morning a few years ago I had to make the decision of whether to stay with my helpless aircraft as it plunged earthwards or to break open this cocoon of apparent safety and take to my parachute. Prior to this I had never parachuted or had any parachute training.

That morning our flagship, the ASW-19, was awaiting its first flight of the day. As nobody wanted to fly I decided to take her and asked one of the rigging team if it was ready to go as I checked the logbook for signatures. He said yes but he wasn't to know that whilst the aircraft was being cleaned after the rigging had been signed up the tailplane was found to be loose. The problem was acceptable play in the mounting bushes but when the tailplane was put back the elevator control wasn't connected and there wasn't any paperwork to ensure it would be checked for correct fitting. So it was left, an accident waiting to happen.

It was the practice at our club to have an independent check of the rigging and I checked the controls from the cockpit with the wingman telling me if they worked in the correct sense. Due to the design of the cup and ball type linkage, the elevator appeared to be connected.

Checked but nothing happened

As I gave "all out" the aircraft lurched forward and after a few bumpy yards pitched steeply nose up much more than I thought our weak cables could stand (to this day I don't know why the cable didn't break). I checked forward with the stick but nothing happened. I thought I had got into the situation experienced with other aircraft when if launched too fast you can't get the nose down enough to prevent this cable stretching climb. At one point I was going to release but then the glider levelled out into a nice gentle climb.

I was now about 500ft and climbing but still couldn't get any response from the elevator. I must admit it took a few seconds to sink in just what was wrong and with that I reached the top of the wire at 1000ft. I then in a motor function cleared the launch area by turning to the right so that we could continue to launch! The glider was now in a gentle dolphin-like motion and I proceeded to find out how much control I had left.

I tried the trim (even though my knowledge of the glider told me that it was just a spring and not a tab type trim). I raised and lowered the wheel and opened and closed the brakes in an attempt to get some pitch control but without success. I even thought about sending a "Mayday" call to tell them what was wrong in case I didn't survive, but knowing that the base set would probably not be on at this time of year I didn't.

At that point the aircraft pitched up a little steeper than before, stalled, dropped a wing and began to side-slip to the right. While it was flying straight I delayed the decision to jump, having given myself 100ft or so to try to gain control, but it was now 900ft and descending out of control.

From that moment I let go of the stick and started to get out. First I released my harness and cleared each strap. I remember being worried about getting one of my straps caught and it keeping me in the doomed plane. I then pulled my feet clad in moonboots up from behind the instrument panel, because again I didn't want to get hung up, and I was as ready as I would ever be to ditch the canopy and get out.

I reached forward to the large red emergency canopy release and, bracing myself for the blast of the airflow, pulled hard on the knob – nothing happened! Being the forward pivot of the canopy I expected it to be ripped off, but in the ASW-19 you have to release the two normal knobs behind each elbow. This procedure was in the handbook but having flown some thirty different gliders at that time, in my moment of need I forgot this useful fact. When I did remember, the canopy came off and my safe little world was blasted by the sudden airflow.

Realised how close I was to the ground

I estimated I was doing about 60-70kt and it almost took my breath away. I climbed up on to the left canopy ledge and for just a moment looked down. I realised at that point how close I was to the ground and so, still in the aircraft. I turned my back to face the upward wing and streamed the 'chute. As I tumbled out of the stricken aircraft it seemed like an eternity for the 'chute to deploy even though it was only one or two seconds. Time travels slowly when you are that close to the ground.

I got tossed about like a rag doll as the canopy filled with air just 300ft up! I looked up and expected the 'chute to fill my panorama but in fact it appeared to be just the size of a dinner plate held above your head. Not very comforting. I then saw myself drifting towards some heavy looking pipery in the middle of a large concrete pan. I thought if I hit those it is going to hurt and so, although the 'chute wasn't steerable, I started to climb frantically up the opposite lift web, dragging me just clear enough to arrive in the centre of the pan.

With few points for style I collided with mother earth and was surprised to be able to get straight up and pull my 'chute down and towards me. I was still holding the "D" handle. I later found I hadn't escaped completely, suffering several compression fractures to my spine due to the bad landing on the unforgiving concrete.

Collided with mother earth

Apart from Lady Luck, I survived because I got out in time. Years ago I had made the decision that if ever I got into such a situation I wouldn't hesitate to get out. I believe that you have to if you aren't going to waste valuable seconds thinking "will I, won't I?" The way that I got out may not be the recommended method for the aircraft you fly, so read the flight manual for each type you fly and ask yourself how you would get out if you needed to. I hope this article has made you think. One day it could save your life.

Terry Holloway, chairman of the RAFGSA, sums up:

a. Continue to "fly the aeroplane" (*ie* maintain control) as far as possible.

b. Make an early decision to abandon.

c. First release the harness straps, then the canopy whilst attempting to maintain control – particularly in pitch.

d. Step over the side if you haven't been thrown out!

e. Pull the ripcord positively and as soon as you are clear of the glider. However, in extremes pull the ripcord earlier than that, even whilst standing in the cockpit.

f. Finally, I advocate all pilots being mentally prepared for abandonment and having a clear awareness of canopy jettison and emergency strap release for each type of glider they fly.

AGE WITHOUT TEARS

Chris, who has just reached three score years, is convinced the older pilot faces two separate problems

Recent articles and correspondence have brought to the fore the problem likely to creep up on all of us - how to continue enjoyable gliding without becoming a steadily increasing hazard to oneself and to everyone around. As the years roll on there will always be certain functions which will tend to deteriorate, one or two of which might affect one's gliding such as the increasing desire to lift only the wingtip rather than the wing root, or the need to use half-eyes or bi-focals to read the small print on one's map. As an experienced pilot just approaching the three score and convinced that, given a little bit of luck, I can still out-soar many of the youngsters, I have been trying to analyse the situation and have come to the conclusion that there are two separate problems.

The first is the "switch off" syndrome. It seems that a younger pilot is less likely to "switch off" less often, and even in the switched off condition can still be partially aware of what is going on around him, whereas the older pilot's switch off occurs more often and is more complete. This syndrome usually produces the "where the hell did that glider come from?" or the "how did I manage to get this far down wind?" situation. It would seem, therefore, that an older pilot must concentrate much harder on switching on at the start of the flight and on **not** switching off during the flight, quite possibly requiring a decision to limit the duration of the flight.



Chris started gliding at Southdown in 1948 and instructing in 1950, becoming their CFI when they moved to Firle Beacon. He has 1800hrs, a Gold badge and a Diamond, now flies at Nympsfield and Talgarth and particularly enjoys mountain and Alpine soaring.

The second is the "blank screen" syndrome. It is possible that, say, three minutes from touchdown, due to unforeseen circumstances, a new plan of approach might suddenly become necessary. A younger brain is usually able to produce this new plan quickly, even if it may not be quite correct. For the older brain, the effect is sometimes to produce a "blank screen", *ie* no plan, and regardless of mental effort the screen remains blank. The cause need not be as a result of panic, but the effect can be similar. For the experienced pilot, his instinctive reactions will usually extricate him from the situation, but can sometimes produce a sequence of actions completely incorrect for the situation.

The inexperienced pilot is liable to do absolutely anything, the most likely action being to just attempt to arrive back on the airfield any way possible. It should be noted that this syndrome is particularly relevant to gliding. A car driver can usually stop to sort things out and a power pilot can give himself time by just opening the throttle, whereas the glider pilot must have a revised plan to put into operation in a very limited time. The solution is for the older pilot to make a much greater effort to produce alternative plans ahead of their need, or to try to avoid situations needing a sudden change of plan by, say, not flying on difficult days.

It is interesting to note that many of the recent accidents can be fitted into these two categories. It is also reasonable to say, however, that the more mature pilot need be no greater hazard providing he is aware of, and prepared to monitor, these changes in his reactions, and is also, perhaps, prepared to introduce certain limitations when attempting to continue the gung-ho flying of his youth.

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THE TROUBLE WITH LEARNING

Bronwen found getting to solo a doddle but the next stage has become a pain



A member of the Midland GC, Bronwen is an ergonomist and works at Loughborough University.

I became addicted to *S&G* (dreadful only getting a fix every two months!) almost as soon as I was hooked on gliding, so I was at a very early stage in my *ab-initio* training when I read "In the Beginning" (*S&G* 1986, p266, by Elspeth Morrison), a catalogue of the pitfalls awaiting the *ab-initio* - which are designed, it would seem, to weed out all but the real enthusiast! Now, grit, determination, perseverance are not qualities upon which I pride myself. Nor am I a particularly pushy person - I am inclined rather to ask three times if anyone else is in line for this flight rather than to grab the 'chute and jump in. So I found the article rather unnerving - would I ever get through to solo? It seemed unlikely. I didn't want to give in quite so easily, not even I am that defeatist . . . But I did decide that courses might be better for me than the hurly burly of club flying. Not for me the struggle to gather instructor, plane and cable before every flight.

Now, some flights on, and past my incredible first solo (I use the adjective only in the sense that I didn't believe him when the instructor told me I was doing the next circuit alone - well, it was 8am, a time when it was amazing enough to be flying at all!) - now I realise two things:

1. Weekend flying is not the cut throat business I feared.
2. Getting to solo was a doddle compared with the next stage.

My pleasant experience as an *ab-initio* may be partly due to the excellent weekend course system which operates at my club, but also I think to the friendliness of other members, who are genuinely keen for new members to enjoy their flying. Whatever the cause, I have not found it too difficult to get my flights at weekends and have encountered no problems wresting the controls from unwilling instructors.

But at the next stage, early solo, while the other members are still more than helpful in getting me into a plane at the right time, the whole process has become a pain. There are a number of contributing factors. Perhaps the major one is literally finding the right time.

All one wants is to get into the air

For the *ab-initio* weather is much less important than it is to the pundit. All one wants is to get into the air. It's lovely to be able to soar if the day is thermic or the ridge is working. And if it's a really lucky day smoothly gaining height in wave is wonderful (and there's all that lovely space to enjoy a few aerobatics on the way down - under the instructor's control of course). But now the wind speed is critical. I know I will only be allowed to fly alone in calm conditions with a light wind. The wind direction also becomes important. If the wind is westerly or easterly I am even less likely to fly solo because of the nature of our site.

Of course, dual flying is still important. I know I have only just begun to learn the skills I shall need to fly as I would like. But even there difficulties have arisen. As a "solo" pilot I am now cut off from the best way of training at weekends as our courses are reserved for *ab-initios*. Dual flights since my first solo have mostly been in the nature of check flights to get off alone again. These are useful to catch the bad habits that are already trying to form. But somehow I don't get around to doing the exercises on my list.

Threatens to take away a lot of the fun of gliding

Which really is the other fly in the ointment. I now have two or three lists of exercises which I feel I should be doing and a set of goals, six circuits in the K-13, nine in the K-8, etc, etc, in order to move on through our training syllabus. Since shortly before my first solo I have the constant feeling "I should do this", "I ought to practise that again". And it threatens to take a lot of the fun out of flying for me. Oh, I know I am particularly bad at applying myself to a set task. I am much more inclined to have a look at any passing thermal or snatch the last flight of the day for a few aerobatics. But I accepted, albeit with a heavy sigh, that I had to get through this stage of "ought" and "should" in order to achieve my goal of independent and sustained flight.

It is not all gloom of course. The solo circuits in particular I enjoy more each time. I was too astounded really to enjoy the first set. I just concentrated on doing a good circuit (they were indeed the neatest, most rectangular circuits I had ever flown). And I still really love being in the air, even for quick circuits, everytime.

However you are all familiar with the joys of flying. My purpose was to describe some of its frustrations. Nor did I wish merely to complain. I do believe in the cathartic effects of a good moan but would not normally choose to indulge myself so publicly without some constructive end. However, I confess that I have little to offer in answer to the problems I have put before you.

That little is the half formed idea that priority might be given to early solo pilots first thing in the morning or last thing at night, when the weather may be most suitable for early solos, and when flying is less interesting for experienced pilots anyway. I do not have a plan for how this could be carried out yet.

Regarding the other problems of getting the most out of dual flying without making the flights a chore rather than a delight (yes, I know, each one is a challenge, but I frequently just want to have fun) . . ., well, my only contribution is a plea to instructors to set a goal for each flight with early solo pilots - we may not be in the habit of doing it for ourselves yet. I have no statistics but I suspect that a great many would-be pilots fall away at the post-solo stage too, especially perhaps those who solo quickly (like the air cadets discussed in a recent article).

But, in the conviction that the gliding fraternity is a bright bunch, and the faint hope that somebody is still reading, I ask for suggestions, experiences, commiserations, whatever, from you. Have any clubs developed special programmes for this difficult stage in learning? Or is it not a great problem? Should I stop grumbling and turn my energies instead to reading for my Bronze C paper? I do hope this inspires some response. If only to say that we all suffer during this stage. Or maybe we could form a self-help group for early solo pilots. Any ideas?

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BGA & GENERAL NEWS

BGA CONFERENCE



This beautiful bronze sculpture by Eric Yates of black-backed gulls thermalling is the new BGA trophy given by the London GC in memory of John Hands and awarded for services to competition gliding.

Whenever Marjorie Hobby can be persuaded to organise a BGA Conference you know it's going to be a vintage one and this year she was her usual efficient self. Lasham were the hosts and chose a lavish setting - the Anugraha near Windsor.

With Michael Bird as the conference chairman, the series of lectures ran smoothly with a good mix from technical to general aviation interest, Derek Piggott being one of the star turns with reminiscences on his life in flying.

More than 200 were at the dinner-dance when Robert Pooley, Master of the Guild of Air Pilots and Air Navigators, was the guest speaker. He said the BGA manage themselves very well and are the envy of most sporting organisations in this country and in Europe.

Mrs Lynn Pooley presented the annual awards as follows:

Seager cup (longest two-seater flight), John Williamson (Janus CM) for a 360km triangle, Lasham, Husbands Bosworth, Nympsfield on July 8; **Frank Foster** trophy (fastest declared 500km with a maximum of two TPs); **Furlong** trophy (longest triangle); **Rex Pilcher** trophy (earliest declared 500km of the year by a pilot completing this task for the first time) and the **L. du Garde** Peach (winner of the National Club Ladder), Ray Partridge (Surrey & Hants) for a 513.7km triangle, Lasham, Sherborne, Melton Mowbray, in a Ventus at 68.5km/h on July 2; **Wakefield** trophy (greatest distance) and the **Volk** trophy (longest O/R), Chris Garton (Surrey & Hants) for a 670km O/R, Lasham, York, in a Ventus on May 3; **Manio** cup (fastest 300km), Andy Davis (Bristol & Gloucestershire) for 315.38km, Nympsfield, Cerne Abbas, Lasham, at 105.99km/h in a Discus on August 5 - Andy was also awarded the **Enigma** trophy for winning the National Open Ladder; **De Havilland** trophy (maximum gain of height), Martin Durham (RAFGSA) for 26200ft at Dishforth in a Ventus on August 16; **California in England** trophy (longest distance by a female), Lynn Norman (RAFGSA) for a 305km polygon, Bicester, Westbury, Gillingham, Alton, in an ASW-19 on August 6; **John Hands** trophy (services to competition gliding), Pat White for many years dedicated service as competition secretary at Nympsfield and the **Firth Vickers** trophy (second on the National Open Ladder), "Shep" Sheppard (Booker).

At the AGM Phil Andrews, Max Bacon, Mike Cuming, Diana King, Chris Lyttleton and Tony Mattin were elected on to the Executive Committee and Ben Watson, BGA chairman, announced that a BGA diploma had been awarded to Eric Rolph. This was for his many years of helpful, expert advice on the care of wooden sailplanes and for being one of the BGA's longest serving inspectors.

It was a most successful weekend and attended by members from a wide range of clubs. The exhibition spilled over into two rooms and three gliders, ASW-24, ASH-25 and the DG-400, were rigged on the lawn.

£164 FOR HOSPICE

£164 has been raised for the Princess Alice Hospice by the sale to BGA Conference delegates of the book **The Time-Effective Manager** written by Mike Bird, chairman of the Conference. The book is dedicated to Veronica Bird, who died of cancer in 1986. Twenty copies were kindly donated by the publishers, National Magazine Company, of which Roger Barrett, former BGA chairman, is a director. Demand outran supply, and additional copies were provided by Mike Bird. Many delegates gave extra donations above the £3.95 price of the book, so that the original target of £79 was exceeded by more than double.

The Hospice (address: West End Lane, Esher, Surrey) specialises in pain-relief and counselling for the terminally ill, both within its own premises and in homes and hospitals; it is entirely dependent on charity and is an exceptionally worthy cause.

ALAN PURNELL'S 300TH

Alan Purnell (Surrey & Hants GC) flew his 300th 300km on Thursday, April 13, in his Nimbus 3. It was a double dog leg, Lasham, Oxford, Cambridge (turning at Selwyn, his college), Oxford.

He flew the first 300km in 1961, achieving 29 during the classic summer of 1976 and is just six off 50500km.

Alan learnt to fly with the Cambridge University GC in 1956.

THE ASH-25's SUCCESS

Members of the first ASH-25 syndicate in this country were breaking UK multi-seater records in less than brilliant weather within a few days of the glider's arrival. Owned by Michael Bird, John Jeffries and Robin May, it is based at Dunstable.

On April 10 Robin, with Malcolm Bolton as P2, flew 260km and climbed to 11000ft over Stratford on Avon in wave. The next day, with Trevor Stuart, he flew a 303km triangle, Andover, Evesham at 91km/h to claim the UK record.

John Jeffries took over on April 12 with Derek Tagg as P2, achieving a 206km goal flight to Sennybridge, in excess of 120km/h.

The following day with Duncan McPherson, he flew a 443km O/R to Lake Vyrnwy to break the multi-seater distance record. However, John seems to have had TP camera problems, so he might have to do it again.

On April 14 it rained!

RAF CLUB'S FATALITY

A Ventus from Four Counties GC (RAF Syerston) broke up in flight on Saturday, April 9, killing 27 year-old Sharon Morgan who was stationed at RAF Coningsby. Sharon had more than 300 flying hours.

The accident is under investigation.

NATIONAL OPEN LADDER

LEADING Pilot	*Club*	*Flts*	*Pts*
1. M. Davies	Kestrel	2	2760
2. P. Barley	Kestrel	1	1410
3. E. Johnston	Cotswold	1	1230
4. P. Grifiths	Kestrel	1	1310

DISABLED EAST ANGLIAN GOES SOLO



Our photograph is of Gary Bennett of Fenland GC, a paraplegic, who converted a K-13 so that he could learn to fly without rudder

Gliderwork

C of A OVERHAULS and REPAIRS

By L. GLOVER senior inspector



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pedals. He built six sets of controls until he arrived at the set which was cleared by the BGA and the RAF. After going solo he quickly gained his Bronze C and has his 5hrs. Although a civilian, he said he earned his place in the club through doing the paperwork, winch and tractor driving and being the duty pilot. Garry is enormously grateful to the Fenland GC for their help and encouragement and to everyone else who helped him to fly.

INTER-CLUB FINAL

The Inter-Club League final will be at RAF Odiham from August 27-29.

PARACHUTES GROUNDED

Following a directive from the CAA, all GQ Security Aero-Conical (SAC) reserve parachutes, manufactured in the USA, model No. 79A1684, have been grounded. This doesn't apply to GQ SAC reserves manufactured in the UK.

We hope to have more information in a later issue.

2000KM CHALLENGE

OSTIV are offering a DM2000 prize for the first 2000km straight distance flight and a trophy for the first and all subsequent flights over this distance exceeding the previously honoured distance by at least 50km.

Proposed by Dr Joachim Kuettner to advance the art of soaring, encourage the use of atmospheric conditions, advance flight techniques and enhance knowledge of high altitude air flow over complex terrain, it is called the Joachgim Kuettner prize and trophy. **The OSTIV Sailplane Development Panel** and the Training and Safety Panel met at

BGA ACCIDENT SUMMARY – Compiled by JOHN SHIPLEY, Chairman, BGA Safety Panel

Ref No.	Glider Type	BGA No.	Damage	Date Time	Place	Pilot/Crew Age	Pilot/Crew Injury	Pilot/Crew Pl/Hrs	Summary
1	Pegasus	-	S	9.10.87	Nr Aboyne	38	N	150	A visiting pilot released from aerotow at 2300ft ex-pecting to climb in wave, however, due to sink it was necessary to select a field. The field was expected to be 45° out of wind, but was across the ground level wind and down hill. The pilot turned the glider sideways prior to hitting the far hedge. Total flight time 11min.
2	Twin Astir	-	S	7.10.87 1100	Nr Aboyne	30 27	N N	380 93	After being waved off tow at 2100ft P2 was instructed to fly to an area where lift had been reported. However, only sink was found and P1 took over and made a field landing. On rounding out the glider hit steeply rising ground which damaged the wheel box and associated structure. The pilot had not noticed the uneven lay of the field.
3	K-18	-	S	24.10.87 1516	Talgarth	48	N	81	After maintaining height above a bowl and spur for several beats the pilot turned once again through 180° over the bowl. This time he encountered sink and could not climb above the rim of the bowl or turn away in time to avoid it. He dived and then tried to pull up over the face but "toboganned" 300ft down the hillside.
4	K-21	2871	M	21.10.87 1755	Talybont-on-Usk	36 32	N	1900 46	The pilot chose a sports field for landing in. This was viewed from four sides prior to landing but the glider collided with the wire fence supports surrounding a cricket square. The pilot had not noticed the clearly defined boundary of the square or considered the possibility of a fence.
5	ASW-19	-	M	24.10.87	Burn	45	N	126	After a normal aerotow ground run the glider's nose began to lift and the pilot checked this momentarily before the glider adopted a steep climbing attitude. At 50ft he released and regained level flight and decided to land ahead. At this stage he realised that he had *no elevator control* and a heavy landing followed. The pilot had been distracted during rigging and the controls had not been independently checked.
6	K-8	2747	M	27.9.87	Challock	39	N	64	The pilot released just after take-off which the pilot considered to be fast and jerky, but looked normal to bystanders. The glider struck the ground hard, bounced then landed heavily on the mainwheel. The pilot had only flown four times in the previous six months and his lack of practice was considered a factor.
7	Skylark 4	1060	N	26.9.87 1146	Challock	59	N	710	On aerotow the pilot found he could not release. He flew out to the left to signal the tug. During this manoeuvre a large bow formed in the rope and the cable fell off. It was found that the ring had not been correctly inserted into the Otfur release but had jammed between the fuselage and the release. On this aircraft the release is slightly recessed into the fuselage.

RUNNING ON EMPTY

Brand new! A 25 minute film of the Masters of Soaring contest flown in Arizona last year by the current world champions. See Brian Spreckley wave the Union Jack!

This is a masterpiece of soaring photography and storytelling and is available exclusively from the BGA on VHS video cassette for only **£18.95** (plus £1 for postage and packing).

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Rochester Airport from March 11-13 with GEC Avionics kindly providing the conference facilities.

Delegates came from the UK, USA, Canada, many European countries, Australia and India. Three British speakers, John Gibson on winch and aerotow launching, Tony Segal on spinal injury prevention and Maurice Tigwell on fatigue testing of GRP sailplanes, made a major contribution to the technical proceedings.

After a visit to Canterbury the delegates were given a splendid buffet by Kent GC at Challock.

Dick Stratton, *BGA chief technical officer*

GLIDING CERTIFICATES

All Official Observers should have received an application form to re-register and be sent the new OO Handbook. Any OOs who, through change of address, have not received the form should contact the BGA office.

All original OO appointments with the suffix 81 will expire on September 30, 1988.

GORDON CAMP, *FAI certificates' officer*

ALL THREE DIAMONDS

No.	*Name*	*Club*	*1987*
242	Specht, E.	Coventry	20.12

DIAMOND DISTANCE

No.	*Name*	*Club*	*1987*
1/358	Brain, J. V.	in USA	23.8
1/359	Jewell, P. J.	Booker (in Australia)	14.12
1/360	Harvey, R. F.	Coventry (in Australia)	26.12

DIAMOND GOAL

No.	*Name*	*Club*	*1987*
2/1562	Harvey, R. F.	Coventry (in Australia)	22.12

DIAMOND HEIGHT

No.	*Name*	*Club*	*1987*
3/833	Townsend, Elaine	Booker	25.10
3/834	Specht, E.	Coventry	20.12

(The first Diamond height was flown from Aboyne, the second from Dishforth.)

GOLD BADGE

No.	*Name*	*Club*	*1987*
1244	Eade, D. J.	Lasham	26.7
1245	Jewell, P. J.	Booker (in Australia)	14.12

GOLD HEIGHT

Name	*Club*	*1987*
Eade, D. J.	Lasham (in France)	26.7
Pitchfork, G. R.	Clevelands	20.12
Chadwick, B. S.	Welland	20.12
Jewell, P. J.	Booker (in Australia)	14.12
Chadwick, A.	Clevelands	20.12
Hodge, B. J.	Wrekin	17.10
Smith, D. A. D.	Derby & Lancs	16.2.88
Shrosbee, P.	London	10.3.88

GOLD DISTANCE

Name	*Club*	*1987*
Harvey, R. F.	Coventry (in Australia)	22.12

SILVER BADGE

No.	*Name*	*Club*	*1988*
7620	Brook, D.	London	7.1
7621	Bowyer, R.	Staffordshire	27.12.87
7622	Evans, P. J.	Wrekin	28.2
7623	Houghton, K. G.	Shropshire	14.2
7624	McLaren, A. B.	Angus	12.3

8	Bergfalke 2	1587	M	24.10.87 1400	Middleton	42 54	N N	146 28	On a simulated field landing exercise P2 found he was too high so side-slipped then straightened and opened full airbrake. Realising he was too low he pulled the nose up rather than close the airbrakes. P1 prompted on the low airspeed but not the imminent undershoot and the glider hit the hedge. The field was large enough to allow the landing to be made well into the field and the club commented that an inexperienced pilot would be briefed to *select a large field to make a marginal approach unnecessary.*
9	Dart 15	1296	N	10.9.87 1458	North Hill	72	N	1127	The pilot noticed excessive noise and draught, although the glider flew normally. He landed to find the fuselage centre-section cover missing; it had been sucked off soon after lift off. He had been distracted by "chat" during rigging and DI had not checked the restraining clip.
10	K-13	1746	S	28.11.87	Long Mynd	47 34	N N	147 0	P1 prompted P2 that the glider was undershooting and P2 partly closed the airbrakes. However, this was not sufficient and P1 did not take over in time to prevent a heavy landing on rough ground with the airbrakes still half open.
11	L-Spatz 55	2703	W/O	22.11.87 1200	Weston-Super-Mare	39	S	3.75	Soon after lift off on the winch launch the glider rotated into an excessively steep climb. The aircraft yawed to the left until at 60ft the wings were vertical. It continued until the glider struck the runway in a near vertical dive. Initial inspection showed the controls were correctly rigged. Other pilots had noted only a slight pitch up tendency during previous launches.
12	Astir CS77 (Late 1987 report.)	2525	M	6.8.87 1745	Knighton	52	N	227	On the return leg of a 300km cross-country the pilot had to land in a field. The field chosen turned out to be "a little rough", slightly up hill. On landing there was a loud bang as the undercarriage casting broke.
13	K-7/13	1644	M	13.12.87 1530	Keevil A/F P2	46 15	N M	58 0	On a hangar flight at the end of the day P1 introduced his student to a new circuit, the approach of which was from a direction newly cleared of trees. The glider became low and P2 closed the airbrakes. P1 considered the approach OK. However, the left wing clipped the top of the only tree in the area. Club has now stopped hangar flights in this direction.
14	Bocian	1550	S	20.12.87 1245	Nr Crowland P2	41 26	N N	58 25	The pilot was unsure of his position after an aerotow which "dog-legged" to avoid cloud. The tug waved off the glider and P1 released (still lost). At 1300ft P1 decided to land in a field. Several newly sown fields were rejected and the landing was made **downwind and long** into a grass field. The glider was groundlooped before going backwards into a fence and trees.
15	K-21	-	M	2.1.88 1200	Long Mynd P2	55 -	N N	2000 -	While waiting to launch P1 decided to open the canopy due to misting. The canopy was difficult to open and as P1 pushed up hard, the strong wind caught it and bent the rear mounting bracket.
16	Olympia 460	1242	M	19.12.87 1430	Nr Pen y Parc	48	N	98	The pilot tried to reach a hill to ridge soar, but on finding sink pressed on only to find strong sink. A decision was made to land at the base of the hill. Because of the sink a straight in approach was made and green power lines across the edge of the field were not seen until on finals. The glider was flown through the 6ft gap above the hedge and the cables. The fin caught and tripped the power supply.
17	Super Falke	G-MFMM	S	10.1.88	Camphill P2	66 62	M N	972 +907pwr 0	A visiting motor glider rather high on the approach had to sideslip to lose height. In spite of this the aircraft landed long and fast. The pilot angled the aircraft to the left to maximise the available ground run but groundlooped towards the airfield edge and hillside. The aircraft fell over the edge and came to a halt some 100ft down the rock face, arrested by trees.
18	Vega (Late 1987 report.)	2715	M	1.9.87 1600	Nr Roanne	29	N	700	While on a competition flight the pilot pressed on over an area of small fields only to find he had to land in one. This proved to be too short and the glider ran into the fence, causing minor damage.
19	Blanik	2094	S	22.1.88 1440	Snitterfield	69	N	139	The glider was positioned too far downwind and the pilot found he would not clear a row of 50ft trees across the approach. He decided to land short and pulled full airbrake and stalled in just short of the trees.
20	Blanik	2106	S	6.1.88 1032	Rufforth P2	50 26	N N	540 0	During the final turn P1 suggested to P2 that the spoilers should be used. At 200ft an undershoot developed and P2 was told to close the brakes but the rate of descent increased so P1 took over. He was unable to reach the runway and the left wing caught a 15ft high sapling. The instructor had been used to flying a K-13 and found, after landing, that he had been operating the flaps and not the brakes. These had been fully extended throughout.

S = serious; W/O = write off; M = minor; N = nil.

CIVV REPORT

Some extracts from a report by Tom Zealley, BGA delegate, who attended the Commission International de Vol à Voile (CIVV) meeting in Vienna from March 25-26

The meeting was well attended with 26 countries represented and I was supported by Ben Watson (British team manager), Justin Wills (by special invitation of the CIVV president) and Bill Scull (as chairman of the OSTIV Training and Safety Panel).

Rules. Arising from the rejection of some Swiss world record claims, a subcommittee under Peter Ryder (W. Germany) have devised standard FAI claim forms for world records which with slight modification could probably be used for national records and badges.

It was agreed to set aside the rule for Cs of A to be completed three months before a Championship so that the DG-600, LS-7 and ASW-24 could compete in the 1988 Finnish European Championships at which there will be a weight limit of 500kg for all 15 Metre and Standard Class gliders.

Motor Gliders. Per Weishaupt (Denmark) gave his final report as CIVV motor glider subcommittee chairman after 40 years on CIVV. He is being replaced by Alvaro de Orleans Borbon (Monaco).

With W. Germany I proposed that self-launching should not be a criterion to qualify for such records, *ie* both self-launchers and sustainers should be able to claim the same records, but no decision was taken.

There was a brief description of the economy air race proposed by Piero Morelli (Italy) to promote high speed with fuel economy and mention of the planned round-the-world attempt in a motor glider by Peter Riedel, USA veteran pilot.

World Championships. The border is to be opened between Austria and Hungary for the 1989 World Championships in Austria with some 12 TPs in Hungary, up to 200km from Wiener Neustadt, agreed. This will permit task setting when Alpine weather conditions are unsuitable.

It was agreed to rescind the 30 gliders per Class limit with no limit placed on the organisers who considered they could cope with up to 120 gliders.

Bernard Smith (USA) spoke briefly about the arrangements for the 1991 World Championships at Minden. There will be space for a few foreign entrants to the US Standard Class National at Minden this year with a full pre-Worlds for 80 gliders at the site in 1990 when gliders will be available for hire.

Bulgaria, Sweden and France had made offers to host the World Championships in 1993 with New Zealand making an offer for 1995. A decision for 1993 will be made next year.

European Championships. As a condition of receiving grant aid from the Finnish government sports authority for the Championships at Rayskala this summer, there was the possibility of random drug/dope tests on competing pilots. And for photo starts there are to be no photos between one and 15 minutes after the previous one.

Poland reported on arrangements for the 1990 European Championships, including the difficulties of financial forecasting due to inflation, while Hungary made an offer to be the hosts in 1992.

Classes Subcommittee. The main proposal was the introduction of a fourth glider Class with a lower performance, weight, wing loading and, hopefully, price. It was to be a one design Class which could be manufactured by anyone, with a design competition to achieve the desired result. It would be known as the World Class glider. There was considerable scepticism as to the likely success of the project but after reassurance that they were only committed to setting up a design competition, CIVV endorsed the proposal.

There was considerable concern over the proposal to introduce pilot-initiative tasks. On reassurance that they would only be introduced at Wiener Neustadt in 1989 if there had been "extensive positive experiences at the international and/or national levels in the 1988 soaring season", CIVV also approved this proposal.

Competitions in France. There was a proposal by the French Aero Club to run the FAI Icarus Games, a new multi airsport contest in July 1991 (overlapping the World Championships). If gliding was included there was a general agreement that only "second team" pilots would attend. Bernard Smith objected to the distraction it might have on Minden.

Two Classes only for Junior Comp

A proposal by Francois Ragot (France) to hold the first European Junior Championships in France next year was welcomed. It was proposed to have an age limit of 25 years and two Classes only - Standard and 15 Metre.

Other items. It was agreed to support a collection for a memorial to Kees Musters, the Dutch former World and European Champion, killed in December in a hang gliding accident.

Juhani Horma (Finland) was nominated for the Lilienthal medal.

A proposal by the Swedish gliding magazine to produce a World Soaring Directory was warmly approved.

After brief reports from members of OSTIV (including Bill Scull), Justin Wills gave a short speech giving his philosophy for gliding.

INTERNATIONAL GLIDING SHOW

The second Salon International du Vol à Voile is from September 16-18 at Nevers Airport, France, when the latest gliders, equipment and instruments will be exhibited with trial flights for potential customers.



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YOUR LETTERS

THE AVIATION "CRIME"

Dear Editor,

I would like to point out to those concerned with sporting aviation that I believe we are under threat from the powers that be.

I read with awe about the recent case concerning a glider pilot from Kenley which resulted in him paying £1500 in fines and associated costs. As a serving police officer I asked myself what foul crime he had committed to be dealt with so harshly. Serious assault, some form of sexual abuse, racial prejudice, evasion of some tax or duty? No, the "crime" was to carry out a beat up!!

Without going into the finer points of beat ups in general, or this one in particular, the crime was to cause potential hazard/danger to the aircraft, its occupants and possibly others. I reckon, without much fear of contradiction, that this individual would have been less harshly treated had he attacked or injured someone.

For causing death in road accidents through reckless driving or being impaired by alcohol the expectation, in my experience, in the vast majority of cases is a fine far less than that handed down to the Kenley pilot. Leniency is often shown by our courts in other areas, particularly when it is a first offence, so why not here or in other matters concerning flying discipline?

The following are examples of recent court fines:

Low flying in a Cessna 150 - £1000+£840 costs (Yorks)
Low flying and aero's in a Stearman - £1250+£165 costs (Beds)
Infringing Cross Channel SRA - £1000+£345 costs (Kent)
Low flying in Cesna 150 - £250+£716 costs (Essex)

It seems you can physically abuse and harm the young and the elderly in a variety of dreadful and obscene ways and the guilty party is likely to suffer 200 hours of community service. However, if you operate a flying machine, be it power or glider, in a manner deemed "potentially hazardous" by the authority and accepted as such by the courts woe betide you!

PETER MOLLOY, *CFI, Essex GC*

130.1 VYING FOR "CROSSROADS" SLOT?

Dear Editor,

On behalf of the hosts of enthralled glider pilots in the South Midlands forced to listen to Annie's personal soaring lesson on Sunday, April 10, could we please know whether she did indeed manage to find lift, turn more tightly and finally climb "to cloudbase and beyond"?

"Crossroads" might have finished but 130.1 can be just as exciting on a good day!

F. BOYCE, *Woodstock, Oxon*

MORE ABOUT VARIOMETERS

Dear Editor,

I agree with Mr Dibdin's criteria for selecting a variometer, as far as they go. (See the last issue, p70.) The zero stability in this type of instrument may be limited by temperature changes in the "flask". The response speed is limited by the pneumatic time constant of the restriction/flask combination and by the time constant of adiabatic air temperature changes in the flask.

Another problem with variometers of this type is that they measure true rates of climb, while the airspeed is measured as IAS. The indicated airspeed decreases with height as the square root of the air density. For the speed to fly equation to give true readings, the rates of climb and sink and the airspeed should all follow the same law. If the equation constants are set to be true at 3000ft, the errors in the speed to fly values will be acceptable up to 6000ft for "normal" rates of climb and sink, but you do need additional compensation outside these ranges.

Mechanical variometers like the PZL and the Winter have slowish response rates. The needle is connected to a vane which moves round in a small circular can. The vane displaces a small volume of air as it rotates and this air has to be supplied from the capacity before the needle can take up a new position. You therefore have to have changed height by a corresponding amount before you can get the new reading and this takes time. As far as I can remember this works out at about 10ft/kt indicated for a PZL vario. The deflection of the vane is balanced against a small spring which tries to return the vane to the zero position. At small deflections the friction in the bearings may be comparable to the spring force and provide an "offset" which results in an over reading in turbulent, low lift conditions. The remedy is to have the vario cleaned and lubricated!

The pressure transducer type variometers do actually work as very sensitive altimeters. The rate of change of height is derived from the altitude signal and it can be compensated to give IAS rates of climb up to about 20000ft. This is not always done.

I heartily agree with the advice to note what is **omitted** from data sheets! I have just been reading through the data sheet on a computer controlled variometer system costing well over a thousand pounds and **accuracy** isn't even **mentioned**!! You might also check the operating temperature and altitude ranges and the zero drift figure. Remember, the time to **ask** is **before** you buy! Some LCD displays **don't function** below 0°C. This can be quite important if you fly in the winter, fly in wave or fly abroad. The extended range types will work down to about −30°C.

Be **kind** to your instruments! If you allow them to cook in the sun under a closed canopy and then take a nice cool winch launch with all the vents open, you should expect trouble at the top! I measured a panel temperature of 74°C on one glider. The owner

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S&G

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An easy to make, easy to use variometer calibration rig was described in *S&G*, April 1983, p66. You need a wine jar, a polythene bottle, some tubing and a leak valve. The calibration is done by measuring the time taken to climb or sink through a known change of height at a constant variometer reading. The heights are read off the altimeter. You can get better than 5% calibration accuracy quite easily in this way. If anyone wants a set of fittings, I can supply them, but **they** supply the wine jar!

C. J. CHAPMAN, *Nuneaton*

RIDGE RUNNING SKILLS

Dear Editor,

I have never flow in the incredible soaring conditions of central Australia. I am not qualified to speculate on the ease or difficulty of finding lift, navigating, *et al* in order to set the numerous world records Mr Grosse has impressed us with over the past many years. (See the last issue, p62.) I believe I share the envy of many pilots who would love to experience what must be the best thermal conditions anywhere in the world.

I have flown in the semi-desert regions of Texas and New Mexico. Soaring in what sometimes must be near Australian conditions is exhilarating, and I look forward to going back to experience this form of flight again. Record setting thermal flights require great skill in determining which clouds to steer towards, which to stop to climb in, which route might make a better average speed, how high to climb, how fast to fly, etc. Mr Grosse has shown us all his mastery at these skills.

I find it unfair of Mr Grosse to speculate on the number of decisions that need to be made or the implication that soaring the Allegheny mountains requires only to press forward on the stick in order to attain the many record flights that have been accomplished by many pilots.

I believe the difference between ridge running and desert thermal flying for record setting purposes, as well as badge flights, is that ridge running requires the pilot to be an expert at not just one mode of soaring flight, but all three.

For the world record triangle flown by five pilots, they had to be expert at wave flying, which they did during the flight, thermal soaring, which they did much of during the flight, and ridge soaring which they also did during the flight.

Without superb skills in all three areas, not one of those pilots would have completed the task.

I am sure Mr Grosse is a skilled mountain pilot. Someday, I hope he will come to central Pennsylvania as our guest, to find out just what we do. I think he will be surprised just how difficult the flights are, and how skilled, and multi-talented the pilots are.

THOMAS KNAUFF, *State College, PA, USA*

Tom is the holder of the world's longest glider flight, flown approximately 1/3 (4/12) in wave lift, 1/4 (3/12) in thermal lift and the remaining 5/12 in ridge lift.

PUTTING FUN INTO GLIDING

Dear Editor,

From time to time letters appear in *S&G* expressing concern (or otherwise) about the lack of young people becoming involved in our sport. Inevitably, these arguments centre around money, which must play a significant role. But have we established pilots become so involved in the hype of flying massively ballasted super ships and elaborate training programmes we have forgotten that gliding is supposed to be fun?

It is this fun element which initially attracts younger people to the sport and although cross-country flying is enjoyable, this won't be apparent to a newcomer.

Superbly organised training programmes in fleets of gleaming white gliders, supported by efficient staff from air conditioned clubhouses, may produce the ultimate in cross-country pilots but not only does it put up the cost, it presents a very antiseptic aspect to any outsider. And what about all those tedious "How I dunnit" articles in this magazine?

Perhaps we have forgotten that splashing across a muddy field to drag a patched and faded T-21 to the launch point in the hope of getting just one more flight actually was **fun** and created as much a sense of achievement and cameraderie as anything else?

I'm not advocating that clubs should sell their glass fleets and plough up the runways, but couldn't we do more to get away from the Martini ad image and regain our sense of humour?

SID SMITH, *Upton St Leonards, Glos*

NEGATIVE PR

Dear Editor,

The BGA five year plan considers the effect of public relations on our movement, but nowhere have we considered the effects of negative or anti PR.

Why do we insist at our aerotowing clubs on inflicting noise and disturbance on our near neighbours from dawn to dusk, seven days a week, through all the summer months? Should we be surprised at increasing opposition? Surely they deserve a little consideration? Is it not time we had an Association code, say "No aerotowing after 8pm on weekdays, perhaps 7pm on Sundays"? I believe it would make quite an impact on those who are now our enemies were we to show such consideration.

Who would lose? Not the subscription paying member. Much of this evening flying is aimed at collecting a flying fee from a non member who has no long term interest in the club anyway, and for which the financial rewards do not amount to very much if the replacement cost of tugs is considered.

Worth consideration?

VIC CARR, *Wrexham, Clwyd*

PARACHUTE RECOMMENDATION

Dear Editor,

Richard Peakin has written in reply to John McIver's letter in the February issue, p39, criticising a parachute which Richard says was clearly bought from his company, Peakin Enterprises. After refuting some of John's comments about the purchase, design and performance of the parachute, Richard says that in view of the obvious disquiet caused by the letter and because parachutes get sold secondhand, he thought it prudent to make the following recommendation:

Owners of Peakin Parachutes fitted with canopy releases should not use them until they have contacted me and are either fully conversant with their use or (at the owner's choice) have had the releases removed or immobilised. Similarly, owners should not allow their parachutes to be used by others until the above recommendation is complied with.

RICHARD PEAKIN, *33 Western Hill, Durham City, County Durham*

LANDING ON PRIVATE STRIPS

Dear Editor,

On April 3 I was getting low in the Newbury area and decided the racecourse would be the best place to land. On arrival at 1500ft I found a pilot had left his glider in the centre of the airstrip which was selfish for two reasons:

1. It reduced the landing space for another and it isn't difficult to push a glider single-handed to the side or end of the airstrip.
2. We rely on the goodwill of owners of private airstrips and this might evaporate rapidly if they find them blocked when they wish to land. Last year I landed on an airstrip five minutes before one of the regular users returned by air (and not long before two other gliders).

So if you land on a private (or any other) airstrip, please move your glider clear for others. Oh yes, I found a thermal near the racecourse at 1000ft which got me home.

JOHN BELL, *Chichester, Sussex*

BOOKER'S STATISTICS

Dear Editor,

Regular readers of *S&G* must be puzzled by the annual statistics published in the February issue, p32, showing the cross-country kilometres flown by the member clubs. It would appear that a number of these clubs, who publish rounded figures such as "Booker 100900km", are either too big, too busy, or too important to provide accurate and meaningful figures of the actual kilometres flown by their members.

The interesting fact to emerge from these statistics is that the regional club with the highest actual cross-country kilometres recorded is Nympsfield, which this season will yet again be offering superb launch facilities to visiting pilots from April to September, seven days a week, together with various task weeks and other events for the middle-aged boy racers.

SIMON ROBERTS, *Kempley, Glos*

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 7 and for the October-November issue to arrive not later August 9.

GILLIAN BRYCE-SMITH
April 6

AQUILA (Hinton in the Hedges Airfield)

The committee was re-elected at the AGM after a highly successful year with a good start to the recruitment campaign.

The refurbished winch, by courtesy of Jim Wright, our benefactor, should help increase the training capacity and we have a nicely balanced fleet.
J.R.

BATH & WILTS (Keevil)

The year started well with some super soaring days. On Feburary 28 Steve Parker (LS-4) achieved 16000ft in wave over the site with a gaggle of members at 9000ft and two weeks later Bob Hitchen was at 11000ft over Bath.

We now have an airfield manager, Jane Spencer, to relieve the CFI of non-flying headaches.

Congratulations to Marcus Brown on going solo. Bob Bromwich has a new LS-4A.
M.G.

BICESTER (RAFGSA Centre)

At our AGM the Daniels trophy for service to the club went to "Mitch" Mitchell and the Delafield trophy to Dave Aknai for a Gold height gain of 16600ft at Aboyne; well deserved for having spent 4hrs above 10000ft at an average temperature of −35°C! Terry joint, CFI, has handed over the job to Barry Elliot, though is staying on for a transition period.

With the ridge at Halton working, Anne Laylee and Andy Hillary have their 5hrs.

The best news is that Jackie Hymers has resoloed after her gliding accident last year.
M.H.

BLACK MOUNTAINS (Talgarth)

Mike Young has joined us from Booker as our full-time tug pilot for the season. Derek Eckley has extended the clubhouse.

Congratulations to John Bally, a member of the British team squad who is flying his Nimbus 3 in the Austrian Nationals at Wiener Neustadt, the site of the World Championships next year.
W.D.M.

BLACKPOOL & FYLDE (Chipping)

Out of a possible 13 weekends we have only flown on 2½ but it has meant that the new glider/trailer workshop was completed within six months.

We have three additions to the private fleet – two more Skylarks and a T-53, and the EoN Baby syndicate celebrated the aircraft's 40th birthday with a gathering of those who had flown it.
V.H.

BORDERS (Galewood)

Our grass field remained usable during the mild winter and we had plenty of soaring.

In March our fairly rare NW wave allowed many aircraft, including the club two-seaters, to make a transition from hill lift into 6-8kt lift up to 10000ft. Our more usual SW wave gave climbs to 14000ft for Andy Bardgett (Jantar), 16000ft for Ian Sim (Vega) and the club K-8, while only reaching 7-8000ft, reported lift in excess of 10kt.

At our AGM in March Ian Sim became vice-chairman, a position we have re-activated, and Alan Urwin, CFI, was made a life member in recognition of all his hard work over many years.

We hope to have several summer weeks of full time flying and visitors are most welcome. Our site is being signposted with the new tourist information signs on the A697. Pilots travelling to Aboyne and Portmoak will have no excuse to pass us!
A.J.B.

BRISTOL & GLOUCESTERSHIRE (Nympsfield)

The mild weather helped us to do more flying than usual with some exceptional ridge and wave days to well over 14000ft, culminating in a clutch of Gold and Silver heights and wave cross-countries on March 12. Thermal cross-countries were flown as early as January.

Our new manager, Stan Franklin, has settled in well and we hope to give him a much larger clubhouse to run following a successful financial year announced at the AGM. Membership continues to expand, as has the private owner fleet, with many more on the way.

We have replaced our club K-7 with a very nice K-13, converted our remaining K-7 to a K-13 configuration and refurbished one of the K-8s. Launch facilities have also seen great improvements.
S.I.D.

CAMBRIDGE UNIVERSITY (Duxford Airfield)



Tim Knight

Congratulations to Tim Knight who went solo on his 16th birthday, watched by his father and brothers, and also to Jeff Bissett and Mike Steeley on their solo flights.



Dean Marsh was given a special flying day by Cotswold GC to get him solo on his 16th birthday. It is encouraging to see a crop of young pilots featured in this issue.

At the annual dinner at Jesus College trophies were presented to David Evans, Richard and Peter Baker, Steve Mynott and Terry Slipper.

Our thanks to Mike Smith for organising a Bronze badge examination evening – well done to those who passed.
L.A.W.

CHANNEL (Waldershare Park, Nr Dover)

We have added another Blanik to our fleet. Over the Easter Bank Holiday we achieved a record number of launches – nearly twice as many as last year.

Congratulations to Liz Veysey on her full category instructor rating and to Ray Clark and Peter Wall on going solo.
S.B.

CORNISH (Perranporth)

After a frustrating period of rain and high winds, Dick Gillow went solo.

Members went to an interesting safety lecture by the CAA at Bodmin airfield. Several expeditions have been organised.
G.A.H.

COTSWOLD (Aston Down)

Congratulations on going solo to Steve Manktelow, Gordon Kerr and Dean Marsh, Dean on his 16th birthday. Tony Housden got Diamond height at Aboyne and Mike Pirie and Ken Lloyd in France, Ken completing all three Diamonds.

At the AGM the awards were as follows: Best Pre-Silver Flight cup, Robin Atkinson; Best Two-seater Cross-country cup, Howard Johns, Doug Morgan and Robin Atkinson for their efforts in the Western Regionals; Ladder trophy and Best Cross-country Performance cup, Tim Macfadyen and the 100km Triangle trophy, Tony Housden. Trevor Wilson was given a prize to commemorate his achievement in the Enstone Regionals.

We have a SF-34 glass two-seater from April which, with the popular Astir CS, will update our fleet considerably.
G.M.

COVENTRY (Husbands Bosworth)

Nick Hackett claimed the first 100km of the season on February 12 but since then there have been few cross-countries.

The cost of draining our field was very worthwhile as it is now relatively dry, even after the wet winter.

There has been such a good demand for our advanced soaring courses, extra weeks are being offered. We welcome back Roger Goodman from a winter of instructing at Benalla to be the course tug pilot.
D.L.S.

CRUSADERS (Cyprus)

Membership has risen dramatically and most people made use of the tug acquired for a weekend. Congratulations to Costas on his PPL and to Andree on going solo. Our thanks to John Morris for renovating the patio and to Costas for advancing our fly-by-wire technique with the K-13.
T.J.D.

DARTMOOR (Brentor)

At our AGM in March Roger Matthews was elected chairman, Peter Lamb, vice-chairman, Graham Lobb, secretary, Phil Brett, treasurer, Colin Sanders, technical officer, Brian Cordier, site manager and Chris Matten, site engineer. We had 2630 launches last season and John Bolt achieved our first 5hr flight.

Dick Toop, our oldest pilot, was given a hilarious 70th birthday party including the surprise arrival of an old girl friend from New Zealand.
F.J.M.

DEESIDE (Aboyne)

The recent spell of mild weather provided plenty of wave, ridge and thermal giving the usual crop of spring Gold and Diamond and 5hrs to Fiona Bick.

Robin Cutts and Dave Stewart gained their assistant instructor ratings at Booker and Robin will be available through the year to boost the two-seater trade.

At the AGM in March we heard that the club was in good general health and it was decided to buy a third single-seater to reduce the Sport Vega queues. Further hard surfaces are planned for the roads and car-park.

Our task week is from June 19, so if you want to be in wave at 2230hrs in the sunshine, come on up!
L.E.N.T.

DEVON & SOMERSET (North Hill)

We have had good thermal and ridge soaring during the last two months. Congratulations to Alan Bromley and Roger Clarke on going solo.

Our new communication system is progressing well and it should soon be possible for members to contact control from outside the field to find out how the flying is going.
D.A.R.

ENSTONE EAGLES (Enstone Airfield)

Our Regionals are nearly fully booked and a reserve list may soon have to be started.



Bassetlaw GC's CFI John Swannack and Scott Gozney on the completion of Scott's first solo two days after his 17th birthday. Photo: Barrie Codling.

From May 1 we started running midweek courses and Tom Miller is providing aerotows for members during the week.

Pete Fall and Greg Burton gained Silver heights on Easter Sunday. A Blanik has joined the club fleet and we are considering disposing of the blue K-7 and replacing the K-6CR.
R.J.P-B.

ESSEX (North Weald)

There has been more skiing than gliding recently. Our thanks to Tony Manwaring for organising an excellent trip to France.

We have had some good soaring, especially from John Ley who achieved a 2hr flight in January – with John Rollason he now has a brand new ASW-20.

At the AGM our chairman, Mike Audritt, confirmed that we still have access to the corridor between Luton and Stansted for cross-countries to the north. Our thanks to Mike and Chris Nicholas for all their work to preserve this important airspace.

Our thanks also to Paul Butcher and John Buckles for organising a riotous social evening.
J.F.

ESSEX & SUFFOLK (Hadleigh)

Adverse weather and a waterlogged runway affected flying throughout the winter but twenty members cheered themselves up by going on a skiing expedition to France.

At our AGM on March 20 Wally King took over from Mervyn Gooch as site officer and Mike Farr from Alan Hall as secretary. Presentations were made to Pauline Allan (Instructors' cup); Vivien Haley (100km Triangle cup); Paul Rice (Ladder trophy, the 200km Triangle cup and the Geoff Cook Memorial trophy for the longest flight) with the Members' cup for outstanding contribution to the club going to Dick Brooker.

We suffered remarkably little during the October gale with only two syndicate gliders damaged. Paul Robinson and Bob Adams have acquired a Mosquito, Bob selling his BG-135 offsite.
V.H.

HEREFORDSHIRE (Shobdon)

Wales has been quite generous with its wave during February. Ron Downing got his second Bronze leg on an early solo, climbing to 7000ft, while John Bastin went to 14 600ft in 904 for his second Gold height with an unsealed barograph.
M.J.D.

HUMBER (RAF Scampton)

With wet and windy weather we only achieved 25 launches in January with none at all over Christmas. However, Tony Smith and Dave Ruttle found some wave and coaxed 53min and 22min respectively out of the K-8.

Our K-13, damaged almost a year ago, is still not back with us. How much longer must we wait?
K.M.G.

KENT (Challock)

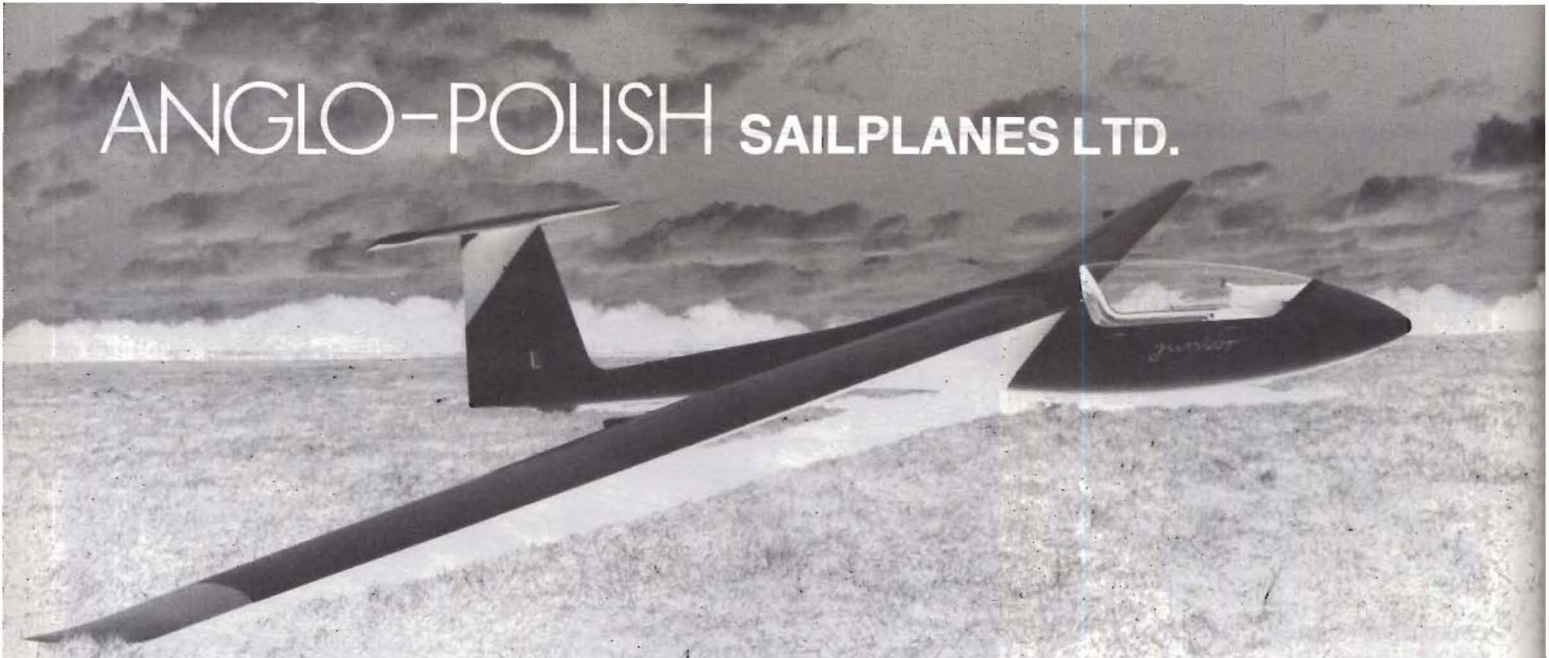


Kirsten Perry soloed the day after her 16th birthday.

Our chairman, secretary and treasurer were re-elected at the March AGM with Les Connolly and Dennis Clarkson joining the committee.

We entertained the OSTIV meeting to a buffet supper (see BGA News). Our open weekend is now planned for September.

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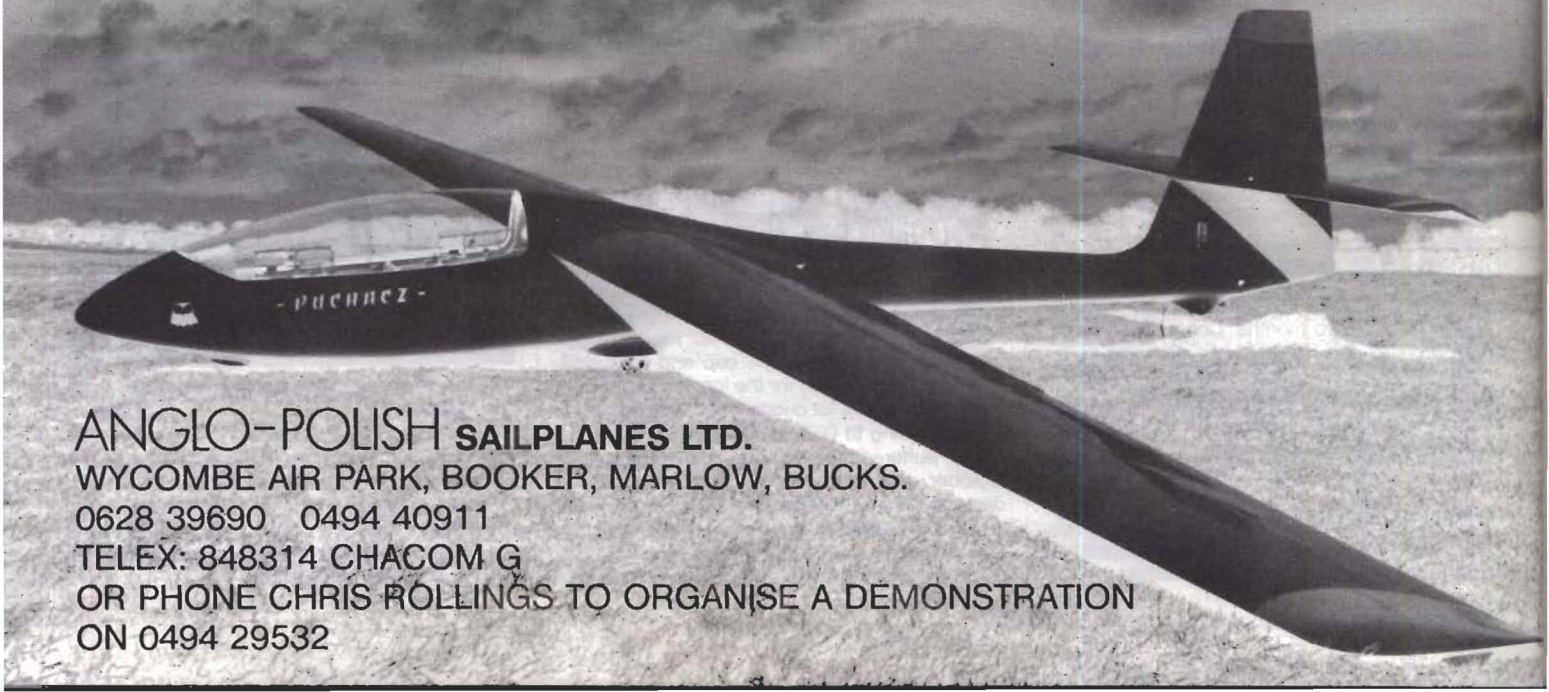
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There was excellent thermal and ridge soaring on Good Friday. Congratulations to Dennis Clarkson, Roy Perry and his daughter Kirsten on going solo, Kirsten the day after her 16th birthday.
A.R.V.

KESTREL (Odiham Airfield)

A club expedition to the North Wales GC at Pen y Parc in March was a wet and muddy experience with little flying but our thanks to the members for their splendid hospitality.

Congratulations to Andy Carnegie on going solo on April Fool's day! We are holding the Inter-Club League final at Odiham from August 27-29.
J.N.

LAKES (Walney Airfield)

Neil Houghton went solo a short time after rejoining us following a 10yr absence. Peter Lewis tried hard to win the wooden spoon by landing the IS-28 with its wheel up.

Our courses start soon and some are nearly fully booked.
M.S.

LASHAM (Lasham Airfield)

The Tost two drum winch is expected in mid April and should be operational by mid May. The grass levelling programme is now complete having taken six years, but results have been well worthwhile.

There are negotiations to set up a Vintage Glider Club centre at Lasham and if successful their members will at last have a place of their own.

A further K-13 will arrive in mid season to give us ten club two-seaters, including a Grob Acro and Janus.

Lasham hosted the BGA conference with a record attendance. It was a great success thanks to Marjorie Hobby. (See also the BGA News.)
D.J.P.

MARCHINGTON (Marchington Airfield)

Brian Marsh and Peter Willes returned from the cross-country course at Lasham last August with 300kms. Gales, crosswinds and floods have made winter flying difficult.
P.A.W.

Obituary - Don Stevenson

Sadly we report the death of Don Stevenson. Don was a true club member, freely giving so much of his time and effort to essential club activities.

He would talk to new members to help them settle in, wield a shovel to clear a drainage ditch and then negotiate with authorities on our behalf - a talent at which he was very skilled. Having taken early retirement, Don was looking forward to many years' of flying.

We extend our sympathy to his wife and family - he will be sorely missed.
P. A. Ward

MIDLAND (Long Mynd)

The season started well with thermals and wave culminating in climbs up to 13600ft on March 25.



Simon Waterfall and Simon Hayes of Phoenix who went solo just after their 16th birthdays.

The club fleet has been reinforced by another K-23 and a twin axle K-23 trailer built by John and Michael Stuart.

Courses have literally got off to a flying start with one winch re-powered with a 7.5 litre V8 engine (running on tax free propane) which launches our two-seaters with contemptuous ease, and a major tug overhaul by Howard Bradley and Steve Allsopp.

Keith Mansell was presented with a silver salver at our annual dinner on March 26 following an eloquent tribute by Humfrey Chamberlain, Rattlesden GC's chairman. Among the trophy winners was Dave Binney, a New Zealand visitor notable for his determination to fly cross-country and his pungent comments about our 1987 weather
J.H.

(Charles Wingfield tells us that his car, photographed in the last issue, p101, was a 1903 Argyll, not 1911 as we were told, and with Jack Best as the co-driver it was successful in making the last Brighton run.)

NEWARK & NOTTS (Winthorpe)

Congratulations to Mike Abrahams on going solo and to Gary Rivers who has gone solo during his PPL course. Richard Thomas has taken Fred Mann's place on the committee.

A new Oly syndicate has been formed with Keith Dykes flying it an hour for his second Bronze leg. Our SF-27's wings are being refurbished.
N.A.C.

NORTHUMBRIA (Currock Hill

Our faithful Chipmunk (G-BSSS) has been sold to Coventry GC to make way for a more powerful Pawnee to improve the safety and efficiency of our aerotowing.

Colin Neve and Roy Mitcheson have their AEI ratings. We are running day and evening summer flying courses at competitive rates as well as Tuesday and Thursday trial instruction evenings.

Our two older K-7s are being overhauled by Bill Fuller and Lyn Greenwood.
R.D.

OUSE & HAMBLETONS (Rufforth Airfield)

Spring arrived on March 29 when pilots took advantage of our new seven day flying facilities and soared the Vale of York in glorious conditions. However, Easter was generally disappointing.

Life is hectic with Tony Simms, our new full time CFI, ensuring we make the best use of our new Pawnee tug and our fleet of nine club aircraft.
G.Z.A.

PETERBOROUGH & SPALDING (Crowland Airfield)

We had a poor start to the season with a waterlogged airfield, two sick tugs and a restructured Bocian! However, the clubhouse refitting is complete with vastly improved facilities and the fleet back to full strength.

At our successful annual dinner in March the trophy winners were Roger Gretton (best newcomer), Richard Kilham (longest cross-country from Crowland) and Richard Browne (fastest club 100km). The wooden spoon went to an instructor who was demonstrating an overshoot and sideslip and completely missed the airfield, performing a graceful touchdown in the adjoining wheatfield.

Visitors are always welcome.
M.J.

PHOENIX (RAF Brüggen)

Simon Waterfall went solo eight days after his 16th birthday and Simon Heys two days after his. Simon Heys started his training at Fenlands GC while a member of 2534 Squadron of the ATC at RAF Raynham.

Although we had a wet start to the year, flying has continued.
P.J.H.

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PORTSMOUTH NAVAL (Lee-on-Solent)

There have been several good soaring flights and Bruce Lincoln, who was awarded the Corner cup at our AGM as best *ab-initio*, has already completed his Bronze badge.

Faced with a large VAT bill for our new tug, Edna Clark collected almost £1000 in fees and subscriptions in one day to help meet it. Well done Edna and Bruce.

Les Hartfield bought a Std Cirrus but then sadly broke his arm so will miss part of the season. Get well soon Les.

H.C.

RAE (Farnborough)

The season started in earnest with five good flying days over Easter. Our thanks to Mick Wells for organising the tasks. A September club camp at the Mynd is being planned by Dave Pearson while our airfield is used for the international air show.

Guy Westgate and Graeme Garrie have gone solo.

The AGM was the most peaceful ever – Jill handed out copies of *S&G* before the start! Social events include a flight safety lecture in April – thanks to Bill Scull, and our annual dinner-dance in May.

M.T.D.

RATTLESDEN (Rattlesden Airfield)

We have bought our site and are up to our ears in debt but we have had fantastic response from the Sports Council, local councils, the Philip Wills fund and our members – thank you all.

We have planning permission to operate for seven days a week but can only aerotow on four days a week from 10am to 4pm, although at the moment we can't afford a tug.

Our once a month weekend gliding courses are successful and, with plans to renovate the clubhouse to attract more family members, will help our fund raising.

Our thanks to Mark Wright, our new social secretary, for organising a superb annual dinner when trophies were presented as follows: President's cup (contribution of effort) Tony Fuller; Chairman's cup (best up and coming pilot) Steve Wright; Cunningham Speed trophy (fastest set triangle) Dick Histed (again) and Numb Bum cup (most outstanding flight) Brian Griffiths. A special presentation of a splendid water colour painting of *one* of his LS-4s in flight was made to Humfrey Chamberlain, our much loved deputy CFI/inspector/secretary/BGA committee member and main initiator of our site purchase, for his undaunted dedication and contribution since he joined the club as a pupil in 1978.

Our new winch is nearing completion.

R.W.

SCOTTISH GLIDING UNION (Portmoak)

We enjoyed almost continuous wave for much of February and March and have decided to start our tug pilot at the beginning of March next year. On February 6 several aircraft left good lift at 12-13000ft and on March 1 Andrew Bain went from

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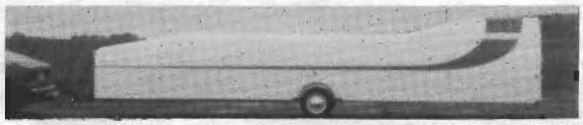


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a winch launch to 12 000ft and down again in just over an hour.

Congratulations to Jim Green, Joyce Grieves, Sally Pearce and Audrey Stewart on going solo, Audrey choosing gliding for the completion of the Duke of Edinburgh's Gold Award, and to John Whitfield for completing his Silver badge.

We welcome Brian Scougall as our tug pilot for the season, John McFarlane from Dallachy as course instructor, helping out while Hamish is unavailable, and James Moffat as cook.

We have ordered a winch from John Bourne which, together with a "dedicated winch operating syndicate", we hope will lead to a higher launch rate, shorter queues and better aircraft utilisation. We also hope to give a better service for trial instruction lessons at the weekends by using our fourth two-seater, when rebuilding is finished, for this purpose.
M.J.R.

SHALBOURNE (Rivar Hill)

After wet January came windy February and our ridge came to life with some good flying and launches of 2000ft from our faithful old winch. Andy Brind and his team spent many hours getting one of the K-7s ready for Easter.

Congratulations to Ken Reid (full Cat), Roger Madelin (AEI), Stan Oram (Bronze C) and, belatedly, to Adam Cumberlege on going solo. Vale Pike, Adam Cumberlege, Andy Brind and Richard Dann all passed their Bronze papers having attended Geoff Nicholls' winter classes.
S.C.O.

SHROPSHIRE SOARING (Sleap)

P.L.U.M., otherwise known as John Jefferson our erstwhile scribe, has hung up his flying boots. Previously from Midland GC, he has been an enthusiastic member since 1972 and was elected our first honorary life member in recognition of his hard work.

Our long term site problems are not yet resolved, but we are more hopeful. Membership is at its strongest ever with an intake of youngsters. Tim Caswell, aged 23, is our pilot of 1987. He joined last March with less than 25hrs and now has a Silver badge, Gold height and nearly 100hrs of Sleap soaring, including ten flights of over 10000ft. Not bad for a beginner!
V.C.C.

SOUTHDOWN (Parham Airfield)

A lot of time was given to debating the future of the site at the AGM. Our thanks to retiring committee members Peter Hurst (secretary) and Rob Walker (PRO) for their hard work. Les Blows and Paul White have taken their places. Steve Way took the most promising young pilot award.

Members are painting the clubhouse, Steve Turner is doing Cs of A etc and members have given a tug a C of A and re-covered a wing.

Three members went on an expedition to Aosta and congratulations to Dick Dixon on his Diamond height.

The 300 and 500km "teach-ins" were well attended by aspiring pundits.
P.C.F.

SOUTH WALES (Usk)

Several wave days have given a number of Gold heights with climbs to 19000ft recorded.

The K-10 has been refurbished and the K-8 is being re-covered. Our instructors will have an easier job with the addition of a rear instrument panel in the Puchaz. Our thanks to all those who have contributed to these improvements.
L.R.B. & J.M.B.

STAFFORDSHIRE (Morridge)

Charles Webb, our popular and long serving CFI, has had a mild heart attack and we wish him a speedy recovery.

Our thanks to Colin Ratcliffe, DCFI, for taking over and to Vic Carr for helping senior instructors to achieve their full Cat ratings to ensure the long term flying management of the club.

At the recent AGM, John Graham was confirmed as treasurer, Pauline Goodwin re-elected as vice-chairman and Ian Davies, who makes an outstanding contribution on the ground engineering side, joins the committee.
M.J.P.

STRATFORD ON AVON (Snitterfield)

By the time this is printed our large hangar will be erected with the doors to be added by members under the direction of DIY wizard Peter Kenealy and ace welder Colin Bushell. Water is a reality and the telephone will be installed soon followed by toilets. Our thanks to those who so generously supported the hangar project appeal fund which

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Wolds Gliding Club

raised a very creditable sum - the fund is open! Congratulations to Chris Knight on his solo and Bronze leg in the K-8 and to Brian Marsh (Libelle) on his 3½hr flight in February on a very margin day. Membership is very healthy and membership and flying fees remain the same.

Chris Roberts has taken over from Tony Edlin as chairman. We thank Tony for all his efforts and realise how hard he fought to acquire a new site with the security and benefits we now enjoy.
H.G.W.

STRUBBY (Strubby Airfield)

Congratulations to Mike Fairbairn and Gordon West on going solo and to John Storry on completing his instructors' course.

The committee was re-elected at the AGM when presentations were made to the following: John Kitchen (first hour's flight of the season which he claimed the day after receiving last season's award); Phil Trevethick (greatest height gain) and Nigel Bartle (Founders cup for the member judged by the CFI to have contributed the greatest effort to the club.)
C.C.

SURREY & HANTS (Lasham Airfield)

Last year wasn't bad financially despite the relatively poor cross-country weather. It culminated in buying the Discus, which is very popular.

Members reduced the C of A bill by performing simple tasks like cleaning and elementary maintenance. Thanks go to John Bastin and Mike Jarrett for the organisation and to those who helped. The theme is to be continued throughout the year by introducing valets with special responsibility for caring for the 11 single-seaters in the fleet.

Sadly we say goodbye to John Bastin, Clive Thomas and Neil MacLean who are standing down from the committee and thank them for all their hard work.

We celebrate our 50th anniversary with a bumper dinner on November 12. Watch out for further details.
C.G.S.

TRENT VALLEY (Kirton-in-Lindsey)

At the well attended AGM in March Vin Marchant and his helpers were thanked for their hard work on the new winch which was brought on site that day.

Congratulations to Ted Crooks, Robin Parker and Rex Flint on their AEI ratings and to our chairman, Roy Dell, on completing his Silver badge and gaining his SLMG PPL. We wish Roy's new IS-28M syndicate good flying. Pete Walker was the first *ab-initio* to go solo this year.

We have Wednesday afternoon flying until October and our flying week starts on August 29 followed by a barbecue on September 3.
L.W.

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TWO RIVERS (RAF Laarbruch)

We bid farewell to Steve and Teresa Wheeler, Andy Harkins and Keith Tegg. We wish Lynne Turner well with her ATC course and welcome back a successful Mike Forman.

Congratulations to Gary Livings on his assistant Cat rating. Ron Harris was our first Malcolm Club sponsored solo and Ian Pettman completed his Gold and Diamond goal.

Our K-8 has been re-covered, we have a super new bus and are off to Systeron after Easter.
I.P.

ULSTER (Bellarena)

Bellarena débutantes at Easter, 10th anniversary of our move to the site, were two V-trailers, the Willis brothers' SHK and Alan Ingram's Breguet Fauvette, the club's newly bought K-6CR and the old bus refurbished as a six berth launch point caravan. A double glazing company's demonstration trailer, this was acquired for nowt by chairman Harry Boyle when the firm went bust and is abundantly fitted with sealed-unit PVC windows and sliding doors. It should look impressive at our May Bank Holiday open day.

It was good to have former CFI Bill Craig and family back from the Mynd for Easter; current CFI Alan Sands was later to rejoin his stateside Nimbus 3 for further record breaking attempts along the Appalachians.

A four-man party returned empty handed from an exceedingly windy week in March; other expeditions to Scotland, Kerry, Lapland and Segovia are scheduled later this year.

William McNair is doing an instructors' course at Portmoak.
R.R.R.

VALE OF NEATH (Rhigos)

We will remember February 5 for a long time - the day the field purchase was completed. Our thanks to Messrs Hall, Penney and Owen for their help.

Our Pawnee is giving truly amazing launches and we have the Aston Down SF-26.

Congratulations to Pauline Clarke, Norman Mussard and Peter Wilson on going solo, Peter the first on the site to have an aerotow solo; to Colin Edwards on his endurance; Dave Ephraim and Ben Fantham on their AEI ratings, and Ben on his Silver badge, and Dave King and Dave Edwardes on their assistant instructor ratings.
D.C.E.

VECTIS (Sandown Airport, Isle of Wight)

We have an open day for May Bank Holiday and an expedition planned to France. Les Tuppen completed her Bronze and we are trying to have both Blaniks in the air for Easter.
J.E.P.

WOLDS (Pocklington)

The year started well with a flush of new solos and much fettling of aircraft. The newest hot ship is a Ventus B owned by Bob Fox, our CFI.

Melanie Malcolm has replaced Peter Higgs as secretary with Bernie Svenson as aircraft officer (equipment), John Bairstow as aircraft officer (aircraft) and Bob Holroyd as social secretary.

Our accommodation block is complete with bed and breakfast available from £4.50. After April 18, when our courses start, winch and aerotows are available seven days a week for visiting pilots at £1.60 and £7.50 respectively.

Bookings are coming in well for our Two-Seater Competition from August 21-27.
D.B.

WYVERN (RAF Upavon)

Congratulations to Bob Preston on his 5hrs in the K-23 and to Sarah Deck and Martin Hardy on their AEI ratings.

At the AGM in March prizes were awarded to Rik Malam (Mike's mug); Steve Welsh (Chairman's trophy); Roy Gaunt (cup for the member contributing most to the club): Sarah Deck (Aquila cup) and Bob Preston (Robbie's Wren).

The skittles evening organised by Paul Lutley was a rowdy, enjoyable affair.
D.B.

YORKSHIRE (Sutton Bank)

Bob Brown, Roger Bennett and George Lungley retired from the board at the AGM in April and we thank them for their efforts, particularly Roger who guided our financial and computing activities for over 10yrs. The financial situation remains extremely healthy despite heavy capital expenditure culminating in buying the remainder of our site.

We welcome Helen Hayes and David Parr to the board and are glad that Colin Almack is to continue as clubhouse director. Our sympathy goes to him and his wife Pat on the tragic loss of their son, Stuart, whose cheerful presence will be sorely missed.

At the annual dinner-dance at Ripon Spa Adrian Hatton claimed most of the trophies.
P.L.

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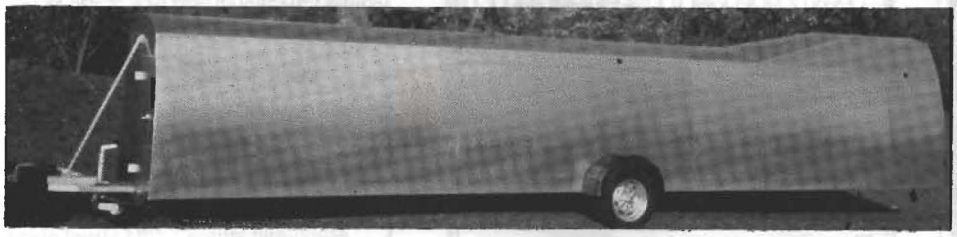
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