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February-March 1988 £1.60

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Magazine of the
British Gliding Association

Kimberley House, Vaughan Way
Leicester, LE1 4SG
Tel Leicester 0533 531051

February-March 1988
Volume XXXIX No. 1

SAILPLANE AND GLIDING

Cover: This beautiful cover is a joint effort by Tony Hutchings and Malcolm Bonner and photographed during a loop in a K-21 over Dunstable Downs with the camera mounted on a pod on the wingtip.

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JOHN GIBSON

A LOOK AT AEROTOWING Part 1

Some tug upsets are caused by simple carelessness, but there are others which appear to be the result of a violent and sudden loss of control by the glider pilot. Station keeping causes difficulties to many pilots, both in the vertical and lateral directions. Part 1 of this article examines the special problems of pitch control of a glider on tow, and shows the basic flaw in traditional teaching.

Bill Scull's article in the February 1985 issue, p10, "Aerotowing Accidents and their Prevention", illustrates the slingshot effect which occurs when a glider on tow goes into a climb, and Fig 1

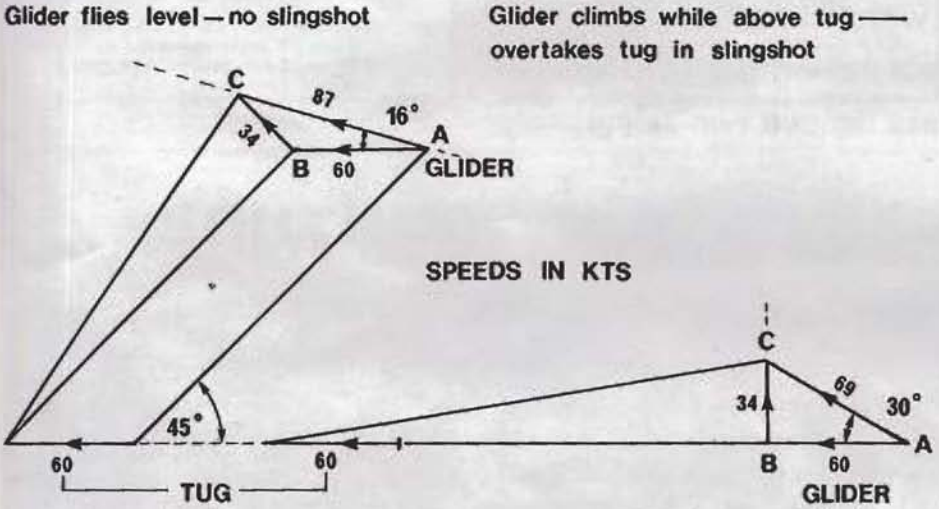


Fig. 1. Slingshot effects.

shows how it works. With the glider level, its end of the rope goes from A to B at the tug speed regardless of the angle of the rope and therefore of the relative height of the glider, with little tension in the rope. If the glider climbs, the end must move round the circle centred on the tug to meet the glider at C. Since the distance AC is covered in the same time as AB, the glider's speed is much greater. In the examples shown the rope end is going round the circle at 34kt. At the top there is little to decelerate the glider. The rope tension, which has both accelerated the glider and provided the winching loads, decelerates the tug and tips it up when it runs out of elevator control. The glider passes rapidly overhead, pulling the tug over beyond the vertical.

The crucial element in a slingshot is that it is started by a nose up attitude of the glider while level with or above the tug. It cannot develop from a level or nose down attitude, though of course the potential for an upset increases unacceptably with glider height.

The extreme rapidity of the upset, giving the tug pilot no time to release, has been well attested in *S&G* and *Soaring*. In the above example, assuming a 100ft rope, the circle around the tug is being swept at 33°/sec, and the glider is above the tug in less than 3sec. Few gliders can pitch down at this rate to unload the rope while flying at 80kt or more, even with full forward stick, more so still as the tug pulls the glider downwards, and the climb can become unstoppable. Trials at Booker (see *S&G*, June 1985, p137) showed that when a fairly sharp pull-up was attempted in a K-13, the accelerating force on the glider combined with the winching load was enough to break the rope at once. As a 1000lb weak link is barely enough for winching a K-13, this is not surprising, but there is enough strength margin to keep a lighter single-seater going.

It is likely that the glider pilot, subjected to rapidly changing and confusing accelerations, may be too disorientated to attempt a recovery. As the glider accelerates up into the climb it also accelerates forwards, possibly at up to 1*g*. As it climbs above the tug there will be a downwards acceleration, perhaps enough to create negative *g*, certainly much less than 1*g*, in the cockpit. Even highly trained aircrew, faced with an extreme emergency outside their experience, can take several seconds to react. As a short rope slingshot is over in this timescale, the bewildered glider pilot is probably pulling back in response to the reduced *g* as the tug passes underneath. A slingshot is far less likely on a 300ft rope where things happen at one third of the pace, much smaller inertial forces are imposed on the pilot, the glider can be pitched down and the tug pilot has more time to release.

Most authorities nowadays require that short ropes should not be used normally, but even the recommended lengths are not especially long. Pre-war and early post-war literature seems to mention only 300ft ropes. In 1962 the ATC regulations required a rope of between 225 and 300ft. At Ridge Soaring in the USA, the standard length was increased from 150 to 200ft, with 400ft ropes for long tows. Tom Knauff comments that "it is truly amazing how much easier it is to tow on the longer ropes." This is even better illustrated by the example of Marion Cruce, who several times in the 1970s towed a 1-26 the 450 miles between Oklahoma City and Colorado Springs at 80kt "in comfort and safety" on a 500ft rope.

At least up to the 1950s, it was quite usual for a winch pilot to convert to aerotow without dual training. It was not considered to be very risky and no accidents arose as a result, as far as I know. In my pre-briefed but in reality self-taught tows, as a winch pilot with 7hrs solo time, height keeping needed concentration but did not seem difficult on the long rope. Keeping position behind the tug in turns was a harder task, and considerate tug pilots gave hand signals before a turn.

John's interest in the subject, previously limited during 40 years as a winch pilot to rather occasional tows, was triggered by Andy Penswick's death in a tug accident at Portmoak on October 25, 1985. "Though he wasn't a close friend", John said, "I knew him well enough to be devastated that a man of such personal qualities and sheer professionalism should be killed so futilely." An article was begun but didn't take shape until John had finished writing the promised feature on winching. "It is my hope that if anything positive comes out of it, it will be a fitting memorial to Andy," he added.

Pilot Induced Oscillations

In the following discussion, use will be made of the fact that a pilot can behave just like an element in a closed loop system, of which an amplifier circuit is one example. Each element, in this case the pilot and the glider, has a gain* which describes the action which follows from the stimulus of some input to the element. When the elevator is moved there is a proportional change in angle of attack and hence also of attitude, pitch rate, *g*, flight path etc. When a pilot trying to control one of these motions sees that it is not at the required value, the stick movement that is applied to correct this error is proportional to the gain of the pilot. The closed loop is formed by the pilot's control movement, the resulting glider response, the observation of this by the pilot, and further control movement until the pilot is satisfied. Like any such system, instability follows from too much gain or wrong choice of

*Gain - originally the ratio of power output of an amplifier to the power put in. Here it is the ratio of the pilot's output, the stick displacement or force applied or the resulting glider response, to the stimulus leading to the pilot's action. the difference between the glider response and that actually wanted.

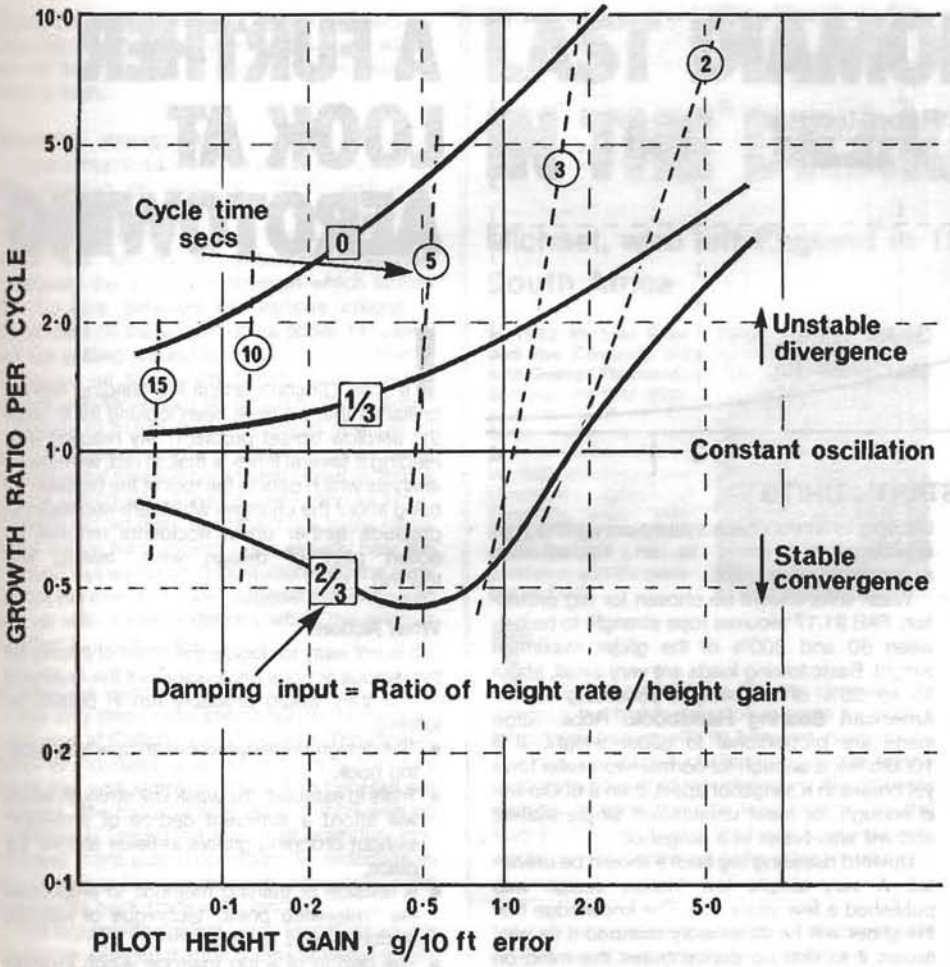


Fig. 2. Flight path oscillations due to pure height control.

feedback, and this is known as a pilot induced oscillation.

Many readers will have seen a glider in a PIO, usually on aerotow take-off or while landing. Often it is non-divergent, but sometimes the ground may be struck, occasionally repeatedly. The PIO is always the result of control inputs proportional to height error without regard for the attitude. Feedback analysis shows that this produces an oscillation with an amplitude ranging from constant to violently divergent depending on the pilot gain, or how much the stick is moved in proportion to the height error. It is comparable with steering a car while looking sideways at the distance to the kerb.

Another form of PIO familiar to instructors is "chasing the ASI", the airspeed oscillation which results from ignoring attitude. In fact most flying tasks are controlled through an attitude "inner loop" within a reference "outer loop" such as speed or height which by itself is usually poorly damped or unstable. Attitude control is so stable and well damped that it is taken for granted, and the part this plays in safe handling is not usually taught explicitly.

In a height PIO the rapidity of the oscillation is a direct measure of the combined glider and pilot gain. Fig 2 shows typical results using as gain units the *g* produced by the pilot's input in response to a 10ft height error. A relatively slow 5sec oscillation is produced by a gain of ½*g*/10ft, for which the stick input at 60kt is about the same as to trim a 30° bank turn at 35kt. This is not very much and obviously much larger gains are easily used in the fright of a PIO, not least because it seems reasonable to work harder to speed up recovery. The actual result of this is a rapid divergence unless damping can be applied by additional control inputs proportional to height rate, but even this cannot prevent divergence with large height gains.

Fear of hitting the ground obviously plays a part in take off or landing PIOs, but away from the ground the trigger can be any change in height relative to the tug caused by turbulence or inattention. The tug drops in a downgust and the glider pilot pushes down to follow, hitting the downgust just as the tug flies into a upgust. It is now well below the tug, so the pilot grabs a bigger handful of stick just as the glider also hits the upgust. After only one half of an oscillation cycle, the next peak could be heading for 40 or 50ft above the tug. Climbing rapidly as it regains the tug level, the glider is set up for a slingshot upset by the mechanism described earlier instead of simply continuing the oscillation.

The pilot is most heavily influenced by height disparities on a short rope. If the tug enters a rising or descending airmass while the glider continues straight on until it reaches the same point, the resulting height difference will increase with a longer rope but the angular error between them is the same. Alternatively a gust induced height increment results in a smaller angular error. It is this angle which is critical for safety and it changes more slowly on a long rope, inducing less high-gain alarm in nervous pilots. The higher frequency at which tug and glider exchange height variations in continuous turbulence on a shorter rope automatically increases the pilot gain needed to keep pace, with greater risk of PIO.

Vertical Station Keeping

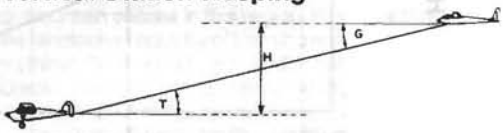


Fig. 3. Station keeping cues.

Fig 3 shows a tug and glider, joined by a rope of length L and flying at a speed V. Their relative positions can be defined by any one of three single measures, the height difference H, the angle T of the rope from the tug, and the angle G of the rope from the glider. Which of these cues the pilot uses is of crucial importance in maintaining stable control.

Keeping the tug in a fixed position relative to the horizon uses H, the height difference cue, the direct cause of the PIO discussed above. Maintaining a given "picture" of the tug, *eg* the fin tip against the wing, uses T, the rope angle from the tug. This is identical in principle to the height cue H, but with an important difference. As the control inputs are scaled by the pilot to this change in angle, which is smaller for longer ropes, the effect is to make the pilot height gain inversely proportional to the rope length. If any oscillations occur they will be slower and with reduced divergence tendencies as the rope length increases.

With attitude fixed no PIO can occur

Traditional training seems to emphasise primarily these two height-related cues together with small and cautious attitude adjustments. The underlying instability is suppressed only by this constraint on attitude. Because the significance of this constraint is seldom understood, it may be abandoned even by apparently experienced pilots. The 168hr pilot in Bill Scull's "Aerotow Risks", in the August 1987 issue of *S&G*, p176, and the 300hr pilot in the February and June 1987 "Soaring Mail" section of *Soaring*, suffered violent take-off PIO when exposed to first flights on new types. Yet it is blindingly obvious that with attitude fixed no PIO can occur.

Maintaining the rope angle G from the glider is done by keeping the tug sighted on a spot on the canopy. This is the same attitude control task as in normal flight, except that the tug replaces the horizon and the outer loop reference is the relative height instead of speed. To adjust the height a new aiming point is selected, just as it would be for a speed change. This technique has a profound and fundamental effect on the stability and ease of station keeping.

Correction of height error is characterised by the exponential recovery profile shown in Fig 4.

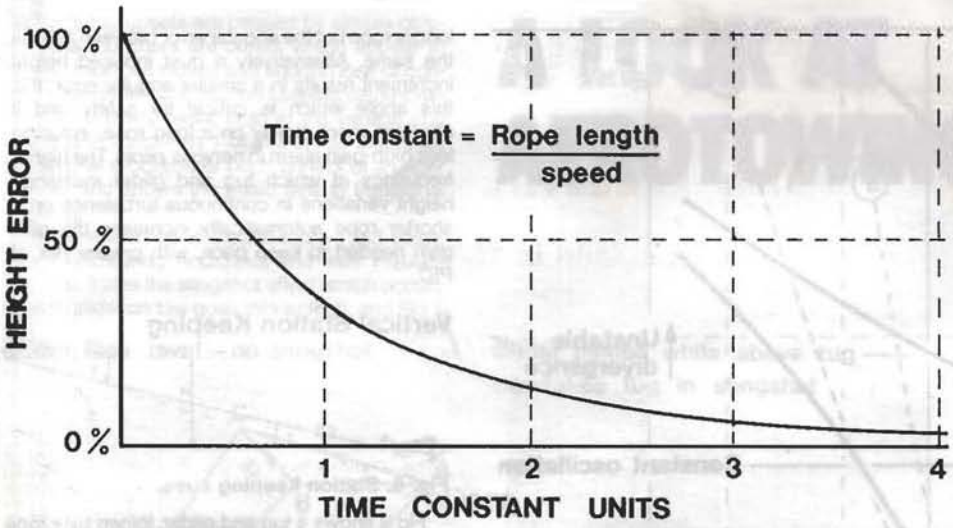


Fig. 4. Height correction by attitude control.

The error at any instant is reduced by 63% after one time constant and is down to 5% after three. This result is the same for any initial error size. The time constant is the time taken to travel one rope length, and is about 1sec/100ft of rope. Flight path stability is unaffected by how hard the pilot works at pointing, and the correction is always smoothly and rapidly convergent. Disturbances have no time to grow into a serious height error if the pilot instantly pins the tug back into place. The possibility of being sucked into a slingshot by climbing while above the tug is removed if the glider is always being pointed at it.

Many experienced pilots probably use the aiming method without being really aware of it. It is almost automatic in the back of a two-seater, even if not consciously employed, because the small and distant area through which the tug is seen effectively forces the pilot to use it. An apparent reversal of pilot skill levels can be produced by swapping seats. The same accuracy can be achieved from the front or in a single-seater by choosing a small area of the canopy in which to locate the tug. Yet only a few references can be found to the effectiveness of the attitude aiming method, and none to the basic flaw in the traditional method - its proneness to PIO.

Safety Summary

Tugging fatalities do not occur very often but even one is too many. Some of the following may be new, but much which is not bears repetition.

Rope length has an effect on safety probably proportional to the length squared. The old 300ft length would be very safe and was well suited for solo conversion to towing, but assuming that dual conversion is now universal, routine airfield operations should use a national standard of 200ft. Short ropes should be confined to special purposes and to pilots who have had certified training for them, which includes demonstrated ability to cope with rough weather.

Tug pilots should refuse to fly Schweizer-hooked tugs without the TNS modification and any tug with an inaccessible release. They should demand ground tests with loaded ropes to prove that they could actually release the rope. They should insist on a better reason than convenience to use a short rope. They have an absolute right to a pilot check system preventing their unwitting attachment to an inadequately experienced glider pilot.

Weak links should be chosen for tug protection. FAR 91.17 requires rope strength to be between 80 and 200% of the glider maximum weight. Basic towing loads are very small, about 18 to 35% of the weight according to the **American Soaring Handbook**. Rope surge loads are proportional to glider weight. If a 1000lb link is enough for normal two-seater tows yet breaks in a slingshot upset, then a 600lb link is enough for most unballasted single-seaters and will also break in a slingshot.

Upward releasing tug hooks should be universal. A very simple low friction design was published a few years ago. The knowledge that the glider will be deservedly dumped if its pilot allows it to drift up concentrates the mind on keeping the glider low. When it does not release under a pull which lifts the tug tail and prevents the angle from increasing, a more logical weak link gives protection.

A glider rear hook which back releases under load at a small cable angle would be highly effective. The case for putting a nose hook on gliders with only a rear hook is not as clear cut as it might seem. They do reduce pitch-up in rope surges and may permit more positive hands-off trim. They do not prevent PIO, gliders perform reasonable winch launches on them and tug upsets have certainly occurred on them.

The responsiveness of the glider should be minimised by towing at an appropriately low speed, cooling permitting, and by requiring low time pilots to ballast well forward of the nominal aft C of G limit if this is particularly sensitive. Such a combination should never be allowed to fly on a short rope.

Attitude based station keeping should replace the traditional but flawed relative height based methods. The difference may look small but has profound and fundamental effects on the safety of aerotows.

Footnote: Recommended practices (RP12) (see **Laws and Rules)** states "The minimum length of aerotow rope recommended is 150ft..." But many clubs use much shorter ones. If John Gibson is right about safety being related to the square of the rope length then be prepared to justify your club's shorter rope to the coroner!

BILL SCULL

A FURTHER LOOK AT AEROTOWING

Is John Gibson's article the blinding flash of brilliance that we have been looking for to solve the aerotow up-set problem? My reaction after reading it several times is that, at last, we have an analysis which gets to the root of the problem. To bring about the changes which are necessary to preclude further upset accidents requires an action plan of design work, testing and training.

What Action?

It is not easy to decide the order of priority for the various actions necessary, but the likelihood is that they would probably run in parallel as follows:

- The design/development of an upward releasing hook.
- Trials to establish the weak link strength which will afford a sufficient degree of protection without dropping gliders in fields all over the place.
- A revision of training methods to emphasise the "reference point" technique of keeping station behind the tug.
- The design of a tug towrope winch to avoid trailing rope problems or,
- A review of tug operational procedures to cope with longer ropes.
- Glider design features such as towhook location.

Clearly there is a lot to do and for eventual total protection a continuing programme of training to establish a new emphasis.

An automatic upward-releasing hook

This remains high on the list of priorities since without it total protection is not possible because the slingshot divergent situation becomes critical more quickly than either pilot can react. The designs that have been developed so far have failed on more than one count:

- Because the towplane may start to tip up before the release angle for which it is set is reached.
- The friction in an angle-and-load sensitive design may alter both criteria adversely.

If the load sensitivity is dealt with by a weak link then the design should be simpler and more likely to be satisfactory. Lower release angles than the 30-35° of the Dick Green hook would impose a discipline on glider pilots to stay low (but still, probably, above the slipstream).

Pending the design, development and production of a suitable device, existing hooks in which the release loads increase with increasing towrope loads shuld be modified. This applies particularly to the Schweizer type of hook fitted to

Super Cubs etc. As John Gibson emphasises no tug pilot should be expected to fly a tug in which he will have difficulty in releasing if the towrope load is high.

Weak link strength trials

Total protection for the tug pilot means a weak link strength of less than 200lb and even strengths of 500lb might make it difficult to get the glider airborne at all or produce frequent weak link failures in turbulent conditions. Obviously the weak link strength which strikes the balance between the various criteria is dependent on the weight of the glider. However, we are getting around to using links of different strengths on the winch (which the Germans ccped with for years!) so why not on aerotow?

Clearly to establish the optimum strength of link for a given weight of glider requires some testing in the safest environment possible, that is a large airfield, where the links which broke in turbulence did not incur significant risk to the glider other than a field landing. I can already hear the cries of "but we couldn't let students do the early part of the tow" but dare I suggest that we could put up with some limitations when the price is another tug pilot's life!

A towrope winch

The only time I have seen a winch for the towrope was at Calistoga in California. The device, fitted to Pawnees, was made from automotive parts and was simplicity itself. The benefits are obvious. The tug was able to land short with no problems of trailing the rope over boundary fences and there was a considerable reduction in the fumble at the launch point, especially if the tug had to back-track after landing.

The arguments against using longer ropes are no longer relevant if such a device were readily available. The benefits in terms of expediting the operation would be significant. Surely the design of such a device (even one to meet CAA standards) is not beyond the wit of man-(even *homo volarens*) — Latin for soaring pilot).

A review of tug operating procedures

If a towrope winch was readily available then changes in operational procedures to cope with longer ropes would not be necessary. Without a winch any club operating from a short site with obstructed boundaries or any risk to third parties would suffer some constraints. The possible penalties to cope with a longer rope are either more taxying or dropping the rope and going around, both with a longer turnround between tows. Dropping the rope incurs the additional problem of giving tug pilots approval to do beat-ups which also may be a fairly high risk if discipline is lacking.

Glider towhook location

Not mentioned by John Gibson is the benefit of using a nose hook which gives a significant protection to the tug pilot. The design requirements (JAR 22) have been changed to make this a requirement in future but it still leaves the problem of the existing gliders some of which are known to be a problem. A solution which stops short of fitting all gliders with nose hooks is to put them on those types known to be critical (K-8, K-18, Olympia 463) and, pending that facility, don't allow inexperienced or out of practice pilots to have aerotows in turbulent conditions.

A change of emphasis in training

One of the important points identified by John Gibson under the heading "Vertical Station Keeping" is keeping the rope angle from the glider constant. This should become the primary reference rather than keeping the height (tug/horizon relationship) or rope angle from the tug constant. Obviously this wants thinking through because although the differences between the references may seem slight the implication for damping PIOs and stopping any divergence before it starts are crucial.

Only by training students using the one reference will the benefits become apparent. Will station keeping be much easier? I suspect that it will. The comparison which holds good is with lateral station keeping. A change in emphasis came about when it was recognised there was an inherent tendency for the glider to return to the correct position (static stability); training problems arose because the student was trying to do something which was going to happen anyway. The pilot input plus the static stability inevitably produced an overshoot of the correct position, compounded by the fact that the actual situation was dynamically unstable, that is the natural oscillation of the glider without any pilot input is divergent.

All that said the implications for training will be examined in detail and be the subject of a further article.

LAST DIAMOND IN THE DRAKENSBERG

Michael, who left England in 1965, describes a height gain in South Africa

MICHAEL HUNT

In 1952 Michael founded the Coventry GC with George Thompson and was the first chairman, later, at various times, being secretary and CFI. He was also on the BGA Executive and chairman again of Coventry when they bought the HusBos site. He is a vice-president and life member of CGC.

The Zulu's called it the "barrier of spears", a romantic but highly descriptive name for such a formidable barrier with its frequent indentations and rocky pinnacles challenging enough for the most enterprising of mountaineers. Any traveller wishing to enter the little kingdom of Lesotho from the eastern side of the Natal Drakensbergs would do well to think again for there are no roads or mountain passes in this region. From this side the landlocked country of Lesotho resembles the mythical "lost world" so vividly described by Conan Doyle in his gripping adventure story about the land of the dinosaurs.

The Drakensberg range stretches for hundreds of kilometres through Southern Africa separating the highveld from the lowveld, but nowhere is it so high or so majestic as where it forms a natural frontier separating the scanty Lesotho herdsmen from their neighbours lying two kilometres below.

Given a steady stream of cold air like the Mistral blowing from the right direction the Drakensberg range would be a site for standing waves *par excellence*. This is not the case, however, for South Africa in general is not a windy country except during the approach phases of a summer thunderstorm. Glider pilots who attend the regular winter camp below the towering Cathkin Peak are aware that the best flying they will probably get is close to the rocks in the narrow blanket of warm air which, with luck, will carry them to the top and along the edge of the precipice.

Distances of 300km or more can be flown in this way and it pays to have a short wing span. On occasions, however, a change in the weather will produce a wind in the right direction and waves may appear for one or more days. In general they are elusive and poorly defined and are more likely to be indicated by the appearance of rotor clouds than by lenticulars. Furthermore they normally need to be contacted at altitudes of around 12 000ft asl or more by using the vigorous thermals found underneath them.

When I came to South Africa from Coventry in 1965 I found that the cross-country flying conditions were every bit as good as I had been told they were. In what seemed like no time at all I had polished off my distance Diamonds in a wooden sailplane on O/R flights. "Now for Diamond height", I thought, "that shouldn't be too difficult". I then found out that there are laws against gliders flying in clouds, but that wasn't all. One would have to be suicidal to even think of trying to enter a typical South African thunder cloud.

For one thing it may turn out to be 50km or more across, posing the question of how one is to get out again, for another there is the fact that hailstones can easily turn out to be larger than tennis balls and their destructive power can be gauged by the damage they do to motor cars (the panel beaters think they are a godsend). This leaves the standing wave as the only real hope for the sailplane pilot wanting to gain 5000m. Hence the winter camp at the Drakensberg (winter, in the South African context is a relative term).

The probability of waves occurring during a given week in winter is not high. I have been going to the camp off and on for the past 12 years or so and have known whole weeks when the menu offered nothing but rock scraping -exciting but definitely not diamantiferous. On at least half a dozen occasions I have enjoyed the excitement of flying in wave but for reasons which probably include such factors as luck, stupidity etc the magic gain in altitude has always eluded me. In one case for the unforgivable reason that I ran out of oxygen. The camp at the end of July 1987 looked like being a rock scraping week judging by the weather.

Airstrip on a farm

For organisational reasons a maximum of 15 sailplanes are usually allowed to attend the camp which is organised by the Magalies Gliding Club (one of the two clubs in the Pretoria/Johannesburg area). The field is an airstrip on a farm some 20km from the base of the mountains and well clear of the foothills. Nevertheless the slope is such that regardless of wind direction all take-offs are downhill and all landings are uphill. All launches are by aerotow to the foothills or to the lower slopes of the mountain depending on conditions. Traditionally accommodation is provided by the Nest Hotel a few kilometres from the field - there is a nearer hotel but it is "dry".

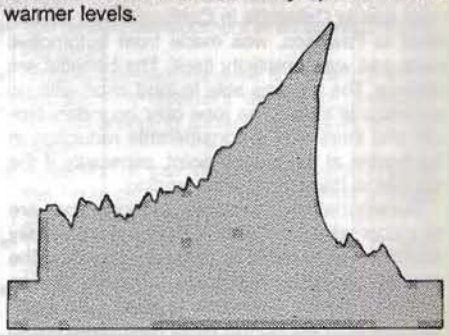
This year we were pleased to welcome a visitor from the UK, Mike Emmett (Booker), who had been invited by Chris Falkingbridge (ex-Coventry GC) to share his ASW-20 with him for the week. We understood that Mike was a Concorde pilot and could therefore be expected to show us some high flying. As it turned out this proved to be correct.

In the event the wave conditions did appear over the site on one day, Tuesday, July 28. At first it looked a day like any other but Chris Falkingbridge, who had taken an early launch so that he could land early and hand over to Mike Emmett, reported wave-like conditions over the foothills at 1030hrs. This produced a mad rush to get on to the launch queue and I was fortunate enough to be near the front. My take-off was at 1100. I released in a thermal over the Little Berg (the main foothill) at 1200m above the field, which is itself 1200m asl. The climb in this thermal was so rapid that there was no sign on the barograph trace of my release. It looked as though I had been towed to 2000m above the field.

Of course had I really thought that this was my day I would have taken the appropriate precautions after release, but it's bad enough having always to get one's barograph sealed and signed before take-off without also having to throw away all one's good thermals when one finds them on tow. But this was not wave flying yet; the air was buoyant and turbulent but the thermals seemed to peter out between 2000 and 3000m above ground. Exploration towards the mountain produced violent sink and brought me back to the same thermal to register a low point at 1500m agl. Other gliders were coming up and joining me and the exploration continued with nobody finding any real chunks of wave.

In the early afternoon conditions improved and some pilots were reporting that they were suffering with cold feet at heights in excess of 4000m agl. Then suddenly it happened. One moment I was flying with three other gliders in a thermal at over 3000m and the next moment we split up and I flew upwind towards a ragged-looking cloud which could have marked the top of another thermal. It turned out to be a small rotor and I climbed in front of it in smooth wave to nearly 5000m where it petered out. Heading upwind to similar clouds enabled me to contact a series of waves of increasing magnitude until at about 6000m agl I contacted one bigger than the rest which allowed me to sit there pointing into wind with a steady rate of climb of 1m/sec. The whole glider, including the variometer, seemed to be frozen in space and time.

Realising when I had passed the 5000 gain I decided to give an adequate margin and carry on climbing as far as possible. This then posed another problem. I still had plenty of oxygen but I was now running out of barographs. I was carrying an 8km and a 10km barograph and my height asl was passing 8500m. This probably meant that I was already off the top of one barograph and was approaching the top of the other. That did it. It probably was not good for the gel coat on the ASW-20s floppy wings either. So out with the airbrakes and a fairly rapid descent to warmer levels.



Our artist's impression of Michael's barograph trace.

Only on the way down did I fully appreciate how much height I had really made. The mighty Drakensberg range looked like a line of small foothills and I could see right across Lesotho. Thanks to my having donned two pairs of socks my feet were only moderately frozen. But my burning need was to land and look at the barographs. With two smoked barographs one shouldn't be far wrong and as luck would have it on this occasion things were OK and I had two very nice traces, one of them peaking 2mm from the top of the chart - a maximum gain of 6000m!

As it happened only three pilots contacted the upper waves, one of them being Mike Emmett who, although he needed his Diamond height, did not take off with a barograph (I would have lent him one of mine had I known). The other pilot, Mark Holliday, had only just acquired a new barograph and just made his Diamond height whilst giving the new instrument its *baptême de l'air*. Where did he get the barograph from? It had just been brought-out from the UK for him by - guess who - Mike Emmett!

Never mind, it will be a pleasure to meet him again next year.

BRENNIG'S SPANISH SUCCESS

Brennig became the first British pilot to fly a 1000km triangle in Europe in July, 1986, but the photographic evidence let him down. So he returned to Fuentemilanos last summer determined to repeat the flight

Fuentemilanos is probably the best gliding site in Europe and is being visited by an increasing number of British pilots every year.

The airfield is about ten miles south of Segovia with the Guadarrama mountains, 120 miles long and about 3000ft above the northern plain, running NE to SW. The mountains can be slope soared in a NW wind and the southerly winds give wave, though better thermals are produced due to the convergence effect. Flying is expensive but good value for money with launching for about 60 gliders.

During July there were a lot of evening thunderstorms due to the thermals building in strength and depth during the day. This caused problems for pilots attempting long tasks but gave great interest and variety to the flights. Later the weather reverted to its normal form and for the last week of August there was some superb wave flying.

With a Nimbus 3 I covered 16 000km in two months including my second 1000km triangle. This usually meant that I flew four 500km triangles a week, landing about 6pm. It was possible to stay up until 8.30pm and do 700 to 800km, but including filling up with waterballast this meant a 15 hour day and after a short while one was completely exhausted.

Unlike the UK, the weather is best before a cold front rather than after. There was a satellite receiver in the gliding office and a temperature ascent was flown every morning with a Motor Falke. The result was pretty good forecasting and at briefing Ingo Renner, CFI, would state the task which he then proceeded to fly in the Janus with a pupil as pilot in charge.

On a good day it is usually very clear and cumulus forms early over the mountains at almost twice their height.

I had three lucky days in a row before the cold front. On the first I flew a 500km triangle in 3hrs 55min, the second (August 19) a 1000km triangle in 8hrs 17min and on the third a 500km triangle in 3hrs 45min.

My 1000km started late, crossing the startline at 1313. The first leg to Monteagudo lake was 137km/h with the second to Hervas at 135km/h, as was the third to Monteagudo town, but muggins misread the weather on the last leg completely and could only manage 97km/h.

After El Barco de Avila you fly over the mountain where a large bare area at 7000ft gives terrific lift. The convergence carries on along the ridge so that the short leg to Hervas is no problem.

When we start flying 1250 or 1500km triangles Plasencia will be a good TP as it is at the far end of the ridge. German pilots spend their winter evenings drawing triangles over Europe, particularly Spain. Ingo, whose flying always exhibits great daring and originality, flew down to Plasencia last year on the western side of the mountains in thermals, then flew back along the eastern side in hill lift. On the way back he herded vast flocks of game from the air.

Monteagudo, my first TP, has been a problem for many pilots as from a distance it looks like the shadow of a cloud. The mountains after Riazza are not so high though still pretty scary, but even after you have left them the terrain fills one with awe. The colours and textures would inspire any textile designer. I would like to have a suit in the material!

Sometimes I had to scratch below hill top height in weak lift with full waterballast; sometimes the belt of lift ran too far to the north and sometimes cu-nims formed along the track, so wide detours had to be made. Always there was great variety and one landed feeling fully tested in every gliding skill.

After I turned the third TP it all went flat and I looked for lift in the sunny area to the north. I was down to 6000ft over poorly lit and inhospitable country before I found lift. I got to Riazza at 9000ft for a comfortable glide home during which I saw the sun set twice, once behind a bank of cloud and once for real.

The next day was even better - 7/8 cloud and wave. I squeezed up through the slot made by the wave, went to the next wave up wind then across to Avila. The next slot was over the mountain to the south. I got down to 6000ft over very inhospitable mountains but failed to find lift.

Really scared by now I made a dash downwind to find a place to land in the valley, but immediately found lift under the cloud. I got to cloudbase and once again attacked the upwind edge. This time I contacted weak lift and by now knew that with two notches of positive flap the scratching performance of the Nimbus 3 was phenomenal. And so it proved. The lift built up until the variometer was trilling its little head off - 18kt I reckoned as I slipped through the slot.

Then above me at 12 000ft was an enormous lenticular 50 miles across. I beat ten miles to its southern edge then climbed to 16 000ft to see a stack of lenticulars to the north, with nothing above but blue. Now there was the problem of getting down. I called Ingo and the consensus was to descend through the slot with full brake. I still had to get through the outer layer; the artificial horizon refused to start but the T&S obliged and I got home.

LOOKING BACK

DAEDALUS AND ICARUS

Was this just a myth or could there be an element of truth in the legend and an attempt was made at gliding or a soaring flight?

Most ancient civilisations have left behind myths that have survived the passage of time in one form or another. These myths have often been dismissed as bizarre stories suitable for children and it is only quite recently that it has dawned on us that they portray the history, religion and sociology of their times. One of the elements that recur persistently in this vast disorganised body of stories is the flying man and of these flying men Daedalus and Icarus have had the greatest influence on art, literature and the pioneer attempts at aviation.

Here, briefly, is the story of Daedalus' soaring flight derived from Ovid's **Metamorphoses,** although several other classic authors also refer to the same story.

Daedalus, which means "bright" or "cunningly wrought", was an exceedingly clever artisan of the royal house of Athens, about 4000 years ago. After a serious misdemeanour he took refuge with King Minos of Crete but eventually upset him too and had to flee a second time. Minos kept all his ships under military guard, so Daedalus made a pair of wings for himself and another for Icarus, his son. The large feathers were threaded together, but the smaller ones were held in place by wax. Each wing was set into a curve like those of the birds.

"... Then Daedalus slipped his arms into his own pair of wings for a brief hovering test flight."

"My son, be warned! Neither soar too high, lest the sun melt the wax, nor swoop too low, lest the feathers be wetted by the sea." Then Daedalus slipped his arms into his own pair of wings for a brief hovering test flight.

"Follow me closely," he cried, "do not set your own course." They took a north-easterly direction towards the string of islands called the Cyclades archipelago. All went well for about 300km, when Icarus, excited by the lift of his great wings, soared too high and the sun melted the wax, so that he fell into the sea and was drowned. Daedalus recovered the body and buried it on one of the islands, which is still called Icaria. Daedalus continued his "flight" westwards and spent the rest of his days in Sicily and Sardinia as a highly successful architect and inventor.

The Greek myths require careful analysis to extract their meaning and some would say that, even accepting that the flight of Daedalus and Icarus is more than the dream of a Greek bard, it is only a parable of the impetuosity of youth; of the folly of nonconformism. Others have suggested that it describes cryptically the flight of the native bronze workers from Crete as the result of Greek invasions, or the invention of the sailing ship by Daedalus to outstrip Minos' galleys.

The question for us, after sixty years of successful soaring, and perhaps more important, twenty years of spectacular hang gliding, is whether after all, the time is ripe to look for a more literal meaning in the Daedalus Gold badge flight.

The evidence is encouraging:

1. Crete lies on a route taken by storks and other birds migrating north-eastwards.
2. The islands have mountains up to 3000ft.
3. Wave clouds have been reported and I have myself seen the area adorned with nicely spaced cumulus congestus.
4. Minoan Crete was a sophisticated country with written archives, multi-storey buildings, plumbing and a system of weights and measures. It could certainly provide the materials for a successful hang glider, and perhaps a simple wooden glider with three-axis control.
5. Daedalus was a clever draftsman credited, among other things, with the construction of animated automated dolls, as well as the ingenuity to solve problems that beat most people.
6. The story says that Daedalus was inspired by the birds in designing his glider; the same was certainly true of Le Bris, Lilienthal and Pilcher, who were precursors of the Wright brothers successful experiments.
7. Some versions of the story say that they took off from a high place, a detail which is primordial to glider pilots, but which would have no significance for those who believe it is only a parable.

Two of the many illustrations of Daedalus and Icarus William discovered while researching this article.

"... who can doubt that Daedalus existed and that some attempt at gliding or soaring flight was made."

Of course, it didn't happen exactly according to Ovid, who was writing about two thousand years later, but who can doubt that Daedalus existed and that some attempt at gliding or soaring flight was made. Perhaps his wings were not made of feathers but cloth. Perhaps he only flew 20km to the first offshore island and then escaped by boat. Perhaps he didn't take off from Crete at all but in the Gulf of Corinth where some accounts place the end of the flight. The uncertainty of the details only serves to multiply the possibilities and to improve the probability that something interesting really happened.

Archaeologists have shown after centuries of disbelief that Troy really existed. We should follow their lead and re-examine the evidence for a real Daedalus flight. We cannot hope to find artefacts like the archaeologists, but glider pilots who know the area could perhaps tell us of the incidence of favourable soaring conditions. If the response is positive, we should have firmer grounds for believing that Daedalus and Icarus were true pioneers of soaring flight.

William's favourite paintings, both by Frenchmen. The top shows Icarus impatient to take off even before the wings have been finished. It is by Joseph-Marie Vien, 1716-1809, a forerunner of neo-classicism.

Below, a painting by Charles Lebrun, 1619-1690, who was director of the Manufacture Royale des Gobelin and presided over the decoration of Versailles. He painted several vignettes illustrating Ovid's "Metamorphosis", this one showing how Daedalus melted the wax which attached the feathers to the wings.

SOMETHING SPECIAL

I must admit I used to throw stones at seagulls in Cornwall where I learned to glide. When the clouds were too low over the cliffs for us to glide I would stone them in frustration, but they would see the stone and nonchalantly flick out of the way.

After living in Cornwall for thirteen years we moved to the Isle of Wight where there was no gliding at this time. With wife, children and dog I walked the cliffs and downs looking for good soaring places and yearning to fly again. One promising looking spot was St Catherine's Down which starts as a high cliff and then runs for about two miles inland at 700ft asl. I once saw a Motor Falke try to soar it but he didn't dare cut his motor! Then hang gliders became fashionable and discovered "my" hill.

At last the Vectis GC was formed and started flying from Sandown airfield which is eight miles from St Catherine's, so if you get low enough for the hill lift to work you don't get back to the airfield. In the early days we had no trailer so exploring the hill had to wait. We bought a K-6ε and trailer but the fields at the bottom of the hill were full of tall crops – wait. The wheat was cut and the farmer left straw bales strategically placed to block a landing – wait. He started to move the bales but would a west wind blow before he ploughed again?

John, a community dental surgeon, went solo in 1958, instructs with the Ventus GC on the Isle of Wight, and says that every now and then he makes desultory attempts at his Gold C.

Well it did, so I took a tow and released at 2000ft asl near the hill – and started to sink; how embarassing! I flew along the hill sinking at about ½kt until I came to Gore cliff which towers above the wild, beautiful and unlandable landslip that slithers down to the sea at the southern tip of the island. There I found weak lift and by flying tight figures of eight I could hold 1900ft.

This gave time to admire the view, now unfortunately spoiled by ugly hang gliders which had just hoofed it off the top of the hill. My feelings about hang gliders are based on prejudice rather than logic. I envy their STOL capabilities and am jealous of them. The lay person's view of hang glider pilots is that they are brave and "macho" but if you drive a proper glider people say "Oh, it must be so peaceful and relaxing up there . . . !" I find hang gliders aesthetically unpleasing.

One hang glider didn't last long and landed, but the pilot of the other knew his onions, came over to the cliff and was starting to come up towards me. I wasn't going to let this bit of string, rag and pipes catch the lovely K-6ε, so I put the camera away and got to work. The air was smooth, so I throttled back to 36kt on the straight and 38 round the corners, concentrated on the good bits and kept the string straight. I gradually got well above him and as if to say he wasn't really trying, he circled off inland and landed on a little green handkerchief.

With some satisfaction I retrieved the camera and looked through the viewfinder, but oh dear where's the ground? A dollop of moist air off the sea was forming cloud and the lift was dying too. I radioed base and asked for the trailer and, tail between legs, sank down in the clear air on the seaward side of the cloud. At about 800ft the lift came back and up we went again with one wing dipped in the cloud, then the cloud vanished as quickly as it came and we eased our way up to 2000ft again.

As we climbed the radio went bonkers with voices from Challock, Dunstable, Enstone and France. I couldn't get a word in edgeways. Far below the tug appeared searching the ground for me, then he saw me and went back to Sandown in disgust as I went off to explore the lower cliffs to the west.

Returning, I saw the trailer in the Blackgang carpark and as nature was calling, decided to land in "my" field. After an exhilarating fast run along the crest of the hill, I turned and landed on the rough stubble.

KEVLAR'S VALUE TO GLIDING

Just what use to the gliding world is Kevlar, the aramid fibre which weight for weight is five times stronger than steel? To find out I joined a press party in November to visit Alexander Schleicher's factory in W. Germany where Du Pont's Kevlar is being used in their latest range of sailplanes

The trip for European journalists was arranged by Du Pont and Alexander Schleicher and we saw the ASH-25 two-seater and the ASW-24 Standard Class gliders in production. The ASW-24 was due to have her maiden flight in a few weeks' time to be followed a little later by the self-launching motor glider version. Both these single-seaters should have flown by the time this issue of *S&G* is printed.

Having seen the golden yellow Kevlar fibre being laid in the ASW-24 fuselage moulds, an obvious question was what were the advantages of using an expensive fibre over the much cheaper glass-fibre?

Gerhard Waibel, the designer, said the new aramid fibre and carbon fibre materials made it possible to design the ASW-24 with far more slender wings, fuselage and tailplane than the GRP ASW-19. They were also able to reduce the empty weight by at least 10%, in spite of improving the aircraft's equipment, and raise the maximum AUW by 10%. The increased flexibility in the distribution of the pilot and waterballast load allowed a significant improvement in the way it can be adapted to weather conditions.

Only slightly heavier than the ASW-19B

Because of the weight saved by using aramid and carbon fibre they could build the ASW-24 as a self-launching motor glider with adequate take-off and climbing power in spite of it having only a 25hp engine. Previously larger engines were needed and the 15m gliders didn't have sufficient soaring potential to make this feasible. With a small fuel supply, the ASW-24E will only be slightly heavier than the ASW-19B.

Gerhard said they were surprised to find that an ASW-24 wing, in an unfinished condition direct from the mould, weighed only 47.25kg. At the same stage of construction, an ASW-19 wing weighed around 62.5kg. Therefore there was a weight saving of around 25%. In addition the new wing has a 17% higher loading capacity, making it possible to fit the retractable engine.

Kevlar was first used by Schleicher's to make one-off seat buckets and cockpit claddings and then Gerhard decided to try it in large quantities for the ASW-22, with a sandwich structure made from aramid fibre and Rohacell foam to give a torsionally rigid structure whilst at the same time reducing the mass.

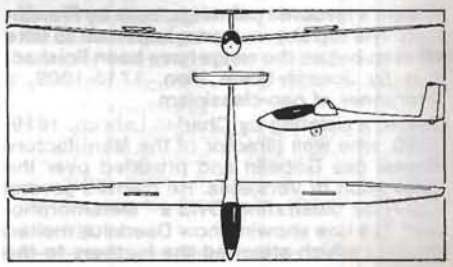
It proved possible to manufacture the ASW-22 with SFRP (synthetic fibre reinforced plastic) sandwich material surfaces from 1982 and rudders and flaps of the ASW-20C and B since the end of 1983 - synthetic in this case being Kevlar.

Martin Heide, designer of the ASW-25 which was also in production when we were at the factory, explained that while carbon fibre was strong enough to use on cockpits, in an accident it would be over-stressed due to its brittleness. The solution was a hybrid laminate and they consider that Kevlar was the ideal partner for carbon fibre - this gave properties which were better than those of the two materials used independently.

When comparing the ASW-22 and ASH-25 with the smaller ASW-24, the percentage of fibre volume moves clearly in favour of aramid fibre in comparison with carbon fibre on the smaller aircraft. And Gerhard predicts that the aramid fibre has a major future as a partner for carbon fibre in highly stressed components. As for moderately stressed components, such as large surface area super-structures and aircraft frames, it will take a dominant place as a reinforcement fibre.

"Only by using new materials," he stressed, "will it be possible to significantly further improve the payload characteristics of gliders and use these aircraft in a rational way as self-launching motor sailplanes."

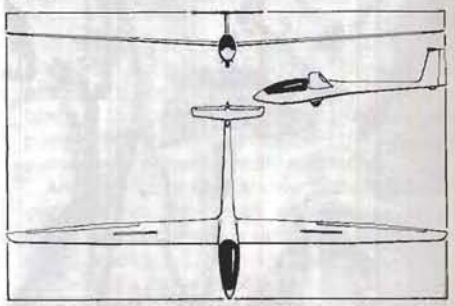
Technical data - ASW-24



Span (m)	*15*
Wing area (m²)	*10*
Aspect ratio	*22.5*
Empty weight (kg)	*220*
AUW (kg)	*500*
Best L/D 43 at	*105km/h*
Min sink (m/s)	*0.58*
Min speed (km/h)	*70*
Max speed (km/h)	*270*

NEW SAILPLANE

LS-7



Another Standard Class glider about to have its maiden flight is the Rolladen-Schneider L-7 with production planned for the spring. The ailerons are of a Kevlar sandwich construction.

GLASS AND CARBON FIBRE

Doug, chairman of the BGA Technical Committee, writes about inspection guidelines and techniques for composite gliders

The high performance sailplane has been at the forefront of expanding aerospace technology by exploiting the potential of glass and carbon fibre composites since the late 1950s. Several thousand gliders made from these materials have been produced which in itself is significant in comparision with the aerospace industry as a whole.

Based upon the considerable experience of sailplane operation there are two aspects receiving particular attention – detection and diagnosis of damage and the durability of gel coats. This article gives general information on inspection techniques and clearly cannot cover every eventuality.

Whilst the aerospace industry is expending considerable sums of money developing non destructive testing (NDT) techniques requiring expensive scientific equipment, this approach is not available to the gliding movement in general.

The high performance sailplane consists essentially of closed cell structures with the minimum of access panels necessary to ensure aerodynamic smoothness and this imposes constraints upon maintenance and potential damage assessment.

One can draw an analogy with the medical field in diagnosis of potential defects before applying surgery. Examples are stethoscope, endoscope, X-ray (portable) and dye penetrants which can be particularly useful for diagnosis. It often pays to borrow this type of equipment. Portable X-ray has been used to detect bearing failures in control systems and pinpoint positions so that the minimum area is cut away to gain access.

A severe groundloop will usually result in invisible failure

The groundloop is one of the more insidious manoeuvres made by the modern high performance glider, at take-off or landing. Due to the inertia effects of the T tail, high load levels can be generated in the tailplane attachments and local structure, and into the base of the fin and fuselage structure. A severe groundloop will usually result in visible failure of the fuselage between the wing trailing edge and fin. However, the base of the fin and the tailplane itself also need checking. At the base of the fin is the rib which distributes loads into the fuselage shell and frames and contributes significantly to the torsional stiffness of the empennage/fuselage combination. This is a significant factor to the determination of flutter speed. This is particularly important as it is flown to the limits of the flight envelope fairly frequently, for example crossing start and finish lines, and inter thermal and wave flight.

After a groundloop it is essential to examine for possible damage. Use a stethoscope or put an ear to the fin and apply an up down load at the tip of the tailplane to induce a natural oscillation. Listen carefully for creaking noises which usually indicate a disbonding of the fin root rib or frames, and/or shear failure of the rib when near to the cut out for the elevator pushrod. A further problem is the buckling of the fin shell to such an extent the inner skin of a sandwich construction can fail in shear with no visible external failure. This can be detected initially by applying a point load with a finger, say 10lb approx, and assessing deflection by distortion of the light lines and comparing with other areas of the local fin shell. If the area feels spongy, drill a ¼ to ⅜in diameter hole and examine the internal structure using an endoscope. If damage is detected, *ie* crazing which is seen as whitening of the laminate, it must be repaired. It is also essential to examine the tailplane structure and again in the case of a sandwich construction failure it can occur to the inner skin without any visible signs of damage to the external surface. Again an endoscope can help to diagnose possible internal damage.

It is also necessary to examine the wing structure following a groundloop. Initially visually check over the upper and lower wing surfaces for distortion of the light lines which can indicate permanent deformation due to buckling of the wing shell. In addition examine the root ribs and spigots. If in doubt as to structural integrity, get further expert advice.

Alternatively coin tapping can be effective to the trained ear in detecting damage. The principle is that a structural element will respond to a mechanical excitation by vibrating and generating a specific tone. If there is damage or a fault there will be a change of tone due to the change in its vibration response.

Another simple aid is penetrant dye. If the laminate is damaged the dye will penetrate the fracture path. I have seen compression shake in a spar boom where the wing surface had a barely visible crack but upon checking with a dye the spar boom was fractured completely. This type of failure is similar to that which can occur in timber when the initial visual evidence is innocuous but in reality the implications are very fundamental.

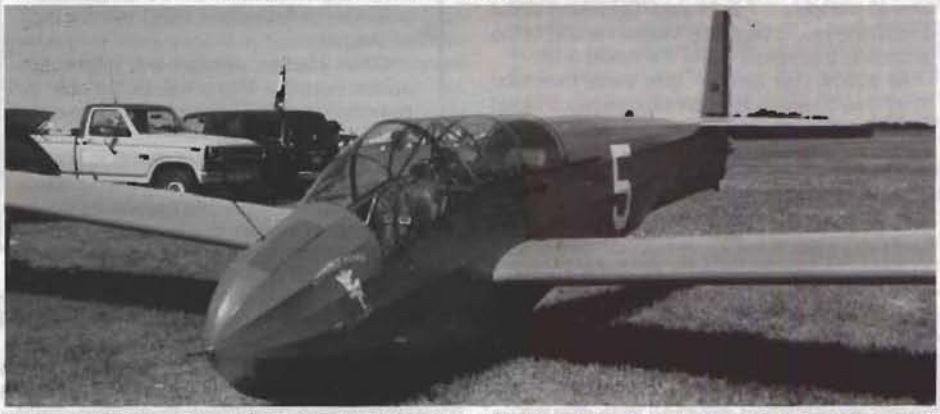
The examination of the extent of damage must be methodical and thorough, repairs must be in accordance with the manufacturer's maintenance handbook and where damage exceeds the scope of repair as defined by the manufacturer then repair schemes must be approved by them. The principle of repair is to restore the structure to its design standard, whether constructed of wood, metal or composites.

After repairs it is important to re-weigh the glider to determine the C of G position and max and min cockpit loads; and after repairs to flying controls check the correct control surface balance as changes to balance can have an adverse effect upon flutter speed.

It is also desirable to know the natural frequencies of the wing and the empennage/fuselage combination. These can be measured by simply counting the cycles/min by inducing the wings to oscillate at their natural frequency and similarly measuring torsional frequency of the fuselage by applying a light vertical oscillatory load at the tip of the tailplane. Whilst this is not a precise test method it can indicate potential damage if a reduction in natural frequency is observed.

There will be a second article, this time on gel coats.

THREE YEAR RESTORATION



Brian Strickland, on a visit to the Confederate Air Force air show in Texas, USA, discovered and photographed this beautifully restored Schweizer TG 3A. It was built in 1942 and the Confederate members worked on it for three years, putting in 3500 hours.

HILL BOUND

"A north-westerly airstream covers the British Isles," said the voice of the announcer as I sat up in bed.

"Just the day for an O/R," I said to my crew as we sat down to breakfast.

By the notable efforts of Dave Clayton's Jeep, by dint of some manhandling and *much* argument, we were at last rigged and ready to launch a thousand feet above the Menai Straits.

Below us the hill dropped away to the little village of Aber in a slope of more than Mynd-like proportions. Behind the mountains of Snowdonia reared up in peak and gully and rock-face until they disappeared into cloud. Far away to the south-west, the twin pinnacles of Yr Eifl (The Rivals) marked the start of the Nevin cliffs.

Attached to the end of the bungy, the Jeep trundled off below me. I hoped it would be able to stop. I heard Dave Carrow grunt as he held back to the limit. Then, in two skips and a jump, we were airborne and skimming over the Jeep at 70 IAS to cushion on the updraught beyond.

Ten green! Not bad! I slid off towards the north-east where, some five miles away, Penmaenmawr falls 1500ft almost sheer to the sea.

Plenty before the end of the afternoon to make me sweat a bit

The gap between the Aber ridge and Penmaenmawr seemed rather large - they always do! - but I slid into the lift level with the top and was rapidly swept upstairs. From 2700ft asl I headed back for Aber where, behind the foreslope, Moel Wnion (known to us as The Onion) rises into a superb hog's back to 1900ft. It was all just too easy, but I wasn't grousing about this. There would be plenty before the end of the afternoon that would make me sweat a bit.

At 3000ft I hit cloud - drat these thermals! They'd no business to be forming so much cloud right on the coast. I don't care for cloud when the peaks are sticking up into it only a mile or two downwind. I used the brakes and stayed out.

My next objective was Carnedd-y-Filiast, the end peak of the Glyder (how suitable!) ridge some four miles to the south-east across the Nant Ffrancon valley. It looked a bit unpleasant, as there were foothills in front of it which might mask the lift. However, I had previously earmarked a landing field (quite 100 yards long!) so off I pressed. The lift did not come till I was close to the slope and some 200ft below the top. However, when I got to it, it was good and soon shot me up to cloudbase again.

From there to Eilidir Fach was easy.

From Eilidir Fach to Moel Eilio is another biggish gap with the same situation of masking by foothills. Some downdraught in the gap gave me a bad moment, but as soon as we tucked well into Eilio, up we went to cloudbase again.

The next step was to Mynydd Mawr which I remembered from the ground as one of the most savage rock bowls in North Wales. It didn't look less so as I sailed into it from the air, but the lift was superb and two circuits of it put me back to cloudbase ready to jump to Garnedd Goch.

Garnedd Goch is a really nice shaped mountain and I had time to breathe while I settled down to plan the next bit of the trip.

This is a five mile gap to The Chessmen - so christened by us because their names in Welsh mean Red Peak and Black Peak. These peaks form the ends of a two mile ridge which rises 1700ft in one clear sweep of scree and rock, straight off the coastal plain.

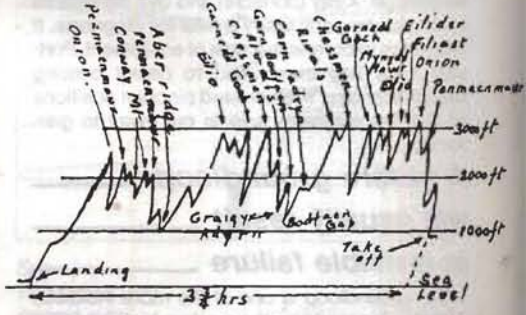
Five miles crosswind at, say, 300ft/mile meant arriving at about 1500ft asl - lower if I met any downdraughts. I told myself firmly that even if I got there at 500ft, I couldn't fail to climb up such a superb face. All the same, I felt nervous!

In fact, I got there only just below the top and climbed quickly back to cloudbase before pushing on to Yr Eifl.

These "Rivals" are really the most remarkable sea cliffs I have ever seen. And there is definitely *no* landing for some six miles. Since, coming back, I might have to arrive low and climb up them, I made a very careful study of them before pressing on for Nevin.

It was all downhill now and I scudded along at 70. I had intended to make my TP a lump of hill behind Nevin called Garn Bodfaen, but now, four miles beyond it, I could see a lovely cone shaped hill, Carn Fadryn (1250ft asl). To reach it would be easy and I *thought* I could get back.

I reached Fadryn at 1800ft asl and found that, due to its cone shape and isolated position, 1800ft was about the limit of its lift. I played with it for a few minutes - enough to show it would hold 1800 - then set off back to Bodfaen. This was the lowest yet - 1200ft asl only, when I reached Bodfaen. However, this is a very nice hill and I was soon back at 1800ft and pressing on for The Rivals.



COPY OF BAROGRAPH CHART: W.E. CREASE.

The beginning of the cliffs leading to The Rivals is a headland called Graig-yr-Adyrn (The Birds' Rock). It deserves its name, for certainly nothing other than a bird could get foothold there. True precipice is rare anywhere in this country but Graig-yr-Adyrn drops 500ft as straight as a plummet into the waves at its foot. Although at 1400ft when I rounded it, it still gave me the "Willies" - quite illogically, for I had not the least need to worry. From there to The Rivals the green ball never dropped below 10.

I began to feel much happier. It seemed to me it was in the bag. I sang love songs to the Olympia, I felt so fond of her.

I didn't stop at The Rivals, but went straight on to the Chessmen. I wanted to see what they were good for. It seemed to me they might produce up to 6000ft or even more. But back at 3000ft I was into cloud again! The thermals were developing even out at sea!

Looking back, I should, of course, have gone up through the cloud and would probably have been able to sit in hill lift above the tops. There was no ground above 2500ft within ten miles of me, so I should have been perfectly safe. But so firmly had I impressed on myself before the flight that I must not, under any circumstances, go into

S&G Classics

CHOSEN BY THE ARM-CHAIR PILOT

The Editor has asked me to select a dozen articles from earlier numbers of *Sailplane & Gliding* for reprinting. *S&G* was formed in October 1955 by the amalgamation of *Sailplane & Glider* and *Gliding* (so that's why it has such a funny name!) and has appeared six times a year ever since. I therefore have 193 issues to choose articles from, and the task is impossible in any objective sense, as became obvious as soon as I started dipping into my lovingly preserved back-numbers.

The only solution is to make a very personal selection, a sort of Arm-Chair Pilot's Desert Island Discs, consisting of twelve articles which are for me unforgettable. As it happens I started gliding in 1955, and was an avid reader of *S&G* from that very first number. Reading the old copies again I seem to remember practically every article, but pride of place must go to "Hill Bound" by W. E. Crease (February 1956, p12).

Take out a map of the North Wales coast and follow his description contour by contour as he takes his Olympia on a flight which, so far as I know, has never been repeated. The only phrase which may mystify the modern reader is "the green ball". It refers to the little ball on the "up" side of the Cosim variometer, which rose in its tube in proportion to the rate of climb. The corresponding ball on the "down" side was coloured red. The Cosim was calibrated in ft/sec, and 20fps was the top of the tube.

Other chosen articles will follow as space permits. There will in fact be a baker's dozen because in order to prevent me from including any of my own articles in the selection of twelve the Editor has asked me to choose one of them as a thirteenth, *hors concours* as it were! A clever pre-emptive strike.

cloud, that the thought, now, never even entered my head.

Instead, on reaching cloudbase, I pressed off without further thought for Garnedd Goch.

Note here the error of over-confidence. Had I troubled to think, I should have seen that to cross a five mile gap from 3000ft to reach a 1700ft hill fully open to the sea wind is one thing. To cross the same gap to a 2300ft mountain with ground at 1000ft in front of it is quite another.

When I eventually reached the face of Garnedd Goch I was just 500ft above the ground, with the mountain sticking up another 800ft above me. Decidedly nervous, I tucked myself in to the face, but the lift was there all right and a couple of short beats on the west end of it took me back to 2000ft asl.

Then came the most startling moment of the whole flight. As I set out to extend my beat to the north-east, flying some two spans from the hill and barely a span directly above it, I rounded a spur to find at the other side not a continuation of gentle, heather covered mountain, but an enormous rock bowl. In a split second, the gap to the ground below me dropped away from 50ft to 1500ft and as I peered down 700 or 800ft of naked rock to the screes below, I very nearly dropped the controls and shoved my hands over my face.

However, as I cleared the edge and flew out into the bowl, the sense of vertigo disappeared as fast as it had come, expecially as the green ball shot up to 20ft/sec and held there. In one circuit I was out of the bowl and another took me to cloudbase.

After that, I had only to skip to Mynydd Mawr, then to Eilio and round by the foothills to the Aber ridge.

The trailer was waiting for me at the foot, but no sign of crew, and I decided I could push on to the limit of the lift in the other direction. So straight along the Aber ridge to Penmaenmawr, rounding it well below the top (I had lost all qualms about soaring below the top of cliffs by now). Regain height to 2000ft on Penmaenmawr and a sweep over the sea to Conway mountain. Along Conway mountain, turn over the river, back round the Conway bowl to see how good it is (the answer is "very"), back round by Penmaenmawr and scream back to Aber at 100 IAS.

Still no crew! I regained height over the Onion, had ten minutes aerobatics and came in to land by the road.

Two hours later my crew returned from an expedition into Anglesey!

* * *

Taken over all, *the* outstanding feature of the flight was the scenery. To see it coming up in one endless panorama of lake and peak and pass was like climbing forty mountains in a day. I shall never forget crossing the Llanberis valley, Lyn Padam brilliant below with gulls dotted all over it, startlingly white against the blue water. Beside and above me, peak after peak towering into cloud and, for full measure of beauty, lying ahead and to starboard and moving with me along the mountains, a complete circular rainbow with its paler shadow lying alongside it, a double ring of vivid colour against the black rock and purple heather beyond.

Not less lovely was flying down the cliffs of the Nevin Peninsula – blue sea on both sides and the waves creaming along the yellow sands.

Anyone can have their six hours in cloud, their Gold distance and Diamond height. I shall be very happy to remain hill bound for the rest of my days.

TERRY HURLEY

THE NATURAL HISTORY OF HUSBOS

For a year Terry kept a note in his diary of the wildlife and plants sharing the club site

We left at midnight, like Cinderella. Behind us in the clubhouse the St Valentine's party had just entered its terminal, or barrel-walking, phase but outside the air was cold and sharp and the frozen grass sparkled in the moonlight as if littered with smashed crystal.

A few yards ahead a shadow detached itself from the angle of the hangar wall and became a fox. It moved without sound then stopped and stared back at us for a long moment before merging again with the darkness. It was calm and beautiful and quite unafraid. Afterwards it occurred to me that rather than the fox passing through our airfield we were more likely intruding on what it regarded as its hunting grounds, and I began to wonder just how much wildlife was coexisting with the club on the 82 acres that make up the airfield at Husbands Bosworth. I started keeping notes in my diary.

In many ways February is the true start of the year in the country. At night you can hear vixens screaming their passion – an eerie sound if you're alone in the dark – but the authentic sound of awakening life. The winds still blow strongly from the north and the cold polar air brings down mixed flocks of redwings and fieldfares – the fieldfares smart with their airforce-blue barred wings. They stay for a day or two feeding and resting, then one morning they go up together into the wind filled sky and disappear southwards.

During March we begin to see geese passing overhead – long, wavering, arrow-headed formations high against the slate coloured cumulus. When the fields are flooded they often stop to feed, one of their number always on guard, its snakelike head moving in neurotic jerks, watching all around the horizon. Usually we have snow in March. Often this is the worst and heaviest snow of the winter and even after the thaw there are still patches like scurf lying under the shadow of the hedges. In light snow you can find the purposeful tracks of the badgers which live alongside the airfield – I don't intend to say precisely where – and you can follow them along their traditional routes which neither airfields nor roads have managed to alter. If you're lucky you can sometimes catch a brief glimpse of one of our badgers in your car headlights. More often you find them dead at the side of the road, killed by the traffic. Last year I found three like that. Three is a very high proportion of a community of badgers. I guess that for badgers these days it must be like Passchendale or Guadalcanal.

The airfield has become a sort of pesticide-free oasis in the cultured wilderness

As the hard English winter gives way reluctantly to spring small flowers begin to appear along the ditches and sheltered sides of the banks. By early April you can find campion, mouse-ear and meadow-rue around the overgrown bomb stores and on the field and in the rough edges under the fences there are shepherds-purse, pennycress, saxifrage and flax. The airfield is surrounded by scientifically managed farmland and has become a sort of pesticide-free oasis in the cultured wilderness. Plants that vanished from the rest of this region twenty years ago still survive at HusBos.

At this time, too, in the dark bottoms of the ditches frogs and newts begin to move. You may not have hunted for frogs since you were five years old but be reassured – the skill is never lost. Any hungry Frenchman could catch himself a banquet in our ditches.

Hares live on the airfield – those that outrun the foxes – and at this time of the year they're bolder or madder than ever, racing in circles, leaping, boxing, and generally behaving like the Fourth Form let out from school. I like hares. I like to watch them. I like to chase them. And I like them roasted in a sauce of mushrooms and red wine.

Then it's May. Gliding commences in earnest. Film is loaded into cameras, long lines are drawn on maps, and pilots come down talking about thermalling with swallows. There are martins patterned like miniature killer whales, the cuckoo is back, and it's almost summer. The grass is growing quickly on the airfield and the motor-mower is brought out to cut long, pale green swathes and frighten the hares, the nesting larks, the plovers and the voles. The voles are okay, though. They dive into their burrows until Armageddon has passed by, then reappear to resume their frantic little lives. In the hangar the resident sparrows will

be raising their first brood by now and anyone who wants to fly must wash the glider's wings beforehand. It would be easier if we had covers for all our gliders. Or a cat.

June. Summer. Good substantial thermals. The blend of mown grass and aircraft dope that is the fundamental odour of flying. Teeth surprisingly white against darkening skin. Even longer lines drawn on maps. The field is rich with wild flowers and hovering over the flowers are butterflies with imposing titles - Red Admirals from the Mediterranean, Fritillaries, Meadow Browns, Gatekeepers and Skippers.

Even the flowers have impressive names like ladies-smock, sweet Cicely, pimpernel and vetch. These old names tell you something about their history and the lives and interests of the people who named them.

The acid-yellow of the warblers

By this time birds are almost too numerous to mention. All the summer visitors have arrived. In the small copse behind the old caravan you can glimpse the acid-yellow of the warblers and hear the chiff-chaff and sometimes the drumming of the lesser spotted woodpecker. In the westerly winds great hatches of flies and sedges drift across the field from the nearby reservoirs and following them are the swallows, their neat tails flicking open and shut like scissors as they execute maximum *g* turns and pull-ups. At sunset, as gliding stops, a pair of tawny owls patrol the edge of the tree line for voles.

July and August are the months of high summer when the gliders launch and vanish into the heat haze, leaving the airfield strangely empty. Crews doze on the grass waiting for the telephone to ring. You can hear the high, distant screaming of swifts and smell the warm pollens drifting in the breeze while you bask like a snake with the rare English sun burning your skin. It's too hot to do anything until evening. Unless the breeze drops. If this happens clouds of tiny, unidentifiable black flies rise out of the depths of the field and swarm on to anything brightly coloured, including my orange overalls. At night, in the light of the lamps outside the hangar bats hunt moths, diving and turning, silent and agile. Sometimes in the quiet you think you can hear their teeth click as they kill.

One day in September it becomes impossible to deny that autumn has set in. Each morning you find yourself watching for the swallows, relieved when you see them still working over the field but aware that they're tending to congregate on telephone wires, lined up like pegs on a clothes line. Then they're gone and in the early mornings there's a mist that takes longer to dissipate with each day.

If you're lucky there can be a few cold, pale blue and gold days in October - the sort that make England worth living in. Rooks and flocks of plovers feed on the stubble. The plovers wheel together above the fields showing first white then black, as if a chequered flag was being waved in the air.

With the autumn gales herring and black-headed gulls move inland, blowing like scraps of paper in the wind. On Wednesdays and Saturdays the Pytchley hunts over the district. When they meet outside one of the village pubs they make a fine, bold spectacle, but in the field they're disappointing. Hardly any of the riders tackle the jumps and the expensive horseflesh jostles, steaming, to crowd through the gates. I remember the fox I saw last February and hope he survives the season.

In December there are strange tracks in the thin snow - neat, tiny holes that could have been made with a dibbing stick. I have to look through several books before I can identify them. Muntjac deer - probably escaped from a nearby private zoo, and running wild over our airfield. Briefly I worry about the zoo and escaping tigers.

At HusBos the club flies throughout the year, even in the worst weeks of January. It isn't always a lot of fun, however, and you're often glad to come into the steamy warmth of the clubhouse, your face burning after the cold outside, to the air heavy with talk and the smell of frying chips. About this time a notice appears on the board - in another two weeks there'll be a St Valentine's party. I read the notice and rub a clear patch in the condensation on the window to peer outside at the relentless, depressing, grey sky. The door opens and Mark comes in rubbing his hands together. His face is scarlet, the skin cracked with cold but he's laughing. In the broad Shire accent which he doesn't know he has he tells me that he found a right old mess outside the kitchen that morning. All the dustbins tipped over and their contents dragged out. "You know what," he says shrewdly, "It wouldn't surprise me if there weren't a bloody old fox living round here!"

A QUESTION OF ENVIRONMENT

Brian, the 15 Metre Class World Champion, explains his philosophy behind starting a soaring centre at Le Blanc, France, with his wife

When people ask why I am setting up a soaring centre in France I find the reply very difficult without going back to my own progress in cross-country flying. The factors which I believe have helped me over the various hurdles to become confident and competent enough to become a good cross-country pilot, are those which I hope to provide for others keen to progress.

The ATC, then the Lincolnshire GC had little expertise and virtually no facilities to encourage soaring flights of any duration. However, like all small clubs there were a number of us who had some idea of what gliding ought to be like but felt it beyond our reach.

A number of us ("progressive" pilots) bought a Skylark 3 with the club CFI, Jack Nicol, who had a considerable press on attitude. Alas, with only two instructors in the club there was never the opportunity on the right days to go off on one's own. I suppose there was underlying pressure and one felt quite selfish if the two-seaters were not fully staffed.

The first great step forward came when I flew at Four Counties at Spitalgate, home then of great pundits like Harry Orme and Don Austin. My five or six winch launches to get away started to feel very stupid when they would take one launch and disappear who knows where for hours on end. Here there were more single-seaters than two-seaters and in some of them one did not have to land after thirty minutes!

This contact with pilots of a high calibre and their encouragement fired me to take the Skylark for longer and longer flights, eventually culminating in a close circuit flight of some 100km. At the time I was flying at Four Counties there were other young determined pilots who were beginning to make 300km flights and even sorties into competitions. This provided the necessary determination to overcome the usual problems of lack of time, money or a good glider.

The next few years were completely consumed with starting a new club along with other like-minded pilots - a club with the lofty aspirations of taking all pilots who went solo with us on to Silver C as a matter of course. Those years spent instructing and helping were very rewarding but my own skills did not improve considerably. Even though I was making some longer flights, this was mostly due to flying a Kestrel 19.

It was not until I started to make the occasional cross-country from Booker with other pilots such as Chris Rollings and Rex Pilcher that I realised what I had been lacking. I found that flying cross-country with a number of other pilots had terrific advantages over bumbling about on your own, not least of which was the amount of fun we were having.

I suddenly found that group flying was very exciting. It made you completely honest about your own judgment and ability and the discussions afterwards were most instructive, enabling each good or bad decision to be assessed again. Since those early days at Booker I have been convinced that the route to competency in soaring is through informal, fun flying and let the natural competitiveness and curiosity of the individual do the rest.

". . . the right environment is more important than any other aspect."

During the years of coaching for the BGA and as CFI at Booker I was involved in and responsible for various schemes for improving soaring training. These have led me to believe in helping the self-motivated and that the right environment is more important than any other aspect.

Soaring courses for many people are a substitute for doing it for themselves. The lasting benefits of such courses are doubtful, particularly when in the last few seasons it has not been uncommon to fly on only three or four days. Having suffered the frustrations of eleven years of professional instructing in a slowly deteriorating climate, there appeared little alternative other than to try to create the right environment somewhere where the weather is suitable for the task. *Voila Le Blanc.*

Le Blanc is a small town with an airfield and gliding club, near to Chateauroux, the site of the 16th World Championships.

We chose Le Blanc for two main reasons. First, it is in the best soaring area in Europe outside Spain, for weather and also for gliding terrain. Secondly, the Le Blanc club doesn't fly midweek so we can operate without any interference or restriction. We were also extremely lucky that the club is friendly with excellent officials who showed enthusiasm for our project, particularly Jacques Benoist, the CFI.

The airfield is owned by the town and the Mayor has been to welcome us and offer every support and encouragement. There are many other good reasons for choosing Le Blanc ranging from no controlled airspace to speak of to good quality accommodation and excellent restaurants, to say nothing of the wine!

Gillian and I are providing facilites for visiting pilots with at least Bronze C to come and enjoy soaring in what we hope will be the right environment. We provide a Met briefing each day and usually suggest two tasks geared to the experience of the pilots present. Usually four or five pilots fly each task, joined by myself and Gillian. The briefing includes advice on how to approach the conditions and any possible navigational problems. At the morning briefing we normally have questions or comments on the previous day's task with pilots' impressions from both the fastest and slowest. We may cover some aspects of the previous day's conditions or techniques in an informal lecture. After flight debriefing is a casual affair sitting outside the bar.

We will not be accepting more than ten pilots in any week in order to launch everybody within one hour and to maintain a close communicative atmosphere. Some two-seater training is available in the Marianne or a K-13 and there will be lead and follow when considered appropriate. If the weather fails to co-operate and you end up *au vache,* with the cows, we will organise your retrieve.

For further details write to Brigid Finucane, 53 Raven Rd, Stokenchurch, Bucks HP14 3QW.

MARY WITH THE WORLD CHAMPION

Mary flew with Brian Spreckley, the 15 Metre World Champion, in the Marianne on the second and last day of the Booker Regionals - a 147km triangle, Membury, Bicester

I was scheduled to fly in the Booker Regionals with Brian Spreckley on Sunday, July 19. The two-seater turned out to be a splendid Marianne on loan from the manufacturer, Marc Ronjon of Centrair. Certainly the trailer was imposing. Marianne, when assembled, has 18½ metres of wingspan, a fuselage streamlined like a teardrop, with a front seat of considerable comfort and a back seat which can entirely swallow up a small pilot. The glide ratio is 40:1, despite the provision of a fixed wheel sturdy enough to withstand beginner's bounce. The handicap, 97%.

Sunday, like Saturday, was a washout. So was Monday, Tuesday, Wednesday and Thursday. Friday looked possible. I had promised to crew for Chris Alldis but when Spreckley asked me to get out the Marianne I forgot about that, and after removing seven gliders and two tugs managed to rescue the dusty maiden from the back of the hangar. Not single handed. I had been economical with the truth when I asked two innocent bystanders to help me get out *a* glider.

"I was very impressed with the quality of the Marianne."

Everyone grumped along to the briefing, which had been rescheduled for 11, 12, 1, 2 and 3 o'clock, by which time the dilatory cold front had reached Booker and it was tipping down icy rain. Gloomy prognostication for the weekend by weatherman Peter Baylis sent everyone away despondent. I hung around until 5 o'clock, when Spreckley had promised we would fly even if it wasn't soarable. We did, for thirty minutes, and I was very impressed with the quality of Marianne.

Steady as a church on aerotow, stately in roll, Marianne is actually very easy to fly, even for me. We managed to stay up on nothing much but a hint of negative sink. Like the Pegasus, Marianne has no vices. No problem landing, at 100km/h. As we were trundling the glider back to the hangar, Spreckley said "I have to fly with Bernie Morris tomorrow." I said that was fine by me, after all I did have a go, and if there was only going to be two contest days possible out of nine, I could hardly expect any more. With so much misery all about, 40 Nationals pilots and 24 Regionals pilots all ready to slit their wrists, my disappointment seemed of no consequence at all.

Saturday everybody did get launched and flew into the ground. For the Nationals, they didn't get far enough to call it a Day, but Spreckley and Bernie Morris won the Regionals in the Marianne, which is rather splendid going for a two-seater.

Sunday was definitely going to be the big one. At any rate, the only one. The air was electric with anticipation. I was very happy for them all. Rolled up to lend a hand and help any way I could (Bruce Cooper was crewing for Chris Alldis on the weekends). Coming out of the cafe, lightning struck. My orbit encountered Spreckley, and he said "Do you want to fly with me today, Mary?" Did I? **Wow!!! "I sure do!!!"** "Well, get the glider down to the back of the queue and get yourself ready."

Eight days out of nine I had brought my little package of Kwells along to Booker. Now that at last I really needed them they were at home on the dressing table. I'm okay if I'm doing the flying, but otherwise a little medication helps a lot. Never mind. Not going to turn down a chance to sit in the back seat and fly with the World Champion in a competition. I'll just keep my eyes open and my mouth shut.

Brian spent a lot of time at the start, mixing it up with the gaggle. I was nervously wondering what was the etiquette of a mid-air collision - if two gliders collide and the pilots descend intact or otherwise, does everybody else carry on as if nothing had happened? Seems a bit callous. Fortunately despite my terror as Spreckley kept shifting from one bitty core to another, the seven or eight other gliders flying at exactly the same level managed by a miracle of agility to avoid each other and us. This is where they separate the men from the little old ladies. I would have chickened out long ago. Brian took his start picture about the same time everybody else did, and all seven started out on track, but Brian wasn't satisfied and returned to make a second start. This time the thermal was perfectly timed to drift back over the start point at maximum starting height. I got the point. Starting as high as possible is money in the bank.

Speed to fly between thermals was 140km/h. We jinked about under a robust cu, seeking out the best bits. He's never satisfied to sit in one spot, always nibbling at the corners and looking for a better one. And when we did connect with a good core, he don't half crank it in. Even at height, a 40° angle of bank. I thought one turned tight down low, and eased up at cloudbase, but not Spreckley. Wing down, 100km/h, and up she goes.

"On a day like this," Brian explained, "it's better to stay high if possible." Sounded like a good idea. But only once did we actually climb all the way up to cloudbase, in fact we only had two decent thermals the whole trip. One was over Benson, when we climbed tightly right up into the grey mist before diving out on track lickety split. "No point in a cloud climb unless there's only one cloud" said Brian. "If you come out on the wrong heading that's a costly mistake." I could agree with that, from experience.

Getting down past Didcot, we chose the upwind line of cloud which would drift us down over the TP, Membury mast. Even though the downwind line had looked healthier, it was clearly the right decision. Once near the TP, Brian said, "It would be better to be high", but we lost a bit and actually took the picture at about 2800ft. Only one snap. Right over the mast, it looked to me, and he didn't waste any time about it either. Wonderful to be that positive about it.

The next leg proved exceedingly awkward. We never did find a decent climb at all, 2kt here and 2kt there and what looked like it would be good wasn't very good at all. A cloud over Abingdon promised a lot and delivered little. Over Headington roundabout we went meandering and couldn't find anything satisfactory. At this point there were two streets of cu: one straight to Bicester which looked second-rate and decaying to me, and the other, young and fresh, to the north toward Kidlington, which I would have chosen ...

"He doesn't pray for thermals. He swears at them."

Not that the northern route would have turned out any better, but between Headington and Islip nothing but nothing worked. We scrabbled ignominiously in ½kt here and ½kt there, losing height steadily, scraped close enough to Bicester for another quick photograph over the control tower, and then there was nothing left but the Bicester house thermal over the town at about 400ft. Half a knot, half a knot, half a knot onward. Brian said rude words. He doesn't pray for thermals. He swears at them. We couldn't go anywhere else to look for a better, we had to work the one we got. And this went on and on. I didn't feel too good. I felt terrible. I didn't say anything, I didn't moan or complain. Didn't dare. I just threw up neatly and quietly and only coughed a little. "Do you feel all right?" asked Brian ...

"Not exactly." I confessed. "What should I do with the bag?" "Drop it out the window" he said. "I thought that was illegal!" But we were not over the town any longer, so I folded it neatly and pushed it out the DV panel. Hoping it would land where nobody would find it.

Felt a lot better, after that. Began to sit up and take notice, so did the thermal. It improved, and we began to climb away. Everything got more cheerful, the sun came out, the day began to look better all around. I looked down and called Brian's attention to that white seagull circling just below. "That's not a seagull, that's the sick bag!" It was following us up.

We managed to outclimb the sick bag, and heading for home found a really good thermal over Brill on the Hill, that charming little village with the windmill on the green.

"Only one more good climb and then we can head straight for home," said Brian, kindly. "Three thousand feet over Brill and we can get home?" I asked. "With the wind behind us, yes, but we'll go a bit higher and then we can go faster." He doesn't use a calculator, he just knows.

"One more turn, and we go." And did we ever! Marianne put her nose down and skedaddled. 140, 150, 160km/h. Leaping and bounding, belting through the turbulence, pouring it on while Booker rose steadily up the windscreen and disappeared behind the hill. Great stuff! I loved it! Scared the hell out of those squirrels! Parting the branches, we swept over the finishing line, swung round the final turn, and had to put the brakes away to avoid some idiot who kept on motoring across our path towing his glider.

We came fourth for the day which was won by Chris Evans with Gill Spreckley coming in 2nd. Brian won overall. Brian and the Marianne. ■

WHOSE FIELD WAS IT?

Greg from South Wales GC completed his Silver C with a distance flight on September 5 but the difficulties started when he decided on a field landing

Greg started gliding in September 1986 and when not flying works as an electronics engineer for Mitel Telecom (owned by British Telecom).

After achieving Silver height and duration, I was looking for a reasonable day for a 50km attempt from Usk. Weeks of high pressure and haze left me thinking there might not be another soarable day for this attempt until next season. Hence it came as no surprise to my colleagues and instructors when they saw me disappearing in my syndicate owned K-6E on a semi-decent day at 1600hrs. Cloudbase was at 3500ft, which was a struggle to achieve after being released by the tug at 2000ft and failing to find lift until 900ft. However, once there, I was able to maintain this height without too much trouble.

Noticed the curtain of rain was catching up

On the air map I had marked the general direction for the flight. This I calibrated in 10km intervals. With a wind of approximately 30kt behind me, I soon crossed the river Severn, 4km north-east of Lydney. I flew over Gloucester and Cheltenham at 3000ft. From the map I could see I had almost covered the distance. I was about to turn northwards towards Evesham and Bidford when I noticed the curtain of rain which had pursued me from Usk was now catching up, so I decided on a field landing. This would not be the first outlanding: that was a couple of weeks earlier in a large stubble field with a road running along its boundary hedge, making the retrieve easy.

This fresh in my mind, I selected another large stubble field facing in the right direction for the wind. Everything went according to plan – the circuit, the approach and the approach speed until I crossed the boundary hedge. Oh blast! It was a standing crop of wheat. Only one thing for it: let the airspeed decay and try to round out and stall the glider on to the top of the wheat as I had been instructed, if such an occasion arose.

I have never known a glider stop so rapidly as I sank beneath the ears of wheat. Throughout this abrupt arrival, I heard nothing unusual, that is, part of the airframe failing, in particular the tailplane. I removed the canopy and climbed out. The aircraft was fully intact. As for the wheat, which was short compared to most, the only part flattened was underneath the glider. The ground run was only a couple of metres.

As I walked towards a gap in the fence it started to rain. A young woman offered me a lift in her car to the farmhouse which turned out to be the wrong one. I was told the farmer had probably gone to the local agricultural show down the road. I used the farm telephone to contact my retrieve crew, leaving the appropriate money, and returning to the glider found two local lads on motor-bikes. My concern at this stage was to inform the owner of the field and obtain his permission to remove the aircraft. These lads obliged by riding to the farmhouse they believed to be the correct one, but this wasn't the owner. The rain had now stopped and the three of us sat on a bench by the public telephone box in the middle of the hamlet to await the retrieve crew. I also thought I would be conspicious to the farmers returning from the show.

A couple of hours later two children on their bicycles said they would take me to the field's owner. Again, it was not the correct one but the farmer knew the owner and, unable to get him on the 'phone, gave me permission to remove the glider.

The problem was to derig the glider and carry it a quarter of a mile across the wheat in the rapidly failing light. K-6Es aren't quite as light as you think when you have to lift them over fences.

We arrived back at Usk at one in the morning. I had flown 92km and there was no damage to the glider.

The following is an extract from the letter written by the farmer who had given permission for the retrieve and notified the agent working for the owner, Lord Dulverton: *"The field was combined last weekend and had they not known of your landing, they wouldn't, they say, have guessed you had emulated Rudolf Hess (aerobatically speaking, that is to say!)".* ■

Doc before his last flight two summers ago when he soared in the Cambridge University GC's K-7. Photo: John Glossop.

IMPRESSIONS OF DOC

When Doc Slater died in October a few weeks before his 93rd birthda write obituaries and appreciations from the many who loved him. But of reprinting an article by Platypus, written for the BGA 50th Annivers coming up to his 85th birthday, simply because it gave him great plea

He regarded it as a kind of obituary he was able to enjoy. "No one better way", he commented, "and most have to wait until they die for them."

We all have our own treasured memories of Doc who became a lege accentuates that special quality in the following tribute.

In the summer of 1961, when cumulus still seemed to blossom effortlessly all day and when any worthwhile flight ended in moonlit retrieves along winding roads before motorways were invented, we rumbled in through the gates of the Derby & Lancs Club close to midnight. In the little square of light which was the courtyard of the farm, an impromptu concert was in progress. A young Camphill member, wrapped around a cello, was making a brave and pretty successful attempt at sightreading a handwritten score, while the bar piano resounded and shook under the attack of ten large outspread fingers. Light glinted on massively thick spectacles through disordered strands of waving white hair. It is not my first memory of Doc, but it is my most vivid.

Doc's enthusiasms were gliding, photography, model aeroplanes, astronomy and always music

I was delighted to discover that Doc's enthusiasms were the same as my own - gliding, photography, model aeroplanes, astronomy and always music. What they have in common is that they are all beautiful, but the beauty can only be enjoyed as the reward for concentration, continual practice and patient analysis of one's mistakes. Only a fool says "But that's *work!*" I define work as *wishing you were somewhere else.* Total absorption in doing something which, if successful, is beautiful and satisfying is never work.

In a 16-millimetre film that is not merely a magnificent piece of almost professional cinecamera work but a priceless historical document, Dudley Hiscox recorded the visits of early British gliding enthusiasts to German gliding sites in 1931. In addition to the elegant new soaring machines, we see a tall young man, serious and light-hearted at one and the same time, launching tiny paper gliders of unorthodox aerodynamic form down the slopes of the Wasserkuppe. Yes - across half a century one recognises Doc Slater, and the audience gives an affectionate cheer for the most loved figure in our movement today.

Doc's Box Brownie - succeeded by a Leica in 1935 (which I remember him using at least 25 years later) - took hundreds of irreplaceable pictures of every aspect of early British gliding, the pilots, the designers, the machines, the workshops, the instruments, the wreckage, but above all hills and clouds and great expanses of ever-changing sky. People today have forgotten how to use a yellow filter and black and white film. Doc's skies remind us what gliding is about: the freedom and the mystery and the never-being-the-same of the sky.

What makes *S&G* in the 1930s an exceptional magazine still worth reading today (and not just for nostalgia's sake) is Doc's intense curiosity and truly scientific interest in every aspect of gliding weather. The articles "Queer soaring at Dunstable" (a title unlikely to be used nowadays) are a classic of devoted observation and analysis. Doc's articles make it clear that it is simply not the case, as we sometimes think today, that standing waves were a mystery in the 1930s. Predicting them and using them was difficult, but the principles were well understood.

Doc's easy-going and amiable temperament has not prevented him from expressing furious scorn for a fair number of knaves or fools: leaving individuals aside - though there are some whose names, long since forgtten, still provoke scathing references to BGA battles of long ago - the categories who felt the lash in the pages of *Sailplane and Glider* in the 1930s would have to include:

— most power pilots, especially whenever they leapt gaily into a glider and shortly afterwards stepped, or crawled, ruefully out of the remains; Doc would really make their ears burn.

— popular newspaper journalists, whose ignorant banalities and inept sensationalism on the subject of gliding were pilloried with a mixture of loathing and glee.

— people who wanted to exploit and misuse gliding, whether as a "youth movement" or as a source of notoriety, money or power.

Doc is a *true* Victorian; not one of the stuffy re-

Below: Doc being presented with the Royal Aero Club's Silver Medal by HRH The Prince of Wales in 1979.

by Platypus

***lday, there were a flood of offers to
But we have taken the unusual step
ersary Year issue when Doc was
oleasure.
ne could have written about me in a
for people to say nice things about***

legend in his own time. Platypus

pressed 19th century figures which the 20th century wrongly imagines the Victorians to be, but lively, creative and often eccentric *doers* with their strong belief in Reason, Science and Progress, in the spirit of Brunel and Darwin. He despises the pseudo-science of pulp writers of the **UFO, Bermuda Triangle** and **Visitors from Space** school, the astrology and the superstition into which so many of the present generation have retreated.

Doc's favourite photograph taken when he was walking his beloved dog, Major, by Michael Manni. For many years Doc took Major out twice a day, sometimes letting the dog choose the route.

The man who in the same day could compose a piece for piano, voice and any of 12 different wind instruments (all of which he could play), perform a tracheotomy to save the life of a child, design a flying wing that would do aerobatics under and over the hospital beds of his young patients, edit a magazine, formulate a new meteorological theory and observe an occultation of a planet by the moon, has only one serious deficiency - he doesn't know the meaning of the expression too often heard among today's young "I'm bored."

Doc - Some Milestones

1894 Born November 18. Family background - legal profession.
1900 Started learning piano.
1903 Discovered Solar System (in school atlas).
1905 Was given 2¼in refracting telescope.
1905 Abbotsholme school (forerunner of Gordonstoun).
1908 Started collection of 100 steamship postcards. Didn't stop; now has 3000.
1912 Three months in Dresden studying piano: nearly became professional.
1913 Started gauge 1 model railway with double mainline 200 feet long. Made own rails from wood. Invented method of telling time by the stars (Sirus and Vega) published in Boy Scouts' handbook. Went up to Cambridge to study maths and music.
1917 Started cello sonata.
1919 Student doctor at St Thomas's Hospital, London.

1921 Wrote music for St Thomas's Hospital Christmas shows and continued till 1938.

1921 Diploma for midwifery for helping out with post-war baby boom.

1922 Passed qualifying medical exam on second day of Itford Gliding Competition. Dashed to Itford in time to see wreck of Aachen low-wing glider. Rode 4200 miles on bicycle during the year: longest distance in 24hrs, 132 miles. (Averaged 3700 miles a year for seven years at this time.)

1923 Started photographing clouds; now has collection of 1000 cloud pictures.
Started designing tailless models (*ie* fin but no stabiliser) of laminated stiff paper and seccotine fishglue on Weiss/Dunne pattern.

1924 Worked in fever hospital till 1936. Had song published and broadcast on wireless. Royalties £2 0s 6d.

1925 Finished cello sonata.

1926 Bought 2¾in telescope. Saw markings on Mars (no canals!) at closest approach of planet.
Model glider soared Ditchling Beacon (four years before Kronfeld) for over 1½ minutes.

1927 Observed total eclipse of sun from chartered Imperial Airways plane at 5000ft. (Upper haze obscured corona.)
Soared model glider out of sight at Himmeldankberg.

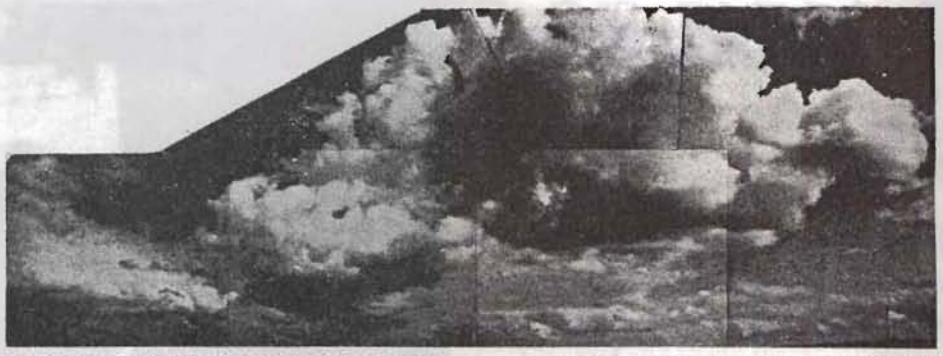
1929 Missed Gliding Lunch – busy writing pantomime music for hospital. Performed on single occasion on tin whistle, ocarina, guitar, xylophone, bicycle bells, one-stringed fiddle etc.

1930 Joined London Gliding Club at official inauguration in February. Six ground hops in March and April. Got A at Rossitten Gliding School; missed B by seven seconds. First British *ab-initio* to get a gliding certificate.

1931 Visited Germany again, filmed at Wasserkuppe by Dudley Hiscox. After continual frustration finished B in high wind at Dunstable.

1932 Took share in Kassel 20: got C. Flew at first BGA Nationals at Furness.

1932 BBC show "General Post". Doc's biggest musical work; in which broadcasters did each other's jobs (to music) *eg* prima donna broadcast a commentary on a football match.



This is typical of Doc's cloud-scapes, taken before the war at Dunstable. It is made up of seven separate shots.

1933 Took over editorship of *Sailplane and Glider*.

1934 Bought Blue Wren.

1937 Attended and reported on first World Championships. (Only person in the world to have attended every World Championships up to 1974 inclusive.)
First aerotow. First thermals.

1940 Returned to medicine.

1941 Transferred from fever hospital work to mental hospital service.

1942 Joined Royal Meteorological Society. Put on Council. Selected speakers for Gliding Symposium (Philip Wills, Geoffrey Stephenson, Dudley Hiscox, Ann Welch).

1943 Started series of piano concerto evenings (orchestra was second piano).

1946 Joined British Interplanetary Society; edited its Journal. On Council till 1973.
Became officially world's first "Gliding Correspondent" for *The Times*, although had written for it since 1937.

1947 Wrote regular half-page of gliding notes for the *Aeroplane* till 1962.

1949 Silver C altitude at Challes-les-Eaux. Missed Silver duration with 3¾hrs on another flight.

1950 Sang in drag for BGA Ball (repeat of earlier act representing own hospital, before Queen Mary and Princess Mary at Coliseum in 1922).

1952 Gave first of series of papers to International Astronomical Federation (Stuttgart). Paper on likely physiological problems of weightlessness in space-flight.

1954 Observed total eclipse from 16000ft between Iceland and Shetlands from chartered plane – on oxygen.

1955 IAF (Copenhagen): paper on "space-gliding" meteorology – problems of a winged spaceship descending through the turbulent ozone layer.

1955 Joined editorial board of *Space-Flight* (Editor Patrick Moore) and wrote articles.

1957 IAF paper showing improbability of evolution of *homo sapiens* developing (*not* popular with those seeking civilisations elsewhere).

1958 Organised first ever International Symposium on Space Medicine.

1965 Obtained 6in telescope (transported to Whipsnade in glider trailer).
IAF paper showing improbability of *any* life (even *less* popular than 1957).

1966 Moved to Cambridge.

1967 Awarded FAI Paul Tissandier Diploma.

1968 IAF Congress paper planned for Prague, but Russians invaded, so no Congress. The paper was on the theme "intelligent life doesn't necessarily lead to civilisation"!

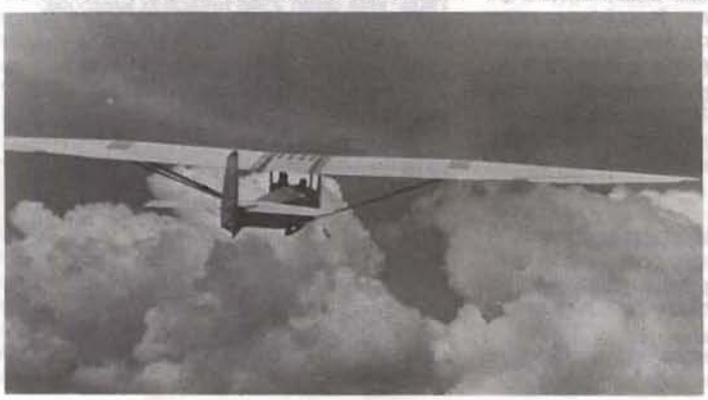
1971 Elected Vice-President of BGA.

1974 Reported on World Champs in Australia.

1975 Cello sonata first performed in public at Cambridge 50 years after completion. (Audience halved by unexpected competition from Mozart opera on same evening.)

1979 Awarded Silver Medal of Royal Aero Club.

Two of a series of postcards Doc had printed from his own photographs. On the left, a Falcon 3 and on the right a Green Wren.



THE RETRIEVING BUSINESS

Dilys reveals a system she once had of subsidising her gliding. And the idea came from Doc Slater.

I was so delighted to see there was only one reply (December issue, p313) to that silly letter (author known only to the Editor) in the August *S&G*, p203, about sponsoring young pilots. However it did remind me of the idea I cribbed from Doc Slater which supported my gliding (and eating) for a few years.

Doc Slater told me that during the 1930s, when he lived at Whipsnade near London GC, he'd thought of a brilliant idea to pay for his gliding – to charge for retrieves. He of course was much more commercially orientated than I could ever be; Doc would grab the relevant trailer for the outlanded glider, one suspects often from under the nose of the organised crew, and rush off to negotiate his terms with the pilot in the field! I gather not many were allowed to turn down his offer.

When I was doing more retrieves than I really wanted to do, simply because I was around the gliding club the most, I felt this idea could be adapted to suit my needs. I had a few false starts but gradually through trial and error I devised a suitable system which worked out quite well for everyone. My first notice requesting payment only "of dinner in accordance with the life style of the pilot" was not too successful; although I did experience quite a few unusual eating places (quite a few stories there!), bacon butties sitting by a grotty caravan in a layby on the A10 early one dawn being one. But after all, I was retrieving the club's tug pilot, and yes he had landed out in the tug.

It was the chap who, after a long and involved retrieve which had started early in the afternoon, raced me back to the club without even stopping for a cup of tea, arriving just after the bar had shut, because his wife had a lovely three course dinner waiting for him that convinced me that payment in **cash** was required.

Three pundits meant it was obviously going to be a fantastic day.

The system and prices soon evolved. I left a booking book in the clubhouse – no need to wake me up just to tell of your intention to go cross-country. It also gave the pilot an idea of who else was requesting a possible retrieve. If the only name in the book was the local pundit – worth adding yours, pundits never (well hardly ever) land out. Two pundits' names down – worth thinking again. Three pundits' names down – definitely worth adding your name, it's obviously going to be a fantastic day!

Putting your name in the book, was agreeing to pay me a £3 standby fee. Having wasted all day once or twice for chaps, who perhaps encouraged by the fact there was a retrieve waiting, came bumbling in late at night, persuaded me to charge a booking fee and between you and me this was my main source of income. Why £3? It was the cost of a three course lunch plus one mug of tea – I told you I wasn't commercial.

Yes I was caught out, just to prove that sometimes pundits do get it wrong and land out. On the worst occasion five of them landed out, luckily in the same area, so I managed to round them all up and let them entertain themselves in a pub while i rushed back and forth to the club. Mind you the lady publican gave me some awful looks when I kept returning every two hours or so, yelling "Next"!

Despite what you may initially think, I did more hours flying while operating this retrieving business than in most of the other years, only once embarrassing myself by landing out. I had to get back to the club by taxi and train, retrieve the paying customer before doing my own retrieve.

I think the LGC pilots appreciated the system. Two of my regulars once tried negotiating discounts, but I knew I'd arrived when two of the "Booker Boys" offered to double my rates if I would defect!

NON-SEXIST IN THE WEST COUNTRY

You can't be sexist around Bristol & Gloucestershire GC. For the club has probably the biggest number of woman pilots in Britain and when the sign writer left off the E in "here" for the open day notices he was cajoled into doing one saying Fly Him! as well . . . Photos and caption by Bernard Smyth.

BOOK REVIEWS

John Shanley took this unusual photograph from a Super Cub he was flying at Sutton Bank. Has anyone else interesting flying shots? If so, we would love to see them.

Gravity Currents in the Environment and the Laboratory by John E. Simpson, published by Ellis Horwood Ltd, Chichester at £35.00

Do not be put off by the rather austere title; this is not a stiff mathematical book where the equations outweigh the prose. It is one of the most fascinating expositions I have read; the information is right up to date and includes papers published within the last two years. The book is illustrated with a series of beautifully clear diagrams and many photographs. There is a useful bibliography at the end of each chapter.

John Simpson is known to many glider pilots and meteorologists. He began studying the sea breeze front at Lasham many years ago and produced a splendid film on the subject in 1967. He tracked the development of the sea breeze by aircraft and modelled its behaviour in a laboratory water tank. From sea breezes he has gone on to look at every kind of gravity current, and there are far more varieties than I imagined.

Gravity currents can range from the surge of water pouring from a broken dam to the oozing slick of oil from a maritime accident. The sea breeze comes high on the list but equally interesting is the outflow from thunderstorms with their associated downbursts and duststorms. There are the atmospheric bores which generate wave like clouds, and a strange formation known as a "rope cloud" first observed on satellite pictures.

There are gravity currents in rivers, lakes and oceans. One example is the bore that flows up tidal rivers such as the Severn but there are internal bores which show up on echo sounder records. Loch Ness is credited with its own internal bore, not attributable to any monster.

On the catastrophic scale there are accounts of avalanches, mud slides, eruptions and surges of lava from volcanoes; on a lesser scale there are explanations of how the flow of gas along sloping mine shafts produced disasters. Moving to a much smaller scale there are cross sectional views of the spread of oil and viscous liquids over water.

The chapters on laboratory experiments have splendid pictures showing how atmospheric flow can be modelled in a water tank; the advancing front of a dust storm and the front of a density current in the water tank reveal almost identical features. If your interests lie in flight through the air or travel by water this book will give you a new outlook.

TOM BRADBURY

Vola a Vela - Story of a World Gliding Championships - Published by Edizioni Bora, Bologna, Italy. Text in Italian and English. Obtainable from G. Rosati, Via Amatrice 20, 02100 Rieti, Italy. Price 50000 lire plus p&p 6500 lire (approx £25).

To my knowledge very few books have been published as an aftermath of a World Championships.

Apart from being obviously interesting to the people who appear in this book as well as to those who attended the World Championships, it warrants more general interest. The book has been beautifully produced with some good photography and gives a good insight as to what goes on at these events. It does not really matter that much where the WC are held as to a large extent they follow a well proven pattern. This particular one was in Rieti, Italy, in 1985.

Participants normally receive daily bulletins and all sorts of other gen which seldom reaches the gliding world, but this "tribute" to our sport features the weather, the tasks and potted histories of the pilots as well as the day's flying, etc, etc.

Because of the enormous size of World Championships nowadays no one gliding magazine can do justice to reporting a WC in detail and much can never be recorded owing to lack of space or deadlines.

If you have not yet used your Christmas book tokens here is an opportunity to put a lovely book on your coffee table. It will give you a good introduction to talk gliding, especially with your non-gliding friends.

RIKA HARWOOD

Flight. The Five Ages of Aviation by John Black, published by T. G. Foulls Ltd at £29.95.

This is the ultimate in coffee table books. It looks expensive, has some incredibly beautiful paintings by 55 members of the Guild of Aviation Artists, and only a few have ever been published before, and inspired text.

While John fits the progress of flight into five sections from The heroic age, World War 1. The uneasy peace, World War 2 and 1946 to the present day, this isn't just a history book. He has a very individual approach, not only recording the incidents he thinks are of significance and interest but those he feels have been neglected and deserve more attention. His clear, easy style fits easily alongside the illustrations and this fresh treatment makes it a most appealing book. There is an enthusiastic foreword by HRH the Duke of York.

G.B-S.

FEAK AND WEEBLE

Roger, flying his syndicate Astir CS on one of last summer's good days from Southdown GC's site at Parham, declared a 300km but made some basic mistakes which could have been dangerous

Roger has been gliding for 29 years, has 900 hours, is a full Cat instructor and DCFI of Southdown GC, formerly being CFI of Cranfield GC. He has Gold distance and Diamond goal.

The first days of the July course had been hot and humid but with a cold front on Tuesday night, it was clear that Wednesday was going to be the big day. Many brave declarations were made that morning, the pundits declaring 500kms and the more realistic aiming at 300. Mine was a task I had contemplated and failed many times, Cooksbridge, Shaftesbury, 310km. In theory, two thirds can be completed on the ridge - Lewes to Petersfield and again Salisbury to Shaftesbury, along that spectacular escarpment embellished by white regimental badges carved on the chalk hillside in years gone by.

Convection was slow to start in the light north-westerly. The hill was not working and no-one was staying up until 11am when the first cumulus appeared overhead. Taking with me a bottle of water and some dry wholemeal biscuits, I launched at 11.05am and slowly climbed to cloudbase at 2500ft. To the east, the sky was rapidly clouding over. I pushed on and tiptoed carefully along the ridge to Lewes where I photographed Cooksbridge level-crossing. The return trip to Parham was easier but slow. Cloudbase had risen to 3000ft and the cu was streeting with heavy sink in the blue areas between.

"I took a good swig at my water bottle, munched a dry biscuit and felt good."

Over Storrington sandpits, I took a good climb to 3500ft and increased speed. Within gliding range of home, I could press on and take more risks. Just after 1pm and already two hours' airborne, I took a good swig at my water bottle, munched a dry biscuit and felt good. Pressing on, down to 1800ft at Duncton quarries, I made my first mistake. The cloud, for which I had sacrificed height, failed to work. Keeping within gliding range of Parham to regain altitude in weak lift, I drifted behind the ridge for no real gain of height - 1500ft and a tight final glide home and still in sink. Turning north along the line of a street, I was down to 1000ft just south of Petworth before I found lift. But it was a good one - choppy and rough and requiring steep turns and a lot of concentration. They all did that afternoon, as I worked steadily west along a familiar route. I was enjoying myself again, 3500ft cloudbase and going up. Petersfield - Winchester (photograph the Cathedral from cloudbase at 4000ft) set course for Salisbury. Stockbridge on my right and Chilbolton radio aerial to the north-east. Good thermals but hard work. Then Salisbury, the big sprawling city on the water meadows of the Nadder and the Cathedral with its soaring spire in its little patch of green by the city centre. Down there lies Yvonne Fletcher, the young London policewoman shot by Gadaffi's thugs . . .

Concentrate now! It had been a long haul. At 3pm we were now entering new country. Two lines of Downs meet at Salisbury. To the north-west lies the Wylye valley, leading to Frome. To the west, runs the Chislebury ridge. Climbing to cloudbase I had time for another drink but did not relish the dry biscuits and needed to concentrate. Soon the round hilltop fort of Chislebury came into view, emblazoned on the scarp face to the north by an array of military badges, gleaming white on the green hillside. After taking photographs, I hit my best climb of the day: a steep and choppy thermal to 5000ft. Press on now! Dorset or bust! Away on my left I could identify Compton Abbas, ahead must be the ancient Saxon hilltop town of Shaftesbury.

The gentle rounded chalk hills gave way to steeper wooded slopes and the tender green of the downland turf contrasted with the rich dark pastures of the Blackmoor vale to my right. Frustrated by a helicopter flying too close for comfort, I took my TP photographs and lost 1000ft in the process. Second mistake. Then I set off back along the ridge for home - 3.45pm and starting to feel very tired.

After a scrappy climb back to 3500ft I pressed on along the ridge and looked for the military badges once again. No sign - should be there by now. Third mistake. Away to my left I could see the circular fort and just visible to the north, a glint of white chalk. I had followed the wrong hills. I was on Winklebury ridge instead of Chislebury. I reached the badges with 2300ft and started to climb. Weak lift, hard work, drifting to the south again. Lining up the street I tried again. "Here we go!" Six up and choppy - turn tightly - vario stops - lost it! Press north again. Down to 1800ft, Salisbury just visible ahead - press on - no lift. Salisbury coming up, 1500ft and I could see the spire, but from a very different angle. Dead ahead a runway - "Old Sarum. No that's Boscombe Down. Old Sarum is just north of the city." Not thinking properly. At 1000ft the circular mound of Old Sarum castle was dead ahead. The wide green runway beckoned from beyond. "This is it: I am going in." Wind was cross, which way to land? A light aircraft took off from my end. Undercarriage down, circuit, base leg, good look out, not too fast, touchdown, taxi to control tower and stop. It was 4.05pm. Five hours airborne.

Reporting to the control tower, I felt decidedly weary. My legs were wobbly and I had the greatest difficulty in finding the code number for Storrington in the telephone directory. After finishing my biscuits, I felt better. The sky was still working - what was I doing down here?

Low blood sugar was the kindly verdict. I felt that I had been lazy and stupid. In fact, both were true and after a good meal on the way home I felt 100% again.

If there is a moral to this story it is not only to carry water but also to carry energy! Something easy to eat and easily accessible. Fruit juice, barley sugar, glucose, nuts and raisins, chocolate bars - all supply energy. Don't try to make a long flight sustained only by water and dry biscuits. That was my big mistake. You will need and use a lot of energy and will make demands upon yourself far in excess of a normal day's work. Add "Energy" to your next pre-flight check list and make sure you have enough.

The Private Pilot's Licence by David Ogilvy, published by A. &. C. Black at £7.95.

David Ogilvy's new book is almost entirely devoted to how to train for, get and keep a PPL. It is a useful handbook for any glider pilot wanting to gain a power pilot's licence with detailed sections on various aspects of power flying.

Although David has sampled the delights of gliding it doesn't seem to have left much impression on him, but at least his three paragraphs on the subject are quite complimentary to the competence of glider pilots who have been through his instructor's hands.

B. H. BRYCE-SMITH

ANNUAL STATISTICS OCTOBER 1, 1986 to SEPTEMBER 30, 1987

GLIDING CLUBS	AIRCRAFT				ALL LAUNCHES	NO. OF AEROTOWS	HOURS	CROSS-COUNTRY KM	MEMBERSHIP		Estimated No. of Temporary Members
	Club 2s	Club 1s	PO	Tugs					Flying	Non-Flying	
ALTAIR	5	1	5	1	3161	50	300	144	18	10	157
ANGUS	2	0	5	0	3013	0	458	297	59	27	175
AQUILA	1	2	6	1	1027	789	271	200	37	4	129
AVON	4	3	29	4	7465	7465	1400	5000	96	0	1560
AVRO	5	2	2	0	3839	3	533	0	124	115	240
BASSETLAW & DISTRICT	1	1	0	0	1442	0	180	240	28	0	65
BATH & WILTS	3	3	18	3	3841	940	1051	3000	90	10	25
BLACK MOUNTAIN*	3	1	20	1	2216	2216	2965	N/A	70	0	400
BLACKPOOL & FYLDE	2	3	19	0	4052	0	1651	1250	92	25	100
BOOKER	11	11	82	9	12200	12200	1600	100000	470	20	2300
BORDERS	3	2	14	1	1860	1828	1069	1800	76	8	240
BRACKLEY	1	1	6	0	4738	8	947	2142	72	0	52
BRISTOL & GLOS	4	4	40	3	9103	4323	6735	65654	279	55	1080
BUCKMINSTER	2	1	11	1	3718	2143	1170	14405	84	0	725
BURN	5	3		1	6231	1602	2043	4200	140	30	600
CAIRNGORM	2	0	8	0	855	52	450	1000	34	0	275
CAMBRIDGE UNIVERSITY	4	4	35	2	8751	3148	3709	23694	226	53	1181
CHANNEL	4	0	7	0	9695	0	1100	N/K	91	23	1170
CONNEL	3	3	1	0	1466	0	307	-	27	0	552
CORNISH	3	2	4	1	2960	102	567	350		23	387
COTSWOLD	4	3	40	0	8220	0	2303	22710	208	32	797
COVENTRY	6	5	62	4	13129	11199	6719	23674	265	11	2550
CRANFIELD	1	1	14	2	1169	1169	508	1805	67	0	250
DARTMOOR	2	1	4	0	2680	0	287	0	46	0	179
DEESIDE	4	2	10	3	4305	4305	5267	0	103	2	415
DERBY & LANCS	3	4	26	0	7543	0	2857	N/K	190	87	713
DEVON & SOMERSET	3	3	21	1	8395	896	2664	8500	181	69	1248
DORSET*	3	3	13	1	4018	694	755	250	110	40	300
DUMFRIES & DISTRICT	2	0	4	0	728	0	97	112	21	0	51
EAST SUSSEX	3	2	10	0	6277	285	889	1500	143	49	576
ENSTONE EAGLES	3	1	7	1	2320	450	865	20000	40	1	366
ESSEX	4	2	-	1	6791	1170	1625	14933	181	10	962
ESSEX & SUFFOLK	2	2	14	2	2283	2283	1314	5000	110	0	450
FILTON MOTOR GLIDER	1	0	0	0	365	0	16	200	12	0	6
HEREFORDSHIRE*	3	0	10	1	1500	1500	1000	15000	67	0	155
HIGHLAND	2	3	4	0	2380	59	406	408	45	6	187
IMPERIAL COLLEGE*	-	3	see Lasham		600	50	220	1400	50	0	50
KENT	3	3	28	1	6284	3500	6000	3000	230	20	2140
LAKES	2	1	5	1	902	902	262	-	26	6	274
LASHAM	10		127	5	35679	15770	14900	179460	672	113	4168
LONDON	5	5	81	3	23200	3700	13000	72000	350	42	5522
MARCHINGTON	3	0	10	1	1580	1450	780	4554	80	12	240
MENDIP	2	2	12	0	2857	0	832	3000	65	10	300
MIDLAND	3	4	20	1	12001	245	4516	4632	228	53	1475
NENE VALLEY	3	2	3	0	2061	14	175	350	37	0	120
NEWARK & NOTTS	2	2	9	0	3932	44	718	1696	64	20	498
NEWCASTLE & TEESSIDE	2	1	5	0	1074	0	319	800	30	0	133
NORFOLK	3	2	30	2	4472	4019	2295	3000	163	46	849
NORTH DEVON	5	0	5	1	140	69	940	8040	10	0	0
NORTH WALES	2	2	3	0	2397	0	278	60	60	0	200
NORTHUMBRIA	3	2	16	1	3174	627	541	800	63	13	200
OUSE*	2	2	23	1	7365	740	1200	N/K	117	41	400
OXFORD*	3	3	13	0	5257	0			90	13	879
OXFORDSHIRE SPORT	3	1	2	0	1840	0	1950	90000	60	0	45
PETERBOROUGH & SPALDING	2	1	10	2	1665	1665	609	2850	62	0	407
RAE BEDFORD	1	0	7	1	200	10	90	1600	15	18	23
RATTLESDEN	2	2	11	0	2828	588	624	350	61	0	121
RIDGEWELL OATLEY	1	0	0	0	96	0	7	0	17	2	4

ROYAL AIRCRAFT ESTABLISHMENT	2	3	8	0	4422	0	1165	2456	60	20	0
RSRE	2	2	1	0	1132	0	171	0	15	14	120
SCOTTISH GLIDING UNION	3	4	32	2	7740	5078	5887	8000	210	15	1502
SHALBOURNE	2	1	14	0	3300	0	700	1500	65	0	250
SHROPSHIRE	0	0	12	1	727	1057	1057	9000	31	1	20
SOUTH WALES	3	2	19	1	5230	1527	2029	25340	118	10	762
SOUTHDOWN	2	3	28	3	6023	4812	3725	10231	209	41	630
STAFFORDSHIRE	2	2	3	0	2900	0	493	0	83	1	240
STRATFORD ON AVON	3	1	8	0	1785	7	280	1350	69	12	382
STRATHCLYDE*		31	0	0	700	50	125	20	40	2	130
STRUBBY	2	1	5	0	2768	0	289	0	47	0	163
SURREY & HANTS	0	11			see Lasham G.S.				224		
SURREY HILLS	6	2	3	0	5000	0	520	0	90	0	250
SWINDON	1	1	6	1	1243	215	280	4837	33	4	224
THRUXTON*	2	1	4	1	1710	1710	571	1970	52	1	981
TRENT VALLEY	2	3	19	0	5870	0	1361	7500	87	0	333
ULSTER	2	0	8	1	1052	979	452	0	38	1	90
UPWARD BOUND	2	0	2	0	1648	0	240	0	25	0	212
VALE OF NEATH	2	1	7	1	1669	295	433	50	50	0	210
VECTIS	2	0	2	1	819	819	249	0	25	3	103
WELLAND	2	2	6	0	2452	13	415	2100	40	5	240
WEST WALES	3	0	4	0	1033	0	172	100	33	0	20
WOLDS	4	2	20	1	10513	1163	2060	4150	191	6	1883
YORKSHIRE	3	4	33	3	12000	7000	1500	26000	266	32	820
CIVILIAN CLUB TOTAL	229	194	1215	80	365076	119027	130507	806164	8553	1287	48231
ARMY GLIDING ASSOCIATION											
KESTREL	2	4	4	1	4800	400		5000	82	0	298
WYVERN (SW District)	2	4	4	1	6675	100	1366	8611	115	0	250
ROYAL NAVY GSA											
CULDROSE	3	2	1	3	1168	1000	541	N/A	50	1	216
HERON	3	2	3	1	1500	1200	500	5000	45	5	100
PORTSMOUTH*	6	6	6	2	4326	3136	1009	760	163	47	497
RAFGSA											
ANGLIA	2	2	4	0	2128	17	843	810	39	5	150
BANNERDOWN	2	3	7	1	6352	122	1215	4637	91	0	25
BICESTER	5	8	16	4	15764	5948	6242	33678	269	8	613
CHILTERNS	2	3	4	0	4976	12	1240	1573	81	0	210
CLEVELANDS	2	3	13	2	4719	2049	1650	13978	130	2	200
CRANWELL	3	3	5	1	5882	475	1193	5984	150	0	120
FENLAND	2	4	5	0	7433	87	1326	6758	80	0	100
FOUR COUNTIES	5	2	8		6127	43	1562	18689	84		
FULMAR	2	3	0	1	3420	352	469	1143	30	0	100
HUMBER	2	3	4	0	2950	2	486	1382	57	2	100
WREKIN	2	3	4	0	6172	247	1159	5064	102	2	156
SERVICE CLUB TOTAL	45	55	88	17	84392	15190	20801	113067	1568	72	3135
CIVILIAN CLUB TOTAL	229	194	1215	80	365076	119027	130507	806164	8553	1287	48231
GRAND TOTAL	274	249	1303	97	449468	134217	151308	919231	10121	1359	51366

**No statistics received. Last year's figures used.*

BGA & GENERAL NEWS

UK CROSS-COUNTRY DIPLOMA

The new lapel badge.

A few months ago Bernie Morris, chairman of the BGA Instructors' Committee, suggested there should be some challenging and meaningful (but not too daunting) level of achievement in cross-country soaring between the 50km of Silver distance and 300km Gold. Bernie felt that completion of 300km is not always easy for pilots with limited opportunities for a full day's solo soaring, or those without access to a high performance glider: ironically the Silver Badge often signals the end of a pilot's cross-country career, whereas surely it should mark the beginning.

Attempting a new intermediate standard between Silver and Gold would maintain the interest and currency of the newly qualified cross-country pilot, and if the standard involved the elements of accurate navigation, into wind legs, TP photography and final glides, it would considerably enhance the pilot's chance of success when the eventual opportunity to attempt Gold distance/Diamond goal does arise.

Bernie's conception was promptly ratified by the BGA Competitions Committee and the Executive Committee, and the new **UK Cross-Country Diploma** is now born! The award is in two stages:

1. Complete a pre-declared 100km triangle
2. Complete a pre-declared 100km triangle at a handicapped average speed of over 60km/h.

Administration. Successful flights are authenticated by Official Observers (OOs) on special new orange claim forms, which are then sent to the BGA office for registration. A card Diploma will be issued as a supplement to the usual gliding certificate, and when both parts of the qualification have been completed, the pilot will be entitled to wear the new lapel badge designed by Steve Longland. A fee of £4 is payable for each part, or £7.50 if simultaneously claiming both. There is no extra charge for the lapel badge.

Validation. Diploma flights must essentially comply with the **Sporting Code** in the same way as FAI badge flights, but of course there is the additional element of speed for part 2 of the Diploma. Detailed rules are given on the orange claim form (available from the BGA office), but a summary of the main points is given in the next column. As with our FAI badges, the Diploma scheme depends on the voluntary assistance and impartial scrutiny of OOs. To facilitate validation of claims, each club is recommended to establish three or four standard triangular "milk-runs" over suitable terrain, clear of awkward airspace, and to employ prominent TPs with which pilots and OO assessors can all become familiar.

Authorisation. As well as the award of the Diploma, successful claimants will be listed in *S&G*; furthermore, by way of maintaining a continuous interest and demonstrating currency in cross-country flying of this standard, pilots may periodically update their Diplomas with subsequent claims at any interval in the future.

Summary of the Rules

1. Claimants must already possess the BGA Bronze Badge.
2. Flights must take place within the British Isles and be round a triangle exceeding 100km, which is properly declared before take-off.
3. Photographic evidence is required of rounding TPs.
4. Start and finish times for part 2 speed flights may be by ground observation by OOs, or by a time recording camera which is also used to photograph the TPs, or by subtracting an amount from the elapsed time between take-off and landing; this amount is 15min for a wire launch, or 10min for an aerotow not exceeding 2000ft, and includes an allowance for a safe circuit and landing after return.
5. Handicapped speeds are calculated using the glider's still air speed index in the current **BGA Competitions Handbook.**
6. Barograph traces must accompany the claims submitted to the BGA; photographic negatives should not be sent routinely, but must be retained for possible calling forward by the BGA for inspection.
7. As a general rule the provisions of the current FAI Section 3 **Sporting Code** apply.

Gordon Camp, *FAI certificates officer*

JUNIOR NATIONALS

As foreseen in the October issue, p250, it has now been decided to hold the first British National Gliding Championships at Booker from Tuesday, August 16 to Thursday, August 24, for those under 25 at the date of the Championships. In fixing these dates it was important to stay within the school and college holidays and the midweek to midweek arrangement is so that those flying club gliders will have the aircraft for only one weekend.

Booker GC have generously agreed to be the organisers and will run it without charging a Comp entry fee. Aerotows will be at normal club rates. Because the cost of entering gliding competitions is a big factor in discouraging young people, a major part of the BGA Sports Council grant for youth training will be allocated to subsidise entry. At least £100 will be available to offset the expenses of each of the entrants.

Applications will be considered by a panel of the BGA Competitions and Awards Committee - the only essential qualification will be a Silver badge coupled with whatever other evidence can be provided that the applicant has some "get up and go". The closing date for entry is the end of April so there is still time to complete your badge and build up a bit more experience.

Part of the objective of these Championships is to discover those with competitive talent at the earliest possible stage in their gliding career. Once identified it is the intention to arrange specialised training for those who have shown the ability to get to the top. The top four pilots in the Championships will win the right to further subsidised competition entry - the top two to the 1989 Nationals and the next two to the 1989 Regionals. In addition, to encourage clubs to take a positive attitude to the Championships, there will be a prize for the winning pilot's club.

More detailed information and entry forms are being circulated to clubs or may be obtained direct from the BGA office.

Tom Zealley, *BGA Comps Committee*

COMPETITION DIARY

May 28-June 5:	Regionals, Coventry GC, Husbands Bosworth.
June 11-19:	Standard Class Nationals, Bristol & Gloucestershire GC, Nympsfield.
June 12-26:	European Championships, Ryskäla, Finland.
June 25-July 2:	Competition Enterprise, Devon & Somerset GC, North Hill.
July 9-17:	15 Metre Nationals and Regionals, Booker GC, Wycombe Air Park.
July 23-31:	Regionals, London GC, Dunstable Downs.
July 30-August 7:	Regionals, Yorkshire GC, Sutton Bank.
August 6-14:	Open Class Nationals and Regionals, Lasham Gliding Society, Lasham Airfield.
August 13-21:	Regionals, Enstone Eagles GC, Enstone Airfield.
August 21-27:	Two-Seater Competition, Wolds GC, Pocklington Airfield.

THE 1988 COACHING PROGRAMME

The coaching resources will be increasingly directed towards the further training of instructors (to produce a properly structured training pyramid); particularly the establishment of regional coaches in addition to examiners.

The basic training of assistant instructors will continue with some courses run by the professional coaches and some sub-contracted **suitably trained regional coaches** who will use the BGA equipment. The assistant instructor course will be developed in the light of the AEI experience (with more emphasis on instructional skills, fault finding, supervision, check flights, soaring and cross-country).

Training will also be provided in a number of new areas:

- Consolidation of the recently established AEI programme with sufficient AEI regional coaches to meet requirements and to monitor standards.
- The instructor completion course will be changed from a seminar to introduce a flying element (check of standards/further training) which requires the course to be during the season rather than in the winter.

- Training of CFIs in the development of their instructors and, in particular, the preparation of assistant instructors for the full rating. This will be achieved by changing the full rating preparation weekend to involve CFIs.
- Provision of a weekend course/seminar for all CFIs and CFIs designate.
- Provision of Restricted (gliding exercises only) Motor Glider Instructor Rating courses, instead of field landing courses, to encourage the establishment of field landing training on a regional basis.
- The soaring and cross-country courses will be directed towards the development of instructors as soaring and cross-country instructors.

Full details of the programme are published in the CFIs' newsletters (so ask your CFI) or are available from the BGA office.

B. C. Morris, *chairman, BGA Instructors' Committee*

TARGET REACHED

Robert English is thrilled to report that he has reached the £15000 target for the Monica English Memorial Trust to buy a motor glider to give flights to the disabled and thanks those who helped for their generosity. (See February 1987 issue, p34.) But since this sum was fixed costs have gone up and Robert needs to raise another £5000.

Although confined to a wheelchair, he recently showed great spirit and commitment to the fund by doing a sponsored parachute jump at Bridlington strapped to the instructor.

Robert commented afterwards, "I wanted to show disabled people they can do whatever they want. They must never give up".

If anyone else would like to contribute, please send donations to Robert at The Waldernheath Hotel, Flat 9A, Cornwall Road, Harrogate HG1 2NE.

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
117	Pirat	1709	S	9.8.87 1730	Nr Severn Bridge	62	N	227	After finding heavy sink the pilot had to make a field landing and selected a large stubble field. Increasing headwind and sink on the approach caused him to just clear the hedge. As he did so he saw a bank of earth just inside the field and the glider hit this before stalling to the ground. Hurried selection and poor inspection missed the earth bank obstruction.
118	Phoebus c	1547	M	6.8.87 1630	Nr Chipping Warden	60	N	848	At 1500ft on a cross-country a field landing became necessary so the pilot picked a field 5 miles ahead. He did not have enough height for a proper circuit so failed to notice that his intended landing direction was downhill. The glider had to be groundlooped to avoid the far fence and was damaged while running backwards.
126	DG-202/17	2802	S	29.6.87 1630	Spey Valley, Scotland	41	N	780	The pilot had to land out during a competition and selected a silage field, half of which had been cut. His intention was to "skim the long grass" before landing in the mown section. After a normal circuit the glider undershot by 10yds into the crop and groundlooped, damaging one wing.
127	DG-101G and Kestrel 19	3202 1984	W/O W/O	16.8.87 1917	Sutton Bank	35 59	F F	- -	**This was a FATAL mid-air collision.** The gliders were seen to fall from about 600ft above a ridge near the airfield. Both pilots were killed. The DG-101 caught fire on impact and was burnt out. Probably due to an oxygen bottle being damaged on impact. The low setting sun may have been a contributory factor.
130	ASW-20FL	2752	N	26.6.87 1600	Littleton, Hants	47	N	920	In a cross-country competition the pilot had to land out. He selected an uncut hay field and made a "normal landing". Hidden in the 2ft high crop was the concrete base of an old aerial pylon. This punched a hole in the bottom of the fuselage.
131	ASW-17	1891?	M	24.8.87 1800	Nr Basingstoke	49	N	3000	On a cross-country the pilot had to make a field landing. **A field was selected from 500ft** and a full circuit and normal touchdown were made. Towards the end of the roll out the glider passed through a wire mesh fence. The pilot later flew to the field and found that he still could not see the fence, even from 150ft and knowing its location.
133	Astir CS	2329	M	20.8.87 1400	Lasham	39	N	65	After a cross-country flight the pilot was at 1500ft 3 miles downwind of the field. He decided to leave weak lift and return to the field. At 700ft he decided to make a field landing in a good sized field. The landing was made with a 15-20kt tailwind and the aircraft hit the hedge at about 40kt, substantially damaging the glider.

NATIONAL LADDER

In the short time between the end of the National Ladder competition and going to press, I could not get the full story on photos. There are no major changes in the Open Ladder, but the Club Ladder has suffered somewhat.

In short, the Open Ladder result is unchanged but I have not been able to award the second place in the Club Ladder due to lack of photographic evidence. For the full story, please have a chat with your local ladder stewards who will have more details than I can give here.

Ed Johnston, *National Ladder steward*

COLD WEATHER WEAR

If you have trouble keeping warm on the airfield you may be interested in a range of low temperature protective clothing produced by Vacuum Reflex Ltd. They are intended for just about anyone who has to work or play in low temperatures from cold store workers to Antarctic explorers.

The clothing comes in various weights and the boiler suit, which has every appearance of a flying suit, is ideal winter airfield wear. For more details contact the firm at Barrack Square, Martlesham Heath, Ipswich, Suffolk IP5 7RF. They also make battery heated socks and gloves.

BOOKER'S YOUTH DRIVE

Booker Gliding Club, as part of its drive to help young people to stay in gliding, are offering a one third discount to Air Cadet solo pilots on its trial lessons and two-day and five-day gliding, soaring and advanced courses. (For more on Air Cadets see 39-40.)

Reduced rates for block booking trial lessons will also be available by arrangement with the club.

AEI rating. Mike Cuming says that pilots wishing to gain an AEI rating but having difficulty "cornering" an AEI coach may be interested to know that Booker are running a series of AEI courses in the spring, open to non-members. Tel 0494 442501 or 0494 29263 for details.

100 000 aerotow party. Since the amalgamation of Thames Valley GC and Wycombe GC in 1982 to form Booker, almost 100 000 aerotows have been flown from the site.

For details of the anticipated monumental 100 000 tow party, contact the secretary at the number above. All past members and course members will be welcome.

PHASE OF FLIGHT - APPROACH									
101	Cirrus	1916	M	31.5.87 -	Kirton-in-Lindsey	46	N	190	The pilot chose a long approach in light cross-wind conditions. An undershoot developed and so he put on speed then pulled up over the boundary. The glider was then landed main and tail wheels together some 15yds short of the cut grass runway area. The left wing caught in the long grass and the glider groundlooped.
104	K-10	1626	M	15.7.87 1500	Marchington	65	N	7.5	Apparently waved off by the tug, the pilot returned to the airfield and tried to land as soon as possible using full airbrake. Due to recently flying a glider with a knob on the airbrake control he pulled the release knob instead and landed well into the field. Being too fast he bounced to 100ft and then did a 180° turn and landed back on the runway.
121	Sie 3	2347	S	1.7.87	Aston Down	46	N	37	On final approach the pilot said that the trim lever moved back causing him to land short of the runway with "little stick feel". The glider groundlooped and was badly damaged. However a witness reported the glider was low on the approach and not lined up prior to undershooting. Also rearwards trim movement would give a large stick back force.
PHASE OF FLIGHT - LANDING									
93	K-7	-	M	12.7.87 1100	Shalbourne P2	57 53	N N	400 -	After a good approach and initial flare the student allowed the speed to fall and the instructor failed to react in time to prevent a heavy landing.
97	K-13	-	M	5.7.87 1829	North Hill P2	44 21	N M	398 -	The pilot elected to land on an uphill section of the airfield not normally used. A normal touchdown with almost full airbrake was made but, after the glider had rolled about 30ft, a loud crack was heard. This was found to have been caused by the glider hitting a 9-12in high ridge which damaged the front skid mounts.
107	K-6	2018	S	2.8.87 1420	Kirton-in-Lindsey	67	N	540	In the circuit with another glider the pilot decided to turn in early and land to the left of the normal landing area, leaving the RHS clear. On the ground run the glider's left wing hit the cable tractor at the side of the control van. The pilot had misjudged his distance from this.
116	K-8	2543	M	11.7.87 1215	Templeton	35	N	32	While landing on the grass alongside the runway the glider's wing lifted in the crosswind. In correcting for this the pilot failed to roundout prior to landing heavily damaging the nose skid.
122	Olympia 419	1051	S	15.8.87 1530	Usk	65	S	99	In gusty conditions the pilot elected to land to one side of a tractor which was in the middle of the congested airfield. After a normal approach he made a correction to stop his drift towards the tractor. During this a wing dropped and in recovering the glider was stalled in from about 8ft, injuring the pilot and causing substantial damage.
123	IS-30	3168	M	4.8.87 1700	Talgarth P2	57 24	N N	1314 0	P1 decided to land in front of a rain storm and in the circuit noticed that the glider ahead had needed a long landing run. He changed his landing direction to land more up hill but failed to notice that this placed him directly downwind. He landed too fast and groundlooped to avoid hitting a boundary fence. The wind had backed through 90°.
129	K-13	2317	S	17.6.87 1340	Lasham P2	52 26	N N	120+ 1400pwr 0	The pupil allowed the speed to decay through 50kt just as the glider hit the wind gradient. In spite of prompting airspeed wasn't regained. The instructor failed to close the airbrakes in time to stop an undershoot into standing corn. The glider groundlooped and was substantially damaged.
135	Vega	-	M	8.8.87	Portmoak	42	N	40	On his first flight on type the pilot noticed rain approaching so returned to the field. He found that he was too high even with full brake so did a S turn and landed well down the aerotow strip. This was downhill and downwind and the glider had to be groundlooped to avoid the fence. **The pilot had not noticed that the wind had changed.**

The height of good service

We've always aimed to give flyers the best possible service. So when we were appointed Licenced Repair Agents by Grob and awarded an exclusive spare parts franchise for their gliders, motor gliders and light aircraft, it was a time for celebration, reflection and considerable investment.

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GLIDING CERTIFICATES

ALL THREE DIAMONDS

No.	Name	Club	1987
231	Cook, I. R.	Lasham	22.9
232	Johnson P. A.	London	23.9
233	Tull, V. F.	London	22.9
234	Baker, P. E.	Cambridge Univ	26.9
235	Slater, T. W.	Deeside	26.9
236	Walsh, A. P.	Norfolk	8.7
237	Hunt, M. S.	ex Coventry (in S. Africa)	28.7
238	Green, G. D.	ex SGU	2.10
239	Johnston, E. W.	Cotswold	25.9

DIAMOND DISTANCE

No.	Name	Club	1987
1/355	Slater, T. W.	Deeside	26.9
1/356	Walsh, A. P.	Norfolk	8.7
1/357	Green, G. D.	ex SGU (in USA)	3.10

DIAMOND HEIGHT

No.	Name	Club	1987
3/806	Reed, J. R.	London	13.9
3/807	Cooper, R. G.	London	18.9
3/808	Cook, I. R.	Lasham	22.9
3/809	Symon, Allison	Deeside	22.9
3/810	Johnson, P. A.	London	23.9
3/811	Tull, V. F.	London	22.9
3/812	Woods, Virginia	Lasham	26.9
3/813	Morland, N. C.	Lasham	26.9
3/814	Macpherson, D. J.	London	18.9
3/815	Whitehead, M. A.	Cambridge Univ	26.9
3/816	Baker, P. E.	Cambridge Univ	26.9
3/817	Davis, M. J.	Wrekin	5.10
3/818	Fairston, B. A.	Booker	9.10
3/819	Hunt, M. S.	ex Coventry (in S. Africa)	28.7
3/820	Stemerdink, J. W.	Deeside	30.8
3/821	Collingham, C. E.	London	22.9
3/822	Akani, D. P.	Bicester	9.10
3/823	Johnston, E. W.	Cotswold	25.10
3/824	Barley, P. R.	Wrekin	25.10
3/825	Ratcliffe, C. J.	Shropshire	25.10
3/826	Smith, L. P.	Bristol & Glos	25.10
3/827	McCall, C. F.	Fulmar	25.10
3/828	Weston, R. A.	Wrekin	25.10
3/829	Arnold, J. G.	Wrekin	28.10

(With the exception of 3/819 in S. Africa and 3/816 at Portmoak, all these Diamond heights were gained at Aboyne.)

GOLD BADGE

No.	Name	Club	1987
1229	Reed, J. R.	London	13.9
1230	Woodhouse, R. B.	Norfolk	22.9
1231	Johnson, P. A.	London	23.9
1232	Downham, E. H.	London	18.9
1233	Macpherson, D. J.	London	18.9
1234	Davey, G. R.	Bicester	17.10
1235	Day, M. T.	Lasham	26.9
1236	Akani, D. P.	Bicester	9.10
1237	Wilson, T. G.	Cotswold	25.10
1238	Day, J. F.	Ouse	26.10
1239	Andrews, A. D.	Wrekin	28.10
1240	Frank, S. W.	Highland	19.5

GOLD HEIGHT

Name	Club	1987
Healy, P. T.	Lasham (in France)	27.7
Coles, F. J.	Deeside	10.9
Ladley, D. I.	Norfolk	11.9
Reed, J. R.	London	13.9
Blows, L. G.	Southdown	18.9
Callaway, G. J.	Bath & Wilts	18.9
Woodhouse, R. B.	Norfolk	22.9
Johnson, P. A.	London	23.9
Marson, R. F.	RAE	10.9

PHASE OF FLIGHT - OTHER

102	Falke M/G	G-AXED	S	23.7.87 1430	Carlton Moor P2	50 26	N N	474+ 94pwr 0.25	The motor glider student did not fully compensate for drift in the 10kt crosswind so P1 started to apply power but allowed the into wind wing to stall. The aircraft pitched down and landed heavily on the mainwheel, grounding the propeller tips and damaging the fuselage structure.
110	Microlight and Blanik	- 2923	S S	1.8.87 0915	Shobdon	0	N	-	A microlight aircraft was blown backwards as it was being started and the propeller hit a glider. The wooden propeller was destroyed and the Blanik sustained a damaged tailplane.
113	K-13	1652	S	31.7.87 1122	Nr Bishop Hill P2	69 40	N N	350 -	After a safe field landing P2 was left in the cockpit with the stick pushed forward while P1 went for help. The glider had started to move backwards into a gulley and so when, 2½hrs later the team arrived, P2 was understandably anxious to leave the cockpit. With a man on the wing he did so, but a gust blew the glider over on to its back.
128	Falke M/G	G-AZHD	S	14.8.87 1845	Winthorpe P2	37 0	N N	500+ 398pwr 0	The pilot noted that his first take-off was lengthy due to long grass in the centre of the airfield. As the runway was in use for winch launching he decided to use an area to the side of the field where the grass had been flattened by traffic. On the roll the wing hit a post, which marked a public footpath.
132	Ventus M/G	3171	M	3.8.87 1734	Lasham	49	N	3000	The motor glider returned to the airfield with the motor extended. The pilot intended to land near his trailer and the approach was over a tug and glider waiting to take off. On finals the aerotow started to move so he had to pull up over a glider to land parallel to the aerotow. With the engine extended he stalled rapidly and landed hard.
136	Taifun 17E M/G	G-OACE	S	2.9.87 1210	Aboyne P2	42 34	N N	141+ 131pwr 117+ 20pwr	The motor glider was positioned too high in the circuit so that an overshoot was inevitable. Restarting the engine was attempted, but the master switch was left off. A forced landing was made in to a good field. During the approach poor speed and height control resulted in an "arrester gear" type arrival when the gear caught in the downwind wire fence.

PHASE OF FLIGHT - LAUNCH - WINCH

137	Bocian 1E	2143	M	23.8.87	Dallachy P2	51 16	N N	1000 5 min	The instructor allowed the student, who was new to the club, to handle the second take-off after a competent first flight. After correcting an initial swing to the right with left rudder the aircraft yawed to the left at unstick. Before the PI could recover the port wing dropped and hit the ground and the glider rapidly groundlooped.
143	K-8	2332	N	19.9.87 1445	Ringmer	57	N	320	The pilot reported that the launch was normal, apart from being slightly fast at about 500ft, and reached 1350ft. The winch driver had decided to abort the launch at this height due to the drift towards a road. As the glider released, the winch stalled and the driver was unable to prevent **the cable falling across a road and power lines.**
144	Club Libelle	2415	M	29.8.87 1601	Odiham	33	N	? +5000pwr	The glider was just passing through 10-20ft when the cable back released. The pilot did not lower the nose quickly or sufficiently enough to prevent a heavy landing due to lack of elevator control.

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

Crawford, N.	Northumbria	13.9
Downham, E. H.	London	18.9
Harris, Kay	London	26.9
Macpherson, D. J.	London	18.9
Snowden, D. R.	Trent Valley	22.9
Parker, R. G.	Trent Valley	26.9
Day, V. J.	Booker	9.10
Mitchell, J. S.	Bicester	9.10
Davey, G. R.	Bicester	17.10
Gagg, M. H.	Wrekin	17.10
Steinitz, Katrina	Deeside	26.9
Porteous, D. A.	Angus	9.10
Davis, E. R.	Kestrel	17.10
McQueen, B.	Deeside	13.9
Collingham, C. E.	London	22.9
World, T. M.	Portsmouth Naval	24.9
Day, M. T.	Lasham	26.9
Slater, S. W.	Trent Valley	26.9
Hirst, A. T.	Booker	5.10
Hallum, A. D.	Booker	9.10
Akani, D. P.	Bicester	9.10
Tait, R. G.	Highland	17.10
Wilson, T. G.	Cotswold	25.10
McCall, C. F.	Fulmar	25.10
Day, J. F.	Ouse	26.10
Moss, M.	Blackpool & Fylde	26.10
Pye, J. R.	Blackpool & Fylde	28.10
Coomber, P. D.	Aquila	28.10
Andrews, A. D.	Wrekin	28.10
Arnold, J. G.	Wrekin	28.10
Atkinson, R. P.	Cotswold	28.10
Frank, S. W.	Highland	19.5
Smith, M. S.	Bath & Wilts	18.9

(All but four of the Gold heights orginated from Aboyne.)

GOLD DISTANCE

Name	Club	1987
Macpherson, D. J.	London	8.7

SILVER BADGE

No.	Name	Club	1987
7590	Evans, D. A.	Blackpool & Fylde	13.9
7591	Hayes, M. C.	618VGS	3.7
7592	Symon, D. N. K.	Deeside	26.9
7593	Stone, R. E.	Kestrel	26.9
7594	Herring, J. E.	Lasham	24.9
7595	Foster, D. V.	Lasham	25.9
7596	Bruce, Debbie	Avon	28.9
7597	Soilleux, J. A.	London	18.9
7598	Peatfield, N. A.	Shropshire	26.9
7599	Cooper, R. J.	Southdown	26.9
7600	Stewart, H. S.	Dorset	25.5
7601	Brown, D. B.	Blackpool & Fylde	13.9
7602	Griffiths, G. B.	Rattlesden	27.9
7603	Dixon, M.	Southdown	6.10
7604	Steinitz, Katrina	Deeside	26.9
7605	Jennings, G.	Lasham	8.9
7606	Skilton, B. G.	East Sussex	30.9
7607	Kelly, B.	Avon	14.6.86
7608	Jackson, A.	Cairngorm	17.10
7609	Pearson, K. S.	Essex	5.10
7610	Doodes, J.	Essex	7.10
7611	Addison, G.	Northumbria	13.9
7612	Bell, K. W.	Northumbria	5.8
7613	Smith, R. A.	Fenland	25.10
7614	Worman, C. R.	Chiltern	26.9
7615	Pilgrim, C. D.	Four Counties	28.10

YOUR LETTERS

FEARS ABOUT THE STRENGTH OF GRP

Dear Editor,

It is many years since I was active in the gliding scene and only occasionally see *S&G*. However a friend recently gave me the October 1986 copy and I was very interested to read the article on the "Mortality of gel coats", p226.

During the period when the Olympia 4 series were being designed and developed (some 35 years ago) and subsequently the Peak 100 and the stillborn 200, I was keenly aware of the potential of GRP. Although we made a point of building fairings with it to gain experience, I was inhibited from using it for the structure partly because of concern over quality control and possible invisible damage resulting from such things as heavy landings, but mainly the uncertainty over the possible, or rather inevitable, deterioration of the strength characteristics with time.

In particular the reports issued by the Royal Aircraft Establishment, who were doing a lot of research on the subject at that time, showed that microscopic cracking of the gel coat, which is almost inevitable in a structure subject to varying stresses over the years, allowed moisture to penetrate and this was then taken up through capillary action into the glass-fibres. The result of this was a drastic reduction in strength.

Although very keen indeed to be amongst the first to make a glass-fibre sailplane, I felt that it would be irresponsible not to design on the basis of the long term reduction in strength. Unfortunately that would have meant a structure very much heavier than the wood and steel tube currently used.

The problem had not been solved up to the time when I "dropped out", although several sailplanes had by then been made with glass-fibre, and I strongly suspect that it may still be there at least to some extent. The concern is not so much with the visible deterioration as described in the article, but that an apparently perfectly sound sailplane may in fact be nothing like so strong as designed and originally tested.

HARRY MIDWOOD, *Chippenham, Wilts.*

IS YOUR PARACHUTE SAFE?

Dear Editor,

I feel I ought to relay my recent experiences regarding parachutes in the hope that others may be warned and, just possibly, a nasty accident avoided.

About five years ago I decided to buy a 'chute, knowing initially nothing about parachutes. I contacted all the firms advertising in *S&G* but soon found that the standard "slim backpack" would not fit the combination of me and my glider. Most firms were not very helpful but one offered to make a pack to fit the recess in the seat back, (T-21 type seat). After much discussion, including a visit to the manufacturer with the glider, I became the proud owner of a new parachute complete with new canopy. A small leaflet was included giving some advice on use, storage etc and repacking instructions.

An annual repack was suggested as being adequate for my use and for three years the parachute was returned to the manufacturer for repacking. The manufacturer then went out of business and last year the repack was done through one of the glider equipment suppliers advertising in *S&G*. However this year I found a very experienced and highly qualified packer nearer home and took the 'chute to him.

Imagine my surprise when I got a phone call from this packer asking whether I had been given any particular briefing by the makers about my 'chute. I had not. He then said that he considered the equipment extremely dangerous and was not prepared to repack and sign for it without important modifications, and the chance to brief me properly.

There were two main problems. First the canopy lines were connected to the pack/harness with "quick release" connectors. These were positioned exactly where a novice user would naturally grab hold of the lines. A light squeeze of only $^{3}/_{16}$in would then release the canopy with unthinkable consequences. I was not aware that these were fitted so could not have avoided holding them!

Secondly, and also unknown to me, I had a steerable canopy which I obviously did not know how to steer. But in any case there were no steering lines fitted so even if I had known how, I could not have steered the canopy. The canopy has a forward airspeed of some 7mph. Left to its own devices it will evidently turn downwind, thus giving a landing speed some 14mph more than it should.

Thirdly I was not aware of the correct adjustment of the harness, nor how crucial that is, (and no it is **not** as obvious as it would seem). If your harness is like mine (two leg straps plus chest strap plus side adjusters) try putting it on nice and tight but leave the side adjusters slack. Now bend over as if to touch your toes and pull the pack with your hands over your shoulders. You will be left with your 'chute on the floor at your feet. Imagine that in mid-air!

My 'chute has now been modified and I hope I am thoroughly conversant with its use, but do you know **exactly** what is in that cushion on your back and how to put it on and use it? The packer I used tells me that about 60% of the glider pilots' 'chutes he packs are unsatisfactory in some respect when he receives them, or the pilot does not know what he has got! If in doubt the remedy seems to be to find a **very** experienced and qualified person to pack **and check** your 'chute and your knowledge!

I have evidently flown for the past four years with a 'chute which, in my packers estimation, stood an 80% chance of killing me had I baled out safely! And this was a brand new parachute bought from a manufacturer advertising in *S&G* at the time. There seems no reason why other parachutes from that manufacturer should not have "instant death" canopy connectors without the owners' knowledge. Whatever your 'chute please be certain you know **exactly** what you have got.

JOHN McIVER, *Dumfries, Scotland*

MORE ON TOW POSITION

Dear Editor,

I have been fortunate to have been towed in the low tow position in Australia and the high tow in France in identical gliders (Club Astir). (See letters in the June issue, p147, and the October issue, p257). The low tow was definitely easier for this novice.

The move from low to high tow for release was usually an "up, up and away" manoeuvre. The release from the established low tow position is less hurried as no change in perception occurs.

LAURIE TEBB, *Huddersfield.*

AN ANSWER TO AIR SICKNESS

Dear Editor,

I have always suffered from travel or motion sickness and as a new glider pilot, obviously precluded from using the usual travel sickness drugs, I have been frustrated in my attempts to gain Bronze legs as nausea has forced me to land after thermalling well within the 30min.

Following advice from two instructors at Cotswold GC I have obtained a set of "Sea-Bands" and can confirm that they definitely work. I have achieved a 1hr 3min thermalling flight free of nausea or any discomfort.

ERIK BLACK, *Cheltenham, Glos.*

(Erik sent us a leaflet explaining the product. Two bands are worn on both wrists to exert "a carefully controlled pressure" on the acu-pressure points. They are from Novafon UK Ltd, 3 Atholl Rd, Pitlochry, Perthshire PH16 5BX Tel 0796 2735 and priced at £7.95 including p&p.)

MORE ABOUT AIR CADETS

Dear Editor,

In his article "Poles Apart" (August issue, p192) Mike Cuming suggested that the emphasis in Air Cadets' gliding is all wrong. He proposed that the taxpayers' money would be better spent training more cadets to advanced standard and concentrating less on sending these youngsters on a first, and often only, solo.

To fully discuss all the implications and background to his ideas would take an essay, or even a book. While I am pleased to see a fellow taxpayer seeking value for money and campaigning for his chosen sport and pastime, it was sad to see an ex-Air Cadet contending that ". . . the majority don't actually enjoy their training . . ." and that because the bulk of those sent solo are not motivated to continue there is a fundamental injustice in training them up to solo standard. Mike's flippant style and horrible massaging of the statistics may fool some of your readers some of the time, but I cannot believe that an ex-Flight Staff Cadet could so thoroughly forget the prime aim and *raison d'etre* of Air Cadets' gliding. For the benefit of readers who may not have had any contact with the organisation may I use one of your columns to jog his memory?

Although they are *Air* cadets, gliding is only

one of many aspects of their training. Sponsored and funded by the Ministry of Defence, the organisation provides a wide range of sporting and other activities for young people. Gliding, like all of the others, is designed to help them mix, extend their self-confidence and develop a sense of mutual respect and responsibility during their formative years. The heavily supervised and regimented atmosphere may not hold much "glamour and fun" for many readers of *S&G*, but 48 000 Air Cadets in the UK think otherwise. Any instructor who has sent one of these cadets solo knows that the achievement will be a milestone in that young person's memory and a tremendous boost to his or her self-esteem at a critical age. Nonetheless, with shooting, sailing, canoeing, rock climbing, orienteering and a host of other activities available for sampling, it is not surprising that one solo flight, even in a modern glider, does not fire them all with single-minded enthusiasm for gliding. However, the pre-solo drop out rate is less than 1% - a figure which most gliding clubs would envy - so some must enjoy it!

The few who do get really hooked make the effort, as Mike did, to become a Staff Cadet at a weekend Volunteer Gliding School when there is a vacancy. On the 16 schools equipped with GRP gliders they will be able to progress to advanced and soaring standards. Hopefully, when too old to remain cadets, they will become civilian instructors at their schools and maintain the instructor staff levels for the next generation of cadets. The degree of commitment and self-financing of those who do suggest that factors other than personal achievement in advanced gliding motivate them. It would be quite wrong, however, to think of them as a bunch of uniformed and civilian social workers polishing their haloes in the pub (if they are off the field and away from the hangar before closing time!). Quite a number of Air Cadet instructors are members of GSA and BGA clubs and syndicates and all are well aware of the capabilities of our GRP aircraft. As a reward for many weekends of dedicated basic training they are invited to attend Portmoak or Catterick soaring camps - very few, but very worthwhile.

Mike made reference to our fleet of motor gliders. In fact 12 of our 28 schools are equipped with the Venture and, unpalatable though the fact may be to *S&G* readers, in Air Cadets' use of a motor glider is twice as productive as a winch launched GRP glider in terms of first solos in a given period of time. Add to that the increasing difficulty of operating winch launched gliders from some of our sites and it may be that the proportion of motor gliders in the Air Cadets' fleet will have to increase - a further blow to aspiring soaring pilots.

The primary aim of Air Cadets' gliding is to give young people the thrill, satisfaction and character building of flying solo. For those still too young for basic gliding training there is a measure of experience flying to whet their appetites. The combined efforts of the 28 Volunteer Gliding Schools and the Central Gliding School at Syerston should achieve in excess of 1500 successful first solos per year and some 15 000 cadets are given glider air experience now that conversion from the old wooden gliders is complete. This still means that although many Air Cadets have a chance to fly in a glider only a relatively small proportion can be trained to fly solo. In the context of the Air Cadets' movement, any extra effort available must, in the first instance, be allocated to increasing that proportion rather than providing extra soaring training for a very few. In the second instance, since there is a finite capacity at our sites and the potential Staff Cadets need advanced training to set them on their way, it is our intention to maintain a measure of advanced training and soaring in the long term interests of the movement. Some of this may be diverted eventually into BGA circles as the cadets get older, but the main aims of the two organisations are indeed poles apart and they cater for two totally different groups of people.

Having said that, many of those involved in the management and supervision of Air Cadets' gliding have a great interest in the promotion of sport gliding. A good deal of effort is already made on our part to "bridge the gap". For example, Air Cadets' representatives attend the BGA Executive and Instructor Panel meetings; entrants have been sponsored in BGA competitions at all levels; very shortly each cadet who goes solo will be given a handout to tell him or her about civilian gliding and how to get started. So we are doing our bit. If you want them as members of your clubs you must actively recruit from those 1500 solos per year. How you do it is your business, but I suggest that you will have to do something to tempt them once the Air Cadets' organisation has pointed them in your direction.

ROY TURGOOSE, *chief instructor, Air Cadets' Central Gliding School.*

(Roy says this is his personal view and in no way represents an official reply by the Air Cadets' Headquarters or the Ministry of Defence.)

ADVICE TO AIR CADETS

Dear Editor,

The letter from Charles Docherty in the last issue, p315, is just part of the surprisingly wide response I have had to my article about Air Cadet gliding and ways in which we can all make the most of it.

I have heard a lot of enthusiastic comments by "the clubs" - the most valuable of which seems to have been resolutions to form some sort of link with the nearest Air Cadet gliding school. I would be most interested to know what results have yet to come from these resolutions.

I was delighted to find that *S&G* is indeed read in the "enemy" camp and hope you will publish the following advice for any Air Cadet pilot who may read it.

1. **Play down** your experience when visiting a strange site: your instructor will very rapidly assess your **actual** ability, irrespective of what you say.
2. **Give** your local club a chance: visit them expecting to **learn** something.
3. Gliding is primarily a self-help sport - so it's up to **you**. People will be amazingly helpful but only once they have seen you are trying.
4. Have you thought about summer jobs at the full-time clubs, or crewing at competitions? There are lots of opportunities.

M. F. CUMING, *London*

OLD PILOTS AND INSTRUCTORS

Dear Editor,

Bill Scull's article "Old Pilots-Bold Pilots" in the October issue, p228, was no doubt written with every good intention but is so pointed as to leave doubts in many younger minds as to the ability or otherwise of some of our older pilots.

I resigned as CFI of Dorset GC earlier this year for three very good reasons:

1. I considered myself too old at 57 to be able to give the right kind of encouragement to the younger pilot by personal soaring and cross-country flying - a two hour bladder is very limiting!
2. To give more time to pressing business matters.
3. The ever growing dictatorial attitude of the BGA.

I have a very young outlook on life and have no intention of giving up instructing or personal flying while I am able to pass my medical and have the patience to put up with the antics of the average club pilot, I only hope I recognise the ageing symptoms before they are remarked upon by others.

As CFI I found it prudent to stop others instructing and indeed curtailed the flying of older, and in some instances very experienced, pilots simply because their ability was declining much more rapidly than they realised. This, however, cannot be quantified in terms of actual years survived. We all know of individuals who are old before their time and others who despite their age are so young and sprightly there is no way they can be held in check. I guess that even Uncle Bill must seem pretty ancient to the teenagers in our midst.

There can be no reason for the old-uns to be grounded simply because they reach a certain age but I did insist that those of retirement age or disabled should have an annual medical and take regular check flights. I loath unnecessary rules and regulations but feel that all pilots, not just instructors, should have an annual medical in the 50 plus bracket.

Still on the subject of instructors, we have the continuing threat to a decreasing number of very good instructors to withdraw their licences simply because they only have Bronze Cs. There are three or four in my club who have no interest in cross-country flying but are dedicated teachers of good circuit practice and airmanship and we would be the poorer without them, unlike the automata coming off the BGA treadmill who often have more to learn about real flying than their pupils.

I believe our instructors should be of the highest possible quality and properly trained but I am unconvinced that someone with all three Diamonds before he is 20, and who

never takes a launch without flying a 100km, is the most suitable person to teach others to fly. My observation is that he expects every pupil to learn at the same rapid rate he did and doesn't have the patience or understanding to help those with a lower learning curve.

I do approve of properly conducted instructors' courses but opposed to the system for producing Air Experience Instructors. The CFIs used to train suitable instructor material to become passenger carriers - is it necessary to drag someone to a distant airfield and involve him in an expenditure of £100 plus when the same could be achieved at the home club with perhaps the final approval of the regional examiner?

Incidentally, during my years as CFI I was never once contacted by a regional examiner and when I asked our national coaches for advice I had three different replies - so much for organisation. There is always room for improvement at all levels so come on the BGA, sort yourself out, get out and about to your member clubs and find out the real needs of their members.

DENNIS NEAL, *Wimborne, Dorset*

Bill Scull replies: I'll try to answer Dennis's points.

"Dictatorial attitude" indeed! We try to steer a course well short of CAA regulation to keep gliding free and safe. Reflect on nine people killed at gliding clubs this year. You seem to agree with me on the matter of old pilots and have taken action where necessary. Good!

There has been a minimum standard of a Silver badge for instructors for several years but we have occasionally allowed a short-term dispensation. These days Silver C is a most basic gliding qualification and surely not too much to ask of a good and credible instructor. Incidentally, where are all these "20-year-old instructors with three Diamonds" you have observed?

We have not taken away the right of CFIs to train passenger carriers (see **Laws & Rules**, para 7.4) who, of course have never been able to give trial lessons. The AEI can and this is reflected in the comprehensive training he receives.

Yes Dennis, you're right we do have communication problems but communication is a two-way thing. Even with our limited resources if you take the trouble to tell us your needs we'll always try to help.

OLD PILOTS - BOLD PILOTS

Dear Editor,

Who's going to tell the CFI? And more to the point, who's going to tell Bill?

JOHN ELLIS, *CFI Howick GC, Natal, South Africa.*

THE WINCH LAUNCH

Dear Editor,

I read John Gibson's article "Understanding the winch launch" in the February 1987 issue, p28, with interest and should like to comment on the points he makes concerning placarding and the design strength cases.

First, neither BCAR/E nor OSTIV prescribe an upper limit on cable strength, or the use of a weak link, because it is not their job to do so. Safety in the winch launch, just as in manoeuvres, is achieved by two means:

a) Designing the glider for adequate loads, and

b) Operating the glider in such a manner that these loads are not exceeded.

The first of these means specifying some suitable minimum values for maximum cable load and maximum winching speed - this is the job of the design requirements; the second means providing corresponding handbook and placard information - maximum weak link strength and winching speed - is the job of the certification authority. The designer has to design for the appropriate loads (which can exceed the specified minima if he wishes) and then state the appropriate operating limitations corresponding to those to which he actually designed.

Secondly, the critical wing lift in the absence of an up-gust (maximum cable load at the critical angle at which pitching balance is just achieved with the elevator fully up, the glider being in accelerated flight) does increase as the winch speed increases. Values for a one-off two-seater of 1100lbs AUW constructed many years ago are as folows:

Winch speed (kt)	50	60	70
Wing lift (lb)	2000	2220	2480

The chosen cable load was 1350lb being 1.2 times an intended nominal weak link strength of 10cwt. Doubling the latter to 20cwt at 60kt increases the critical lift to 2500lb. Thus the degree to which the wing lift is sensitive to either speed or cable load, while noticeable, is not spectacular - rather less than might be expected - and there does seem to be some possibility of easing the limitations. However, on the example glider the hook was positioned rather far forward, and on other gliders with more typical hook positions the results might not be so encouraging.

Thirdly, OSTIV does include a wing link standard - the 500kg value, formerly a recommendation, was made mandatory in 1971. However, the German (LFSM) requirements of 1976 prescribe an additional minimum of 1.3 times the maximum weight, which is also included in JAR 22. All modern German gliders meet this, if not more, and this suggests that constructors do not find the requirement too difficult to meet. Anyway, it seems that OSTIV standards need amending, and a weak link strength of some factor times the maximum weight does seem sensible. Whether this factor should be 1.3 as in LFSM, or 2 as John suggests, or some other value, is for discussion.

Finally, the absence of a gust case is rather curious. Such a case is included in BCAR/E, and was formerly in OSTIV, but for some reason it did not appear in the 1971, or in any later, edition. It is not in LFSM or JAR 22 either, and until now no one seems to have queried this. The latter is perhaps not so surprising since LFSM was developed from OSTIV and JAR 22 from LFSM.

I intend to take these two two points up with the OSTIV Sailplane Development Panel.

CEDRIC VERNON, *Dorking, Surrey.*

John Gibson replies: I am grateful for Cedric Vernon's interest in a rethink on winch placard and weak link policy and in putting this to OSTIV. A few brief comments:

There is no reason why a regulatory body should not prescribe a maximum operating cable or weak link strength, as FAR 91.17 does for aerotow. In this case a unique factor is more appropriate, which I believe should be 2 for operation and 2.4 for design. The minimum design winch speed should be related to the stall speed, *eg* the greater of the current 60kt or twice the stall speed.

Such provisions would provide maximum operating flexibility and safety. A weak link factor of 2 is permitted on some designs, *eg* K-13, Open Cirrus, and is required now for very light gliders. A design case adding the full 2.4 factor to the wing lift would not produce a critical wing load in typical designs, and the operating load at normal speeds and attitudes would be much less.

CERTAINLY NOT A SCUD

Dear Editor,

Oh, memories are short! (See the photograph of Amy Johnson in the last issue, p305, with an unidentified glider.) Are there no members of my old club old enough to remember JJ's Scud 2; oh, where are you Peter Bourne; tell them, please!!

Of course, it's not a Scud; it's the tail of a Manuel Wren. But whether it's Bill's own Willow Wren, BGA 162, I cannot tell. I have that delightful glider in my care, but the fabric bearing the "trailing edge outline" has long since gone. But I believe it may well be, for he had a scheme of that style on at one time; primrose yellow with green edging, its original colours?

Come on Chris Wills, out with the albums! Someone must know who is the instructor.

MIKE RUSSELL, *Henham, Bishops Stortford, Herts.*

CLUB NEWS

Copy and photographs for the April-May 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 February 9 and for the June-July issue to arrive not later than April 5.

GILLIAN BRYCE-SMITH
December 2

AQUILA (Hinton-in-the-Hedges)

Our two expeditions were marred by too many gliders and bad weather at Portmoak and bad weather alone, at the Long Mynd. Nevertheless, congratulations to Pete Coomber on his Gold height at Aboyne.

The committee is giving the club a major review for 1988 to make the best use of facilities. Visitors and new members are welcome.

J.R.

ARGYLE & WEST HIGHLAND (Connel Airfield)

We operate during the week from April to November, sharing the airfield with the weekend only Connel GC.

After lots of trauma and much of last year lost to gliding politics, we are dedicated to training pilots at all levels. Launching is by reverse pulley autotowing or winching from either of two tarmac runways.

It is one of the more beautiful areas of the Scottish Highlands and cries out for the "let's go to the continent we are bored" types to find out what mountain and wave flying is all about. The Great Glen and Ben Nevis are just round the corner and our local hill is 3600ft Ben Cruachan.

A.S.

BLACK MOUNTAINS (Talgarth)

CFI John Bally is standing down after a long, arduous period guiding the club through its formative years. We are extremely grateful for John's efforts. John Price, DCFI, is taking over. We also thank Bill Dean for his stint as a full-time tug pilot.

Many thanks to Bernie Morris and Chris Rollings who held a very successful AEI course here during November.

October was wet but we had some good conditions in November with many of our visitors in wave up to 15000ft.

W.D.M.

BOOKER (Wycombe Air Park)

A new rule has had to be enforced at Booker – gliders finishing, or practising finishing, from the west are now obliged to pull up **before** reaching point "ECHO". This is presumably to allow the helicopters (which always do beat-ups the other way) to pass underneath.

Yet another Vega B has appeared on site, and another K-8 brings the club's total of Schleicher single-seaters to nine.

We are planning to host the 1988 Junior Nationals in addition to the 15 Metre Nationals and a Regionals. Normal business will, however, continue unabated, so book your advanced course now.

After a disappointing Aboyne expedition (only 15 Gold heights), some members have discovered that wave exists at Booker itself – and there have been several climbs to 10000ft.

M.F.C.

Argyll and West Highland GC's spectacular site photographed by Anthony Shelton.

BORDERS (Galewood)

In October North Weald enjoyed two superb weeks of hill and wave soaring with us.

At our well attended annual dinner in November wings were presented to pilots who had soloed during the year – Linda and Phil Harwood, Werner Hindmarsh, Martin Soulsby, Graham Blair, Denis Patterson and Neil Watson, Neil, having gone solo on his 16th birthday, also won the Club Ladder trophy for the most progress. The Height trophy went to Ken Fairness and the Distance trophy to Derek Robson.

A.J.B.

CAIRNGORM (Feshiebridge)

Despite the relative lack of wave, visitors took advantage of the mountain soaring to make it our busiest wave season to date.

A notable exception amongst the many height claims was Alan Jackson's Silver distance to Dallachy in his Skylark 3, making him late for our 21st anniversary party organised by Bill and Miriam Longstaff. Members past and present, and many others whose help has been invaluable, resurrected memories of old with the aid of Bill's historical slides showing founder members in all their youthfulness on a rough looking field surrounded by dwarf size fir trees.

S.M.

CAMBRIDGE UNIVERSITY (Duxford)

Several privately owned gliders and the winch hut were damaged in the October storm.

Our Astir is spending the winter at Dishforth for members to experience wave, otherwise we are operating as normal during the winter weekends.

Congratulations to Stephanie Smith on going solo and our thanks to Marshall for the Bonfire Night party and the Social Committee for the November Nosh, both of which were a success.

L.A.W.

CHANNEL (Waldershare Park, Nr Dover)

We escaped the worst of the bad summer and have 13 new solo pilots and our first batch of cross-country flights from this site. Congratulations in particular to Emma Austin on her Bronze C and Dave Jones and Aidan Waters on their AEI ratings.

Our new clubhouse and bar are a great luxury after five years in an old coach!

In September a herd of escaped cows leaned that Blaniks were good to lean on. Before we could mend it, the hurricane finished the job of writing it off and it has been replaced by the ex-Marchington Blanik. Waldershare Park was devastated by the storm, losing some 2000 trees, and is barely recognisable.

We had enjoyable visits to the Long Mynd in August and Portmoak in November.

M.E.S.

CLEVELANDS (RAF Dishforth)

Runway resurfacing has given us the opportunity to hold a successful club flying week and two wave weeks for visitors. The wave was not particularly co-operative but obliged with a Gold height or two. With the decline of the summer thermals, we have also welcomed an increasing number of weekend visitors.

We said a fond farewell to the faithful K-8, our longest serving club glider, and its successor, the K-18, is proving popular.

J.P.

CORNISH (Perranporth)

Although a slow start to the course season, in the end we did extremely well with students coming from far and wide, even one from Israel who brought his family with him. Next season we are

running 20 courses (at 1987 prices) with a maximum of six pilots per course.

Our Blanik has just returned from its C of A in time for a good ridge day, the first for many weeks.

G.A.H.

COTSWOLD (Aston Down)

A tremendously successful expedition to Aboyne in October resulted in Diamond heights for Ed Johnston and Dave Roberts for them to complete all three Diamonds. There were also Gold heights for Terry Gardner, Robin Atkinson, Trevor Wilson and Chris Clarke, Trevor and Chris completing their Gold badges. Congratulations to Derek Locke and Mike Pearce on going solo.

The SF-26 has been sold and we hope to update the fleet with a higher performance single-seater.

We wish every success to Margaret and Paul Kevern, emigrating to Australia in the new year.

Our club competition is from July 25-30. Visiting competitors are welcome and should contact the CFI, tel 045 383 2061, to book.

G.M.

COVENTRY (Husbands Bosworth)

There has been more mushroom picking on the airfield this autumn than flying! Members who went to Feshiebridge had an enjoyable time, though no badge claims, and some gliders are at Dishforth for the winter.

Alan Foxon is now winchmaster, replacing Roger Goodman who is instructing at Benalla until April. We have added a new Bocian to our fleet, along with a new assistant CFI, Harry "Del Boy" Middleton, and a new assistant tugmaster, Bob Bowles.

D.L.S.

CRANWELL (RAFGSA)

Congratulations to Jean Dickson on being the only female to go solo this year.

The new bar is being decorated, thanks to the hard work of members, and there is a newly formed SHK syndicate.

S.J.H.

CRUSADERS (Cyprus)

Our club is on the up and up with plans to buy a new club two-seater. Congratulations to Avo on getting various qualifications.

With all the fleet on line, we are into the soaring season with great expectations. Pete M. flew Silver height without a barograph but congratulations on both Bronze legs.

Farewell to Mark and Neil, and thanks for all their work. Our thanks also for their help to T.J., out from Bicester, and Andree.

We have visitors most weekends including BA crewmen.

T.J.D.

HEREFORDSHIRE (Shobdon Airfield)

Following a good course season which, with weekday launches, also encouraged visitors to our site, we are now hoping for winter wave.

Our numbers have been augmented by a joint membership scheme for AVRO GC members, which has been to our mutual benefit.

Congratulations to Brian Sedgwick on his assistant instructor rating and we welcome John Mitchell, new to the area, to our instructor team.

Our new telephone No. is 056881 8908.

J.W.

KESTREL (Odiham Airfield)

We have been adventurous lately in experimenting with autotowing. So far it has been successful and, with the return of the Rallye tug after several months out during the soaring season for its C of A, we now have three methods of launching.

Congratulations to Bobbie Stone on completing her Silver C with a 70km flight to Shoreham airfield at the end of September and to Bob Davis for his Gold height on his first flight in wave from Dishforth.

We have a small club expedition to Dishforth over the Christmas/New Year.

J.N.

LAKES (Walney Airfield)

Linda Dawson, the first female solo pilot at Lakes GC for many years.

Our annual dinner in November was a great success and we were able to thank our guests for their help over the last year. Lady Redshaw presented the trophies as follows: Neil Braithwaite (best cross-country and greatest height gain, both from Walney); Peter Craven (worst outlanding flight anywhere); Peter Lewis (Club Ladder) and, jointly with his wife Joan and son Martin, for services to the club; Linda Dawson (for best progress) and Peter Redshaw and Peter Craven, the wooden spoon for abusing their Nimbus 3.

Linda Dawson became the first female to solo at Walney for many years and she has also produced a most welcome club newsletter. A recent spot landing competition resulted in a victory for the pupils.

M.S.

LASHAM (Lasham Airfield)

Despite indifferent soaring weather Lasham had its best year to date with launches up by 1550 and reported cross-country flights exceeding 123000km. The two-seater fleet increased to ten, which includes seven K-13s.

Derek Piggott is retiring as CFI at the end of 1988 after 30 years, but hopefully will remain as our consultant instructor. We all appreciate his long devoted service and all he has done for Lasham. We congratulate him on his well deserved British Empire medal. The new CFI, Terry Joint, (currently CFI at Bicester) will join us in October.

In the spring we will have our first winch for many years - a Tost two drum mounted on a lorry chassis. It will be used for cross runway wire launches and developed for main runway use. If successful, a second one is on the cards for 1989.

D.J.P.

LONDON (Dunstable)

We have a new Robin tug to replace the one which disappeared in a puff of smoke. The expedition to Aboyne was so successful we have already booked a fortnight for 1988.

After considerable hassle the Munster van Gelder winch has been overhauled. Although still not up to the specification the designers intended (!) it is giving us good service and enticing visitors to sample winter flying on our hill.

The regulations for the Dunstable Regionals, July 23-31, will be available early in 1988. Finally, our thanks to Paul Tickner, the 1987 course instructor.

O.T.P.

MIDLAND (Long Mynd)

The club fleet has been strengthened by a K-23 which is extremely popular and joined one of our K-21s on an expedition to Aboyne. Members have also visited Sisteron with plans to repeat these trips in 1988.

Seven-day operation continues until Christmas with good support from members and visitors. We are re-powering a main winch with a 250hp V8 engine, confident of higher launches for the heavier glass gliders in light winds.

A second AIE course was held for six members by Bill Craig and Roy Dalling and we now have 12 AEIs to introduce visitors to gliding.

At the AGM Keith Mansell retired as chairman after 20 years. Tributes were paid to the tremen-

Al Raffan of Nene GC, holding the bomb, with Horace Bryant, CFI.

dous amount he has done for the club and he was made an honorary life member.

J.H.

NENE VALLEY (RAF Upwood)

Our neighbours, Fenland GC, put us in a spot by delivering a practice bomb on August 31. Al Raffan flew the Geier 1, built for the 1957 World Championships, for 2½hrs and landed at Upwood at 4pm.

The rush was on to get the "bomb" back to Fenland while the weather was still good and John Young delivered it on September 20 in the club K-8. They were expecting him and ready to fly it back that afternoon, but John wouldn't let it go. The big question now is when will Fenland deliver the bomb again? The rules are that the same person can't deliver it again.

T.S.

OUSE & HAMBLETONS (Rufforth Airfield)

At our 26th annual dinner-dance trophies were presented to Julie Atkinson, Tom Stoker, David Jones, Steve Hammond and David Bullock. A most enjoyable evening.

On November 1, Tom Hollins and Brendon Jones took a 3000ft aerotow in the Blanik and Brendon demonstrated his skills as a parachute instructor by jumping from the back seat, making a perfect landing on the grass runway. After some refreshment in the clubhouse, we were given a short talk on the art of parachuting.

Dick Boddy has resigned as chairman and we thank him for his hard work and leadership in the last nine years. We hope we can build on the foundation he has created and hope he will soon be restored to good health.

G.Z.A.

PETERBOROUGH & SPALDING (Crowland Airfield)

We are very sorry to lose our chairman, Kelvin Davis, who has a new job next to the airfield at Usk. Ted Brooks has taken over with Rachel Worth as treasurer. Kelvin's departure reduces our instructors so we are looking to uprate a few of our assistant instructors and those with the AEI rating.

In addition to our two sets of evening classes we are hosting a further education college course involving several flights for each student. All the publicity is increasing the interest in AEI flights with a welcome enthusiasm.

We are still toying with the idea of selling the Pirat. Any offers?

P.N.W.

SCOTTISH GLIDING UNION (Portmoak)

The autumn was not kind to our many visitors with few days of note. We were grateful to Fenland GC who fettled our winch during a wet week.

Congratulations to Sally Hillard and Hugh Williams on going solo and to Ian Patterson on his Silver C. The award of Diamond goal to Colin McAlpine in the last issue was premature - he borrowed his partner's camera, but nobody said anything about film! His flight did, however, contribute to his winning the Club Ladder award at the Christmas dinner-dance. The other awards went to Peter Bower, Tony Shelton, Val and George Peddie and Paul Copeland, with the Service Salver going to Roddy McLean.

Following Roddy's move to Norfolk Norman Revell is supervising the Saturday morning *ab-initio* syndicate and we are grateful to Frank Smith for filling in. Bob Petrie is now looking after the winter Tuesday club flying which will continue until the courses start in March and we resume our seven day operation. Our thanks also to Hamish for running the summer courses and to Crawford Sneddon for a hard season's tugging.

M.J.R.

SHALBOURNE (Rivar Hill)

Our chairman, Ken Mackley, is giving up gliding due to the demands of his successful business. We wish him well and there will always be a warm welcome back at Shalbourne.

November saw a well supported expedition to Sutton Bank. A memorable and enjoyable week but, alas, not much flying.

The winter lecture series got off to a good start with two well attended talks. Congratulations to Angi Porter (5hrs) and Richard Dann on going solo.

S.C.D.

SOUTH WALES (Usk)

The wet weather and early sunsets are reducing flying but a north-westerly still brings droves to the site hoping for wave with success for Bill Mills (Gold height) and Angelos Yorkas (Diamond height).

Our club fleet now includes three two-seaters and, with the arrival of the Pawnee, the hangar is overflowing.

Congratulations to Marc Morgan on going solo and we welcome Simon to the instructor team and his wife Patricia to the club.

Our Bonfire Night party was a great success. Our thanks to the fireworks team for nearly an hour of entertainment and the kitchen crew for serving soup and hot dogs.

J.M.B. & L.R.B.

STRUBBY (Strubby Airfield)

Lisa Trevethick of Strubby GC who recently went solo in the club T-21.

We thank our retiring secretary, Eric Hughes, for a job well done. Chris Collis has taken over.

Our congratulations to Simon Batchelor, Lisa Trevethick and Chris Collins on going solo and to John Storry on becoming our first home bred instructor.

The season went quite well with an 8% increase in soaring hours. The club Bocian is having a face-lift, thanks to club members with the expertise by John Turney.

There was an enjoyable expedition to Sutton Bank in September which fostered a spirit of adventure and visits to other sites have become the norm rather than the exception.

C.C.

THRUXTON (Thruxton Airfield)

A new name - it seemed logical, having moved from Inkpen ridge many years ago - isn't the only change to affect the former Inkpen GC.

The 1987 season saw a very welcome increase in membership and finances. Much of this is due to new policies introduced under Ray

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EXHIBITION – Open from 6pm Friday, March 4 to Sunday, March 6.

CONFERENCE and EXHIBITION CO-ORDINATOR
Marjorie Hobby, 9 Knoll Road, Fleet, Hants GU13 8PR. Tel: 0252 615365

Godwin's energetic chairmanship and not least to his generous commitment of time to midweek instructing.

Due to the enterprise of a number of members, we have acquired the use of a Blanik and K-6CR which, together with a Bergfalke, have considerably enlarged our fleet.

J.B.L.

TRENT (Kirton-in-Lindsey)

It may not have been a great year for gliding but we had some good flights. There were eight Silver distances from the site and expeditions to France, Aboyne and Portmoak. Denis Snowdon, Robin Parker and Steve Slater gained Gold heights at Aboyne and our pilots became expert at curling in Portmoak!

John Rice and Dixie Dean contacted wave over our flat site in late August - John achieving 13000ft and Dixie 11000ft from winch launches.

Systematic improvements continue on our equipment, facilities and fleet and although Wednesday flying has finished for the winter, visitors by road and air are welcome at weekends. We want a tug and a pilot for the next season - any volunteers?

Congratulations to Pete Robinson on mastering his landings, going solo and quickly graduating to the K-8.

L.W.

VECTIS (Sandown Airport, Isle of Wight)

Congratulations to Ian Ashdown (PIK 20) from Southdown GC for braving the Solent to be the first winner of the Solent Challenge cup. We will need to regain our honour and the cup.

The great storm left some unkinking to do on the Blaniks and a nearby caravan wasn't cleared for aerobatics.

At the annual dinner the Chairman's cup was awarded to John Kenny, DCFI, for his unflagging services throughout the year; the Most Improved Pilot award to Andy Noctor and the CFI's trophy to Eric Fry who recently completed his Bronze C.

J.E.P.

WOLDS (Pocklington)

At our annual dinner-dance in November most of the awards went to our hang gliding refugee, Tony Spirling. He carried away the Most Improved, Most Meritorious and Club Ladder trophies with the Longest Flight cup going to Chris Venter. Congratulations.

After many years Bernie Svenson is giving up as social secretary. Our grateful thanks for all he has done. Bob Holroyd takes over.

Our annual Two-Seater Competition is from August 21-27 (Sunday to Saturday) and preliminary information will be ready soon.

We are just completing the purchase of additional land - hopefully we shall soon own all the airfield.

Steve and Melanie Malcolm are renovating their 1947 Olympia in its original livery. It is thought this is the oldest Olympia in the country - unless someone claims otherwise.

D.B.

WREKIN (RAF Cosford)

We have achieved our target of 6000 launches for 1987 although our hours and kilometres didn't reach a corresponding high.

Pip Barley, Mick Davis and Ray Weston got Diamond heights during our expedition to Aboyne and Tony Andrews Gold height to complete his Gold badge.

Stan Stanley has gone solo, converted to the K-18 and is also solo aerotow.

The AGM produced trophies for Mick Boydon, Ray Weston, John Phillips and Pete Evans with the most prestigious trophy going to Mike Gagg for his hard work on the aircraft. A special presentation of a painting of our tug to Taff Shanahan had to be delayed because of his holiday in Australia. It is in recognition of his work over the years, flying and maintaining the Supermunk, which he has reluctantly given up on doctor's orders.

We say thanks and farewell to Richie Arnall who has been posted back to Kinloss.

M.B.

WYVERN (RAF Upavon)

Congratulations to James Carey on going solo. Once again we had an enjoyable and riotous Christmas dinner, organised by Paul Lutley. We are planning an expedition to Roanne.

D.B.

"Anyone who intends to take up gliding or sailplaning must first find suitable terrain". From **Gliding and Sailplaning** *by F. Stamer & A. Lippisch, 1930.*

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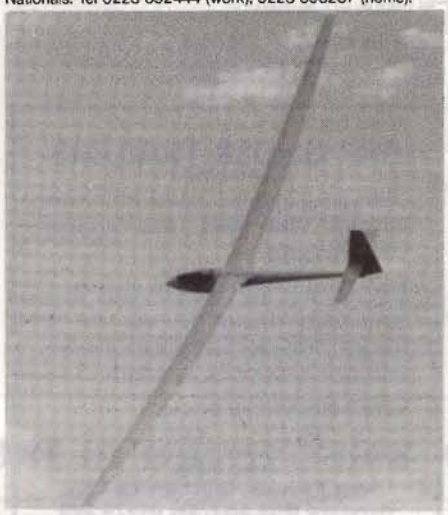

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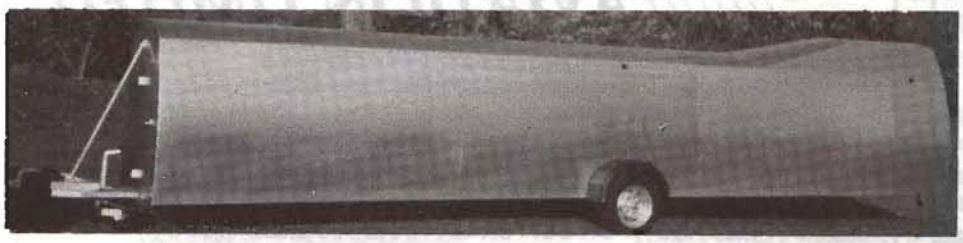

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The cartoon used in the last issue, p309, was by R. P. Griffiths.

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