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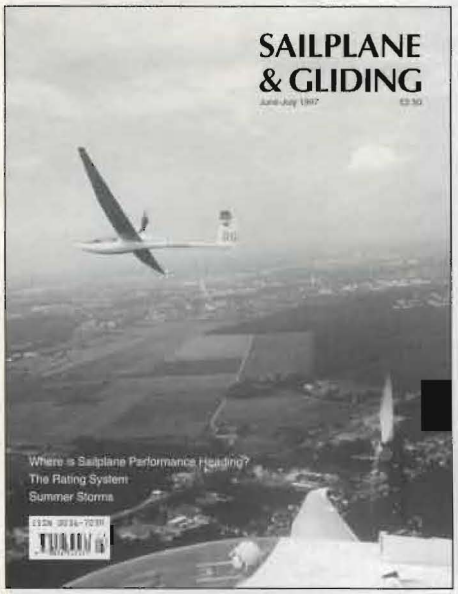
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Cover: Jochen Ewald, flying a DG-800e, photographed Wilhelm Dirks testing the 18m DG-600 with winglets.

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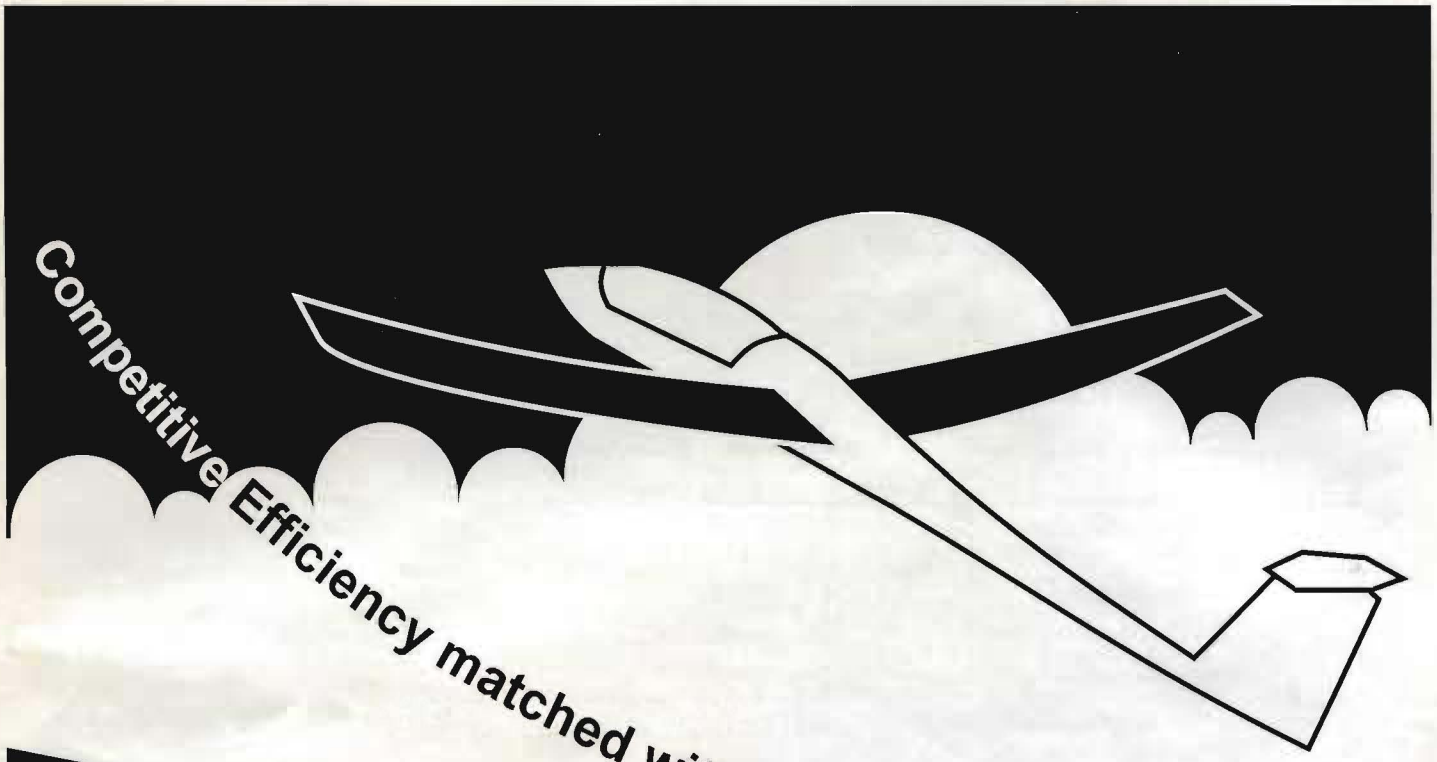
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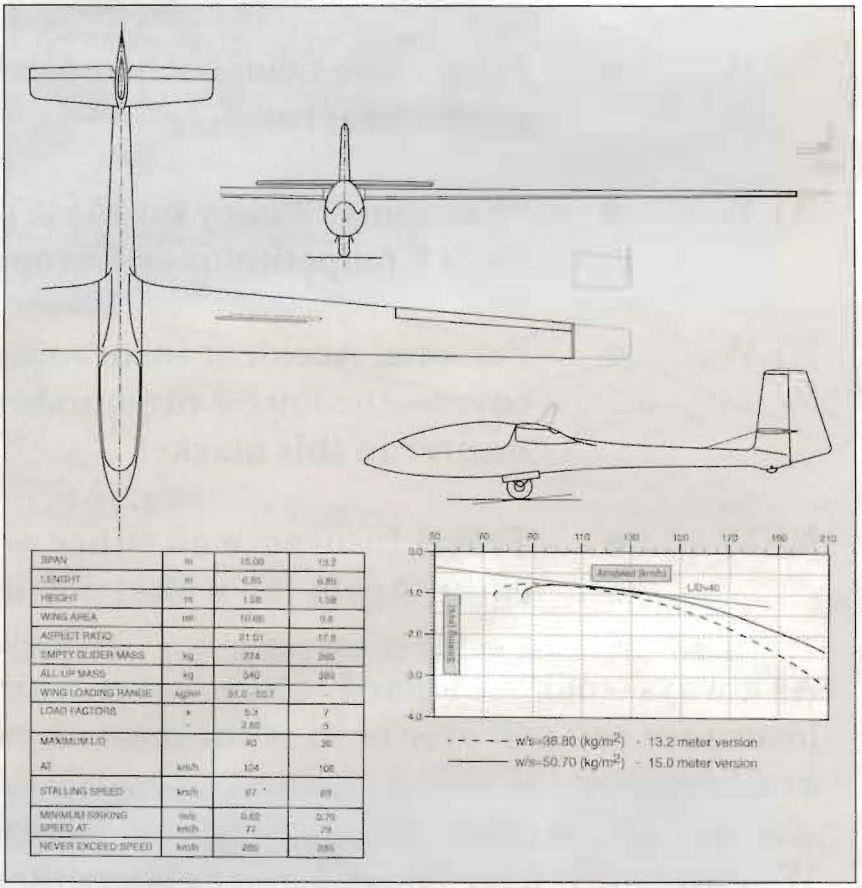
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YOUR LETTERS

DATA LOGGERS

Dear Editor,

After reading Wayne Richards' response to Ian Strachan's letter (and to Wendy Durham's comments) on data logger failure (February issue, p11), I write on behalf of several confused club colleagues having a problem with Wayne's sums. We expected to see the eggheads (*ie* the numerically literate) pointing out the problem *en-masse*.

Wayne says that by changing from commercial to military specification components a failure rate of around 0.5% could be improved to 0.1% but that this would add a "...zero to its price". He goes on to ask "Would you pay this extra for a 0.4% improvement in reliability?"

Back in the mists of time when we went to school, a 0.5% failure rate improved to 0.1% represented a factor of **five** (because you get one rather than five failures in a thousand flights); this shows a a 50% improvement rather than the 0.4% stated. Apply this to parachute operation and the difference takes on real significance!

Regarding his potential ten times increase in price, presumably only the costs of the *components* rise when those of improved reliability are substituted. Even then, the mark up on most Mil-Spec electronic and electromechanical components is significantly less than ten times the cost of their commercial equivalents. It would seem that a cost increase of less than ten applies and then to only the materials' fraction of the total.

On reflection, perhaps Wayne could be offering us five times better reliability (and reduction in customer angst) for a doubling of its price.

Is this "the modern maths" or modern marketing.

TONY GEE, *Marlow Bucks*

MORE ABOUT QFE

Dear Editor,

With reference to John Stewart-Smith's letter in the last issue, p69, I think John has missed a large problem in setting QNH, namely where do we get it from? The vast majority of glider pilots do not have RT licences and so only have access to the allocated glider frequencies. Do we want regional QNH broadcasts on the already crowded 130.1MHz? I think not.

I was taught, and now teach, that the altimeter is inaccurate in the circuit and so you should use **the mark one eyeball** in assessing the circuit heights by looking at the angle to and distance from the landing area. This is how you have to judge your circuit into a farmer's field. (QNH is useless in field landings because not many fields have spot heights on the map for you to calculate your QFE for the circuit.)

Leaving the altimeter set to QFE is invaluable in calculating final glides, but the adding/subtracting of airfield height above sea level when set to QNH would require yet more electronics in the cockpit (or maybe a three sided John Willie).

If a glider is approaching an airway the pilot can adjust to 1013mb to check clearance and return to QFE later on.

I think John is a frustrated power pilot seeking to complicate a sport whose beauty is its simplicity and ease in which to participate.

IAN PADGETT, *Fenland GC*

John Stewart-Smith replies: I think that Ian Padgett misunderstood my letter. I was not saying "We should set QNH while gliding." I was asking "Should we set QNH while gliding?"

Where does Ian get QNH if he wants it? From the same place as he gets the QFE! An instructor must know that if he sits in his glider on the runway and twiddles the little knob on the altimeter until the instrument shows airfield elevation then he has set QNH as accurately as he would have set QFE anyway. By the way, why do "the vast majority" of glider pilots not have RT licences? They'd be safer if they had.

I'm surprised that Ian was taught (and apparently believed), and now teaches, that the altimeter is inaccurate in the circuit. Perhaps that's not what he meant, but that's what he wrote. The altimeter is as accurate in the circuit as it is anywhere else. In fact, it is more accurate at low altitudes than at high altitudes. You don't actually need spot heights to show the elevation of the ground below, Ian. Have a careful look at your up to date aeronautical chart.

No, I'm not a frustrated power pilot trying to complicate gliding. I am a fairly experienced pilot interested in promoting flight safety and discussion of safety related topics. My question was really "Why do we do it this way?" Your answer seems to be a classic: "Because that's the way we do it". "There's no reason, it's just policy", was always a well used RAF dictum!

CLASS D AIRSPACE

Dear Editor,

I see from the last issue, p72, that the revised airspace rules for 1997 specify that for transit through Class D zones, glider pilots are now required to contact the zone ATC. More interesting is that we are required to describe ourselves as either a "Standard/15 Metre Class or an Open Class glider". Well that is real nice.

As a pilot of a mere Dart 17R (max L/D 35 at 46kts when it was new and probably much less now) whose performance hardly approaches that of a Standard/15m Class glider, I would like to know exactly what I am meant to describe myself as? Although technically at 17m it is an Open Class aircraft, I don't feel that describing myself as one will be very helpful to ATC in alerting them to my performance. As Darts still make appearances in Regionals I get militant when being labelled "Vintage Class", however, I did wonder whimsically whether the description "Crap Class", which undoubtably has a certain ring to it, would go down very well with the ATC concerned. (We are talking about aircraft performance here by the way - the pilot is neither vintage nor crap!)

From my study of the notes on airspace it appears that if you are not flying a high speed piece of plastic then Class D ATCs are not expecting to hear from you. My perception is that the BGA/NATS has assumed pilots of lower performance aircraft, who of course will need to stop and thermal in the Class D area, are not going to want to call a Class D ATC. Whether this is because they think that older gliders do not have 720 radios, the pilots do not have R/T licences, no enthusiastic pilot would ever fly such an old aircraft or even that these aircraft are not capable of serious cross-country flying I hate to think.

There are plenty of owners of wooden aircraft such Darts, Skylarks, Pirats, SHKs, K-6s etc (not forgetting Platypus' T-21 of course!) who do actually fly their aircraft cross-country. We may not break speed records, nor be able to do 750km in them, but Diamond distance is certainly possible: Steve Longland proved it and the contributions in the last issue from Adrian Emck and Mike Oliver (p81 and 83) showed again that it can be done.

It is possible that the lack of a suitable identification category for "non racing gliders" to relay to ATCs is deliberate, and that low performance gliders will not be accepted for transit in Class D airspace by the controllers (excuses possibly being the inability to maintain required height bands or too slow progress perhaps)? If this is the case, could this be made clear explicitly rather than by omission.

DAVID CARTER, *Oxford*

Carr Withall, BGA Airspace Committee chairman, replies: David Carter has brought up a point I should have clarified. The description of whether one is flying a Standard/ 15 Metre or Open Class glider was to give controllers the two approximate performance criteria over a ten mile best glide. We agreed with controllers only to have two Classes to keep it simple.

All gliders below a glide angle of 1:50 should count themselves as Standard/15 Metre Class. The loss of height over ten miles has been given as 1500ft, flying at 50kts. The present day Open Class gliders with glide angles of well over 1:50 will be expected to lose 1000ft over ten miles. The controllers are expecting gliders to thermal and possibly have to change track by up to 90° to find lift. Every Class D ATC unit has been sent a comprehensive gliding information pack.

I also had a Dart for several years and my logbook shows many cross-countries up to 325km. You have not been forgotten.

THE POSITION OF RELEASE HOOKS

Dear Editor,

One has to disagree with The Arm-Chair Pilot about old forward located winch hooks. (See the last issue, p80.) All the stick force told you was how horribly you were twisting and loading the tail, and even that depended on where you set the trim. (Nick Goodhart pointed this out years ago.) At least in the first part of the launch, the climb attitude is an excellent wing load indicator as I hope my articles in *S&G* have made clear. Most hooks now seem to be well situated, though the worst I ever saw was in a modified M100s which was so obviously too far back that I am at a loss to understand how it got cleared. Actually I think it was just done without asking.

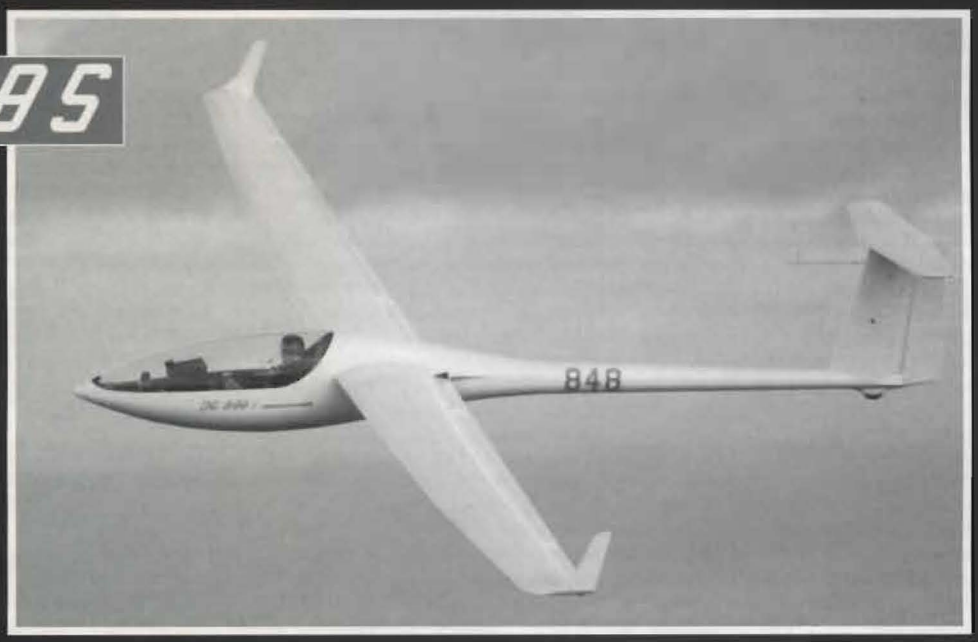
On the other hand, although I have been probably most directly responsible for removing the tyranny of believing that exceeding the placard limit by 1kt in a winch launch would instantly place us at peril of a glider disintegrating around our ears, I endorse in the strongest possible terms The Arm-Chair Pilot's plea for common sense about the grossly excessive launch speeds to which some clubs now expose their members. ➡

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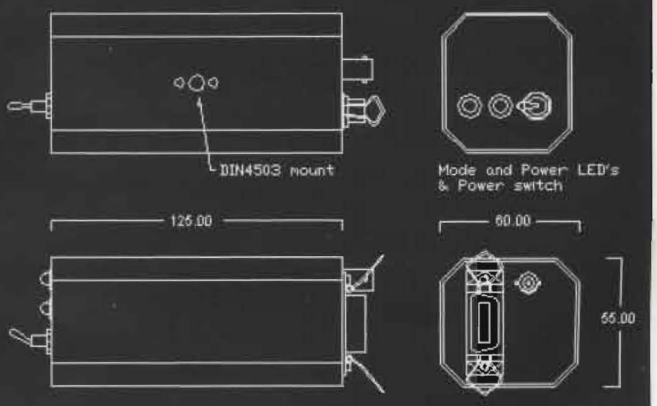
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To jump from the realisation that high speeds are not as dangerous as was once thought straight to the idea that very fast launches are acceptable is utterly absurd and idiotic. It completely ignores the issue of the quality of the launch, which demands that the pilot and glider both receive due respect. Anyone who is completely happy to get a 75kt launch in a K-8 has no business to be flying it. As The Arm-Chair Pilot knows, maximum launch height can be achieved at sensible speeds, typically only 1.5 times the stall speed to perhaps a little more.

The Arm-Chair Pilot's club has a powerful winch that can nevertheless provide exactly the correct cable load for perfect launches at sensible speeds (as his experience proves). A load of some 1.1 to 1.2 times the glider weight is just right, coupled with power modulation for initial acceleration and pre-climb phases. An absolutely excellent series of articles on this winch type appeared recently in the Bristol & Gloucestershire GC's newsletter which should be required reading. My own club launches anything from a 45kt vintage design Gull 3 to the DG-500 on our 300bhp winch at pretty well the right speeds most times.

Why do people, especially instructors who should know better, put up with violent take-offs and rocket launches?

JOHN GIBSON, *St Annes-on-Sea, Lancs*

Dear Editor,

The Arm-Chair Pilot's thought provoking article expressed concern at high energy launching dished out by most clubs. What a sea change I have seen in the 20 years I have enjoyed gliding. In my early days some pilots wagged tails as their speed approached the placard limits and pulled off if 1kt over that guideline. Only a week ago a new club member commented that he felt safer in the K-13 when it was launched at 70!

The dynamics of the winch launch are straightforward yet contradictory advice abounds. One point from the article bears repeating. The author abandoned a fast launch. On his next he asked for less energy, stayed inside the recommended speed and enjoyed the highest launch of the day.

The explanation is simple. With a reasonable wind the longer you stay on the wire the higher the launch. The wings work best at min sink for the high wing loading on the wire launch. Fifty knots is the best speed for the K-13 with the winch pulling 1100lbs (the maximum available on a 180bhp version of the Supacat winch).

In addition the harder the winch pulls the higher the launch, but this could cause over-speeding. Can you have the best angle of climb and slowest safe speed? Yes, if the winch driver offers the optimum load and the pilot takes responsibility for the speed. The usable load is limited by the maximum pull generated by the glider's elevator. For the K-13 in the established climb this is not much over 1200lbs.

It has no difficulty in pulling the speed back to the optimum 50kts at North Hill. This is independent of windspeed. Above 1200ft the angle of the cable reduces the available pull from the elevator. At the maximum launch height in strong winds the load in the cable has to come back to 500lbs.

In the first 100ft the wind strength dramatically alters the optimum load. Glider speed increases as the engine accelerates, with the geometry of the rotation into the climb and with windspeed. In strong winds speeds of 70 to 80kts are commonplace at 100ft. These can be eliminated. The right loads range from 1100lbs for no wind down to 500lbs at 25kts.

That in a nutshell is the simple formula for smooth launching within the placard limits to maximum height. For other gliders the maximum pull of the elevator (not its weight) determines the ideal range of loads. For example the K-6 can only pull 800lbs while the K-8 manages over 1000lbs.

Finally why do most winch designers include automatic gear boxes or torque converters which swap cable speed for load? The change is usually for the worse. For example they add to the pull at the top on a windy day when you need less. They can give the stationary cable a mule-like kick on the all out.

Winch launching is never dull. Even talking about it generates heat!

GORDON PETERS, *Wellington, Somerset*

WALKING ON AIR

Dear Editor,

The Scottish Gliding Union have formed a company called Walking on Air to bring gliding to the disabled.

It is recognised by the Inland Revenue as an established charity.

With wheelchair bound people as the target we already have 600 potential members in Scotland and a small group have had trial lessons to prove the viability of the project.

To date we have attracted the goodwill of the Allied Dunbar Foundation and with the help of the Scottish Sports Council have a grant from the Lottery Sports Fund.

I would like to appeal to all clubs in Britain for a donation. If every glider pilot in the UK gave £1 or £2 there would be a great boost to the funds.

Although this project is based in Scotland there is no reason why other clubs around the UK should not follow the same path. We would, of course, be delighted to assist any such venture in the future.

GRAHAM E. LAWRENCE, *Glasgow*

We welcome your letters but please keep them as concise as possible and include your full name, address and tel/fax number. We reserve the right to edit and select but point out that the views expressed in letters and articles are not necessarily those held by the BGA. Also, please send contributions to the editorial office at Cambridge and not to the BGA.

World Championships

Bob, British team manager for the World Championships in June, gives the latest news

You may well recall in the last issue, p87, that I thought Jacques Aboulin might be the new director for the World Championships. This was not to be and it was announced at the recent IGC meeting that Michel Fache would be the man taking the can, I mean plaudits. Michel is no stranger to the Alps - I am told he has competed in all three Classes in the area.

One of the first problems he has had to deal with is that the French equivalent of the CAA issued an edict on March 23 stating that because we do not issue pilot licences and Cs of A in a manner approved by the International Civil Aviation Organisation, British pilots needed to have a *Validation Etranger* "Stranger's Licence". (See Dick Dixon's comments on p168. Ed.)

Regarding the gliders themselves, the edict stated that British gliders were expressly forbidden from flying in France unless "exceptional" authority had been obtained from the appropriate authority (SFACT). This authorisation will normally be given for competitions and/or for short period visits.

Naturally we were concerned that this was a cunning Gallic plot to exclude us from the World Championships and, more importantly, meant that we might not be able to practise in the mountains prior to the official practice period. (A number of team members were planning to practise in late April/early May.) My fears were abated when I was assured by the organisers that the appropriate permission had already been obtained for the Comp.

(In fact we are taking eight gliders so that all the team members listed in the last issue will be competing.)

The whole subject is now (mid April) being addressed at BGA and CAA level and we are hopeful of an amicable and sensible outcome. For a number of individuals it has been a frantic time rearranging expeditions etc, and some have been foiled in their attempts to fly in France since the edict.

Another interesting fact is that the latest Filser LX5000 Flight Information Centre (two of which we have just installed in our glider) has an interesting page named TEAM. A reliable source has advised me that this page, coupled with an extra piece of hardware (providing a data link transmitter and which fits in the instrument), will enable team members to read their colleagues positions, GPS derived and portrayed on an area map, without having to make any open radio transmissions.

I am concerned about the legality of the use of such technology in a gliding competition under the present rules. The information is transmitted between gliders on a frequency which is not in the list of approved frequencies for the competition and which, if transmitted to someone outside your own Class, could be construed as "outside assistance".

If it is at all encoded then it could be construed as illegal. I am in the process of writing to Michel Fache voicing my concerns.

THE FIRST FEW SECONDS

The article by P. J. Goulthorpe "Charlie" in last June's issue, p140, set out a simple theory to account for the performance of a glider on the winch. However, getting the best out of a winch launch depends on getting into the climb as quickly as possible. So in this article he looks at the physical limitations which apply to the start of the launch - those first few seconds. There is, of course, more to a well-executed launch than flying to absolute limits. Safety and good airmanship add their own demands, as any instructor will be quick to insist, but it helps to be clear at the outset what the glider can and cannot do and why

Waiting for a winch launch can take ages until at last your turn comes. But then matters improve and, once the "all out!" signal has been given, the business proceeds with a briskness that is sometimes alarming.

A little mental preparation is needed. To that end, the following offers some thoughts about what happens to a glider in the few seconds between departing the launch point and settling into a steady climb on the winch.

The aim

In the initial phase of the launch (Fig 1a), the aim is to join the intended launch path at a target airspeed as soon as may be done with safety. The urgency is that to reach best launch height no more cable than necessary should be wound in before the main ascent starts. The hazard is that being too precipitate risks a cable break, or a stall, in a steep climb close to the ground.

Limitations

The operating manual for the glider puts limitations on:-

- Maximum pull on the cable hook (for which the weak link should act as a fuse).
- Maximum airspeed during winching.

The ground roll

Acceleration before take-off is controlled entirely by the winch operator. Cable speed needs to increase progressively without snatch so as not to endanger the glider, over run the cable, or break the weak link.

Typically the acceleration during the ground roll is 0.5*g*, which requires a cable pull of half the glider's weight plus whatever is needed to overcome its rolling resistance - a total that should be well within the maximum pull permitted by the weak link. Gaining speed at that rate, the glider will reach flying speed within 4sec and a ground roll of 150ft; sooner, if there is a headwind and in much less distance.

At this stage the cable is sliding on the ground, its weight supported; the cable pull is horizontal and applied beneath the glider, well below its C of G, so the aircraft's inertia will cause a nose up moment. Unless anticipated by the pilot, this may cause the glider to pitch up unduly as soon as flying speed is reached. (Fig 2a.)

In an aircraft with a high C of G (*eg* a high wing, pilot-sits-upright type such as K-8), the nose up moment is especially strong. Unless its acceleration is moderated during the ground roll, the pitch up at take-off is more than can be corrected with the stick held fully forward and the glider will rotate very rapidly into the climbing attitude. Fortunately, as it does so, the cable pull aligns more nearly with the C of G, reducing the unwanted nose up moment, and the glider returns under control. (Fig 2b.)

For gliders which have a nose wheel or skid and which sit tail-up at the launch point, rapid acceleration during the ground roll can bring the tail down heavily to the ground. That can be disconcerting and is plainly an abuse of the glider.

So the winch operator needs to keep in check the rate at which the cable speed is increased until the glider is airborne. It is helpful that the cable is sliding on the ground at this stage and the frictional load provides a restraint. After the take-off, the winch operator seeks to establish and regulate a steady cable speed which he judges to be the right one for the first part of the launch.

The rotation

If the winch operator holds the cable speed steady then acceleration after take-off is in the control of the pilot. As he rotates the glider into the climb, its airspeed will increase. Moreover, as the attitude gets steeper the effect becomes more marked; when the ascent is very steep, a small change in attitude will result in a big change in speed (Fig 1c). So rotation increases the glider's speed more and more as the climb steepens.

Throughout the brief rotation the cable stays more or less horizontal. It follows that the horizontal component of the glider's airspeed will not change; it will remain equal to the steady cable speed plus any headwind. All the gain in airspeed will be a vertical addition. So, during rotation, all the glider's acceleration is in the vertical direction. The effect of a vertical acceleration is to increase the glider's weight; half a *g* vertically would make the glider weigh half as much more, for example.

Now at every point in the launch the three main forces acting on the glider, weight, pull and lift, are in balance in a triangle of forces. Weight acts vertically downwards, pull (at this initial stage) acts nearly horizontally, and the lift acts (as always) at a right angle to the flight path. (Fig 1b.) So, as the flight path steepens, the triangle changes shape and both pull and lift increase in relation to weight. It follows that whenever weight is added to by a vertical acceleration, both pull and lift at that point will be increased also, in the same proportion. (Fig 1c.)

So, during rotation, not only does cable pull increase in step with the increasing angle of climb but it increases even more because of the acceleration involved. (And the same applies to lift and wing loading). Pull becomes rapidly larger as the glider rotates and as the climb steepens pull becomes more and more sensitive to the rate of rotation.

So rapid rotation can overload the cable and break it or its weak link at an angle of climb which in itself would not require an excessive cable pull. The most critical moment in a launch is just when the attitude is steepest, at the angle chosen for the start of the climb. It is best that the rate of rotation is much reduced as this point is approached.

However, there could reasonably be a compensating increase in the speed of rotation just after take-off, when pull and lift are much less and rotation causes less acceleration. This suggests that a ski jump shape would be a good model to take for the pitch-up profile, with the rapid rotation done early. (Fig 1d.)

Fortuitously, the change in trim which occurs during rotation as the cable pull realigns towards the C of G (Figs 2a and 2b) disposes most gliders to follow such a profile naturally. The practical point for pilots is to allow the glider to pitch up quickly at first but to make sure the rotation washes out as the pitch up proceeds. Being tentative about the initial rotation and then speeding it up, as height and airspeed increase, is not the best way. It is very likely to break the weak link if the chosen climb is a steep one.

Cable breaks towards the end of the initial phase of the launch are not uncommon. When they occur it is often supposed that the cause was a drag rise induced by a rapid pitch up or by a gust. However, the drag of a modern glider in such circumstances is unlikely to exceed 5% of its weight, whereas the forces brought about by acceleration can be much greater and are much the more likely cause of failure. The remedy is to moderate the rate of rotation, especially lat-

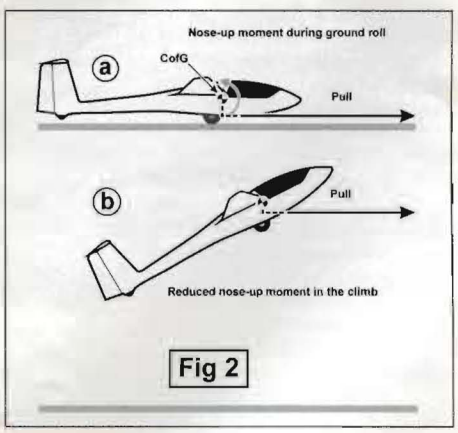
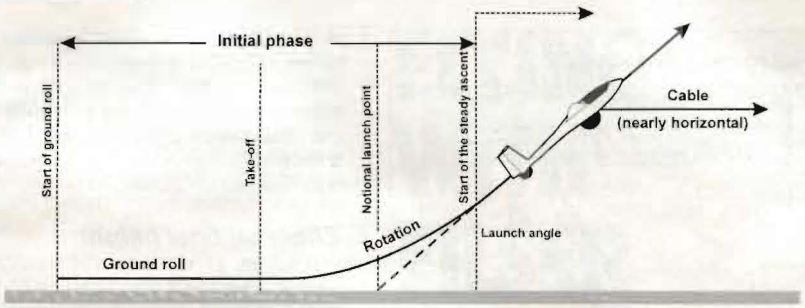


Fig 2

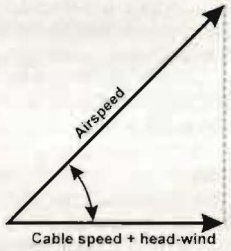
Fig 1a THE WINCH LAUNCH



DURING STEADY ASCENT

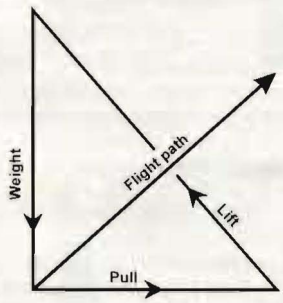
Fig 1b

SPEED OF THE GLIDER



The faster the cable and the steeper the climb, the greater the airspeed

FORCES ON THE GLIDER

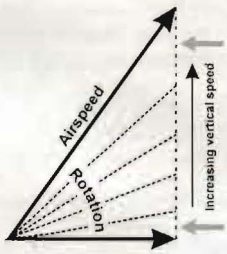


The greater the weight and the steeper the climb, the larger the pull

DURING ROTATION

Fig 1c

GLIDER'S ACCELERATION

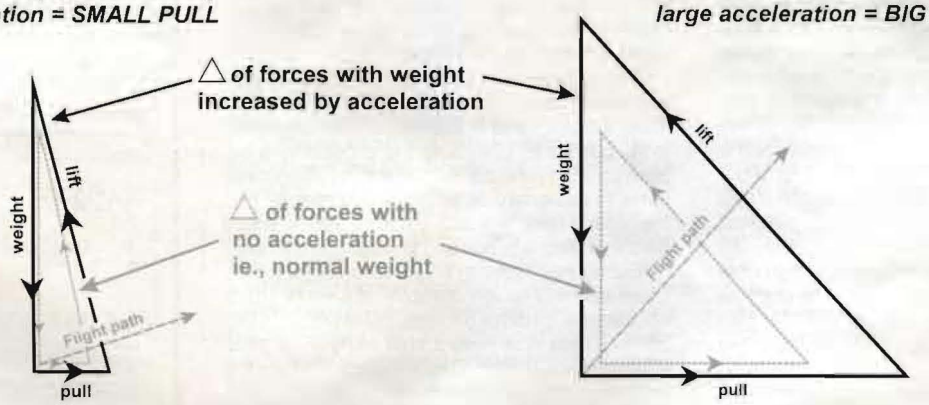


Speed gain is vertical. So the acceleration is vertical, increasing with the rate of rotation and steepness of climb. Vertical acceleration increases the glider's weight.

FORCES ON THE GLIDER

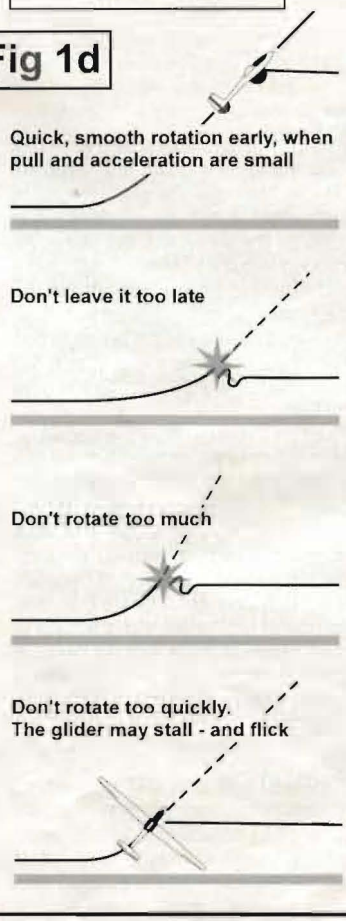
EARLY in rotation; shallow climb, small acceleration = SMALL PULL

LATE in rotation; steep climb, large acceleration = BIG PULL



HOW TO AVOID BREAKING THE WEAK LINK

Fig 1d

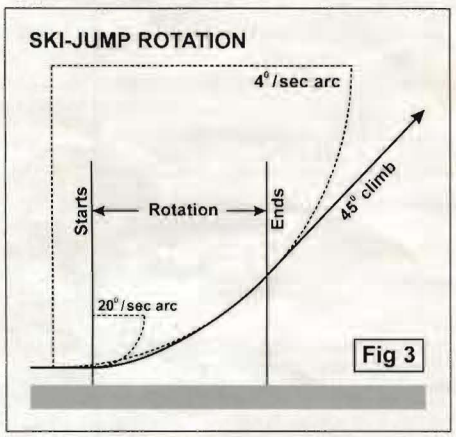


terly, and if that fails, to settle in future for a less steep entry to the main ascent.

An example

Some figures may help to appreciate what has been described. Imagine a glider just airborne and level at 45kts. Suppose the pilot intends to enter the main ascent at 45°, an angle which is almost as steep as the weak link will allow. As the glider is rotated into a 45° climb, it will gain a vertical speed equal to its horizontal one, *ie* 45kts. So, if the rotation were completed in 4. 5sec (say), the glider would have a vertical acceleration averaging 10kts/sec, or a little more than 0.5*g*. That would increase the weight, and hence both pull and lift, by 50%.

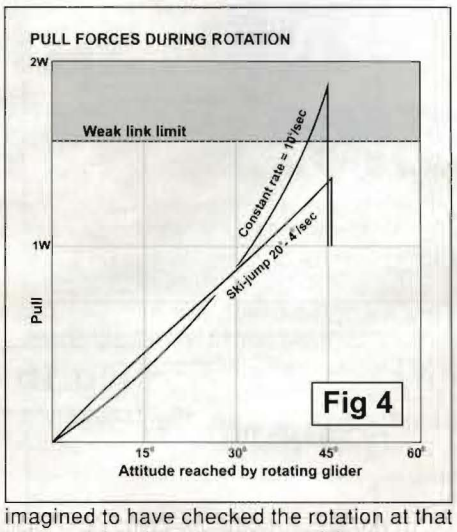
But that is just an average; how the acceleration varies from point to point depends on the shape of the flight path adopted by the pilot to make the rotation. There are any number of possible paths - abruptly curved or gradual. But clearly the 0.5*g* acceleration cannot be sustained as the 45° attitude is approached because the weak link will certainly not tolerate the addition of 50% to pull at that point. So, the rate of rotation must be reduced there and, to keep up the average, made faster near the start where the pull is small enough to allow much more than a 50% increase.



As an illustration, Fig 3 shows the rotation beginning at 20°/sec and relaxing to 4°/sec towards the end; successfully completing the rotation to 45° in perhaps 4.5sec overall. It is a shape that could be described as a ski jump.

The pull forces (as multiples of normal weight) arising during that rotation are shown in Fig 4 where they are compared with an alternative pitch up in which the glider rotates at a steady 10°/sec throughout; so both aim to reach a 45° climb in 4.5sec but only the ski jump succeeds. The other breaks the weak link.

The data in Fig 4 make no allowance for the weight and sag of the cable, nor the drag of the glider, so the pull forces would be a little larger in practice than those shown. Another practical point is that with the pull changing so rapidly the winch operator may not be able to hold the cable speed absolutely steady, but such variation as there is will be small compared with the 45kt gain of vertical speed; so the picture presented in Fig 4 will not be misleading in any important way. The abrupt reduction in pull as the glider reaches the 45° climb comes about because the pilot is



imagined to have checked the rotation at that point and thereby to have stopped the acceleration instantaneously. That is not entirely realistic and no doubt any practical attempt to fly the manoeuvre would produce some blunting of the peak. However, that also is a detail which does not invalidate Fig 4.

Stalling

A ski jump profile, which has a rapid rate of rotation into the climb immediately after take-off when the airspeed is low, can be expected to present some risk of stalling the glider. It is a possibility to take very seriously because such a stall might not be the gentle curtsy with which most gliders greet the stall in normal flight. Under the cable and manoeuvre loads which have been shown to arise during the rotation, a stalled glider might depart very violently from controlled flight. Indeed the BGA has in the past given publicity to catastrophic accidents which occurred in just these circumstances.

A measure of the risk can be made from the lift which is required during rotation. In normal gliding flight the lift very nearly equals the weight, so at a point in the rotation where the lift needed is more than the normal weight the stalling speed will have increased there. In the previous example the glider started to rotate at a rate of 20°/sec when its airspeed was 45kts. That can be calculated to give it a vertical acceleration of 0.82*g*. If its normal stalling speed were 33kts, then its new stalling speed would become very nearly 45kts. In short it would be just at the stall, and the proposed 20°/sec pitch up would be the fastest possible in these circumstances.

Such figures from one example have no general application, of course, but they serve to make the point that in every practical case there is the possibility of stalling the glider during the pitch up if the rotation is rapid enough. The measures to safeguard against it are to ensure that the glider is flying well above normal stalling speed before rotation is begun and to moderate the rate.

The figures in the example also suggest that, when pitching up too abruptly, the weak link is no certain protection against stalling. The 20°/sec rate produces a stall early in rotation when pull is well within the weak link limit. As the rotation progresses and the airspeed increases, the stall becomes generally less likely while the risk to the weak link grows. However, a stall can be induced at any stage if the rotation is seriously mishandled. That conclusion is in line with experience; cable breaks are much more common than stalls but the latter do sometimes occur and can proceed all the way to disaster with the weak link still unbroken.

Effect on final height

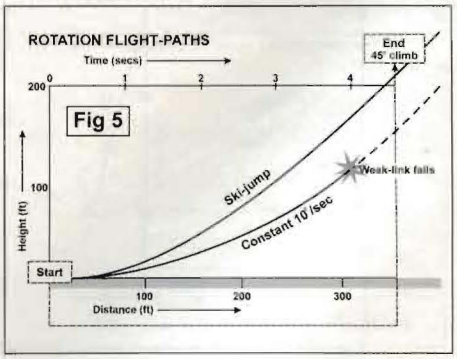
It is true, as was said at the outset, that the more quickly the rotation can be completed the more cable will remain for the main ascent and therefore the higher the launch. However, it is clear that being too precipitate risks a cable break or a stall. So it is worth assessing the trade-off between speed of rotation and final launch height

Consider the effect of a 1sec delay in completing the initial phase. If it is supposed that the cable speed is held steady at 45kts (76ft/sec), then the approximate displacement of the notional launch point (and hence the difference between the lengths of cable remaining) is 1sec at 76ft/sec, or 76ft. (Or it may be a little less than that, depending on the style of rotation the pilot uses.) Since the intended launch angle was 45°, the final height attainable will be about half the initial cable length. So each 1sec delay in completing the rotation will reduce the launch height attainable by about 38ft. If there is a headwind, the cable speed and the height foregone per second will be less.

As the climb angle is approached the loads on the glider are very sensitive to the rate of rotation. Many pilots might choose to slow down the rotation by 2 or 3sec and decide that the sacrifice of 80ft or so from the final launch height (less if there is a headwind) is worth making to enjoy a much less critical initial phase.

Although the figures used have no general application, they are not untypical. It can be instructive to time the rates of rotation in use by different pilots and to form a view of what rates are appropriate. But it needs bearing in mind that much depends on the steepness of the launch angle and the shape of the manoeuvre; the overall time taken is no measure of those aspects.

How the rotation appears to an onlooker is illustrated in Fig 5 which shows the flight paths in still air for the 20°-4°/sec ski jump and the 10°/sec constant rate examples. Both aim to reach a 45° launch angle in 4.5sec and have a constant cable speed of 45kts; so they move forward together but at different heights. It might seem that the ski jump is the more aggressive but it is the other which breaks the weak link, since it it does not reduce the rate of rota-



tion sufficiently as the climb steepens.

But it is only for the steepest launches that the rate of rotation becomes so important. As Fig 4 shows, for launch angles of 35° or less (as many club launches are), the pull forces are much the same for both examples and neither would break the weak link. Perhaps that leads to some lack of appreciation that any one technique is better than another.

Wind

Headwind benefits the launch because less cable speed is needed; so, in the ground roll and during the time taken for the rotation, less cable is wound in and more remains for the main ascent. (And that in turn gains much added height from a headwind.)

To the pilot it is apparent that the ground roll takes less time and much less distance but, once airborne, his technique in the rotation and climb needs no change on account of the headwind. He flies attitude and airspeed in the same way whether there is a headwind or not; the vertical acceleration and the forces involved are not altered, although to an onlooker the rotation may appear unusually abrupt when foreshortened by a headwind.

However, windy conditions are often gusty ones in which the entry to the main ascent will not be well controlled. So the launch angle may need to be less steep than the weak link would tolerate in smooth conditions. Crosswinds impose gusting limitations on the launch angle but without the benefits to best height, so they are wholly adverse to performance.

Summary

To reach best height from a winch launch the initial climb must be as steep as the weak link will allow and it must start as soon as possible after the launch. However, rotation into the climb accelerates the glider upwards and has the effect of increasing its weight. As a consequence, pull and wing loading are similarly increased during rotation. The effect becomes greater as the climb steepens, so the rate of rotation must be reduced to near zero as the limiting angle of climb is approached, otherwise the weak link will be broken. This suggests that a ski jump shape is a good model to take for the manoeuvre, in which the rapid rotation is done early. However care is needed not to stall the glider by unduly rapid rates of rotation.

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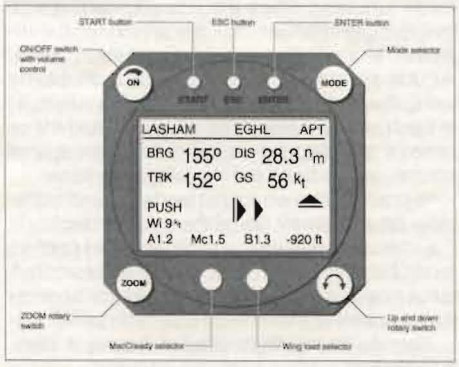
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FLYING WITH FILSER

Ian, a Lasham pilot who started gliding at Aboyne in 1976 and has more than 900hrs, evaluates the latest piece of equipment which combines the GPS with an electronic variometer and flight director





During 1996 I flew my DG-800A equipped with the Filser LX5000 GPS/Flight Information System. I arrived at this fortunate situation in a rather roundabout way.

Early experience with portable GPS receivers in previous gliders clearly showed their potential. However, since they were primarily developed for marine or land use, their memory capacity was limited and at times the speed of processing data lagged behind the somewhat more hectic needs of gliding.

In late 1994 I installed a Cambridge "S" Nav in my new DG-800A but wanted a more capable GPS receiver with a much larger memory, faster performance and graphic display capabilities. The answer seemed to be the Filser LX500 which is a panel mounted (80mm) GPS unit with a specification that met all my needs. Early flights proved that the Cambridge/Filser combination met all my expectations.

Enter fate from the world where I try to earn sufficient cash to fund my gliding activity (Marine Electronics). The boss of Filser Electronics GMBH - (Hr Walter Dittel) was looking at potential marine applications for their technology and Dickie Feakes (RD Aviation) contacted me for some ideas on potential marine applications, but inevitably talk turned to gliding!

The result was that they offered me the chance to try the latest Filser LX5000 which combines both the GPS and flight director functions in a single panel mounted unit.

If there is a tiny complaint about all DGs it's that the instrument pod is not the largest space in the world in which to install two separate integrated units. However, after some very careful plumbing, wiring and squeezing, it all went in and I have since had the privilege of flying with two first class flight instruments - sadly my gliding ability has not increased in direct proportion.

The Cambridge and Filser shared the TE flask and Prandtl tube system and I was able to fit both ± 10kts electric varios (57mm diameter). The Filser LX5000 is a powerful unit combining both full flight director and GPS navigator functions.

The variometer function provides a total energy compensated variometer (pneumatic or electronic); net relative variometer; digital averager; speed-to-fly indicator and audio functions. The GPS Navigator offers track (TRK); bearing to waypoint (BRG); speed over ground (GS); distance to waypoint (DIS); estimated time of arrival at waypoint (ETA); estimated time *en route* to the waypoint (ETE); selected track to the waypoint (TRK) and graphic task/track plotting.

Further functions include a temperature compensated electronic altimeter, a final glide calculator with automatic wind compensation and a flight path recorder (position, altitude and vario).

The LX5000 will store data on about 5000 airports, 600 TPs and 100 tasks (up to ten TPs each). A comprehensive European airport database is already installed - TPs and tasks are up to the user. Data can be input from the display unit but this is rather laborious. The unit is designed more practically to be uploaded/downloaded using a portable PC and DOS based software is provided.

The control unit fits a normal 80mm diameter panel cutout. However, the extremely ingenious fixing screws also double as rotary control spindles giving full control of all functions as well as leaving the LCD screen at maximum area for display purposes. Installation is very straight forward with a full harness provided with high quality plugs etc.

The LX5000 as tested offers seven operating modes -

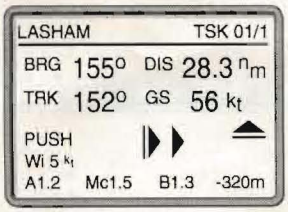
APT gives direct access to stored airport data. This can be used for a direct flight to an airport and allows five pages of data to be scanned for flight or arrival information.

TP provides a similar level of data for a direct flight to a TP.

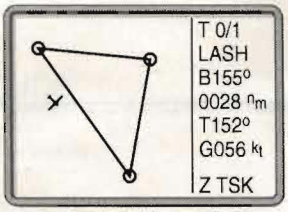
TSK. Using the stored TP data, up to 100 tasks can be entered into memory and activated when required. In task mode again five pages of data can be displayed on the screen showing each task leg as it is flown, plus there are three "screen zoom" levels showing each leg graphically right down to photo sectors - a truly valuable aid for navigationally challenged pilots such as myself!

Set up. This mode allows comprehensive customisation of the variometer system to the sailplane (polar, GPS configuration, NMEA outputs, audio settings, TE compensation etc) as well as setting daily flight information such as QNH. Sensibly the permanent data is password protected to prevent inadvertent change.

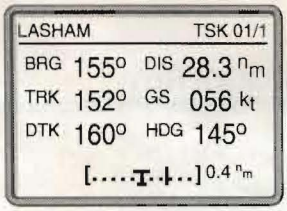
Statistics. Post flight statistics are presented for each task leg and the full flight history (up to ➡



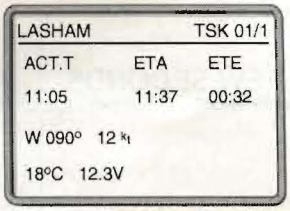
Task - main screen.



Task - graphic display



Task - CDI display.



Task - route details.



Task - TP details.

30hrs of flight logging) can be downloaded using the PC. This provides a very useful quick post flight record of the task with average speed for each leg and overall. Much more informative is the graphical analysis available on the PC which displays the task, track over the ground, barograph trace and vario trace, thus allowing the pilot to demonstrate the consummate skill with which he sped round the task (or in my case stimulate debate as to which task I was actually trying to fly!). It should be emphasised that the LX5000, although an integrated GPS/flight recorder, is not an IGC approvable configuration. (Filser have developed and launched an IGC approved product.)

Near airport. In this mode the screen display lists the ten nearest airports from the APT database. On first use this appears rather more suited to powered aircraft, but the APT database does include (as supplied) most UK gliding sites and can be edited. It is possible, with a little effort to customise the database so that you can include any suitable landing site as an APT - microlight operations, farm strips, known fields etc.

I found it of particular value when flying in the Alps in France to be able to nominate the various key landable fields as "airports" and thus have an instant readout of range and bearing to the nearest piece of landable terrain. A further benefit is that if you select your chosen APT you have available either full data (altitude/runway details etc) from the standard database or you can enter these details yourself when creating your edited data. The very helpful French publications on landable fields in the Alpine region give you all the data you need. As a note of caution, I would emphasise that whilst it is great to have this back up whilst flying in the mountains, it is usually indispensable to follow the experts' advice and visit the fields on foot before even thinking you might land on them.

Position. Here the information displayed provides pure GPS data (lat/long, time, receiver status etc). There is also a useful stop watch function available here.

Fitting to the glider. The installation kit is comprehensive and all wiring looms are pre-formed. The opportunities to get things wrong are really minimal and it was very straightforward.

Setting the calibration parameters. It is a very comprehensive product and virtually every calibration function can be set to user defined levels (*eg* polar, vario, audio, units etc). This initially looks a daunting task but is actually very logical. The software even helps you as, for example, the audio section allows you to run a demonstration of the various audio configurations/tones available before making your choice - very neat!

The permanent data is set up in a password protected section and the degree of user choice should meet all needs. Polar data can either be selected from a database already programmed into the unit by glider type or customised from a three point input using PC software.

NMEA outputs can be activated to feed information to other onboard electronics or recorders.

Flying With Filser

Having dealt with the installation and calibration there was now no excuse not to try it for real. Operation is simple once a few basic commands have been mastered.

On switching on the GPS receiver it takes a few moments to acquire a fix and then prompts you to input the airfield altitude - it's actually smarter than this, for if you regularly fly from the same site it recognises that's where you are and prompts you to confirm the airfield (*eg* Lasham?). You then need to put in the QNH value and you are ready to go.

The mode switch enables you to select any operating chapter but for gliding these are likely to be APT (your local field) or TSK when flying a task. Although it is easy to use tasks which you have pre-programmed, provided you have entered and downloaded say the BGA TP list from your PC, it is very easy and quick to format any task using the BGA trigraph identifiers. The ballast and MacCready settings are input using rotary controls on the unit fascia.

So, having told your Filser where you are and what you want to do, it is time to go.

In flight the unit has two clearly differentiated functions:- a variometer/flight director and a GPS navigator.

In each chapter (airport/near airport/TP/task) these functions share the first display page so that all flight information is directly visible (or audible!). More detailed navigational information, including a graphic track plotter, is available by using the page select control (up/down switch) in each chapter. However, when viewing these pages the gliding data is not visible although, of course, all functions are still fully operational.

In practice this works out perfectly well as for most cross-country flights the primary display is the one used. Reference to other pages is often made but only for brief periods. (For example a quick check on the graphic display for orientation or a look at the ETA/ETE to the next TP.)

The variometer/flight director display is comprehensive:-

Speed-to-fly - (push/pull) is of course derived from the input polar and ballast setting. The climb/cruise function can be activated by a switch (flap or manual) or *via* airspeed (user definable).

Wind - a headwind/tailwind component is displayed and actual wind (speed/direction) is also available on a Nav page.

Average climb. The average climb rate is shown and the time constant can be user defined (normally 20secs).

Ballast/MacCready. These are user settable from the front panel.

Arrival height/glide slope. You can set a user defined arrival height and then a graphic and numeric indicator will show the height required corrected for the wind component. The navigation display gives the main data (bearing, track and distance) relative to an airport or TP as well as groundspeed, and there is a CDI graphic display to show the direction to steer.

Flying a task

The comprehensive capability of the Filser LX 5000 makes navigating around a task very simple and removes most of the pilot workload in this area. The user manual correctly points out that this does not excuse you infringing airspace or safety requirements.

GPS does not always work and (perhaps more importantly) we don't always input correct data! However, on most occasions an LX5000 will give superb navigational capability allowing the pilot to concentrate on exploiting the energy sources to best effect.

A typical flight would see the unit using task mode at take-off - this gives NavData relative to the defined start point. Once settled down with an updated MacCready setting mode and a look at GPS wind for comparison with visible drift, the graphics screen is selected (maximum zoom in) to show the start point and start sector. Flying into the sector gets a graphic thumbs-up from the Filser and switches the navigational data to show the first TP. The only other thing to remember is to press START as the line is crossed to initiate the statistics for the task.

Once on track the display is switched back to the primary screen (combined flight director/navigator) and the mind is free to concentrate on the flying. Depending on how lost I am (or how low I have got) use is made of either the other display pages or chapters (near airport when its all gone desperately wrong!).

When within 5km of the TP, it's back to the graphics page (maximum zoom) to concentrate hard on planning the rounding. Again the Filser helps by displaying the photo sector and advancing the programme to the next TP as soon as the glider is flown into the sector. On with the next leg and the process is repeated.

Any on-task changes (bugs/ballast/-MacCready) are easily input to the unit without excess button pushing.

Final glides are as painless as anything can make them (depends on what you have set as your arrival height) and although I rarely used the graphics function returning to my home site, it is a very useful feature when not too sure of what you are aiming at.

On landing it only remains to scrutinise the statistics and either congratulate yourself on a great flight or wonder how everyone else has washed their gliders, derigged and had a cup of tea before you have landed.

Comparisons

Using the Cambridge "S" Nav and the Filser LX5000 I can only conclude that they are both fine examples of their art. Both are highly user configurable and thus to an extent user preference can be accommodated by either unit.

As electronic varios/flight directors, I could detect little performance difference between them - I am sure both manufacturers would rush to correct the error of my views - but I am not an expert and feel that the potential of both units exceeds my capability to exploit them to the full. One minor complaint is that the electric vario of the Filser is rather too damped for my tastes. The Filser range of audio tones and features is considerable but more than I felt I needed to use.

However, (and here comparison is no longer valid) as a GPS navigator the Filser is outstanding (at least for my flying ambitions). Its combination of a comprehensive memory, an excellent range of screen displays and navigation data, as well as the graphic capability combined with a very legible and high contrast LCD display, confirm my original decision as to its merits.

Combine this with a highly capable electronic vario function all contained in an 80mm standard panel display and I think it would be hard to get more performance into a comparable package.





Left: Jasper's father (in the cockpit) and Mr Newman. Right: Jasper in the cockpit with his sister at the front.

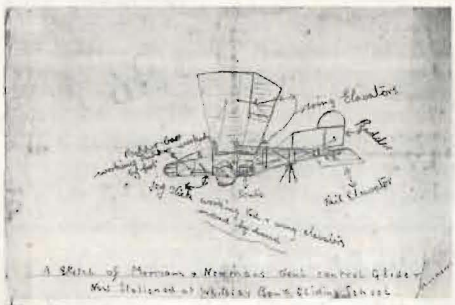
FIRST THROUGH THE CLOUDS

JASPER MERRIAM writes about his father, F. Warren Merriam, who it is believed formed the first gliding club in the world and then went on to build his own glider, the Merriam Newman

My father, an automobile engineer, paid the British & Colonial Aeroplane Company £50 to work in their sheds at Bristol in 1911, overhauling and keeping machines in working order. He also gave his engineering experience free for five months. The same year he had his first flight in a box kite and went on to become chief instructor and manager of the Bristol School of Flying, teaching more than 1000 to fly.

In 1922, apart from giving joy rides in sea planes on the Isle of Wight and testing the first all wood flying boat, he built his own glider, the Merriam Newman, at Wroxal.

It had a wooden frame, was screw and glue jointed, covered with fabric and doped, which dried and contracted to give a stressed skin. My mother did most of the dope work and all the sewing and fabric trimmings. Wire and turnbuckles for adjustment from extended positions braced the structure. The wing span was 36ft and it weighed 200lbs. It was built by trial and error in 18 months.



The sketch of the glider by 14 year-old Olin.

There were no technical drawings. All my father had was the sketch above by my step-brother, Olin. The drawing was remarkable as he was only 14 years-old and died a year later. Dad, being a keen photographer since the start of the century, took pictures of everything.

The maiden flight was at Wroxal and the glider was airborne for only a few feet before landing safely. It was more like a miracle witnessed by the family, farmers and labourers who assisted in the launch.

News travelled fast. Others wanted to have a go so the first gliding club in the world was formed and advertised in the Isle of Wight *Mercury* and in the November 1922 issue of *The Aeroplane*.

It was decided to start the gliding school at Whitely Bank where there is a good hill facing the south-west. The advertisement read: "The fee for a course which can last as long as the pupil desires will be £25, which will include instruction in the building of a glider and also the theory of gliding".

The one and only glider was the first to be modified for dual control and my sister and I were his first passengers, though I don't remember the event. Launching was man powered with an elastic catapult hooked under the rudder bar for release by the pilot. At first the glider had a release mechanism under the tail unit which was man operated. It was a tricky manouevre and on one occasion the chap went off with the aircraft!

In 1931 I remember a straight hop in a more advanced design with an open cockpit. I sat on my father's lap, he with the joy stick in one hand and an apple in the other.

Another time two tug-of-war teams were training for carnival competitions and provided a first class launch which will never be forgotten. There were two seven a side teams a wing span apart with a man on each wingtip and one on the tail to operate the release mechanism. "Ready? Walk! Run!! Release!!!" the pilot ordered. Split seconds before the last command to release, a strong gust of wind took all by surprise. The craft went up on its tail, the launch teams lost control, falling over each other, and the wingtip men had to let go. Fortunately the glider settled down without damage. On a later attempt 20ft was achieved over 30 yards.



Mr Newman (left) and Jasper's father with their glider.

Unlike the Merriam Newman glider which had an undercarriage (rather large wheels) a newer model, the Merriam Wilde, had a skid. The fuselage had exposed longerons. Other than the tail unit, wings and control surfaces, everything was uncovered. This made for simple maintenance and any damage would be quickly rectified so good progress was made learning to fly.

For the first hops the old dual control machine was still in operation. Then this latest design was brought out for the advanced pupils. Heights of 500 to 1000ft were achieved over a distance of a mile or more, launched from high ground, and my father prepared for the *Dail Mail* and *Daily Express* £1000 altitude and distance competitions at Newhaven, though sadly didn't win.

NB. Why the title? This was the book written by my father who continued gliding until the outbreak of the last war when the gliding club was disbanded.

Below: My mother doping the wings. Olin is in the photo with me and my sister.



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JACK ALCOCK



Jack, who for many years was an RAF pilot and CFI of Shackleton and Nimrod operational conversion units, started gliding in 1952 and has a Gold badge and two Diamonds. He was CO of the Air Cadets Central Gliding School, has been CFI and chairman of RAF and civilian clubs and amassed 10 000hrs, 6000 as an instructor. Jack holds the Queen's commendation for valuable service in the air. He is now Senior Regional Examiner Motor Gliders.

DON'T MISS OUT ON MOTOR GLIDERS

Jack emphasises the value of motor gliders in training and urges pilots to get their full qualifications for instructing before the stricter rules are imposed after June 30, 1999

It is now becoming quite common for gliding clubs to have at least one motor glider for members to use. Some clubs are prevented from operating powered aircraft by planning limitations on the airfield but there is still a significant number that choose not to operate motor gliders for a variety of other reasons. In this article I have given a resume of the main advantages of motor gliders in the gliding scene and brief details of the SLMG instructor ratings, in the hope that it might encourage those clubs to consider acquiring the use of one.

It might be useful if, first of all, I told you of my function as SRE Motor Gliders. The title is a bit misleading because my "region" is the whole of England, Scotland, Wales and Northern Ireland! Over that area I have two distinct tasks.

- I am responsible to the chairman of the BGA Instructors' Committee for all motor glider instructor training and instructional standards.
- My position carries with it chairmanship of the CAA SLMG Examiner Panel and I am responsible to the CAA for our standards of PPL and SLMG PPL instructor training.

The latter task includes being the link man between the BGA and the CAA on all motor glider flying matters. It is fortunate that we have been able to establish a very sound professional relationship with the CAA staff - they do listen and, so far, we have always been able to resolve problems.

Now the main bit - what motor gliders can do for gliding clubs.

- They can be used to shorten basic training times. If a new member is first given a couple of glider flights, he can then be taught the basics of all upper air exercises and circuits in the motor glider before returning to apply them to gliders. It generally costs them no more overall and the student can see real progress.

Not least, this is a big help in keeping members. What proportion of your *ab-initios* get fed up with hanging about all day for a few launches and give up gliding?

- With more time in the air and "instant thermals" from the engine, the motor glider can be very useful in sorting out learning problems. In particular, with the potential to achieve five or six circuits in half an hour, the motor glider can be of great help in sorting out landing techniques.
- It is now widely recognised that motor gliders are invaluable in teaching glider navigation, field landings and aerotow launch failures and make a substantial contribution to safer gliding.
- A motor glider is particularly useful for those clubs in poor soaring areas as students can be taken to thermals, ridges and waves and taught safe and efficient soaring techniques before being let loose on their own.
- It is an ideal tool for teaching the basics of instrument flying. In less than an hour, it is possible to teach the average student sufficient so that if he inadvertently gets into cloud on limited panel instruments, he can safely turn round on to a reciprocal heading and maintain that until he clears cloud. The hour's training also includes how to recover safely from stalls and spiral dives, which are the main causes of glider cloud flying accidents.
- Clubs can train their own members to PPL standard comparatively cheaply and, in some cases, prepare them for instructor ratings.

Not every club will want to do all that, but I would say that the key to successful powered aircraft operation is high utilisation. Anything above 400hrs usually makes commercial sense and results in cheap but still profitable flying for members. So the more activities you can include the higher the utilisation and the cheaper it gets.

Having decided to operate a motor glider, a club needs qualified instructors. There is a great deal of misunderstanding about motor glider instructor ratings but I think the situation is basically quite simple. There are two quite distinct and separate ratings.

1. The BGA Motor Glider Instructor Rating (BGA MGIR). This entitles instructors to teach gliding exercises on motor gliders. Any gliding full Cat with a current SLMG PPL and CFI's recommendation can be trained through a series of three stages (totalling two/three days) by authorised coaches or on special courses.

The limitations on the BGA MGIR are that the instruction does not count towards any CAA licence or rating, nor can the instructor send stu- ➡

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dents solo on the SLMG or supervise solo flying by those who do not hold an SLMG PPL. It must be renewed by a test every two years. All clubs should hold a brief on the BGA MGIR, but if not Ruth Sands at the BGA office has a supply and lists of MGIR coaches.

2. To teach for the SLMG PPL the instructor must hold a current CAA SLMG Flying Instructor Rating. To gain this rating the candidate must show he can teach the full PPL syllabus to the appropriate standard.

Besides general handling, the syllabus includes navigation at medium and low levels, lost procedure and diversions, basic instrument flying, practical training for the R/T licence and, of course, the instructors must be able to help students prepare for all the ground examinations. Obviously to be able to teach all that requires some training.

Experience has shown that the average gliding full Cat needs about 15hrs of flying training and ground training which, together, takes about nine days to complete. The courses are planned to be flexible and those with additional previous relevant experience can expect to complete in shorter timescales.

We try not to waste your time and money. Entry standards are similar to those for the BGA MGIR but 25hrs as pilot in command on SLMG and a Class 2 medical are essential pre-requisites. Fuller details are given in CAP53. This rating must also be renewed by a test every two years. The training can be done by any member of the CAA SLMG Examiner Panel, or on BGA or other courses. Again, Ruth has details.

I hope that has cleared up any misconceptions on SLMG instructor ratings. You should note that the guidance on SLMG instruction given in the current issue of **Laws and Rules** has become overtaken by events and should be ignored. That is until it is amended.

As to the future, last year's CAA circular on motor glider training indicated that, amongst other things, from June 20, 1998, PPL training would only be permitted from licensed airfields and using aircraft certified for public transport. Those conditions would have forced many clubs out of PPL training.

You may already know that the CAA has recently agreed to my request that our current arrangements should be extended until the new European regulations come into force on July 1, 1999. (See the last issue, p105.)

So this has solved those immediate problems. The European rules are not yet finalised. Without doubt they will be stricter than the system we now enjoy but I believe we are going to be able to negotiate a workable arrangement.

Whatever happens, the CAA will not touch our BGA MGIR and those who hold a CAA SLMG FIR on June 30, 1999, will have "grandfather" rights to continue instructing. So if we qualify as many as possible before then, the BGA should be well placed for many years ahead.

I hope this article will at least promote some discussion on the extended use of motor gliders in the BGA. I believe that the benefits in improved training and increased safety are irrefutable.

If anyone should want further information on motor glider matters or just wish to discuss the issue, please call me on 01452 830 737 and I will be pleased to give any help I can.

HOW WE WON THE LOTTERY

Simon, the manager of Wolds GC, tells how they were successful in their Lottery Sports Fund application and gives advice to other clubs

With a smile of Cheshire cat proportions, I opened the mail in late March to find that we had been successful in our Lottery Sports Fund application for £77 272 towards upgrading our fleet. This has taken eight months' hard work and more than nine months of waiting but it has been worth all the effort.

Roger Coote, BGA development officer, suggested I should explain the background to this application for the benefit of other clubs.

It is best to form a sub committee of members with time and expertise to formulate your plan. I was on our committee with a retired company director, a retired civil servant, an ex CFI, the club treasurer and two or three others who were prepared to help. And you do need a lot of help. If your project is a large one there is a great deal of planning and writing your application and the business plan which must accompany it.

The chairman should be the project manager and this entails endless time on the telephone researching your requirements, gaining estimates of costs, liaising with people outside the club and, of course, writing the application. It seems that applications not accompanied by supporting information, or a properly prepared business plan, are less likely to succeed than those that are well supported.

The Sports Council's Lottery Unit need all the fine details of your project, so consider all this very carefully. We wanted to upgrade our ageing fleet but it wasn't enough to say "we need help for fleet improvement". The Sports Council asked for a list of gliders and whether they would be new or second hand, the type of instruments we would fit, details of the trailers, the delivery dates, who would fly the gliders and why we wanted to improve the fleet. There is the same attention to whatever the nature of the project.

Expect such questions as:- What are the financial implications of your plan? Can you afford to reasonably maintain the borrowing levels that will meet your part of the funding and to what extent will your bank or members support your club? Can you afford the extra costs such as insurance, staffing or maintenance?

There is no easy route to a successful Lottery application but the result will reflect, in most cases, the work put in by your sub committee.

Your plan

When you come to prepare your plan there are two buzz words you must bear in mind. The first is *excellence*. How will the results of your project help your club members improve as pilots and how will it help you raise your general standards? Buying a modern fleet with far higher performance obviously made this a reasonably easy question to answer.

The second important word is *development*. You must show that as a result of your application your club will become stronger and more secure as an organiser and provider of gliding facilities. Infrastructure projects such as buying land or building hangars will help here.

To help the Sports Council's case officer we wrote a fairly detailed history of the club showing and explaining all the key moments of our development, such as buying land, and how they were achieved. It is vital to show that you intend to improve your standards and facilities, so the best way is to give your development track record. Does your club have any particular standing in hosting BGA competitions or do you have many pilots coming to you on expeditions?

Mention the achievements of individual club members - such as whether they are competition pilots, the number of Diamonds they hold etc. Link all this in with that word *excellence*. Don't worry if you aren't in the same league as the Lashams and Bookers of this world. If you are a young club you won't be expected to have World Champions based with you. But look to the future and explain that the development of your club will lead to greater things.

Two other factors are important - youth and public access. Do you have a dedicated youth policy? We have a bursary scheme for young *ab-initios* as well as low cost membership. Do you have a specific policy to attract members of the public? It is extremely important to show in your plan that outsiders are welcome as well as giving you extra income. If you hold open days or give trial instruction lessons, then emphasise the fact that membership is available to anyone.

Get help! Producing a successful application isn't easy. While we have a rich source of expertise at Pocklington we couldn't have achieved our success without the help of Roger Coote. His advice was crucial in the way we modelled various parts of the plan. Perhaps your bank or your accountant will also be able to help and make friends with your Sports Council development officer (SDO) based at the local authority. Ours in East Yorkshire gave excellent advice. The Sports Council need the comments of your local SDO as part of your application, so you must involve them at an early stage.

To summarise

As we have always been intent on making our site secure by buying land, we have never been able to afford new gliders. I don't think I will forget the elation of opening that letter giving us the grant aid and the feeling of ordering two new K-21s and a new Discus. We thank our team and, of course, Roger Coote. If there is one bit of advice I would emphasise is use Roger - he knows his stuff.

And remember those two words - *excellence* and *development*.

TAIL FEATHERS

Feckless

When you see a glider pilot, usually male and youngish, driving a brand, spanking new car at high speed across the bumps and ruts of a gliding field, you know immediately that this shiny vehicle has been paid for by some corporation, in which he is a star salesman or rising executive. It is a truth universally acknowledged that company cars are built in different factories from ordinary cars: they are constructed to different specifications and made of unique materials. Unlike the engines of ordinary cars, company car engines do not need oil or water. Their tyres do not need pumping up regularly, and their exquisite leather upholstery shows no ill effects from carrying a bouncing cargo of wing dollies, tow bars, tool boxes and leaking ballast carriers.

Screeching to a violent halt that would halve the life of an ordinary car, the young fellow then leaps with enthusiasm into a club sailplane. He knows that club gliders are just like company cars, built in different works from the machines sold to private individuals. Club gliders too are indestructible, quite unlike the private glider (even if outwardly identical) which he yearns to buy with his next bonus. That private ship he will cherish, and sigh and fuss over every scratch, because, like the car his poor old father drives in his retirement and pays for out of his own pocket, such aircraft are made of much more delicate stuff.



His poor old father.

Club gliders, unlike private gliders, do not blow over when left unattended in high winds. Their canopies are made of space age transparent steel, and need not be latched down securely the way private canopies should be. If you can't see out clearly, a rough wipe with a dirty cloth - no need for water or wax - will do fine. The diamond-hard surfaces of club canopies are proof against abrasion and scratches.

Club gliders love rolling across ruts at full tilt, just as the company car enjoys it. Their variometers are specially designed not to mind insects stuck in the pipes, though they appreciate it if you occasionally apply your mouth to the pitot and blow as hard as you can to clear the dead fauna from the tubing. The wing sections specially designed for club aircraft are likewise indifferent to any amount of dead bugs, so these should be left to accumulate. Club gliders can be dived from 35 000ft at VNE without the gel coat suffering from the 50° change in temperature. In short, the club sailplane is a truly wondrous piece of kit. Amazing is too modest a word. It's all very well Herr Waibel telling us how he creates elegant contest winning designs for private pilots to buy (see p160) but why doesn't he tell us the much more fascinating secrets of how club gliders are manufactured?[1]

Speechless



Chanced to overhear two chaps.

Some time ago an old - well, ancient, really - friend of mine was out on the field at a site quite a long way from London, and chanced to overhear two chaps talking fairly loudly. The subject was the forthcoming club dinner-dance. They obviously did not know that the old gent was a mate of mine, since the conversation went more or less as follows:

"We were thinking of getting that Platypus guy along to do the after dinner speech."

"And did you?"

"Nah."

"Why not?"

"Well, he asked us to pay him a (derisory figure) pounds fee, and we decided he wasn't worth it."

"Quite right. Bloody cheek."

Well, the club in question is now under the curse of Plat, in which everything they attempt will look as if it is going to work just fine, then it will all fall apart at the very last moment: winches, weather, you name it - all under my malediction. I'm a pretty sunny character most times, though with the odd *bersercker* streak inherited from my Norwegian great-grandmother.

I must make it clear that the curse is not for refusing to pay a fee so measly that it would not fill my petrol tank, but for putting about a barefaced lie.

For I must state, just in case this sort of scurrilous nonsense goes unchecked and spreads out of control, that I have never asked for a penny at the dozens of occasions on which I have spo-



A portion of my petrol .

[1] Platypus has just rung up from a South of France gliding site appalled to have been told that the quality of club gliders was discussed extensively in *Australian Gliding* some years ago and he doesn't want to be accused of plagiarism! Ed.

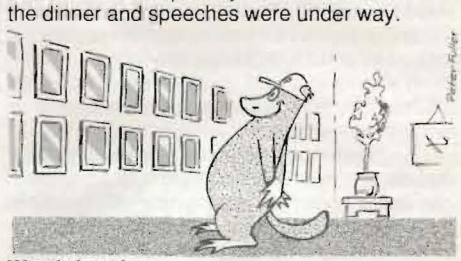


Drinks ahead of me.

ken in England or abroad. Yes, they always put me up for the night (it's better than sleeping in the car) and one club without any prompting kindly offered a portion of my petrol costs for a 300 mile round trip, which I accepted. However I never ask for fuel costs, or for anything except the bed. It's a pleasure, as well as educational, to visit a variety of clubs, and especially the small ones, because of the lively enthusiasm and all-mucking-in-together camaraderie; I have made many new friends that way. So there is no reason at all for them to pay for my petrol.

They haven't got much cash to throw around, and I'm a widower with no dependants and few expenses apart from three gliders and a cellar to maintain. Of course I am allowed a free dinner too - though for years I was so nervous I never ate at all, or drank anything thing but water, until the speech was finished, so it was a cheap deal for my hosts. Now I am less nervous and think it's enough just to let the audience get a couple of drinks ahead of me. If I'm half drunk and the audience is totally drunk, for instance at a great Booker beanfeast (an opportunity to celebrate Brian Spreckley's victory at Benalla in 1987) everyone has a good time; they'll laugh at anything in that state.

On which subject it was rather disconcerting for me, as the main after dinner speaker for the second time in three years, to see that 90% of the audience at the 1996 Soaring Society of America convention in Alabama drank nothing but iced water during the meal. Some of them had a small cocktail beforehand, but the effect of this was bound to wear off by the time the dinner was over and the prizes and preliminary speeches were done. I was addressing a truly sober audience, which is itself a sobering experience. Speaking under those conditions requires the sharpest wit and fine timing, not the broad knockabout humour that had them literally rolling around the floor at the Booker do. To be fair to the Booker boy racers, the hotel had got so far behind with the food at the 1987 do that an unusual quantity of drink flowed before the dinner and speeches were under way.



Worth framing.

A great thing about the American gliding conventions, apart from the vast and luxurious hotel beds, is the wonderful "Thank you" letters they write to me when I get home: these are so sincere and warm, and worth framing on the wall, that I want to swim right back over there and give an encore. That's all I really want. Honest.

EVOLUTION OF THE HIGH PERFORMANCE GLIDER

PART 3

"Enter the hang glider" is how Ann starts the last part of her award winning paper published in the Royal Aeronautical Society's Journal. We are grateful to the Society for giving us permission to reprint a much enjoyed feature

The first sign of a radical new direction appeared in the USA in the late 1960s with the "Low and Slow" movement: people who wanted to escape from concrete airports and heavy, expensive gliding. The early hang gliders were not capable of soaring, but what mattered was that very large numbers of people world-wide discovered that they, too, wanted cheap, simple flying and set out to get it.

Within five years of the short flights of pioneers like Richard Miller, thousands of hang gliders were in the air. In 1975 the Austrian, Sepp Himberger, announced a World Championship at Kössen. He expected about 50 pilots but more than 200 turned up.

Within a year FAI had accepted hang gliding, established the Commission Internationale de Vol Libre (CIVL) and the first official FAI World Championship was held at Kössen. There a few pilots showed that their "ragwings" were just capable of soaring.

Progress was rapid simply because there were so many people all wanting the same thing. Within a few years hang glider performance had so improved that their pilots were finding themselves in the same thermals as gliders - with the hang gliders climbing faster because their small turning circles allowed them to use thermal cores more efficiently.

Minimum sink rates were, in fact, not so different, but glide ratio was: 1:10 for the hang glider as against 50 or so, Figs 46 and 47.

The hang glider pilots did not mind this. They were on a steep learning curve in soaring techniques, and were enjoying themselves. Distance flying was, for them, exploration flying - as it had been for glider pilots 50 years before. With their slower inter-thermal speeds the pleasure of soaring for 4-5hrs above the changing land below was, and is, to them as satisfying as is racing over it at high speeds to glider pilots.

The world distance and goal hang gliding record is just on 500km. They have a whole new range of electronic instruments, including no less than 14 types of thoroughly tested electronic barographs which provide detailed printouts of flights.

Although hang gliders do not have the potential for performance improvement as did gliders, the typical competition aircraft has a L/D of 12. Again, typically, the span is 10m and wing area 14.5m², Fig 48. Empty weight averages 32kg with pilot weight from about 70-90kg - more than twice the aircraft structure weight. The landing run is 2-3 paces and the hang glider can be retrieved by ordinary car or even foot. The minimum sink rate is just on 1m/sec (as against 0.5m/sec for the Nimbus) with a workable speed range of 25-90km/h.

Hang gliders do not have the pitch stability problems basically inherent in tailless aircraft. The soft wing is held reflexed by luff lines from the king post; as speed is increased so is the amount of reflex. They have become technically sophisticated with variable geometry and floating cross tubes. When the 80% double surface fabric wing is tensioned in flight this increases the ability to fly faster without loss of glide performance. It is achieved by moving the cross tube along the keel, flattening the wing and reducing tip wash out. Tension is released for better slow speed handling. Flattening the sail is not entirely a simple process on a soft wing as it tends to bow the leading edges outwards and it causes some tightening of the luff wires which increases reflex. A compensation system avoids this with a rearwards inclination of the top of the king post when the sail is tensioned. Aspect ratios on hang gliders are not high, typically 7, as increasing the aspect ratio tends to increase wing twist and attempting to reduce this by increasing sail tension tends to worsen handling.





Left: Fig 46. Hang glider flying close to its VNE, with the pilot's C of G as forward as his arms permit. Photo: Glenn Edwards, Icon Picture Agency. Right: Fig 47. Typical foot launched hang glider landing. Just prior to touchdown, the pilot increases the angle of attack to achieve maximum drag. Landing speed is 5km/h or less and the run, two or three paces.

The next and somewhat unexpected step in soaring development was sparked off by the sky divers "square" parachute which, unlike the older "rounds", flies like an embryonic aircraft, Figs 49 and 50. Soon squares were being foot launched from mountains. Once more, it was very large numbers of people who saw the chance of cheap simple flying. In a few years squares had grown into paragliders and were soaring, first in hill lift but soon in thermals.

The typical competition paraglider has a span of 10m, Fig 51, similar to the hang glider but with a wing area of 30m², about double that of the hang glider. Aspect ratios are around 4. The paraglider itself weights only some 7kg with a pilot weight range of 45-56kg for smaller 23m² wing area models and 85-105kg for larger 30.7m² versions. Paraglider canopies are usually made of ripstop nylon with polyester Tijin being increasingly employed.

The very large quantity of suspension lines are 1mm to 1.5mm diameter, of dyneema or kevlar and the double surface canopy is made up of a large number of chordwise ram air cells with intentional cross span leaking for quicker reflation should it collapse.

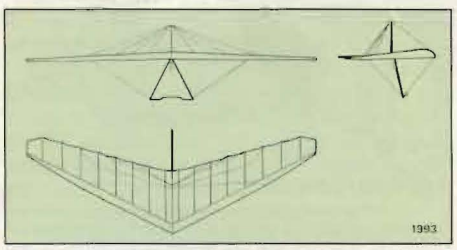


Fig 48. The 10.1m Solar Wings Rumour hang glider.



Fig 49. High performance paraglider turning. The pilot distorts the canopy as required by pulling on the appropriate lines.



Fig 50. Paragliders and a hang glider circling in a thermal under a small cumulus.

There are now some 250 000 paraglider pilots flying in Europe alone, with sales over the last ten years exceeding 200 000 units. They have large world championships with well over 100 competitors and the distance record is now almost 300km. A whole range of lightweight electronic instruments have been designed for them because, again, the market is large enough to support the necessary R&D and production costs. This is barely the case now in conventional gliding.

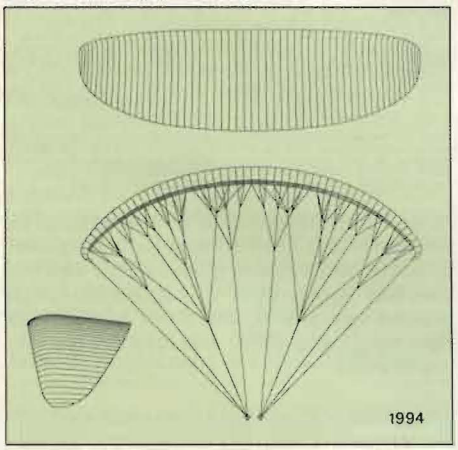


Fig 51. The 10m Rave Airwave paraglider.

In thermals paragliders are even more effective than hang gliding as the canopy can be kept in the thermal core with the pilot's larger circling diameter just outside it. The sink rate of 1.2m/s is a little higher than the hang glider and the L/D worse: the best having an L/D of 7 and a low speed range of 20-49km/h. They can be safely landed in tiny spaces and so are able to use weak lift very low down without risk.

As a result of the explosive popularity of paragliding - with a back pack aircraft and independence of operation - hang gliding is now no longer growing numerically and the pilot age is also going up.

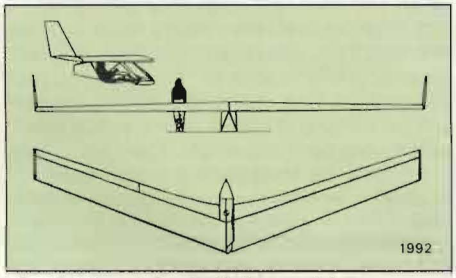


Fig 52. The 11.9m Swift hang glider.

Although many hang glider pilots can afford the top end of their range of new products, it is the complication compared to the simplicity of back pack paragliders with, now, not that much less effective soaring performance that is disadvantageous. We see history repeating itself.

Market forces indicate the likelihood that gliding and, in turn, hang gliding will continue the decline in numbers. This will not be a problem for their pilots for some time as there are plenty of excellent gliders and hang gliders in production with clubs and similar organisations to look after them. What it does mean is that there will be less incentive for manufacturers to risk money in a declining market, leading in due course to stagnation and further decline.



Fig 53. The Swift Class 2 rigid wing hang glider foot launching off a hill. Considerable strength and balance are needed.

Since soaring is, without question, a most satisfying and challenging of airsports, efforts have to be made - and some are already being made - to overcome reasons for decline, particularly in conventional gliding. Apart from external problems, such as controlled airspace, reasons include high cost of gliders and repairs, their weight, need for large airfields for launching and fear of the ordinary pilot to land out a big heavy glider. Gliders became heavier and faster through the search for ultimate performance which was, and is, indeed a worthy objective,

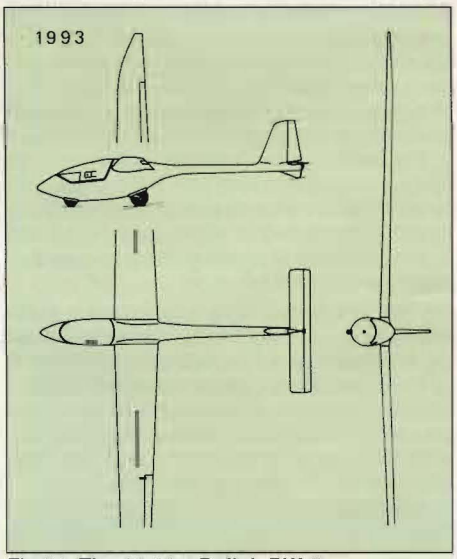


Fig 54. The 13.44m Polish PW-5.

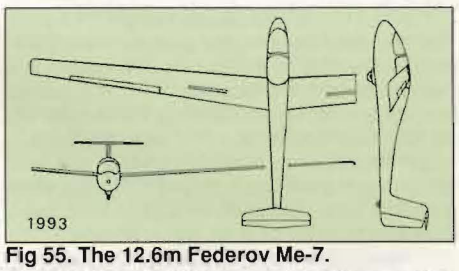


Fig 55. The 12.6m Federov Me-7.

but it has overshot the needs of the ordinary pilot. The passion in the early days for breaking records was great but today new world records are almost impossible to achieve without very considerable expenditure of time and money. The wants of the ordinary pilot are more modest - good soaring at weekends and perhaps a two week competition in the summer. For this a massively fast and heavy glider is not necessary. The hang glider has demonstrated that very satisfying cross-country soaring is possible with low glide ratios, provided that the glider is light. Polars of hang gliders and paragliders show a worse performance than even the Vampyr which flew only a distance of 7.5km in 1921. In fact the Vampyr was probably capable of flying similar distances to hang gliders, the difference being that today's hang glider pilot well understands about thermal structure and weather and has accurate instruments to provide information on how the air is behaving. The glider pilots of the early 1920s had neither.



Fig 56. The World Class Me-7 entered by Russia and now in production.

So how can the present relative disadvantages of gliding - high cost, heavy and complicated gliders - be overcome? It is important to find the solution since traditional gliding is likely to be the biggest loser.

Maybe we should think back to 1938 and 1958 when, already, the need for lighter and cheaper gliders was foreseen and implemented with the introduction of the Standard Class. The World Class glider concept of Professor Piero Morello of Torino University is a valuable attempt to renew that objective: and succeeding in that two of the entries are already being produced. Performance is slightly down on the current Standard Class glider but balanced, for many pilots, by the lower weight, cost and complication. The L/D, being achieved by World Class gliders, of 30-35 has been shown by achievements over very many years to offer very satisfactory cross-country soaring. ➡

Flying a successful 250km triangle on a summer day, for example, can give as much pleasure to the pilot as flying, say, 350-400km in a heavy glider without, for many pilots, worry about managing a possible outlanding. It should be not be forgotten that, for any pilot with ambitions to reach the top in competition gliding, the best grounding is a solid background of soaring when a middle level club pilot. An L/D of 30 is more than adequate for such an apprenticeship.

Throughout its history, gliding has produced designers and constructors of extremely high quality who, in turn, have produced some of the most aerodynamically efficient aircraft ever. It would be unfortunate if this process were to disappear almost as a victim of its own success. There is a limit to what can be paid for new gliders with only very small improvement in performance and which are already too costly for all but a few.

Soaring is weather limited - substantially in the summer, with thermals that are in any case available for a maximum of around 8hrs a day. Mountain wave soaring is possible in winter and on some days for longer, but not everyone lives near a convenient mountain of suitable configuration. Glider flying is flying for pleasure though demanding real skill and dedication to do well. Within these limitations the glider pilot endeavours to get as much satisfying cross-country soaring as possible, but what is achievable will be from a combination of glider performance, operational complication and affordability.

For such middle level pilots a good day's soaring can probably be considered as 3-6hrs airborne time flying cross-country and returning to base. Less than about 3hrs and all the travel and preparation may be frustrating; while more than 6hrs is tiring. As an example, this could mean flying a minimum of, say, a 100km triangle and a maximum of 300km. Obviously the actual task the pilot sets for himself and average speed will depend on the strengths and frequency of thermals and the wind.

With light winds and the thermal spacing of, say, 10km and a 5000ft cloudbase, a 50:1 glider will use 2-3 thermals to get round a 100km triangle, perhaps without much circling. A 10:1 hang glider would need to find and use 10-12, or more, thermals and the flight would be quite hard, though very satisfying if successful. With L/D = 30 the pilot will need 5-6 thermals, which should give a reasonable chance of success and a satisfying challenge. Increase the distance to 300km in the same conditions and the pilot with L/D = 50 might need 6-8 thermals, the L/D = 30 perhaps 18, becoming difficult, while the L/D = 10 hang glider would land part way round the course.

Today, an L/D of 30-35 is easy for an aerodynamically literate designer to achieve and do so relatively inexpensively. So what other considerations are useful?

1. As high an inter-thermal speed as can be achieved without becoming expensive. Flaperons, using a small negative flap angle, provide one way to do this without high cost.
2. Easy to land in fields. Not difficult with sensible air and wheel brakes provided the glider is light.
3. Although any well designed glider built of modern composites slips through the air easily enough, the ability to carry some waterballast is useful and not difficult with composites. Hang glider pilots carry waterballast in flexible bags, and so do paraglider pilots.
4. Easy rigging and derigging, preferably single handed; plus easy maintenance.

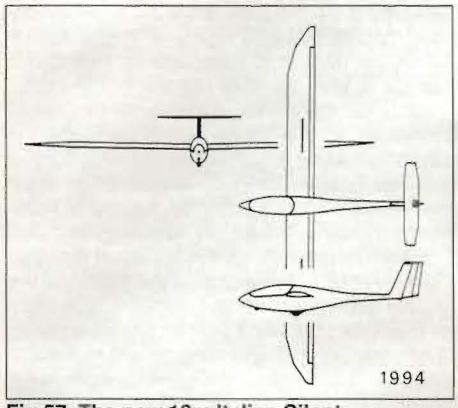


Fig 57. The new 12m Italian Silent.

What is available at the lighter end of the glider market? At the bottom of the range is the Class 2 hang glider which has rigid wings and aerodynamic controls. As hang gliders these never became popular because of the difficulties in foot launching from hills, in spite of their L/D being better than the flexwings. Being first cousins to the flexwing hang glider they are usually tailless. Now, with composite construction and the availability of aerotowing by microlight tugs the Class 2 hang glider is returning, largely in the form of the American Swift, Figs 52 and 53.

The performance is reasonable with L/D=25, but rigid wing tailless aircraft seem never to be quite free of pitch stability problems and require higher drag reflex sections. They are also less "clean" when circling due to slip and skid resulting from control by tip draggers or elevons. The Swift is a good try, though in the strictest sense not a hang glider as, in no wind, it is difficult, and sometimes impossible, to foot land safely. The pilot view when thermal circling with other gliders is also less than ideal.

The Swift could be developed in two ways, either as a more foot operable hang glider with some slight loss of performance, or upgraded to a light glider, using its wheel for take-off and landing and able to improve its performance. It might also sprout a tail.

Fig 58. The Silent light glider being aerotowed by a microlight trike. Trikes are proving efficient tugs as the tow point is on the C of G and the Rotax engine is water cooled, allowing a quick descent with minimal engine temperature fluctuation. The climb rate with the Silent is 500ft/min and the four bladed propeller gives a quiet tow.



On the conventional gliding scene are the World Class gliders. The winning Polish PW-5, Fig 54, the Russian Me-7, Figs 55 and 56, and others. The Me-7 is lighter, at 125kg than the PW-5 at 170kg. Its span is 12.6m as against 13.4. The L/D of the Me-7 is 31 and for the PW-5 just on 33.

Another new glider is the Italian Silent, Figs 57 and 58, ready to start production after two years intensive research. It is 12m span but with an empty weight of just under 100kg, so it comes into the FAI Section 3 definition of an ultralight glider with the whole range of world records open to it. None has yet been established*. The Silent has flaperons with flaps used only in the negative sense, -6 for higher speeds giving a VNE of 200km/h. The L/D is 32 at 95km/h. It can be rigged on its trailer single handedly and be aerotowed by either microlight trike or Pawnee. Table 4 compares the characteristics of the modern light glider.

To return to circling rates, Fig 59, the Silent can complete a thermal circle at the minimum sink speed of 61km/h in 15sec compared with the Nimbus's 30sec. It is in this area of the performance efficient light glider that design energy could profitably be devoted; to better balance the ability to climb rapidly in thermals by improving inter thermal airspeeds and lower ground speeds when flying into wind.

Table 4. Light gliders

year	Glider	span	Aspect Ratio	wing Loading	Empty weight	AUW	L/D	Minimum sink
1933	Windspiel	12	12.63	11.9	55.5	136	23	
1990	Swift	11.9	11.3		55	140	25	
1993	Me - 7	12.6	20.6	32.46	121	250	31 @ 100	0.8 @ 90
1993	PW - 5	13.4.	17.8.	26.57	180	270	32 @ 80	0.64 @ 73
1994	Silent	12	14	20.4	95	210	32 @ 95	0.90 @ 85

Notes. The Windspiel D - 28 was an attempt by the Darmstadt Akaflieg to make the lightest possible performance glider. It flew well but was too lightly built to cope with rough ground operations. The Swift is a tailless rigid wing hang glider but also has landing wheels. The PW - 5 and the Me - 7 were both entries in the World Class Glider competition; the PW - 5 winning. The Silent complies with the FAI 100 kg maximum empty weight Class.

Note: The Windspiel D-28 was an attempt by the Darmstadt Akaflieg to make the lightest possible performance glider. It flew well but was too lightly built to cope with rough ground operations. The Swift is a tailless rigid wing hang glider, but also has launching wheels.

Across the world there are considerable efforts being devoted to light gliders; the American Carbon Dragon, the Australian Tempest and others - some of which are home builts of low performance, ranging from Class 2 hang gliders at one end to the best of the World Class at the other. The need is to keep such gliders light; a very large range of heavy gliders exists for those who want them. The original idea of the Standard Class was to limit span to 15m with fixed gear and no flaps, later changed to retractable gear and the carrying of ballast. Now the most practical way may be to limit weight. There are already two criteria; the hang glider is weight limited by its ability to be foot launched by its pilot, which is

* The IGC has changed the definition from 100kg EW to 220kg AUW and some records in this Class have now been flown.

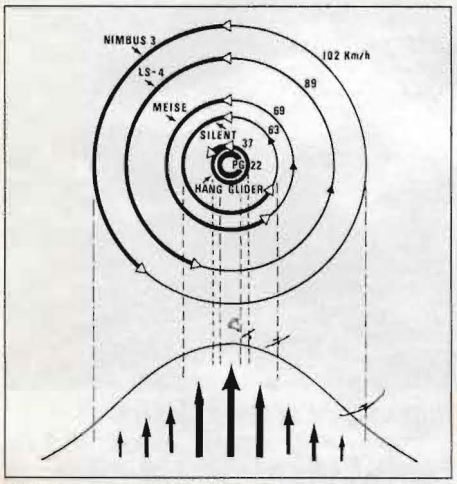


Fig 59. Circle diameters for various gliders at 35° bank. Heavy lines show distance flown in 10sec.

self regulating. The other is the existing FAI ultra light glider category. This is a good objective as current aerodynamic knowledge and new materials can give it, quite easily, an L/D of 30 or better. It would not be to difficult for a version of the Me-7 to be built for this category.

The hang glider has shown that high L/Ds and heavy gliders are not essential for good cross-country soaring except when trying to fly against strong winds. With an L/D of only 12-14 they can exploit thermal cores, smaller thermals, and work lift safely closer to the ground.

The original need for high aspect ratios was to reduce the effect of induced drag, particularly with early gliders when little was known about wingtip shape. Also, some of the wing sections used such as Göttingen 652, may have produced good lift at low speeds but seriously reduced the L/D when flown faster.

Table 5. Typical wing sections, 1923-1994.

	Konsul,Darmstadt 1, Windspiel, Fafnir mid span, Mu - 13, Moswey 3
	Fafnir root, Austria, Rhonadler
	Wien, Meise, Weihe
	Ka - 6
	Elfe S - 3
	Glasflugel Kestrel
	Nimbus 2
	Stemme S - 10

Note: For a short time, about 20 years ago, tail parachutes were tried out for airbraking, but were discarded as inconvenient and unreliable.

Now large spans and high aspect ratios are no longer so necessary for effective soaring performance. Table 5 gives typical wing sections from 1923 to 1994. Recent research has been in the direction of swept tips, as on the Discus, Ventus (Fig 60) and Silent and on the value of winglets; also turbulators (zig zag strips spanwise on the wing undersurface which cause transition to occur in a regulated manner); the total drag of the wing is then less than it would have been if the natural boundary layer bubble had been allowed to occur.

Although the performance of the hang glider is worse than that of the Vampyr of 1921, it can fly cross-country much better because of today's understanding of upcurrent structure and behaviour helped by sophisticated and accurate instrumentation, Fig 61.

SUMMARY

For worthwhile development to continue in high performance glider design there needs to be a continuing supply of high grade and innovative aeronautical engineers. For this to happen there must be work for them to do and this will exist only if the market is large enough. This means that gliding must continue to attract a steady, and large, supply of newcomers as future purchasers and users. For them gliding must be accessible, affordable and enjoyable.

At present the most attractive form of gliding for the young newcomer is undoubtedly paragliding. It is colourful, inexpensive, and fun, with quick basic learning. It needs no airports or launch equipment and the aircraft is carried in a rucksack. Cross-country soaring is challenging but with field landings and retrieves easy. Paragliding also needs good aeronautical engineers to avoid too much empirical designing, as happens with much sports equipment.

In time the paraglider pilot may want more sophisticated flying, but if he looks at conventional gliding he may be discouraged by its present high cost, complication and the sophisticated infrastructure needed to support the operation of large and heavy gliders.

If gliding is to stay in business and flourish there is a need to change what, to many, is an inviolable tradition - the search for ultimate performance almost regardless of costs.

Over the years thousands of hours and hundreds of thousands of satisfying kilometres have been flown in gliders with an L/D of 30. These are neither technically difficult nor needlessly expensive to produce but are still capable of interesting development and have the potential to attract more and younger people into gliding.

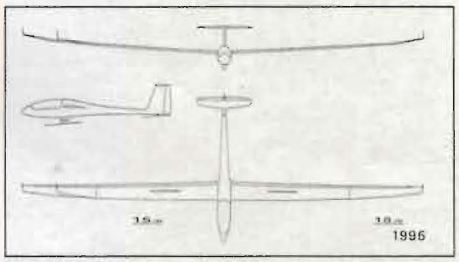


Fig 60. The Ventus C. Composites easily enable the buyer to have a choice of wingtips. A Ventus 2 won the 1995 World Championships 15 Metre Class in New Zealand, flown by Eric Napolean of France. The 15m version has an AUW of 525kg while the 18m version has an AUW of 500kg. Empty weights are 230kg and 254kg respectively.

The World Class and FAI ultra Light Glider Class are particularly suitable for this purpose. It is very understandable that the striving for more performance inherent in gliding since its beginning should still have followers but the price of obtaining even higher performance is now too high for the marketplace.

This is certainly not to suggest that glider designers should cease to concern themselves with "ultimate" performance but they will not be able to succeed unless they are supported by a large enough market to make their efforts financially worthwhile.

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The figures and tables were compiled by Ann.

If you have missed the two previous articles which make up the complete paper, the BGA have back numbers. Just tel 0116 2531051 and ask for Bev Russell.

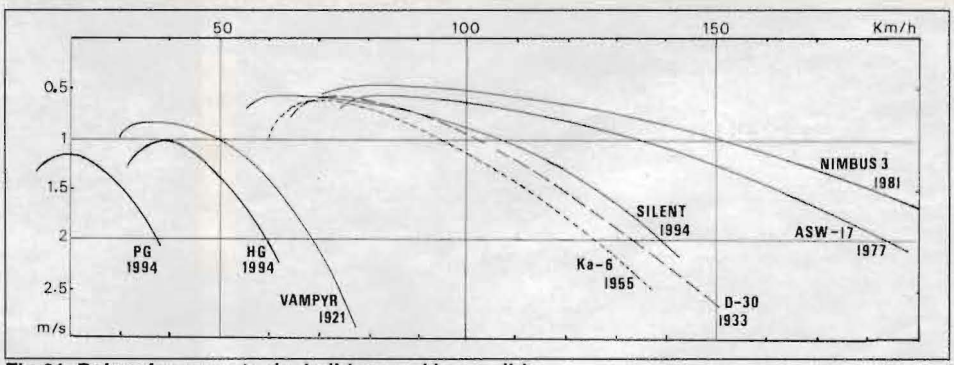


Fig 61. Polars for some typical gliders and hang gliders.

TOM BRADBURY

SUMMER STORMS

Tom says that the UK summers seldom bring wild weather but, just occasionally, the heat sets off violent thunderstorms with devastating hail, cloudbursts and even tornadoes



Photo A. Cu-nim anvils over southern England.

Cu-nim flights

Some cu-nim climbs are smooth, till you reach the top. Others are destructively violent. Several pre-war sailplanes broke up in cloud. Post-war sailplanes were stronger and lots of pilots used cu-nims to gain Diamond height. Some got painful shocks but surprising few came to grief. On June 18, 1960, G. J. Rondel took an Olympia 2B up to 30 580ft in a cu-nim; this seems likely to remain the record for UK cloud climbs.

Nowadays most people get their Diamonds in wave. This is probably a good thing. Cu-nims can grow too big for comfort. A cu-nim over NW Bavaria reached 59 000ft on September 18, 1987; not only is this is far too high for normal oxygen sets but the cloud contained huge hailstones too.

Why cu-nim are bigger in summer

Fig 1 shows the difference in energy between cold and warm airmasses. The shaded area represents the "Convectively Available Potential Energy" (CAPE) of three airmasses. The arctic air not only lacks energy but the cloud top is limited by a low tropopause. In contrast the CAPE of tropical air is far greater at all levels and extends up to a much higher tropopause.

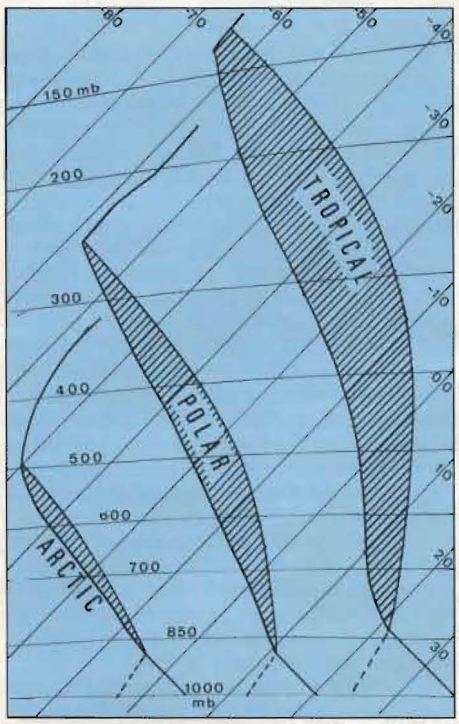


Fig 1. Examples of Convectively Available Potential Energy. This is represented as the shaded area between the environment curve and the wet adiabat.

Importance of wind shear.

The energy shown in Fig 1 is only part of the process. A second factor is the vertical wind shear. This is the difference in the windspeed and direction between the top and bottom of the cloud. Weak thermals are distorted and eventually torn apart by wind shear but large and powerful thermals can deflect the upper winds and build them into the storm circulation. Strong shear is essential for the development of the most destructive cu-nim. Severe hail and tornadoes only develop if there is enough shear.

Convection without wind shear

Fig 2 shows the life cycle of a simple cu-nim without vertical shear. Its life is shortened by the shower falling back into the rising column of air. The weight and drag of rain spoils the lift and soon kills the thermal. The original cloud then starts to decay but the sinking air may spread out over the ground to form a gust front. This can trigger off a new cu-nim.

Single and multicell cu-nim

A single cell cu-nim has a short life cycle, seldom more than an hour and often only half an hour. Multicell storms combine many cells at different stages of development and last for several hours.

The younger cells are mostly updraft - middle aged cells have both lift and sink while the oldest cells have only sink in them.

Fig 3 shows the beginning of a multicell cu-nim with a gust front starting to spread out from the gush of rain.

Left: Photo B. Tropical cu-nim over the Indian Ocean. Right: Photo C. Two tornadoes near Paphos, Cyprus. Photo: M. J. Lomax.





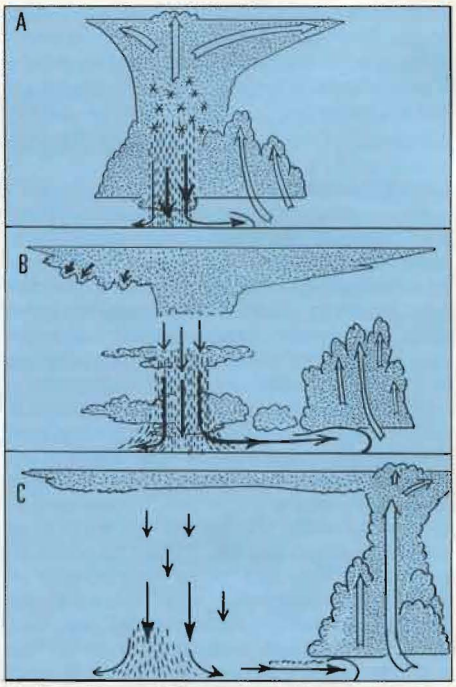


Fig 2. Life cycle of a cu-nim with no wind shear.

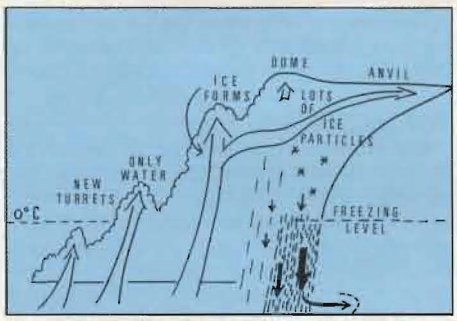


Fig 3. The beginning of a multicell cu-nim.

Supercells

A supercell is a very big, powerful, single cell storm which only grows when there is strong wind shear as well as deep instability. The wind shear helps keep falling precipitation out of the

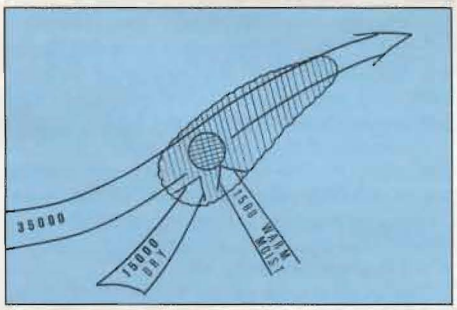


Fig 3. The beginning of a multicell cu-nim.

updraft. Fig 4 shows the initial wind flow; Fig 5 illustrates the main features of a supercell. The warm moist inflow enters at an angle from the SE. It then turns vertical and accelerates up to the tropopause. There the momentum often forms an overshooting dome which penetrates several thousand feet into the stable stratosphere. At high levels the strong SW-W wind extracts the air to form a long anvil cloud. At middle levels a cold dry SSW'ly flow enters and forms the downdraft.

When not credited, the photographs and all the drawings are, as usual, by Tom.

The downdraft

A powerful downdraft is an essential part of the circulation in a supercell. It is boosted by the entry of cold dry air at middle levels. This comes in horizontally until it meets the descending shaft of precipitation.

Being dry it causes evaporation which makes the air colder and denser. Cooling combined with the weight of rain produces a powerful downdraft which becomes even colder and stronger when it includes melting hail. As the downdraft spreads out at ground level it undercuts the warm inflow and increases the lift.

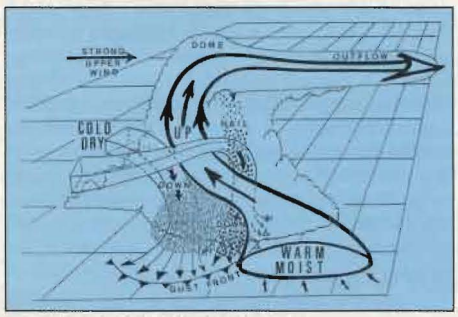


Fig 5. Structure of a supercell.

Downbursts and microbursts

The downdraft sometimes becomes so powerful that it strikes the ground with storm force winds which can blow down trees. This is called a downburst (or microburst if the area is less than 4km).

Microbursts have caused several accidents to big jets taking off or landing in America. High up there is just very severe sink but low down where the microburst spreads out the headwind can change to a tailwind in a few seconds. The air may diverge at 100kts making it impossible to maintain height or airspeed.

To gather speed a microburst needs a long fall through dry air under a high cloudbase. In the UK the air is usually too moist with a low cloudbase so microbursts are rare. However on July 24, 1994, one did occur at Weston on the Green where it destroyed the grounded balloon. There were many severe hail and thunderstorms that day but only one recorded microburst.

Other ground hazards

Although microbursts are rare many cu-nim send gust fronts pushing out miles ahead of the storm. Strong ones overturn parked gliders. At Coltishall the wind had averaged only 6kts all day until a hailstorm produced a squall of 65kts. Even weak gust fronts bring a sudden wind shift which makes landing hazardous.



Photo D. Australian tornado. Photo by P. J. May.

THUNDERSTORMS

Most big thunderstorms occur between late April and early September. Severe storms need the extra energy contained in tropical air which only reaches the UK in summer.

An approaching cold front can act as a trigger but these summer storms may break out far ahead of any front. Watch out for rising dew points during a hot spell.

They show the moisture is increasing which means more energy will be available. The vast amount of pent up energy often needs a trigger such as a range of hills or a sea breeze front to release it.

Generating lightning

Collision between ice pellets and water droplets usually leaves a negative charge on the ice and a positive charge on the droplet. ➡

Below: Photo D. Australian tornado. Photo by P. J. May.



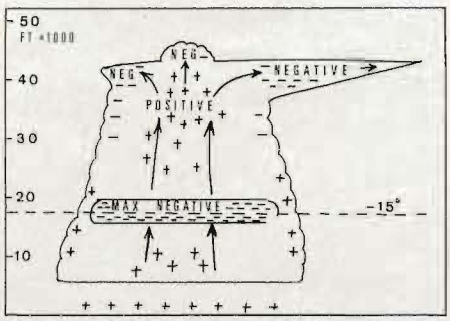


Fig 6. Electrical charges in a cu-nim before a thunderstorm.

Splintering of drops when they freeze also causes electrification.

The lighter positively charged particles are swept aloft leaving the main negative charge to build up around the -15°C level. (See Fig 6.) Practically all lightning flashes occur in cu-nims which rise far above the -20°C level.

The first flashes occur within the cloud while the top is still rising. These flashes transfer a charge from the main negative region in the middle to the positive region near the cloud top. Cloud to ground flashes start 5-10min later.

Growth of a cloud to ground flash

Only one out of five flashes goes from cloud to ground; the rest are internal or between clouds.

The first stage is a leader which consists of downward branching steps. As the branching nears the ground about five coulombs of charge is deposited in the channel inducing an opposite charge on the ground and increasing the electrical field between the leader and the strike point. The first lightning stroke is upward. This short circuits the cloud to the ground and a brilliant return flash follows.

The current rises extremely rapidly to some 36 000amps, (tropical flashes have reached 100 000amps). This instantly heats the narrow lightning channel to 28 000°C, causing a shock wave which echoes about as thunder. A cloud to ground flash typically has three strokes but as many as 26 have been recorded.

Affect on aircraft

Research aircraft have only measured 1/10 of the current found in cloud to ground flashes. In a metal aircraft lightning may cause tiny burn marks near the tips of wings and tailplanes and upset compasses and electrical equipment.

The metal cage shields the occupants but even so the strike can be alarming; on July 23, 1996, an Air UK flight was struck while waiting to take off from Stansted. A hundred passengers and crew were evacuated by the emergency shutes.

The crew are not so safe in a wooden or GRP aircraft. Painful shocks may come from metal components before any lightning occurs. A flash may burn through control cables and weaken spars. The most dangerous location for a glider is at the top of a winch launch when the cable forms a giant lightning conductor. Lightning has been known to strike from a cu-nim anvil many miles from the storm centre and there is no certain safety distance.

HAILSTORMS

Any cu-nim may drop small ice pellets. These are not defined as hail until they have a diameter of at least 5mm and some stones are far bigger. Large stones only form when there is a strong wind shear. Supercooled water droplets freeze to form ice pellets or graupel during ascent in strong updrafts. These are the embryos on which large hail forms. Most of the growth occurs at temperatures below -10°C. Many stones drop out of the lift where the flow curves over near the cloud top (see Fig 5). They fall to low levels where lots are caught in the sloping updraft and carried up again. Each circuit adds another layer of ice. The process often sorts the stones by size so that the largest arrive first. The stronger the lift the bigger the hailstones can grow. In one Welsh storm the lift increased from 60kts at 18 000ft to 100kts at 26 000ft. This produced 60mm hailstones. One giant supercell had lift of 140kts at 36 000ft.

Hail damage in flight

Ordinary small hail has sizes between 5 and 20mm. This may damage the leading edge of wooden wings. Large hailstones which range from 20-50mm can cause considerable damage both in flight and on the ground. On September 5, 1958, a severe hailstorm travelled from West Wittering (near Chichester) to Maldon in Suffolk. A hailstone weighing 141gm fell at Horsham. An airliner was badly damaged when it flew through this storm south of Gatwick. Photos of metal wings show the leading edge covered with deep hail dents.

Hail damage on the ground

In the UK some hail damage may occur on five to ten days a year. Exceptional storms with stones of 50mm or more can break roof tiles and badly dent cars but are only likely once in two years. In continental regions giant stones of 50 to 100mm have been observed. Some stones weighed 500gm and in exceptional cases 1kg. In England the area of highest risk extends from the Home Counties to East Anglia but big storms have developed over the high ground of the Pennines and also Devon and Somerset.

Days of Exceptional Hail in the UK for the 200 years up to 1996

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
0	0	0	0	15	27	42	15	6	0	2	0

Last year (June 7, 1996) stones of up to 40mm in size fell near Sherborne in Dorset. Much glass was broken, holes were punched in plastic roofs and the damage to just one car cost £1500 to repair. Heavier storms have shattered roof tiles and in the worst case destroyed wooden buildings. Between July 11-13, 1984, there were severe hailstorms in France, Germany, Austria, Czechoslovakia and Yugoslavia. At Munich the largest stone had a diameter of 95mm, 126 light aircraft, 22 passenger jets and 400 cars were damaged and 300 people injured.

Length and track of UK hailswaths.

The longest trail of hail damage occurred on September 22, 1935. It extended for 320km from Newport Gwent to Mundersly in Norfolk. Many storms follow a SW to NE track ending in East Anglia. Thunder almost always accompanies hailstorms but the centre of the lightning activity is usually found to the left of the hail track. Where there is heavy hail there is also the risk of a tornado.

Cloudbursts

Severe storms can last many hours and travel long distances but a few remain anchored to some feature, usually high ground. The tremendous gush of rain is popularly known as a cloudburst. No single cu-nim cell can contain so much water. The cloud has to be maintained by new cells which form continuously at a stationary boundary where opposing air currents meet.

A famous example is the Hampstead storm of August 14, 1975, when a massive cu-nim stayed overhead for some two and a half hours. A hot humid easterly flow at low levels was opposed by a south-westerly flow which increased to 45kts at 40 000ft. 170.8mm of rain fell over an area of less than 2sq km; 100mm fell within an area of 15sq km. Cars floated away, tunnels on the Bakerloo, Metropolitan and Circle lines were flooded and main-line traffic was disrupted too.

Such rain causes devastation when the flow is directed down a steep valley. The worst event in the UK was the Lynmouth storm on August 15, 1952, when the floods washed some 200 000 tons of boulders down the valley breaking bridges, battering down houses and sweeping cars out to sea. This was produced by 228mm of rain on an already saturated Exmoor.

TORNADOES

Many countries get tornadoes. In the USA the Great Plains east of the Rockies have some 750 tornadoes a year; Europe and the UK also have tornadoes. One author estimated that there were as many tornadoes in the whole of Europe as in the USA but most were smaller and far less damaging. However one caused the crash of a Dutch airliner near Rotterdam on October 6, 1981.

Tornadoes in the UK

All reports of UK tornadoes are recorded by the Tornado and Storm Research Organisation (TORRO). Some 2000 tornadoes and 500 waterspouts have been listed. There can be 31 days in a year when tornadoes are observed over the UK.

In most cases the tornado is small and damage is confined to light structures such as caravans and hen houses but substantial brick buildings have been demolished too.

There seems to be two kinds of tornado situation in the UK. The first occurs in summer when hot air moves across Europe and comes under a cool south-westerly flow ahead of an upper trough. This situation combines deep instability with a marked directional wind shear.

The second type occurs much more often, chiefly in autumn and early winter, when a powerful cold front sweeps across the country from the Atlantic. Such fronts often travel fast and bring line squalls. A narrow band of cu-nim grows with great violence and spawns tornadoes. The greatest number was on November 23, 1981, when 105 tornadoes were seen. The first one struck Holyhead about 1030 where it damaged

houses and ripped half the roof off a school; the last was seen at 1545 over Essex.

Formation of vortices

There is always some rotation in the atmosphere. This very slow spin is much increased where air converges at shear lines or gust fronts. If the rotating air is then stretched into a column the spin intensifies and forms a visible vortex. Dust devils form when powerful thermals suck up converging air.

There is exceptionally strong convergence under a supercell. Extra vorticity is concentrated at the gust fronts and sucked up into the cloud with the inflow. If the lift is great enough the spin intensifies and centrifugal force reduces the central pressure making the vortex visible as a funnel cloud. Small tornadoes and waterspouts develop this way. Big tornadoes tap an additional source of spin known as a "Mesocyclone".

The mesocyclone

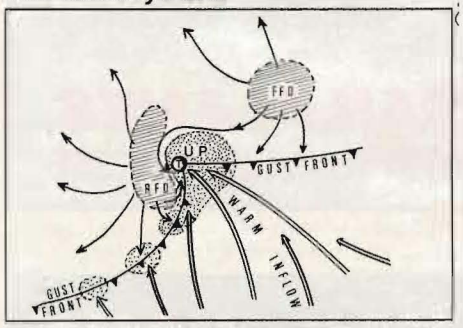
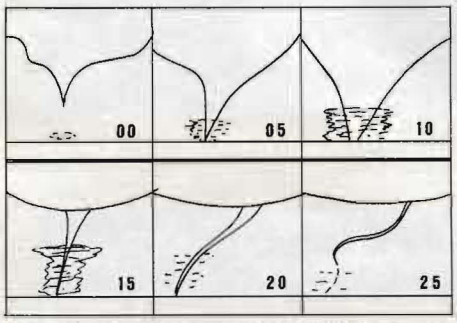


Fig 7. Plan view at base of a supercell showing updrafts stippled, downdrafts shaded and the tornado location within the small circle marked "T".

The change of wind direction with height can start a supercell rotating. This causes an internal fall of pressure called a "mesocyclone" which increases the updraft making the storm even more powerful. Doppler radar has detected a mesocyclone begin at about 18 000ft. It grew both up and down until it affected 2/3 the cloud depth. A tornado formed when the mesocyclone came down to cloudbase and met the extra vorticity sucked in by the powerful updraft.



8. Tornado sequence at five minute intervals.

Fig 7 shows a plan view of a tornado location under a supercell. The shaded areas marked FFD and RFD stand for Forward Flank Downdraft and Rear Flank Downdraft. The stippling shows regions of powerful lift. Gust fronts are marked by cold front symbols. The little circle with "T" is the tornado.

Tornado sequence

Fig 8 shows a sequence at five minute intervals. The first visible sign of a tornado can be the formation of a rotating "wall cloud" beneath the base of the parent cu-nim. From this wall cloud a fast spinning funnel descends towards the ground. Initially the funnel contains only cloud droplets but later it sucks up dust and then heavier objects torn from the ground. A swirl of debris may appear at ground level before a visible funnel touches down.

Most UK tornadoes have a short life and only attract attention when they pass over a built up area. I have not seen one in half a century of weather watching. Like other natural hazards the real drama always takes place elsewhere. Still, something exciting might happen nearby this year.

Correction: We regret an error in Tom's article in the last issue, p84. We interpreted per cc as % instead of per cubic centimetre. This appears in the first table and in the second column on the same page. Our apologies to Tom.

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BOOK REVIEWS

Collins Gem Weather Photoguide by Storm Dunlop, published by HarperCollins and available from the BGA at £4.40 including p&p.

This is a very small pocket sized guide which is surprisingly full of information. There is a colour picture on almost every page and many are so attractive that one regrets they had to be shrunk to such a small size.

The book starts with a chapter on watching the sky and identifying the cloud types. It goes on to illustrate each cloud with notes on appearance, optical phenomena (if any), the height of cloudbase and whether or not such clouds give any precipitation.

A page is devoted to the Latin names of the variations. Almost all are illustrated and there is a "see also..." line guiding you to further pictures.

Optical phenomena such as crepuscular rays, rainbows, corona, glory, iridescence, mock suns, a wide variety of haloes and even mirages are illustrated. There are pictures of difficult subjects such as aurorae, noctilucent clouds, sky colours, haze and atmospheric dust.

The author then goes on to describe how clouds form and the effect of stability. The various forms of precipitation are illustrated. This leads on to the winds and the difficult concept of the Coriolis Force, then the Beaufort Scale which is so important to shipping forecasts.

After touching on the global circulation, climate, airmasses and fronts, the author brings the subject up to date with a section on satellite images. There is a useful set of comparisons between weather maps and satellite pictures. A sequence of pictures illustrate cloud changes as a frontal system passes. This is followed by a section on severe weather such as thunderstorms and lightning with useful advice on what precautions to take. There is a description of vortices, great and small, ranging from dust devils to tornadoes and hurricanes.

The text could easily be expanded to fill a large hardback book and the photographs deserve to be printed much bigger. However, in its present size it takes up very little space in the pocket and is remarkably good value.
TOM BRADBURY

Tiger in the Sky by Pat Jackson and available from Truleigh Press, The Gables, Upper Station Road, Henfield, West Sussex, BN5 9PL, tel 01273 492636, at £8.49 including p&p.

This is the story of Toon Ghose from a young boy growing up in India with longings to fly since the age of seven when he saw a Tiger Moth.

With a companion he set off on a Vespa motor scooter and travelled across Pakistan, Iran, Turkey and Europe, eventually reaching London after many hair raising adventures. He then got into gliding by winching at Lasham and by great good fortune was befriended by Ann Welch, Derek Piggott, Henry Doktor and Ron Campbell, learning to fly gliders and eventually becoming a power instructor at Shoreham.

It is a great story!
B. H. BRYCE-SMITH

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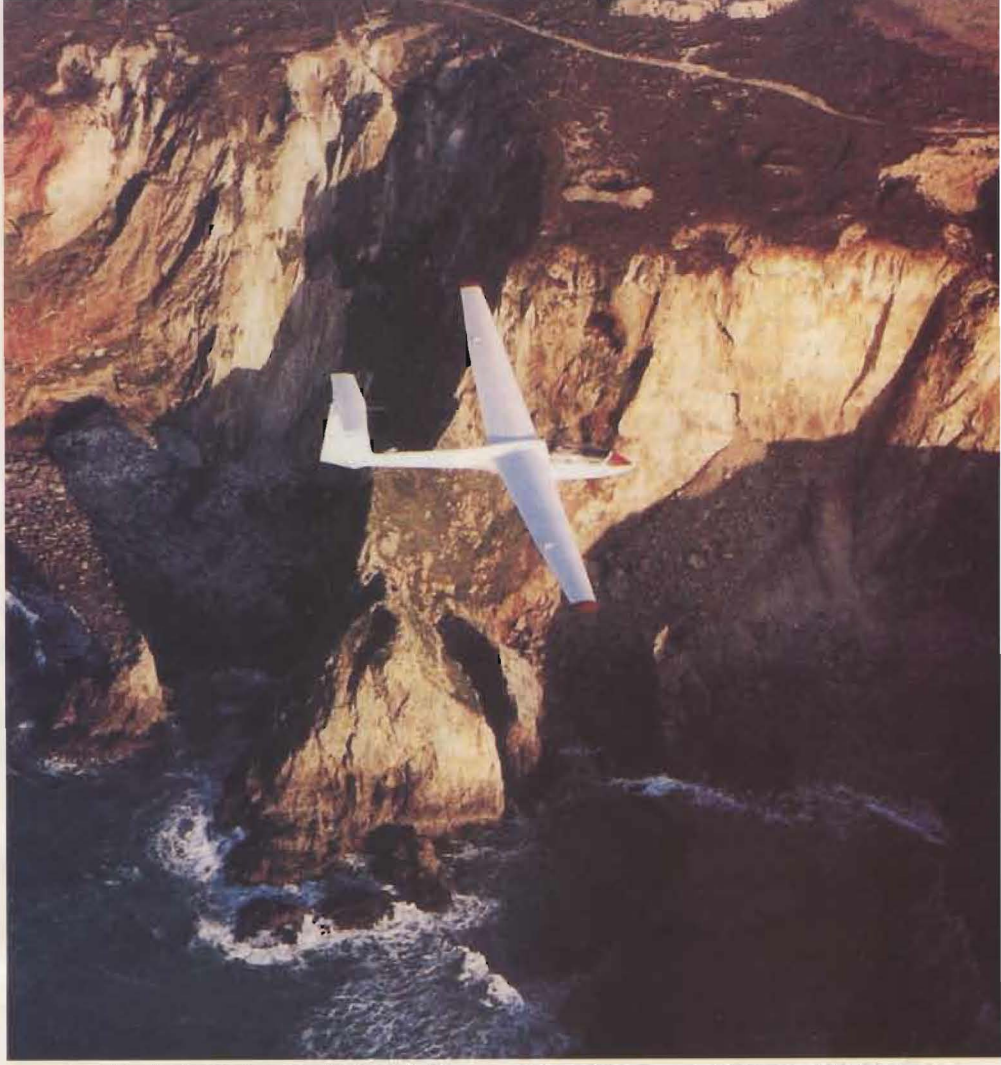
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IVAN FOSTER

CLUB FOCUS

With the Cornish Gliding & Flying Club celebrating its 40th anniversary this summer we thought it an apt time to take a closer look at this club lodged on the edge of England. Hence this write up by Ivan, the club's chairman



Simon Burke photographed the Junior, flown by Cliff Clarke, enjoying the dramatic Cornish coast near their site.

For those not familiar with our site, a first flight out of Perranporth can be something of a surprise. We are perched on a cliff overlooking the Atlantic Ocean and yes an aerotow in the T-21 crossing the ridge at hardly any feet and seeing the rollers thundering into the rocks another 300ft below can be a very stimulating experience, especially if you didn't personally check the rope before the launch... From 2000ft you can see both coasts and most of the county, while from a bit higher the amount of land below you starts to look, well, a bit small.

I don't know how many glider pilots have flown down here in this the far south-western outpost of gliding, but over the 40 years we have been in existence a fair few of you must have at least popped in for a look. It still amazes me how many relatively experienced pilots, especially those from the big flat sites, come down here and get very nervous about flying out over the sea from our cliff top site, but that is just one of the unique charms of this place.

With sea air coming at us from the north and south we are not noted for spectacular thermal soaring, except when the sea breeze front from the south and the one from the north meet. That does produce some very good conditions. I remember a day a few years ago when we had a pilot from a big up-country club visiting. It was one of those classic days. The local movement of the airmass off the sea and over the ridge had produced a quasi wave effect all around the site, there was lift everywhere and no sink of any description. The visitor, in our club Junior, landed well into the evening, the thermals long dead with the syndicate T-21 battling, and failing, to descend just using the spoilers on a normal approach. I wonder what tales of Cornish conditions went back to his club?

Of course, much of the time it is up, around and down. We changed to mainly aerotowing a few years back when the site went into new ownership and the airfield became licensed. It all threatened to come to an end a couple of years ago when our local council, spurred on by a very vociferous NIMBY group, issued an enforcement notice on us and the airfield owners to try to restrict us, among other things, to only 70 movements (a movement being a take-off or a landing) a week. With expert help and some very dogged work from our skill-base within the club we were able, along with the owners, to fight the action, winning a public inquiry and securing the future of aviation, and hopefully gliding, at Perranporth.

Like any small club we rely heavily on a dedicated hard core of members to keep the place operating. Even so, we run a seven day week from May to September, retaining a team of three paid instructors/tuggies as well as enlisting volunteer help. These guys also make sure everything stays upright by doing essential maintenance on non-flying days. Our location is important for us as we get a healthy number of air experience pupils, as well as course members, from families visiting the area.

By the time this is published we should know the result of our application to the Lottery Sports Fund for a 90% grant to buy the site. We have joined forces with the local Wildlife Trust who wish to buy the SSSI that forms part of the airfield. It may seem a strange alliance, but it does prove that given the right conditions we can all work with the conservation movement for mutual benefit. If the application is successful, I believe we will be the only club to own and operate a licensed airfield.

For a small club our fleet is quite remarkable. Thanks to very careful husbanding of funds in the leaner years, we have two K7/13s, one totally refurbished with nose and tail wheels, a K-6CR, Junior, Super Falke and a Pawnee tug. This may seem modest but then look at the private fleet - ASW-20, DG-400, Mini Nimbus, RF-5, Carman, Libelle, two Skylarks, LS-7, a syndicate T-21 mainly used for trial lessons, and a (currently) non-flying Grasshopper. Oh yes, and a T-31 being refurbished. I think it works out at a ratio of just under three members per aircraft!

While Perranporth has its undoubted attractions, we do travel. Annual trips to Aboyne have produced a clutch of Diamond heights (in 1994 17% of all Deeside GC's Diamond heights were by our members) and this year sees the third summer exodus to Chauvigny, about 40km east of Le Blanc, with at least nine of us taking four gliders to Barry and Mo Meeks' excellent camp.

Perranporth, of course, was once a favoured destination for the downwind dash. The spring north-easterlies haven't gone away, so why not try it and enjoy a good Cornish welcome on arrival. True the retrieve may be a bit tedious, but navigation is easy.

On May 16, 1961, 29 gliders landed here and another 11 overflew towards Land's End, at the end of a 300km task from the Nationals at Lasham. On the right day a brisk north-easterly could get you down here in record time.

While we may not be at the forefront when it comes to whizzing round 300km milk runs, we have established over our 40 year existence a healthy and forward looking outfit. Thanks go to those intrepid founder members who got the place up and running all those years ago, some of whom are still gliding and even tugging! It must be the clear Cornish air. If you want to see somewhere special, drop in any time and get a lungful of ozone.

BOB CASSIDY



An aerial view of the building activity at Borders GC's site at Milfield.

BORDERS GC ARE COMING HOME

Bob tells of the great success of his club which reads like a fairy story in these days of airfield closures and bureaucratic restrictions

This season will see the beginning of a new era for the club which started life at Milfield, the World War 2 airfield, in 1969 and currently operates from Galewood Farm, the adjacent 46 acres. Major gravel extraction with runways dug up, forced us to move to Galewood Farm which we bought. It proved to be challenging and rewarding with wave and rotor activity over the site giving exhilarating climbs. The club record currently stands at 28 000ft.

With tricky wind shear and rotor on wave days, landing from the east has often been difficult for the most experienced pilots, making a thorough briefing for visitors essential.

Having mastered the conditions we are now moving back to Milfield, following four years' of negotiation with the Gas Board who wanted to build a compressor station at the end of the Galewood main runway. This would have blighted our expansion plans, not to mention the risk of having to stop flying due to its height and the potential for emergency venting.

Fortunately the Berwick Planning Authority recognised our current planning consent to operate as an airfield and wouldn't consider the Gas Board's application unless they agreed to move us to a suitable alternative site.

The Gas Board looked at all options including moving their pumping station, but the costs were prohibitive. In the end they agreed to pay for the relocation of the club. This outcome was only achieved by a lot of hard work by our chairman, Andy Bardgett, and committee.

As a result the Gas Board briefed their architects to create a new airfield on the former Milfield site (covering 180 acres) which had been stripped of gravel and topsoil. The airfield was levelled, the topsoil replaced and seeded, and they are building us a hangar, workshop, clubhouse and sheltered trailer park. The clubhouse will include a clubroom, bunk rooms, toilets, showers, an office and a briefing/teaching area, all with disabled access.

The landscaped caravan park is almost complete with electricity, water and drainage to all the caravans, some of which will be rented to visiting pilots and their families.

Flying should be as good as ever as all the existing soaring areas are within easy reach of our Super Cub and Pawnee. And the size of the field means we will be able to winch again which should encourage younger pilots on limited budgets. As an extra bonus this summer we take delivery of a new K-21, with funding from the National Lottery.

One last new problem to overcome is the recent introduction of restricted operations above FL245, which doesn't stop us from collecting Diamonds but could spoil our fun on exceptionally good days. We are in discussion with the BGA Airspace Committee to work on our behalf to seek recognition of the club as a wave site and operate above this level.

It's good to be able to report the development of a new airfield with so many being lost and we hope pilots will come and try our hospitality.

We will use the new facilities this summer and the contractors are going to organise access to our old strip while the new area establishes itself. We are waiting to see how well the grass grows but for those who can't wait until 1998, we are planning wave soaring weeks throughout the autumn. And being such a fascinating area, there is plenty of interest for non gliding members of the family.

We are easy to find, just off the A697, north of Wooler near the small village of Milfield. If coming by air, PPR please, avoid overflying Milfield village and join overhead.

For more details contact our secretary, George Brown, Ulgham, Morpeth, NE61 3AR, tel 01670 790465 or 'phone the club any weekend on 01668 216284.



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GPS JOTTINGS

Edited by DICKIE FEAKES

Two significant events have recently occurred in the GPS flight recorder situation. At the March meeting of the International Gliding Commission (IGC) in Brussels, the decision to allow flight recorders (FR) coupled by a cable to a commercial off the shelf (OTS) GPS unit was approved. Such FRs must still undergo approval by the IGC GNSS FR Approval Committee (GFAC) to qualify for IGC certification. The first unit submitted, a modified EW FR, is already undergoing trials by GFAC and approval is expected shortly.

However, it should be remembered that once approved, existing EW FRs will need modifying before they can be used as an IGC approved unit and, furthermore, the unit will only be approved when coupled to certain specified OTS GPS units. The approved OTS GPS units will include the Garmin GPS89 and GPS90.

In the last issue, p102, it was announced that the BGA Competitions and Awards Committee had approved certain existing GPS FRs to be used without further testing or modification for the certification of UK 100km and 750km diplomas, UK records and UK British National records, when supervised by a BGA Official Observer (OO).

The BGA announcement specifically approved the EW and Skyforce/RD FRs but made no mention of other types which are already approved by the BGA for competition use such as the Varcom and the LX4000. There was also no mention of what testing, if any, would be needed for a new FR to be accepted in this group. Neither of these FRs include a record of the Earth datum set in the GPS, and the notes for OOs make no mention of checking this. Potential errors in manipulation of the datum are discussed as the second part of this article.

Three groups can be used. In the UK, there are now three distinct groups of GPS FRs that can be used, depending on the circumstances. The three groups are:

1. IGC approved FRs. These can be used without restriction for any BGA or FAI badge, diploma, record or competition flight. Instruction and advice for OOs is included as part of the IGC approval certification, and should be referred to before any claim is submitted.
2. BGA competition approved FRs. These are listed in the **BGA Competition Handbook** and in addition to all IGC approved FRs, include the EW, Skyforce/RD, Varcom and LX4000 units. Their use and control is under the supervision of the competition director.
3. BGA approved FRs. Only the EW and Skyforce/RD units are currently approved. They can be coupled to any OTS GPS and their use is permissible for UK diplomas, UK national records and British national records, when the flight is being processed by a BGA OO under guidance published in the last issue.

Earth datum. No apology is made for revisiting the dreaded datum! Recent BGA proposals to the IGC suggested that the datum be ignored.

So that the BGA proposal can be placed in perspective the subject is discussed further and conclusions drawn. There are only two datums which are relevant in the UK; the Ordnance Survey of Great Britain 1936 (OSGB 36) datum and the World Geodetic Survey 1984 (WGS 84) datum. Currently, all UK maps are based on the

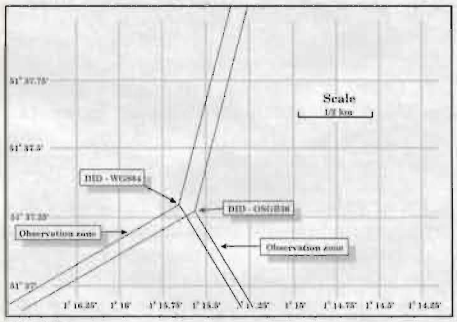


Fig 1.

OSGB 36 datum but they are shortly to be redrawn using the WGS84 datum.

A popular BGA TP, Didcot (DID), is shown plotted using both OSGB 36 and WGS84 datum positions extracted from the **1997 BGA Turnpoint Handbook**. (Fig 1.) A hypothetical task of an O/R from Bicester to Didcot has then been overlaid on the plot and the two observation zone quadrants drawn. It can be seen that the two positions are some 110 metres apart.

The exact significance of this is a matter for discussion. Nevertheless for a FAI badge flight using photographic evidence under current rules, if a pilot was 110m outside the observation zone, then it is likely that the claim would be rejected by the BGA. If a 110m error is not acceptable for photo evidence, then why should it be acceptable using GPS evidence?

Furthermore, certain Garmin OTS GPS units allow the user to define their own datum. Using this feature the 110m is easily extended to 2km and more. Recording of the GPS Earth datum used by the FR is essential if accurate evidence showing the completion of a specified task is required. If, however, all that is needed is evidence that the pilot was in the general area, then Earth datums can be ignored.

Graham McAndrew, chairman of the BGA Competitions Committee, comments: Dickie, as a technical advisor to GFAC, comes from the boffins' directive of "security must be paramount". The Competitions Committee is largely driven by a desire to promote and encourage badge and competition flying. The decision to allow EW and Skyforce data loggers for all the diploma and record flights in our control was part of a successful campaign to reverse the GFAC decision last year not to approve any data logger that took its data from a separate GPS.

This decision was reversed at the March IGC meeting with a sensible compromise that will allow EW loggers to be approved after a low cost modification. EW and Skyforce loggers were approved for UK diplomas and records because they constitute the vast majority of loggers in the UK gliding movement.

We felt the **recording a of change in geodetic datum was of minor importance.** For instance, the typical 110m error that Dickie mentions would take about 30sec of head down fiddling during the flight to change the datum for the TP plus a further 30sec to reverse the action before the return to the finish point - not a good trade off when you should be looking for your next thermal. If the pilot defines a new datum with a 2km difference then there will be two 2km jumps in the trace and the pilot will be at risk of being caught cheating.

Finally it's a good photo assessor who can get it right to 110m and even better tug pilot who can certify the release point to twice that amount.

We intend to leave these rules in place until the data logger situation stabilises and hope that many pilots will enjoy attempting UK diplomas and records with existing data loggers.

Let's Learn From This

Another in the series of true accounts written by members of the recently formed team of accident investigators

CONTROL CONNECTION AND DI

On Saturday, March 8, at the launch point the elevator of a Junior was found to have become disconnected.

It appears that the pin for the locking sleeve had not been fully home and the sleeve had moved which had allowed the elevator to become disconnected. The aircraft had had a DI, positive control check and two launches! Because the pilot heard a rattle on tow back he checked and found the fault.

Club Juniors

1. **It is important** that anybody who takes responsibility for inspecting Juniors should make themselves familiar with the correct assembly of the elevator connection.
2. Once made and signed off at the rigging stage, **the connection should not be touched** (except to disconnect).

In future the access point will be covered over with clear tape so that a visual inspection can be made at DI.

All pilots are reminded how important it is to be vigilant about the basic safety checks on all their gliders.

The Junior pilot who spotted this problem is commended for following up his concern about an unfamiliar noise on his glider.

WHERE IS SAILPLANE PERFORMANCE HEADING?

A fax interview with Gerhard Waibel by Mike Bird

An interview by fax is like a boxing match in slow motion. The slowness in this instance is entirely due to the idleness of the interviewer, not the interviewee. Gerhard Waibel and I exchanged many faxes over a period of weeks in the spring and summer of 1996, after which I did absolutely nothing. Finally Gerhard's two tremendous presentations at the BGA Weekend this February, of which I believe there is no record on paper or tape, shamed me into gathering these 1996 notes together.

MB: *Where are the opportunities for increased sailplane performance in future? I am thinking of boundary layer control; new wing sections; camber-changing or planform-changing devices; wingroot and wingtip drag reduction etc etc.*

GW: There are no limits to sailplane performance. Last year I presented a paper about gliding in 2020 to our national team and they were fascinated.

A historic review "Aerodynamic Efficiency of Gliding Vehicles" by Fred Hermanspann of Seattle USA, given at the OSTIV congress at Uvalde, shows that aerodynamic quality of sailplanes, represented by measured best glide angle, is a nearly linear function of time[1].

MB: *So there is no sign yet of diminishing returns! When do we reach the magic 100 to 1?*

GW: I must confess now that I cannot look into the future better than anybody else. However I have perhaps more information about ideas which are around and have not been verified yet. Extrapolating Fred Hermanspann's graph (see Fig 1) to a glide ratio of 100, we can expect this to happen in the year 2060 for "unlimited gliders". In the 15 Metre Class one can expect glide ratios to reach 60 as early as 2035.

You may think I am a dreamer, but I will answer that I am a realist. Engineers are not professional dreamers, they create things. Thus Dr Werner Pfenninger designed a theoretical all-suction sailplane with an L/D of 103.6 and described his project at the XIX OSTIV congress in Rieti in 1985[2]. Probably not many people have read that paper carefully, but I have. I came to the conclusion that Dr Pfenninger's project is workable. However the efficiency factors he requires for the suction pumps, windmills and suction system are so high that extremely careful design of all components is necessary with today's knowledge, so that it will take more than 60 years to develop this glider.

MB: *What about other ways of increasing lift and reducing drag?*

GW: Your opening question was excellent as the first three ingredients you mention are used by Dr Pfenninger:

1. Boundary layer control, *eg* suction.
2. Appropriately designed profile sections.
3. Camber changing flaps

However the other items you mentioned, namely planform-changing devices, or special wingroots and wingtips, are not used in his design.

MB: *We already have boundary layer control by blowing to precipitate laminar separation on gliders like the ASW-22 and ASH-25. How does boundary layer control by suction work? Is it intended to be used all over the glider, eg at wing -roots and over the fuselage and tail as well as the wings?*

Mike, who captions his photo "eat less!" and says he usually keeps it on the 'frig door.



[1] Platypus put forward the same linear growth theory in *S&G* (February 1993, p10) when he discovered that the max glide angles of the sailplanes he flew since 1949 had always been exactly equal to his age. However, Hermanspann's extrapolation assumes glide angles to improve at the rate of only two-thirds of a point per year. The Platypus model assumes an improvement of one whole point per year. This crude model ignores the fact that not only have gliders got better as Platypus has aged, so has his pay cheque.

[2] 1985 (see *Technical Soaring* Vol 11 No. 2, 3 and 4 - 22 pages of condensed/compressed aerodynamic and static calculations and many, many interesting ideas.)



The first ASW-27 in the UK, owned by Ed Downham and Richard Abrahams and flown by Richard for this photo by Tony Hutchings.

GW: The laminar boundary layer provides the lowest friction drag but cannot be maintained over the whole wing profile or fuselage length. When local pressure increases the layer becomes turbulent with higher friction drag. The benefit from suction is that the laminar layer can be stabilised even in rising pressure. So only parts of the wing, tailplane or fuselage must be perforated or slotted. Intersections (*eg* wing-fuselage junctions) may need extra careful treatment; this is something which I need to know more about.

MB: *Will suction require radically different airfoils?*

GW: The wing profiles developed for suction do not look unusual. The profiles must work reasonably well even when the suction is not working or in rain or when made dirty by insects. After talking to my friend L. M. M. Boermans and to Professor R. Eppler I cannot see much potential left for improving wing profiles except for suction. Pfenninger gives some examples of profiles in his article which do not look too strange in our eyes.

MB: *You say Pfenninger does not employ variable planform in his 104:1 design. What are the problems with variable geometry as a line of development?*

GW: Variable planform is demonstrated in na-

ASW-24B flown by Gerhard's son, Michael.





ture. We think we know *how* birds do it, but we aren't so sure *why* they do it - or what the benefits are. Come on, you're a Bird, do you know?

MB: *The only way this Bird's geometry is varying is in the direction of increasing wing loading and decreasing power to weight ratio. The other birds don't talk to me for fear of having their trade secrets and their private lives betrayed in S&G.*

GW: It would be helpful if we knew if birds vary their geometry a) mainly for performance b) to reduce the loads on their structure at high speed airloads or c) for flying qualities other than pure performance, particularly handling and stability.

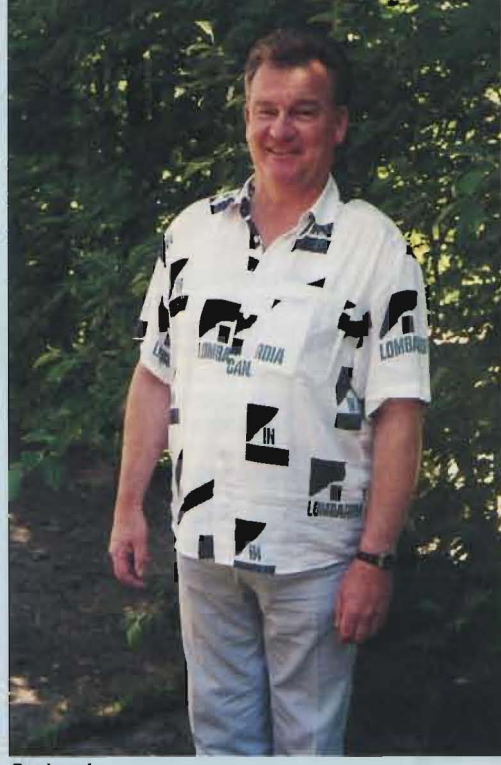
In gliding, variable span without camber changing flap (the Akaflieg Stuttgart FS 29 telescopic wing) has not been a success in my opinion. Neither was camber changing flap combined with variable chord: Sigma was one of these. Another was the SB11: Helmut Reichmann did win a World Championships with it, but he was able to win other World Championships in much cheaper, simpler gliders that were easier to fly and easier to maintain. I am sure that variable span combined with camber changing flap would perform well, but such a glider would be very costly and difficult to maintain.

Birds also present us with many types of wingtip design. This is an area we do not fully understand yet; there is a lot of work to be done. It was hard for me to recognise that I was wrong in my judgment of winglets. Some years ago Professor Eppler was able to show that in gliders the only kinds of winglets that made sense were those that were bent upwards. Afandi Darlington and F. M. M. Boermans did many quick overnight computer analyses at the famous Delft University aerodynamics centre in the summer of 1995, and generated basic guidelines for the design of performance-enhancing winglets.

Such computerised techniques have just become available to help design wing fuselage intersections. I can only say at present that the gains are small compared with the design and construction work involved. But who knows what may be gained in the near future?

MB: *Will 15 metre gliders benefit greatly from suction, too, or are we only considering suction in relation to very large span gliders?*

GW: A glider's drag has two main components: induced drag (due to lift) and friction drag. It is only the friction component that can be reduced by suction. Friction drag is more important to large span gliders, since the induced drag is already very low (being inversely proportional to span[3]). Therefore suction will benefit the Open Class more.



Gerhard.

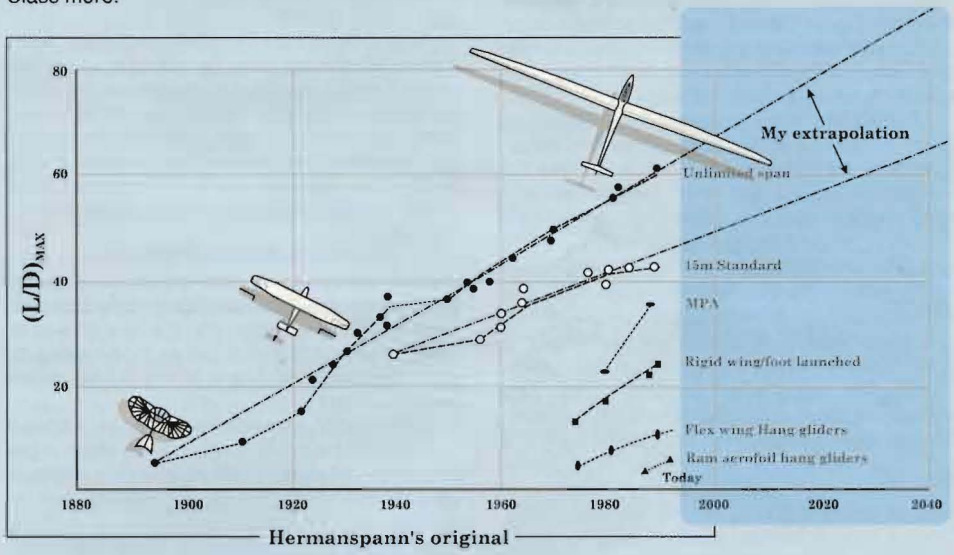


Fig 1.

MB: *What part is played by computers in design advances?*

GW: Computers were developed in the first place by engineers for engineers. Aerodynamic calculations were a major reason they were needed. For me personally they are not very attractive. They are a valuable tool only. For most people they are a toy. I know very few people who really use the full potential of their computers. Like me, they have a big computer handy to play around with, and to do their mail on. I cannot type a letter properly on a typewriter but I get a reasonable sheet of paper out of our computer, also in English or French. But I only use one per cent of the computer's capacity - if that.

Being a pre-computer age engineer, I am well trained to process figures in my head and get a rough result quickly. The general magnitude is always right but the result is not accurate, even to the second digit. This ability, however, has allowed me to judge new findings and their impact on my new project. I must confess that I cannot handle or even write a complicated computer program. I need a competent friend to help me and I have always found one. But on the other hand I could help him check the program out and revise the results quickly.

In most cases if there is a mistake, I can even tell him where it originates. I have learned to like computers. In my eyes they are idiots with a remarkable talent for exact calculations. They are extremely fast and make hardly any mistakes: mistakes come from the operator or, in severe cases, from the chip designer.

On the other hand, aerodynamic and structural calculations are so complicated and must be repeated for so many load cases that computer power is very much needed. From 1976 onwards Schleicher sought the co-operation of highly expert outsiders to help in calculations. Today our "small" computers at Schleicher's are so powerful that calculations can be done inside the factory using externally developed programs.

It is so obvious that the computer is only a tool. We have still to check whether the computer calculation simulates what happens to our glider. In this regard we are no better off than with our manual calculations. That is the point where it gets expensive. We must do tests to ➡

[3]Strictly, induced drag is proportional to the square root of weight divided by span and speed.



see if the calculation simulates the reality close enough. This is so with structures (load/destruction tests), with airfoils (expensive wind tunnel tests) and even more with complex flutter calculations (an expensive ground vibration test is necessary) where critical speeds are calculated and increased before a flight test proves there is no flutter.

MB: *What will be the contribution of new materials?*

GW: I am sure we are not at the end of the development of fibres. We will get totally new fibres and improved versions of the existing ones. Carbon fibre is most promising in that field. I can see greater potential in improved resins to bond the fibres better and keep them in place. We can foresee textile weaving methods which may allow us to design a perforated skin which is stable in shape as well as in contour smoothness under wing bending and torsion loads.

Continuous spanwise slots for suction, instead of holes, are another possibility: however, the edges must not move relative to each other as the wing flexes. A conventional metal structure, which is subject to "oil-canning", is not suitable for laminar flow with suction.

Metals and plastics other than fibre-reinforced seem to have no potential except getting closer to FRP (fibre-reinforced plastics) which are far ahead.

MB: *Which of the likely paths to greater performance involve a penalty in cost?*

GW: What a question! It is a reasonable question but a very complex one to answer.

Until now your question was "How far can performance advance? Where are the limits?" I think I have answered that question. The combination of boundary layer control by suction and improved carbon material are predictable trends. Suction will be expensive, but carbon fibre will get stiffer and stronger and cheaper at the same time. The price of carbon fibre has fallen to a tenth of what it was in 1974 when we first started using it. In real money, after allowing for inflation, prices are a twentieth of prices in the early 1970s.

In addition other discoveries and inventions will come along that will help us. Such advances are unknown to us today and not foreseeable, but we can more than hope, we can almost plan ahead assuming that somebody will assist us with our problems[4].

Naturally we cannot assume that all that planning and designing is free. The design/drawing office at Alexander Schleicher is limited to four people: two engineers and two technicians/draftsmen. This is really the minimum number for a design team, so there is plenty of work for every one of us.

I think it is my job to "live some ten years in the future" and fly nearly all the sailplanes of today. Using all my antennae I must try to pick up every bit of relevant information on:

1. Low speed aerodynamics.
2. New/improved materials.
3. Flying qualities.
4. Material cost trends.
5. Labour cost trends.
6. Production methods.
7. Easier/less maintenance.
8. Improved crashworthiness etc...

Design is about making compromises, especially for smaller machines. From my experience it is easier to design an Open Class ship than a Standard Class glider. For the Open Class fewer compromises must be made.

MB: *So far we have been talking about glide angles as if they were the only important thing that pilots look for and are willing to pay for, but other practical considerations must determine the cost of manufacturing gliders besides sheer performance.*

GW: For a Standard Class design cost is an important sales factor. We can see this with our products now. Our proven safety cockpit won the OSTIV prize, but we can't persuade the customer to pay extra for it. Then the landing gear is a jewel of comfort and safety with a powerful hydraulic disc brake in an enclosed box that can be washed out quickly with a hose. However the competition pilot thinks it's too heavy and the club pilot hopes he won't need it. Some day they may wish they had a really good wheel brake, but it will be too late!

It's a difficult world for designers: how much money will the customer be willing to pay in ten years' time? Ask a banker, where will the dollar head tomorrow, next week, next month, next year? He does not know, but I have to answer that question with every new design. That's where the engineer starts to hope and pray "Please, God, let me learn how to make reasonable gliders!"

To get super performance we need more research into boundary layer control by suction, stiffer construction material (but not heavier relative to stiffness), better and cheaper access to mould cutting machines, better wind tunnels or even flying test beds - and plenty of time, which equals money!

This is what we can see today. I am sure it can and will be done. Even if some ideas in the project do not work as well as intended, we must be patient and not give up. We will see new inventions coming along that will help us. Millions of engineers and scientists using improved means of communication will contribute with their brainwork.

Let me sum up:

I am very optimistic that we will get better sailplanes in the future, from every point of view including cost. Remember that a K-6CR was three times more expensive than a VW Beetle at its time. Nowadays you get an ASW-24 for the equivalent of three VW Golf. The ratio is still about the same. However the Golf and the ASW-24 are both more modern products. There are no limits to sailplane performance in the future. At the moment I do not know how to improve the ASW-27, but ask me in ten years!

Only two things can stop this process:-

- If you forbid scientists and engineers to think.
- If you stop buying my sailplanes which pay for my salary...

[4]MB notes: Frank Whittle knew that the jet engine he patented in 1931 would not be a practical proposition for mass manufacturer until metallurgy had advanced to the point where the engine's high temperatures could be tolerated. He pressed on, confident that while he worked on his designs the materials would become available - and they did.

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LEARNING TO FLY

The ramblings of a (very) mature student

I teach surgery and have done so for thirty years. I know a bit therefore about the problems of instructing people with varying aptitudes many difficult and demanding skills. I also know the anxieties of the first solo, both for the instructor as well as for the instructed.

I have also learnt to fly, albeit at an age when some might think it unwise to trust one's failing faculties. I thought therefore that it might be instructive (sic) for instructors to hear my story as it were from the consumer's side of things.

Like so many flying friends I made model aeroplanes as a lad. Early attempts mostly failed to fly very well, but Keil Kraft introduced me to the principles of aerodynamics and the need for caution in high winds if disaster was to be avoided. Remember the Eaglet, the Phantom, the complex Minimoa glider, the tiny diesels and the smell of elastic lubricant?

My introduction to proper flying took place about six years ago. It was an air experience flight as part of a corporate gliding evening. In preparation I had read one of Derek Piggott's books so I thought I knew what to expect. Nothing, however, had prepared me for the terrors of that first winch launch. As far as I know I didn't gibber too much when the cable back-released at the top of the launch but the deafening twang convinced me that there had been a major structural failure and my time had come. We did a stall and I learned the basic controls and was told I was a natural!

Despite my fears I came back for more on the principle that my first instructor, J.B. who was in the back seat on those first flights, seemed to be thoroughly enjoying every second, and if he was having a good time it must be possible for me to learn to do so as well.

During the next few weeks I experienced a number of different instructors. Some spent much of the time criticising my poor flying. "Get the string straight, you'll never learn to glide if you don't keep the string straight." I became obsessed with that ruddy piece of wool. I also became thoroughly depressed at my inability to keep the K-13's string exactly in the middle for every second I was in the air. Driving to the airfield at times I hoped for a puncture or some other good reason not to arrive!

Then one day I flew with B. B-S. I apologised in advance for what I knew was going to be a seriously bad experience for him since I knew that if I could not keep the string straight all the time we should surely perish. He smiled quietly and invited me to get in.

I flew very badly, even for me. The string was at least 30° out for much of the time and the airflow howled at the side of the fuselage. Quiet words of encouragement only came from behind with a few gentle suggestions as to how my coordination might be improved. In minutes the string was straight and stayed there! Instead of worrying what the instructor was going to say if I didn't get it right I was learning to fly. Ruddy marvellous. My new-found confidence was dented somewhat by a dramatic arrival with a violent and unplanned side slip on finals followed by a real floater of a landing. During the long push back I wondered how B. could have survived such a flight without one "I have control" and still remain smiling. But that is his way.

Since then I have had many instructors. In fact there are sixty or more instructors in my last club, which allows a wide variety of approach. Most are excellent, some, however, have a lot to learn about how to teach. One just couldn't keep his hands and feet off the controls; throughout the flight the stick and rudder jiggled about in a nervous sort of way as though they had a life of their own. Another said absolutely nothing before, during or after the flight. Another, a successful competition pilot, seemed to be unable to understand why I could not fly as well as he after my grand total of 20 launches.

Presumed I was unable to accept instruction

The worst was a young man who was instructing at a club evening for early solo pilots. True, my one and only flight of the evening was marred by the Junior's airbrakes opening on the climb and the canopy lifting about two inches on the landing ground run, both dealt with in a fraction of a second but avoidable with more care. A good instructor would have rightly criticised my checks and then told me to get back into the glider and do it again properly. This one was certainly critical but rather let himself down by revealing his belief that I must be "a successful business man" and therefore presumably unable to accept any instruction!

He had no further advice to offer and for the rest of the evening I was ignored. Not very encouraging, but I did return to the club a while later and J.B. got me back into the single-seater.

The frustrations of trying to progress at a very busy club when professional life allowed Saturday flying only led to my taking up motor gliding. The idea of arriving at the airfield and getting straight into the aeroplane, powering up to soaring height and switching off the engine was very appealing. I joined a dedicated motor gliding club where the instruction was thoroughly professional and with much needed good humour I learned to fly a tail-dragger and did a lot of field near-landings. I got my SLMG licence in 41hrs - very good for my age was the comment from one friendly instructor, an artificial inseminator by profession.

I was encouraged enough by this time to try for a group A licence. I had read that the Beagle Pup was a fine aeroplane with well harmonised controls so I found a flying school which used them for training. It was indeed a superb aeroplane and I converted from SLMG in the statutory number of hours. My instructor was excellent; a serious man but he was also learning to glide so we had more in common than I had feared at first.

Flushed with success I decided to try for an IMC rating. This I did nearer to home and in a Piper Archer. D.G. was my tutor, another thoroughly professional instructor with a wicked sense of humour. During this training I really did wonder about the sanity of instructors who sat calmly back whilst their students attempted recovery from unusual attitudes, in cloud and on a limited panel. Instrument flying according to D.G. started at line up on the runway with take-off monitored by the direction indicator and ASI alone! Great fun though and improves one's flying confidence no end.

Having tried most forms of flying that were reasonable at my age I decided that gliding was still for me. I did not particularly wish to return to my first club for despite the generally high standard of instruction, there was too much shouting too much of the time, especially at the launch point, and I saw little of the supposed social side of launching and retrieving. I therefore decided to try somewhere else.

Mountain gliding in Wales seemed to offer new challenges so I booked up on a course advertised in *S&G*. Here I had the pleasure of encountering an excellent CFI who gave me back my gliding confidence. Even after a lay off from gliding of more than a year and with only two previous aerotows under my belt G.M. allowed me to fly the entire first flight from this very short field. An act of considerable faith which I greatly appreciated. I did over 10hrs flying in a week and really enjoyed the freedom of soaring the ridges, often in the company of buzzards, and exploring the wave in this beautiful part of the country. Here we don't launch unless we expect to stay up for as long as we like. I say "we" because I have joined the club despite the 4hr drive to get there and now at last I have my Bronze badge.

I shall continue motor gliding and to fly the Pup which I share with two friends. I certainly hope for many more hours of Welsh mountain flying and will try for a Silver badge this year in my new glider.

So what have I learnt in these last few years about flying instructors and instruction? That as well as the need for exceptional flying skills instructors require considerable courage and above all great patience. That good instruction requires an understanding not only of the fundamentals of what is being taught but also a highly tuned sensitivity to the manner in which each individual is responding to that teaching. For this reason I believe strongly that it is best for each student to have a very limited number of instructors who can build up good relationships with the student and so get to know in depth that individual's particular requirements and problems.

To accept the position of instructor accepts also the responsibility for the development of the instructed. This is obvious but it carries with it the additional potential for destructive as well as for a constructive influence on that person. It is a role not to be undertaken lightly.

The same is undoubtedly true of instructing in surgery.

THE RATING SYSTEM

Ed has been commissioned by the BGA Competitions Committee to confuse you with a new rating system. It is proposed that this replaces the existing one for competitions in 1998 and entry to the 1999 Nationals. Your comments are invited at EdJohnston@Compuserve.com

Why read this article? You've already skipped it at least twice. The cartoons in Platypus grabbed you first, then a quick pole through the pretty pictures of the clouds, perhaps a visit to the classified ads... Oh God, an article with graphs!

This is all about the new rating system. Now if you are sensible, you will realise you didn't really understand the last one, so not understanding the next one is no major handicap. But there again, if you were sensible you wouldn't be a glider pilot.

Some history

Once upon a time we had a few Regionals and one Nationals competitions. Then they invented the Standard Class, then the 15 Metre Class and we had three Nationals, all held at the same time.

The rating system was designed for this, providing one list for Nationals' pilots giving priority order for entry next year and another for Regionals' pilots for promotion to Nationals. You get the best rating for winning the biggest competition, other ratings being in proportion to your place in the competition (this is a horrible simplification, so don't get cocky).

Then we decided to separate the three Nationals. Later we created the Overseas and the Junior Championships and now we have the Club Class and the 18 Metre Championships. All the time the number of Regionals has been growing steadily. We have become competition junkies, with 26 rated competition Classes last year and 612 places being contested!

The current rating system almost works now, all be it with some major anomalies. However, it never was very good at dealing with international competitions and with the introduction of the new Championships, it will fail.

What are we trying to do?

Rating systems compare the performances of different pilots in different competitions. The resulting list is an order of merit, used to choose who gets into the Nationals.

I've tried to end up with a list which:

- Caters for all types and standards of competitions.
- Takes account of all competitions entered by a pilot.
- Gets the best pilots into the competitions of their choice.
- Balances the numbers of pilots getting in with those staying in the Nationals.

What you really need to know

The mathematically challenged are let off the hook here. If you can get through this bit and want to read on, it must be piddling with rain.

All you really need to know is this:

- You get the best rating by winning competitions.
- If you are thinking about your rating while competing, you are not going to win.
- Once you get a rating, you must apply before January 31, then send the right amounts of money on time to the right place or it's all for nothing.

Now go and make a cup of tea and pick up a Jeffrey Archer.

How does it work actually (for masochists only)

Well, you asked for it. This section explains the detail behind these simple statements.

The system first sets a **competition rating** for each competition. The winner gets this value as their **rating score**. Pilots get a **rating score** based on their proportion of the winner's competition score and the **competition rating**.

A **differential rating** is calculated which is like a bonus scheme for other good performances.

The **pilot rating** is made up of their best **rating score**, plus **differential ratings** from all other competitions entered. An element from the previous year's rating is thrown in for good measure.

Competition rating

The first principle of the system is that all competitions have a measurable standard. Rating a competition is a measure of the quality of the field and must be done to compare pilots flying in different standards of competition.

Each competition has a **base rating**. For Nationals it is 1000pts, Regionals 800pts with various Championships between and Internationals above these figures. The **base rating** will be published for each competition by January 31 each year.

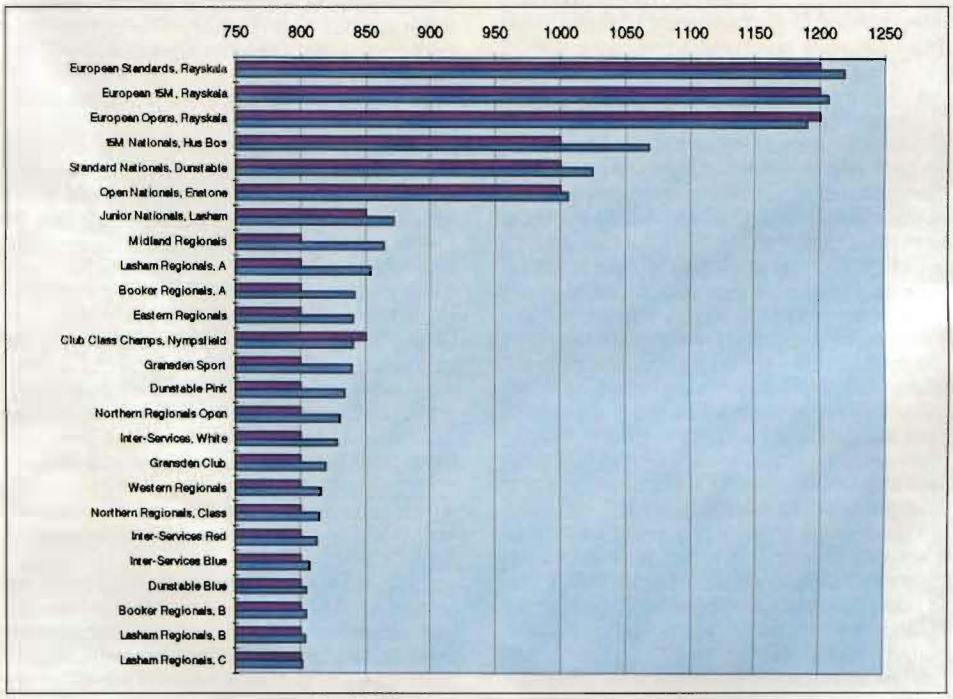
Then the **base rating** is adjusted according to the number of pilots entered. It goes up or down by 1pt for every pilot above or below the entry as laid down here:-

Comp Type	Size of Entry
Internationals	25
Nationals	45
Championships	30
Regionals	15

Therefore a UK Nationals with 48 entrants will get a modified rating of 1003

Then the rating is increased further by 5pts for each pilot whose current rating is greater than the base rating. Thus, if there are six pilots in the same Nationals with a rating score of 1001 or

Below: Fig 1. How competitions would have been rated in 1996 with the top bar of each pair being the base rating, the other the rating that the winner would have got.



more, the competition is rated 1033.

The numbers used attempt to make the rating an absolute measure of achievement. Imagine a standard 15 glider Regionals. They should get a range of ratings, with the first two having a fair shout at getting into the Nationals.

Now imagine the same field, plus two top quality Nationals' pilots. What should happen is the first two run away with it, leaving the others some way behind. However, the winner's rating score should go up due to the improved quality of the field. If the system works perfectly, the original 15 should still have the same rating scores as before, with two of the 15 plus the two Nationals' pilots having a fair chance of entering the Nationals.

A good deal of experimentation has led to the method and numbers used. I ended up with the simplest method I tried, because none works perfectly, but at least this is easy to grasp. (Huh?!)

International competitions are only adjusted for the number of entrants, not the field quality because we don't have ratings for every pilot likely to fly them. See Fig 1 on opposite page to see how competitions would have been rated in 1996 using the new system.

Rating scores

Another basic assumption is that competition scores measure the relative performance of the pilots better than simple placing. If there are 5pts between 1st and 2nd, you should end up with similar ratings. If there are 500pts between, a few more pilots should appear between the two of you on the ratings list.

After a certain amount of experimentation, I derived the formula below for calculating the rating score which mixes scores and pilots from different competitions about right. Hold your breath:

Pilot Rating = (Comp Rating + Rating Slope)
(Pilot Score / Winner Score - 1))

The Rating Slope used is 1200, from which the sad readers amongst you will deduce that you can get a negative rating score. But only if you are really rubbish. There is also a get out. If you have to leave the competition due to act of God, forces out of your control, and you bribe the right person, you can have your entry annulled rather than becoming negative.

Differential ratings

The idea of a differential rating (lousy name, but I couldn't think of anything better) is to completely mystify the pilots in the system? **No.**

It is to take account of other competitions. It rewards good performances, but punishes dreadful ones.

If you get a rating score above a defined high standard, the difference is added to your rating. If you drop below the low standard, you get the difference deducted. In plain English:

Differential Rating = max (0, (Rating Score - HiStd)) + min ((Rating Score - LoStd), 0)
with HiStd = 800pts, LoStd = 250pts.

That means you get a good rating plus a bit more if you win two good Regionals. Ken Barker would have climbed to 25th in the ratings by winning three Regionals last year. Also, if you place in the top 15 in two Nationals, both are likely to count towards an improved rating.

The downside is, win a Nationals then crash Day 1 of the next and you go down, but by no more than 100pts. For instance, if you score around 1400 in your second Nationals where the winner gets around 5500, your overall rating is reduced.

You have to do pretty well to improve, or disastrously to go down.

Pilot rating

Finally, last year's rating less 250pts carries forward as another competition rating score. For instance, a brilliant rating score of 1200 rating points last year gets carried forward as 950 rating points as your best competition, or 150 differential rating points to add to this year's best competition. (Obviously!)

To get your rating, add up the best rating score and all other differential ratings.

What we didn't do

One thing we looked at was entry rationing, that is limiting the number of Nationals' entries you can make from one good performance.

Actually, very few pilots get one fair result and enter three Nationals. A greater number of less deserving pilots get in through unduly high ratings from large Regionals and qualifying list ratings being too good.

Thus we went for simplicity, allowing the best rated pilots to fly in as many competitions as they choose.

Who gets in

Ultimately, this is all about who gets into competitions (Fig 2). Well, first let's look at where the top 150 ratings come from. Each bar below represents ten pilots, and which type of competition was their best. The purple bits at the top of the bars to the right represent the Regionals' pilots, dominant from 60 down. The yellow which make up most of the rest are Nationals' pilots. The odd in between blue bits sometimes at the bottom are ratings from last year, and the bar on the left is for the Big Boys who don't care about ratings because they are always at the top.

If this system was in place now, the Ins and Outs of the over-subscribed Nationals would be:

	From List	Standard	15M
Out	Promotion	2	3
	Priority	4	0
In	Promotion	5	3
	Priority	1	0

All that bloody effort and only nine out of 100 places change hands! Well that isn't exactly accidental. I have tried to make a list which has some reasonable continuity from the last one.

The major difference is for pilots from the Qualifying List (*ie* those who got a good rating two years ago but bombed out last year). You Regionals pilots who complain about it being too hard to get into the Nationals, it is mostly because between a third and half the Nationals promotion list places are taken up by people from the qualifying list who won a Regional competition the year before last!

The other casualty is the person placed reasonably in a large Regionals. This system takes much less account of size (no, I can't say it, it's too obvious).

Ready for a beer?

If you have got this far, you should be.

After the bar, the hang over, the missed 500km, we go to feedback (I can see my phone line throbbing with the waiting e-mail). That means you and any points you feel obliged to make regarding the sheer brilliance and simple elegance of the system.

Then full production, using it for the competition year of 1998, provided no one actually understands it which, like the Comps Handbook, would make the system instantly accepted by all.

Health warning

Oh yes, I nearly forgot to mention. It sort of doesn't quite work.

You see, one of the foundations of the system is that the scoring system works well, and evenly, over all competitions. (!)

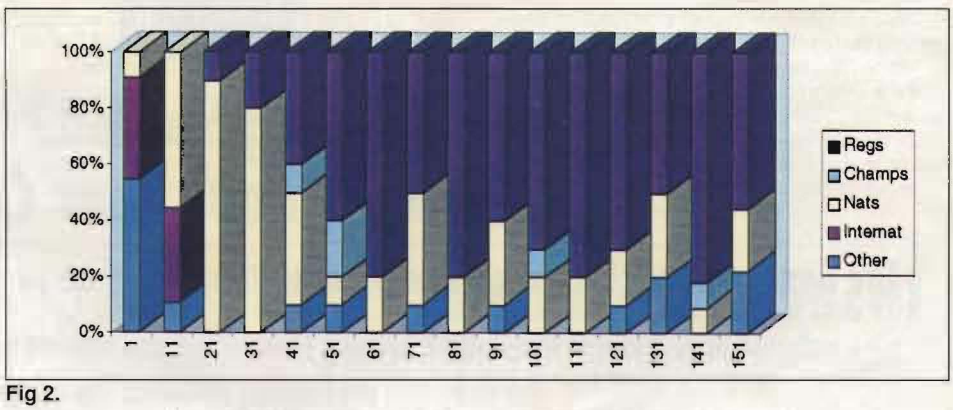


Fig 2.

However, after a good deal of head scratching, it is totally clear that:-

1. This is better than the system we have got.
2. The rating system can't really be expected to fix basic problems in the scoring system.

Rather like cameras versus GNSS data loggers, I can find ten problems with the old system for every one with the new.

I await your comments.

Soaring? Sorted.



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MetFAX AVIATION

SOARING FORECASTS

Derek has resigned as CFI of the London GC to concentrate on the MetFAX service he describes. He has been gliding for 27 years, a professional instructor for 23 and has a Gold badge, all three Diamonds and is an AEI regional examiner

Many readers will be familiar with the soaring forecasts produced by me from the London GC. This has been happening successfully for a number of years but the time has come to move the service forward. As well as outlining the current developments I thought a little background information, how it all started and what goes on day to day, would be of interest.

Some years ago a group of members got together to produce a development plan for the flying operations of the London GC. It was recognised that an important part of developing cross-country flying was a comprehensive daily soaring forecast. As meteorology has always held a fascination for me, I agreed to take on the task of organising this.

The Met Office was moving increasingly towards a commercial operation and could not provide the type of forecast we required for a price that we could afford to pay. Almost coincidentally, a weekend "teach in" organised by the BGA was held at Lasham. Run by a team of professional meteorologists, the course demonstrated that self-help was possible given the will, enthusiasm and a little technology.

Following this I set about developing my interest. I learnt, mainly with the help of Mike Garrod, how to interpret tephigrams, produce charts and tephigrams from coded data, analyse charts more fully, how the weather can develop from a given set of data etc and, of course, I'm still learning. The members of the London GC were persuaded to provide some of the more expensive equipment such as the satellite receiver, HF radios and the MIST weather information system.

Each forecast takes approximately 2hrs to produce. Starting at around 0630hrs each morning, data is collected from the Met Office's MetFAX and MIST systems. The basic information required for each forecast is the general weather situation for the period, an outlook for the next 12-24hrs, surface analysis chart, T+ 24hr surface chart and, most important of all, a tephigram. In addition, information on winds at various levels, dew points, temperatures, cloud cover etc is used to form a "picture" of the day.

Using the MIST information system, most of the information can be displayed on the computer. Some information, such as surface charts, satellite pictures, rainfall radar and winds can be animated making it easier to determine and monitor the run of the weather. The computers' graphics handling ability is utilised to present the forecast in the form many are familiar with.

It was not long after I started producing forecasts for my own club that other clubs and glider pilots came to hear of what we were doing, sampled the product and wanted it for themselves. So we have been supplying a forecast for a number of years to almost all the professional clubs and many smaller clubs and individuals serious about their soaring

Throughout, the Met Office and Jill Harmer in particular have been most supportive. They have provided specialised information and facilities (for a price of course) whenever we needed it.

LGC MET, as we became known, has now grown to such an extent that it has become a little unwieldy for the London GC to manage on its own. The cost of collecting the data and distributing it was well over £5000 last year. Not only that but to service the increasing demand would need investment in expensive equipment or services to distribute the forecast to everyone who wants it at the time they want it.

It is for this reason that we have now teamed up with the Met Office to provide a daily soaring forecast on MetFAX. The information is now accessible to all pilots and clubs using premium rated dial-up fax. The biggest advantage is that from March 1 to September 30 the forecast is totally "on demand", a facility that LGC could never provide.

To access the soaring forecast on MetFAX, simply dial 0331 100 490. Reception of the soaring forecast together with surface analysis and T+24 charts will take 2-4min depending on the weather! The calls are charged at £1/min at all times and run at 9600-band rate. If you have any problems using the MetFAX service please call the MetFAX helpline on 01344-854435.

The information provided by the forecast will be familiar to many. The presentation has changed slightly but now the forecast gives an indication of soaring conditions for the whole of the UK. The country has been divided into three sections, each section having its own text detail. The soaring cross-section has been extended to cover a 140km radius from Dunstable.

The critical limiting factors preventing the cross-section covering the whole country are that the extra data required is not readily available and the extra cost it would involve could not be supported at this time. However, if the demand is there then we will certainly consider extending the cover in the future. Let us know what you want.

The MetFAX Soaring Forecast is based on data collected at 00Z. For general use the 00Z based forecast gives a good indication of the day's soaring conditions but for serious competition this is too far away from the time of the task. To make the best of the weather, competition forecasts must be continually updated until either the first launch or the day is scrubbed. This becomes even more important in a changeable weather pattern. Therefore, all good competition tasks must be based on an 06Z "fine tuning" update.

I am continuing to provide a forecasting service for competitions as a separate item from the MetFAX forecast. Updates can be provided both remotely or on site and for this season I shall be available to give on site forecasts at every Nationals. On site cover for other competitions will depend upon work commitments.

We feel sure the new arrangements will help everyone to get more from their gliding time. As always I will be pleased to receive your comments and to provide any help I can. You can contact me at the London GC or by email on 101333.1656@compuserve.com.

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BGA & GENERAL NEWS

FROM THE BGA CHAIRMAN

This issue Dick Dixon writes about the complexities of flying abroad and describes the work of the BGA Safety Committee



We live, as the saying goes, in interesting times! So far as I am concerned it would be entirely appropriate to add the word "hectic".

At the time of writing the matter which is concentrating the attention of your Executive is concerned with ICAO Annex 1. For the uninitiated - and there won't be very many of those who have recently attempted to fly a glider in France - this is the piece of international legislation which sets out the requirements for the licensing of glider pilots who wish to fly in a country other than their own.

Briefly, the requirements are that pilots must have a current licence issued by their country's CAA and which complies with International Civil Aviation Organisation, Annex 1. Here lies the catch. In Britain the CAA does not administer gliding and has no mechanism for issuing glider pilots' licences. Annex 1 requires that the "licence" is issued by the CAA of the pilots' home country. Impasse!

We are currently talking to the CAA, the DGAC (French) and the FFVV (French Gliding Association) to try and achieve a sensible and acceptable solution to an illogical and frustratingly bureaucratic nightmare.

With the season for our pilots to fly in France already upon us hopefully, by the time you read this, we will have found at least a temporary solution to this particular bit of lunacy.

Other matters in hand are the on-going work associated with the recently introduced airspace changes; the submission by the Competitions and Awards Committee to the IGC of proposals designed to simplify the utilisation of GPS loggers in the verification of badge and record claims and the series of safety presentations by Bill Scull and his team on the Safety Committee.

Which brings me neatly to my theme for this issue - safety and the workings of the Safety Committee.

Bill Scull is its chairman and I am sure he needs no introduction from me. Under its terms of reference the Committee accepts responsibility for all safety aspects of gliding, including liaising with the Air Accident Investigation Branch (AAIB), the preparation and analysis of statistical information and the detection of trends in order to identify appropriate counter measures.

You will be familiar with the annual publication of the Safety Committee's **Accidents to Gliders**, which fulfils part of this role and should be compulsory reading for all glider pilots if we have any hope of avoiding the reinvention of other people's accidents.

To achieve its objective the Committee liaises closely with other BGA committees, for example the Technical Committee. On occasions there are quite complex technical aspects to accidents or incidents when the availability of qualified technical opinion is essential.

Another obvious example of the need for co-operation between committees is with the Instructors' Committee where safe methods of instructing are of vital importance. So the Safety Committee chairman attends the IC's meetings and contributes regularly to the various debates.

At present the Instructors' Committee also provides a team of investigators for fatal and serious accidents and they liaise closely with the Safety Committee and the AAIB.

Clearly the role of the Safety Committee is vital. Accidents and injuries and, tragically, the occasional loss of life are the unwelcome and unacceptable side of our sport. Some accidents will happen but many can be avoided. Read the brief details given in the BGA Accident Summaries in *S&G* or **Accidents to Gliders**. Notice the recurring theme. I am referring to the part played by the pilot! The majority of accidents are due to pilot error. That means us.

Be aware and alert to changing situations. Try not to reinvent the accidents about which you read and you will help to make the task of the Safety Committee just that much easier.

Before I close I must say a brief word about our AGM in February.

I thought it was a great success. Claire Thorne and Sylvia Bateman did a marvellous job in organising the whole event and I know from personal experience how hard they must have worked to achieve such a tremendous result. So on behalf of all those present my grateful thanks to both, and also to all of you who attended and joined in all the activities with such enthusiasm.

We look forward to February 1998!



BGA AGM & CONFERENCE

No doubt due to the enthusiasm of two young glider pilots, Claire Thorne who flies with the Oxford GC and Sylvia Bateman from Four Counties GC, the BGA weekend took off after a phase of near stagnation. More than 300 packed the Hopcrofts Holt Hotel, near Kidlington, Oxford, on February 22 for a lively mix of lectures and the AGM.

Gerhard Waibel, Schleicher's designer, was definitely a big draw and he entertained and informed with his two lectures on design, speculating on the performance likely by 2020.

Other speakers were good value and helped create a varied programme. The girls reinstated the trade stand tradition and visitors were confronted with a rigged PW-5 in one of the hotel's reception rooms.

At the AGM the BGA chairman, Dick Dixon, presented a BGA diploma to Roy "Woody" Woodhouse of Norfolk GC for services to gliding. "Woody", as we reported in the February issue, p37, has recently retired as CFI after 17 years.

Peter Hearne was elected vice-chairman with Mike Brook, John Glossop, David Salmon, Lemmy Tanner and Richard Yerburgh joining the Executive.

The dinner was packed out with more than 220 and many others wanting tickets. The annual awards were presented by Mary Dixon, Dick's wife, as follows:- **Wakefield** (longest distance) Peter Baker (Cambridge), 737.5km in a Discus on June 12; **Furlong** (longest triangle), 595.3km in an ASW-20 on June 13 and **Enigma** (National Open Ladder) Tim Macfadyen (Bristol & Gloucestershire); **California in England** (longest flight by a female) Geralyn Macfadyen (Bristol & Gloucestershire), 532.9km in an ASW-20F on June 13; **Frank Foster** (fastest 500km) Neville Allcoat (Scottish Gliding Union), 103.6km/h (actual speed 116km/h around 540km) in a DG-500 on October 29; **Rex Pilcher** (earliest Diamond distance) Tony Mountain (Bicester), (Discus CS) on May 4; **Manio** (fastest 300km) Ken Barker (Cambridge),118.7km/h in a Duo Discus on August 19; **De Havilland** (maximum height) Neil Foreman (Cambridge) and Peter Coward (Deeside) with 26 400ft at Aboyne in an ASH-25 on September 11; **Volk** (longest O/R) Phil Lazenby (Yorkshire), 563km in a Pegasus on June 13; **Seager** (longest two-seater flight) Paul Little and Chris Taylor (Bristol & Gloucestershire), 598.4km in a Nimbus 3DT on May 4; **Firth Vickers** (National Open Ladder runner-up) John Bridge (Cambridge); **L Du Garde Peach** (National Weekend Ladder) Steve Mynott (Cambridge) and **Slingsby** (National Weekend Ladder runner-up) Dave Caunt (Booker).

1998 CLUB AND 18 METRE NATIONALS

The season is just starting with pilots looking forward to competing in one or more of the many Regionals and Nationals, some of which are oversubscribed. We have the strongest British team for many years and the weather has been on our side a lot of the time.

The British competition scene could not be healthier but unfortunately it would appear that

we could become a victim of our own success. With this increase in competitions, particularly Nationals, there are not enough clubs coming forward to run them.

The BGA Competitions Committee has not had any bids from clubs willing to hold either the 1998 Club or 18 Metre Class competitions and if we don't have any volunteers they will have to be cancelled. Both events are gaining in international status and are likely to become more popular with British pilots.

If your club has rejected or not considered the possibility of holding either of these competitions we urge you to give it some thought. The Committee will consider any suggestions on dates and venues from clubs wishing to be involved. If you can help or would like further information please contact any member of the Competitions Committee or the BGA office who will put you in touch with the appropriate person.

Alex Evans, *BGA Competitions Committee*

NEW IGC SECRETARY



Angela Sheard is the new secretary of the International Gliding Commission, taking over from the illustrious Fred Weinholtz .

She has been associated with flying since leaving school to join BEA/BA as ground staff and long haul cabin crew. Angela learned to glide with the BA staff at Booker in 1972 and since then has been caught up in adminstration. She was British team manager at the 1990 European Championships in Leszno, Poland, and helped the Polish team manager at the 1994 Europeans.

She twice co-ordinated the British Overseas Nationals at Leszno and has had various other jobs at World Championships level.

Angela is fluent in five languages and this, with her quick mind and retentive memory, will help her in this challenging role. She has been working and studying in Poland but is still going to be based in Europe.

SAFETY HARNESS DEFECT

Willans Harness Manufacturing Ltd are inspecting a quick release box from one of their aircraft harnesses after the fracture of part of a locking plunger stopped the release of the relevant strap. This is the first notified failure in a production of 500 000 plungers.

These releases have been in use since 1992, are blue and operated by a lost motion lever. Willans are offering new units fitted with strengthened plungers on an exchange basis. For more details contact them on 01736 796938 or fax 01736 798607

AIRSPACE 1997 CORRECTION

The correct frequency for first contact to ask for clearance with:-

STANSTED is 120.62

LUTON is 129.55

Please amend your lists.

Carr Withall, *Airspace Committee chairman*

DEVELOPMENT NEWS



Roger Coote, BGA development officer, reports on another Lottery Sports Fund award which breaks the half million barrier

The announcement of the Wolds GC's successful application for three new gliders has brought gliding's share of Lottery Sports Fund grants to more than a £500 000.

Fifteen clubs have benefited and there are many more applications in the pipeline. Processing is now taking longer. Initially, provided there were no problems, applications were processed in about three months. The Wolds GC's application took nearly nine months from submission in July to the final announcement in March.

They say the first million is the hardest to make. I wouldn't know! But I do know that if we do have a change of government, the continued availability of Lottery Funds on the present scale will be open to question. The message is to apply now, while stocks last, and if you need help, telephone me on 01273 515373.

(See Simon Parker's article on p146 to see how Wolds made their bid.)

Field Landing Fees

The *Farmers' Weekly* published an article on March 14 which explains why airborne guests occasionally drop into fields and clearly sets out the legal position of both the farmer and the glider pilot in the event of a field landing.

Acceptance of landing fees by the British Balloon and Airship Club has created an awkward precedent for glider pilots, yet the Code of Conduct, agreed in 1972 between the BGA and the National Farmers' Union, still stands. That code, which is now included as RP40 in **Laws & Rules for Glider Pilots**, is fully acknowledged by the author, Edward Newman, who points out that while no agreement exists for the payment of landing fees, glider pilots are fully covered by insurance and will always pay compensation for damage, if properly assessed.

Edward advises farmers to stay calm, be courteous and co-operative and to remember that the landing may have been the pilot's safest option. His advice is not to object to the removal of the glider but to provide reasonable assistance to the pilot and his crew.

I sincerely hope that the widespread publication of such an informative and even handed article will improve glider pilots' relations with farmers. We have always valued our friendship with the farming community and want to keep it that way.

West Wales GC

The club officially ceased to operate a year ago but it has recently been reactivated and is now gliding from Templeton Airfield. Suitably qualified instructors are urgently needed in order to meet BGA membership requirements. If you are able to help please contact Rainer Kiess on 01834 813758 or John Williams on 01834 813835.

Portsmouth Naval GC

Despite the closure of HMS Daedalus, Portsmouth Naval GC is continuing to operate as a Service club from Lee on Solent Airfield as a tenant of the Hampshire Police Authority. The contacts are the chairman David Murray or the CFI Ken Stephenson on 01705 550502.

ALPS DEFENCE APPEAL

On April 11 the BGA had received donations from the following:-

L.E. Jones, R. Mathie, H. Middleton, K. Mansell, K. Whitely, Oxford University GC,D. Vennard, B. Wells, R.A. Downing, H. Maddams, M. Howlett, H. Ashurst, J. Berringer,R.E. Cross, T. Snowdon, P. Hardie, P. Foster, K. Martin, K. Rowley, D. G. & R. Watson, A. Cleworth, M. Pleasance, F & V Russell, R. Feakes, J. Berringer, A. Cooke, Surrey Hills GC, Rattlesden GC, Cornish Flying Club, G. Fisher, K. Gregory, J. Swannack, D. Davis, R. Bowsfield, R. Starmes, H. Katagiri, Dr D. Hardwick, B. Watson, Lasham Gliding Society, P. Naegli, Bannerdown GC, Oxford GC,J. Ellis, M. Costin, J. Riley, M. Rushton, W. Malpas, K. B. Zijp, T. Slater, D. Aknai, D. Noyes, R. Cole, London GC, P. Clarke, R. Noon, D.G. Lee, Clevelands GC, Stratford on Avon GC, Dr P. Reasbeck, Yorkshire GC, Yorks GC, W. Lombard, J. Hill, D. Trouse, P. Twiner, P. Cowling, Fenlands GC, Popular Flying Association, Mendip GC, G. Butler, Penningtons, Robert Williams, A. Davis, S. Eyles, A. Emck, J. Barrett and P. Gray.

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WORLD CLASS PILOT KILLED

We are sad to report that Tim Biggs, the South African who flew in several World Championships, was killed in a mid-air collision with Guillame Nel (Astir) on February 22, flying a Ventus from his home club, Magalies GC.

Born in 1919, he was National Champion many times, won the Rhodesian (Zimbabwe) Nationals on a number of occasions and held single and two-seater world records. When he was 70 plus he gained a 1000km diploma.

Aviation was his whole life. After 22 years in the South African Air Force he founded his own aviation workshop which is today Aero Sales Workshops, a division of the National Airways Corporation.

Tim flew cropsprayers and dabbled in aerial photography, but will be most remembered for his deep devotion to gliding. He built and flew his own gliders, was an agent for Schempp-Hirth and made a big contribution to cross-country flying at all levels. After a break of some seasons Tom entered a Nationals this year.

BGA 1000 CLUB LOTTERY

The **March** draw results are: First prize - M. J. Wooldride (£50.25) with the runners up - A. W. Doughty, J. Patchett, J. Delafield, M. Cater and J. Lowe - each winning £10. 5. **April**: First prize - J. D. Jones (£50.15) with the runners up - D. Gill, N. F. Holmes, J. Dransfield, A. C. Dukelow and S. F. Duerden - each winning £10.5.

GLIDING CERTIFICATES

ALL THREE DIAMONDS

No.	*Name*	*Club*	*1997*
519	Fitzgerald, Justin	South Wales	17.1
520	Campbell, David	Ex-Pat	12.8.96
521	Irving, Donald	Southdown	8.11.96
522	Drury, Graham	Kent	15.1

DIAMOND DISTANCE

No.	*Name*	*Club*	*1997*
1/755	Fitzgerald, Justin	South Wales (in Australia)	17.1
1/756	Campbell, David	Ex-Pat (in USA)	12.8
1/757	Irving, Donald	Southdown (in Australia)	8.11.96
1/758	Walker, Edward	Cotswold (in Australia)	8.11.96
1/759	Drury, Graham	Kent (in South Africa)	15.1
1/760	Tucker, Jeffrey	ESC (in South Africa)	15.1

DIAMOND GOAL

No.	*Name*	*Club*	*1997*
2/2528	Hood, Jeremy	Four Counties	31.8.96
2/2529	Irving, Donald	Southdown (in Australia)	7.11.96
2/2530	Hope, Dominic	Deeside (in South Africa)	24.12.96
2/2531	Hodgson, Malcolm	Lasham (in South Africa)	31.1
2/2532	Tucker, Jeffrey	ESC (in South Africa)	7.1
2/2533	Perley, Andrew	Booker	18.8.96

DIAMOND HEIGHT

No.	*Name*	*Club*	*1997*
3/1373	Duerden, Alan	Clevelands	12.1
3/1374	Lees, Edgar	Glyndwr	12.1
3/1375	Grout, Richard	Clevelands	12.1
3/1376	Hall, Andrew	Lasham	27.9.96
3/1377	McLean, James	Clevelands	9.2
3/1378	Pike, Martyn	Fenland	8.2
3/1379	Nevill, John	Deeside	9.2
3/1380	Foster, Gavin	Glyndwr	6.2
3/1381	Hale, Ronald	Portsmouth Naval	23.10.96

GOLD BADGE

No.	*Name*	*Club*	*1997*
1968	Duerden, Alan	Clevelands	12.1
1969	Hall, Andrew	Lasham	27.9.96
1970	Hood, Jeremy	Four Counties	30.10.96
1971	Rae, Robert	Four Counties	29.10.96
1972	Stevens, Raymond	The Soaring Centre	9.2
1973	Cottingham, Iain	Bicester	24.10.96
1974	Irving, Donald	Southdown	7.11.96
1975	Bradley, Claire	ESC	7.7.95
1976	Hodgson, Malcolm	Lasham	31.1
1977	Perley, Andrew	Booker	18.8.96

GOLD HEIGHT

Name	*Club*	*1997*
Duerden, Alan	Clevelands	12.1
Weekes, Edward	Oxford	27.9.96
Waite, William	Glyndwr	12.1
Hall, Andrew	Lasham	27.9.96
Hood, Jeremy	Four Counties	30.10.96
Rae, Robert	Four Counties	29.10.96
Stevens, Raymond	The Soaring Centre	9.2
Cottingham, Iain	Bicester	24.10.96
John Nevill	Deeside	9.2
Watson, Andrew	Cambridge (in USA)	13.12.96
Hale, Ronald	Portsmouth Naval	23.10.96
Hurle, Ian	Glyndwr	13.3

GOLD DISTANCE

Name	*Club*	*1997*
Irving, Donald	Southdown (in Australia)	7.11.96
Bradley, Claire	ESC (in South Africa)	7.7.95
Hope, Dominic	Deeside (in South Africa)	24.12.96
Hodgson, Malcolm	Lasham (in South Africa)	31.1
Tucker, Jeffrey	ESC (in South Africa)	7.1
Perley, Andrew	Booker	18.8.96

SILVER BADGE

No.	*Name*	*Club*	*1997*
10 186	Moutrie, Tom	London	19.8.96
10 187	Tromans, William	Stratford on Avon	19.8.96
10 188	Anderson, Andrew	Highland	8.3
10 189	Bedingfeld, John	Glyndwr	13.3
10 190	Janes, Stuart	Rattlesden	18.3

UK CROSS-COUNTRY DIPLOMA

Part 1

Name	*Club*	*1996*
Sheahan, Philip	Black Mountains	15.8

ACCIDENT SPOT -

By the BGA accident investigation team

How Long Does It Take You To Pull Off?

It is early April as I write and already this spring there have been three gliding accidents in which the pilot has failed to release from a winch launch in time. In each a wing has gone down, dragged along the ground, causing the glider to cartwheel round and in one case put it over on its back!

In every accident the pilots and gliders were substantially damaged. Right at the start of the season and all because the pilots failed to pull off, believing they could rescue the situation with the stick.

Witnesses all report how fast the situation changed from abandoning the launch and starting again to a point at which the accidents became inevitable. Half a second would have made the difference.

Keep your left hand very near to the yellow release knob. If the wing goes down and you can't immediately stop it going down, RELEASE.

Pushing back the glider to start again takes considerably less time than clearing the wreckage - and then there's the paperwork!

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CLUB NEWS

Copy and photographs for the August-September issue of *S&G* should be sent to the Editor, 281 Queen Edith's Way, Cambridge CB1 4NH, tel 01223 247725, fax 01223 413793, to arrive not later than June 10 and for the October-November issue to arrive not later than August 12.

GILLIAN BRYCE-SMITH *April 19*

ANGUS (Glamis)
Following the demise of our winch last year we have built another. On the first launch the winch took Allan Black and Colin Wight to 1500ft, whilst for the second launch Colin, flying solo, reached 1700ft. This is compared to about 1200ft with the old winch. We have started building a back up winch so that we can use three cables.

Bill Romeling has his Bronze badge. Unfortunately some flying was curtailed by high winds during our Easter flying week. Nevertheless, Allan Black managed a total height gain of 23 000ft from three launches, going straight into wave on at least one launch.

Having now fully settled into our new home, we are starting a concerted drive for new members.
P. L.

AQUILA (Hinton in the Hedges)
A superb, recently re-covered K-13 has been added to the club fleet and plans are well advanced for further upgrades. Now we need to sell the redundant single and two-seaters! An ASH-25, K-21 and DG-200 join the fleet.

Following the worst flying winter for many years, the early Easter saw the first real cross-countries with 200km tasks giving early thermalling practice - and no landouts.

We have additional grass areas this summer to accelerate operations. Drop in and visit us - our fleet is terrribly under utilised and you can usually get a launch without much waiting, even on a good day!
M. E.

BATH, WILTS & NORTH DORSET (The Park)
We had a very successful flying week at Easter with wave flights on Good Friday for Paul Salter, Alan Milne, Alastair Macgregor and Ron Lynch who got to 14 000ft over Bath and then followed the wave across the Somerset Levels towards Bridgwater.

A fortnight previously the whole club fleet had been winch launched into wave directly over the site. We are now finding that The Park produces wave in several wind directions.

Our junior bursary scheme is at last producing results and becoming a success - Richard Foster went solo on his 16th birthday and flew a Bronze leg the next day and Ian McDougall soloed on his 16th last year and has had several long flights for his cross-country endorsement.

We are sorry to say goodbye to Mike Beale who returns to the USA with a Silver badge after two years. We welcome back Steve and Kath Grzeskowiak from Germany.
J. L.

BIDFORD (Bidford Airfield)
Our annual dinner-dance was well attended with awards going to Richard Palmer, Pete Haselor, Mike Towler, Jim Naylor, Chris Morris, Graham Wright, Dave Findon, Mark Dawson, Bob Starmer, John Watson, John Scott, Doreen Bailey and Pete Freeman.

Norman Britton, Pete Freeman and John Watson are full Cats. We have a full competition programme - two wooden ship Comps for the early cross-country pilots and pundits, a Kestrel Comp, a motor glider competition and the Junior Championships in August. Full details of all these events can be found on our web site at http://aol.members.com/Bidford/bidford.htm

A welcome goes to Pete and June who join the team to provide an excellent bar and barbecue service seven days a week throughout the summer. Visitors are always welcome.
J. W.

BLACK MOUNTAINS (Talgarth)
At our Easter AGM Doc Foster and John Warby retired from the committee and we thank them for their hard work. Lesley Wright and Mike Tomlinson have taken their place.

The glorious Easter weather saw more launches in two days than the whole of March 1996. On Good Friday Adrian Thomas was at 14 000ft and Tony Crowden flew an O/R to Cerrig Cennen.

Mike Tomlinson has a Bronze badge and John Clark an assistant instructor rating.
J. C.

BOOKER (Wycombe Air Park)
The best flight before the end of March was undoubtedly Dave Caunt's 500km on Easter Day. Dave Watt and Glyn Reed also managed 300km in the club Duo-Discus the same week.

We welcome Tony Marlow as our new chairman and also John Dobson and Ron Smith as staff instructors. Both are RAFGSA members, John from the Air Cadets at Syerston, and Ron has been instructing with the BGA.

We have applied for a grant towards buying a 265 Pawnee and upgrading a K-13 to a K-21.

There may still be a few places for our "Free" Regionals in July. There is a new pre-booking system where a member may, at no extra cost, share exclusively a half-day's instruction on a two-seater with one other and a staff instructor. We are also arranging training for those who need radio licences.
R. N.

BORDERS (Galewood Airfield)
Our new facilities, a hangar, clubhouse, shower and toilets, caravan park and workshops will be ready by early summer and the new field means we can take-off in almost all wind directions. We aim to expand our operations to take advantage of all this and instructors and tug pilots will be covering weeks throughout the summer and autumn. Visiting pilots will be most welcome to join us. (See p158.)

At the AGM in March trophies were presented to David Scales and Roger Cuthbertson.
R. C.

BUCKMINSTER (Saltby)
We have updated our fleet with a Jeans Astir and a better K-8. Our K-13 is undergoing a nose wheel conversion. Pundit Russell Cheetham has a new ASH-25.

Our BGA soaring course is scheduled for the week beginning June 2 - call Clive on 01476 860385 for details.
N. R.

BURN (Burn Airfield)
It looks as though it will be a bumper year for badge claims with virtually all the available syndicate shares bought within the club - some have already had good soaring flights.

The K-21 has had its fuselage refinished. One of our Tost winches has been given a new cab/chassis to ride on, thanks to Ian Stoddart and other members.

Dave Goodison has an AEI rating and Dave Peters is a full Cat.
A. J.

CAMBRIDGE (Gransden Lodge)
Our fleet has been enhanced with a Pegasus - single-seater options are two Juniors, Astir, Pegasus and Discus. The private owners fleet has been boosted by six LS-8s.

Our thanks to Gillian Foreman for a very suc-

David Brummitt (left) and chairman Joe Acreman (right) of Devon & Somerset GC presenting a cheque to the Wellington St John Ambulance Brigade. The money was raised by the club's raffle to help towards a replacement ambulance.



cessful gliding promotion when we rigged one of the Juniors in a central Cambridge shopping centre. We had an excellent response and some new members.
K. M. B-S.

Obituary - John Deakin
With the death of John Deakin at the age of 63 we have lost one of our most devoted and hard working supporters, who served as treasurer and chairman and subsequently as secretary of the Cambridge University Gliding Trust which had ultimate financial responsibility for the club. John also served on the BGA Executive Committee.

He graduated with first-class honours in aeronautics from Bristol University and after a spell in the aircraft industry, during which he flew with Coventry, he became secretary to the Cavendish Laboratory, the University's Department of Physics.

Never able to fly gliders as much as he would have liked because of his health, John found some solace in power flying and maintained contact with the club.

We send our sympathy to his wife Pat.
Anthony Edwards



Brian Banks of Stratford on Avon GC gets full marks for perseverance! He went solo after 150 plus launches at the age of 69 - skiing gets in the way of gliding every season.

CLEVELANDS (RAF Dishforth)
We had a good start to the year, with respectable thermals from February and some excellent wave. Jim McLean has Diamond height, Mark Tolson Silver height and Keith Christmas has gone solo.
J. P.

CORNISH (Perranporth)
Mike Sheedy has gone solo. We have a dozen certified "First Aiders at Work" as a result of our winter lecture programme and are well on our way to having ten CAA certified fire fighters.

Our seven day week operation starts with our task week from May 10 and visitors are welcome.
S. S.

DARTMOOR (Brentor)
January was cold with east winds. The best wave flight was to over 10 000ft and Mac McAllister got Silver height with his first ever wave climb to 7000ft off the winch in the Swallow.



Secretary, Tom Snoddy, was presented with the height and distance trophy at Ulster GC's annual dinner by the guest speaker, Rhoda Partridge. This magnifient silver Kirby Kite pre-war trophy on a silver column went adrift in the 1960s before resurfacing in deepest Tyrone after more than 20 years.

The AGM confirmed John Marshall as chairman and Jeff Blackburn as vice-chairman. Gill Meakin remains as secretary. Trophies went to Ken Basterfield, Keith Jarvis, Jeff Blackburn, Steve Lewis and Alan Holland.

We have three new cadets, Susan and Alastair Baily and Daniel Massey. David Weeks is just waiting for this 16th birthday.

Frank Hopkins, Paul Franz and Ken Basterfield have AEI ratings.
P. W. W.

DEESIDE (Aboyne Airfield)
Regretfully due to lack of entries the Scottish Regionals had to be cancelled yet again. In 1998 we shall endeavour to host it later in the season.

Ami Scott Murray has her 5hrs and John Chapman and Borg Hansen Diamond heights.

We were at 20 000ft in February and 21 000ft in March. Please note that we gave the wrong phone number for Mary-Rose Smith in the last issue. It should have been 01569 730687.
G. D.

DERBY AND LANCS (Camphill)
Malcolm Blackburn is our new chairman.

During Easter we had some excellent wave days with height gains of more than 12 000ft. Steve Robertshaw gained all three Diamonds at Camphill.

The BGA soaring course we are hosting in June is fully booked as is the Vintage Glider rally at the end of May. Visiting groups are always welcome with good flying (hopefully!), food, accommodation, and hospitality. Please phone John McKenzie (manager) on 01298 871270.
W. T.

DEVON & SOMERSET (North Hill)
The run up to Easter saw a remarkable change in the weather encouraging many to exploit our ridges, wave and the first decent thermals. Easter was very busy with John Street opening the club for the whole week.

Ron Johns was within eight miles of completing a declared O/R to Lasham. The club development plan for application to the Lottery Sports

The "new" K-2 and syndicate members, left to right, Nicky Mills, Robin Willgoss, Malcolm Wilton-Jones and Danny Lamb, who are based at Booker GC. Photo: Paul Mellor. ➡



Fund is nearing completion while thanks must go to Joe Acreman for his tireless work keeping the club running smoothly.

We also thank the caravan committee of Dick Wolff and his team, who have dug a trench to take electricity to the caravan owners. Also Mike and Barbie Fairclough for organising our new cadet scheme. The first recruits have started training.
S. C. L.

DUKERIES (Gamston Airfield)
On Saturday, February 15, David Prosolek claimed the first 50km of the season with a flight to Saltby.

We have bought an old single-decker scout bus and with much midnight oil being burned several members are converting it to a snack bar and control vehicle.
J. C. P.

ENSTONE EAGLES (Enstone Airfield)
At our AGM in April trophies were presented to Tony Cox, Simon Tucker, John Nicholson, Hugh Gascoign, Jane Nash, Alan Jenkins, Mike Weston, Paul Noonan, Paul Murphy and David Carter.

We have joined up with the National Students GC and look forward to providing flights for their members. The Open Class Nationals is from July 5-13. Thanks to the generous help of members at weekends we have painted the clubhouse and are refurbishing the furniture - we promise no more three piece suites!
J. N.

FENLANDS (RAF Marham)
The poor weather has meant a slow start to the season, however, Clive Weston and Mick Debolts have gone solo; Roger Grant and Mike O'Brien have Bronze badges and Martyn Pike (CFI) and Peter Stafford-Allen gained Diamond heights at Dishforth.

The Motor Falke has been kept busy with advanced training.
C. W.

FULMAR (RAF Kinloss)
Steve Darke flew his 5hrs at Sisteron. At the recent AGM trophies were presented to Tim Baxter, Julie Hull, Mike Seward and Mike Forman.

We are delighted with the number of new members and hope to continue our steady increase of flights and achievements.

Forthcoming events include expeditions to Cairngorm and Connell GCs; passenger and barbecue nights, a family day with flying displays on May 31 and flying at Highland GC's Easterton site on June 14-15.
J. P.

GLYNDWR (Lleweni Parc)
Our spring wave produced nine excellent days' flying for the seven visiting clubs, with James Prossor departing the Snowdon primary wave at 26 300ft still climbing at 3-4kts. Garry McKirdy demonstrated that we locals do not know our site very well by extending our ridge from 28km to 105km. Ridge flying from Lleweni to Corwen, Bala, Dolgellau and Barmouth, taking various bowls to Harlech then a cloud street to Snowdon, a wave climb to 6000ft and thence back to Lleweni has left us somewhat embarrassed.

Two days later, when most struggled to stay airborne, Garry flew to Talgarth, stopped for tea, and flew back. John Bedingfeld completed his Silver by flying to Shawbury and Ian Hurle and Derek Heaton gained Silver heights.

Terry Banks from East Sussex GC, one of our best supporters, arrived back from a field landing, having soared the North Wales cliffs, just in time to open officially the new clubhouse and toilet block, followed by a convivial evening for some 30 visitors and members.
M. P. O.

HIGHLAND (Easterton)
At last we do not need to worry about winds with a southerly component - we now have an underground electricity wire along our north boundary - whoopee!!

Our new K-21 is being loved by all. Our "super charged" refurbished winch launches it to great heights even on nil wind days - grateful thanks to Martin Knight and Mike Foreman for their good work.

Martin Knight gained Diamond height reaching 24 000ft in Fulmar's Discus. James Anderson went solo on his 16th birthday in our K-21.

We are planning an open day in June and also a task week.
A. G. V.

LAKES (Walney Airfield)
March was another notable soaring month with Neil Braithwaite having the highest climb of the month to 16 500ft, with Rod Murfitt not far behind. There was also plenty of ridge soaring with durations achieved on Easter Sunday by Lyn Martindale, Rip Pearson and Jim Storer. Jim's Dad, Phil, has gone solo.

The saga of the IS-28 finally draws to a close with it returning to the air after 18 months. Our thanks to Bob Foote and John Martindale for getting the repairs done and to Graham Welch, Dave Bull, John Burdett and all the others who helped out in the later stages.
A. D.

LASHAM (Lasham Airfield)
We welcome our new manager, John Gilbert. John is a Lasham group leader, a keen aerobatic pilot and an experienced manager. Andy Todd has retired after five years on the committee of management. Ross Stewart has been elected in his place.

A safety forum was presented by Saka Havbrandt and Cösta Arvaston from Sweden. They looked at a gliding club and its members from the view of social psychology, a new and relevant way of promoting gliding safety.

Ivan Pyshnyi, a Russian Soyuz astronaut on an exchange visit to Boscombe Down, went solo in one of our K-13s.

The World Class PW-5 glider has been demonstrated at Lasham and flown by many pilots of all abilities.

A fun relaxed competition was flown over Easter. The "Fast Class" with 29 entrants was won by George Metcalfe. The "Less Fast Class" was won by Adrian Emck. The competition Met forecast was aided by a "Cu-Sonde" attached to a tug aircraft, giving temperature and dew point readings on ascent.
A. M. S.

LINCOLNSHIRE (Strubby Airfield)
CFI, John Kitchen, has handed over to Dick Hannigan and treasurer Jeannette Kitchen has been replaced by Colin Watmough. Our thanks to John and Jeannette for their hard work.

Our new K-8 has arrived from Germany just in time for the soaring season. Ron Warwicker has gone solo and Jim Evans and Nigel Bartle have PPL SLMGs.
D. E. S.

LONDON (Dunstable)
At our club forum on Easter Saturday, Steve Lynn, treasurer, produced a very bullish financial report showing us comfortably in the black, having reversed the trend of the last few years.

We are applying to the Lottery Sports Fund to restore our listed building clubhouse and to perhaps add to our fleet and hangarage.

Our expedition to Shobdon was very sucessful, with every day flyable up to 15 000ft.

Our first official glider aerobatics competition for many years was over Easter for the Dan Smith memorial trophy presented by Dan's sister and his son, Graham. It was won by Stan Kwicien, a power pilot who came into gliding a month ago.

John Jeffries will be running a number of soaring courses during the season and Mike Gibbons is our resident tug pilot.
R. C.

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MENDIP (Haleswood Airfield)
Our enthusiastic safety officer, Clive Brain, arranged a very successful lecture on safety by Bill Scull - standing room only. He has also gained both Bronze legs in the Bocian which Bob Merritt took to 9000ft in wave on Good Friday. Stuart Mills reached 12 000ft in his Kestrel in 3½hrs for Gold height.

The club expedition to Sutton Bank is already well supported.
K. S.

MIDLAND (Long Mynd)
The year started well with cross-countries flown on the second weekend in February.

Some Lasham members enjoyed seeing in the New Year with us. Ian and his team of new caterers are doing us proud.

There were a number of "incidents" on the Asterton route up the hill during the cold spell with local boy Roger Andrews performing a slow roll off the icy top and a low inverted beat up of the valley with his Volvo. Fortunately he and the dogs had time to bale out.

Dick Dixon, BGA chairman, was the guest speaker at our dinner-dance where trophies were presented to Simon Adlard, Roger Andrews, Charles Carter, Julian Fack, Paul Garnham, Nick Heriz-Smith, Rose Johnson, Gill Reeman, Bob Rice, Marcus Rowson, Tim Southerns, Oliver Snowdon, Paul Stanley and Mark Stapleton.

At Easter we were visited by Oxford University GC who enjoyed lots of bungying and wave. On Good Friday there were many wave flights with Richard Swire reaching 14 200ft and Simon Adlard taking his girlfriend Liz to the seaside at Aberdovey in his Janus. On Easter Monday Liz Tusar resoloed and Oliver Thorman soloed on his 16th birthday. Peter Stares, another 16 year old, also soloed that week and Simon flew along a street in a one way commute to Bicester in just over 30min - 200km/h.
P. A. S.

NENE VALLEY (RAF Upwood)
Adam Read and Melanie Burton have places on our Kittyhawk youth scholarship scheme.

We are extremely pleased that full planning permission (including a spacious clubhouse and hangar) has been approved for our new site. The lease on the existing site expires in May and we are in the midst of the final hectic preparations for the move. The new site (approx 500m west of our existing site) should be operational by the time you read this article.

The annual dinner-dance was well attended and a great success. Awards went to Richard Aylesbury and Andy Hatfield.
A. F.

NORFOLK (Tibenham Airfield)
At the BGA AGM, ex-CFI Roy "Woody" Woodhouse was honoured with a diploma for services to gliding. (See p168.)

At our annual dinner trophies were awarded to David Hill, Ray Hart, Adrian Bennett, Neville Harrison, Jeremy Clarke, Griff Griffiths, Andy Fitches, Brendan Sargeant, Mike Hellewell and John Allen (2).

The cross-country season got under way in February when Ray Hart failed to collect Snoopy from Crowland but clocked up 71km. In March, Ray Hart and Dave Hill gave a series of fascinating cross-country seminars to capacity audiences. We have re-roofed a hangar and put in fire doors to comply with planning and safety regulations.
B. W.

NORTH WALES (Bryn Gwyn Bach Farm)
Nearly half our members attended our AGM in March. Membership remains stable at around 50, but the vice-chairman suggested every member makes a determined effort this year to introduce one new member, with youngsters expecially welcome. Dave Stephenson was elected treasurer in place of Mike Carlin after several years' hard work. Ian Samples joins the committee as field member.

Late spring weather was pretty mixed with some excellent ridge days interspersed with rotor and strong crosswinds.

During March we were delighted to welcome Dick Dixon (BGA chairman) on his first informal visit to the club. Our summer courses are off to a good start with several visitors returning from previous years - always a good sign!
N. D. J. C.

OXFORD (Weston on the Green)
Following last year's cross-country week, we are planning another for this season. Brian Jones has gone solo.

CFI Cris Emson and Claire are promoting our cadet scheme and the selection of the first six is underway. A winch engine upgrade is being arranged to cater for the growing fleet of big wings.

We were saddened to hear of the death of Colin White.
J. S. G.

Obituary - Colin White
It is with great sadness that I report the death of Colin White in New Zealand at the age of 67. Having landed safely after a glider flight, he collapsed and died. Although he had retired to New Zealand in 1992, he frequently returned to fly with us during the summer.

Colin joined Oxford GC after moving from Sutton Bank in the early 1970s. My first memories of Colin were of a blunt Yorkshireman with an uncompromising instructing style. I will never forget my first cable break with him! But as I became more experienced and Colin mellowed we became good friends.

He was a hard working and reliable instructor who always strove to raise flying standards, particularly during his three years as our CFI. He flew a syndicate K-6E followed by an Astir CS for many years. I always felt that Colin flew in a manner in which he expected others to fly; never flashy, always safe and setting an example to us all. He will be greatly missed.

We send our condolences to his widow Jackie and the rest of his family.
Steve Evans

PETERBOROUGH & SPALDING (Crowland Airfield)
After a poor start to the year we have had some recent soaring days enabling cadet David Leggatt to go solo on his 16th birthday. The event was broadcast on Anglia and Central TV. He followed this up with a Bronze leg on his fourth solo.

CFI Dave Crowhurst and son Jim are now partners in a Skylark 4. Dave is running a series of lectures for prospective Bronze pilots.

At our well attended AGM Dave Mason and Manuel Williamson joined the committee and George Willows handed over as secretary to Frank Panter.
F. R. P.

RATTLESDEN (Rattlesden Airfield)
We thank Sutton Bank for their welcome in March when we had a resoundingly successful trip with Stuart Jones completing his Silver badge.

Our annual dinner was well attended with awards going to Helen Page, Ian Macro, Andy Howells, Mark Wright, Grenville Croll and Richard Page. Helen Page and Roger Devonshire have Bronze badges.

We are hosting the 447th Bomber Group veterans from American on June 7 and arranging an evening entertainment.
H. J. S.

SACKVILLE (Riseley)
At th annual dinner, Dick Dixon, BGA chairman, presented the prizes - mostly to Derrick Steed. Dick and Mary then joined us in dancing the night away and flying with us the next day.

The majority have agreed to increase charges to maintain the high ratio of club gliders to pilots and the aerotow facility - an advantage not normally associated with small clubs.
D. C. W.

SCOTTISH GLIDING UNION (Portmoak Airfield)
We have been awarded a Lottery Sports Fund grant towards a glider and facilities for wheelchair pilots and, with a donation from the Allied Dunbar Foundation, £90 000 has been raised for this unique venture named "Walking on Air". We thank Graham Lawrence and Richard Hungerford for their hard work in this project and welcome inquiries from any club interested. (See also p137.)

The year started well with the first 500km on March 28. Mike Carruthers, Tony Brown and new member John Williams have Diamond heights. Ian Dandie completed Diamond distance in Australia and with Mike has all three Diamonds.

Visitors for the autumn wave should book through the club office. Visit our updated web pages for more information on http://ourworld.compuserve.com/homepages/JCFerguson

We are hosting round three of the Inter-Club League on July 19-20.
N. F. G.

SHALBOURNE (Rivar Hill)
Exceptionally good Easter weather gave Bronze legs to Richard Newton and Dave Draper (both keen to build hours to fly their newly acquired Astir), Dave catching up with his wife's progress.

All three winches are now in fine working order although at the time of writing the K-7 still isn't back from the repairers.

Bob Boyd has succeeded Carol Pike as CFI and Phil Morgan has taken over from Bob as aircraft officer.
C. H.

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SHENINGTON (Shenington Airfield)
We've done more flying in March than in the previous three months due to the improved weather - field landing checks and cross-country flying are well underway. The weekday courses have started and visitors are welcome to fly with us.

The K-7 is back having had its wings re-covered and one of our winches has been converted to use gas.

Tom Horbury and Nick Powley have gone solo and Damien Dyer and Kevin Poyser have Bronze legs. Chris Kidd has an assistant Cat rating and a PPL.

There were committee changes at the AGM in April with Jacqui Miles taking over from Brian Badger as chairman. Our thanks to Brian for all his work.
T. G. W.

STRATFORD ON AVON (Snitterfield Airfield)
Our site improvement continues with the new trailer park/rigging area levelled and seeded to give us more room for the proposed hangar/workshop extensions and car-park.

The spring pre-season meeting was well attended with modest launch and membership proposals approved. Our seven day operation is from April to mid September with a full programme of courses, trial lesson evenings and club flying weeks.

Penny Broad has soloed after a break in gliding. Membership remains very healthy with the majority of newcomers gained from recommendation from existing pilots.

Our fleet of gliders had Cs of A by April and the Rover retrieve vehicles overhauled. We have bought our third Rover 110 for bringing cables from two twin drum winches. Our thanks for the dedication of instructors and the engineering group who work so efficiently to maintain the equipment to a high standard.
H. G. W.

SOUTHDOWN (Parham Airfield)
Spring arrived early bringing hill soaring, thermals and wave. Bob Adam, Eddie Hahnefeld, Ian Ashdown and Craig Lowrie were among those taking full advantage.

At the AGM Steve Way (outgoing chairman) and Sue Morley (membership) were thanked for their stalwart services. Jim Rochelle is now chairman and John Cook replaces Sue.

Sue Hill completed all three Diamonds with a 525km goal flight at Benalla in Australia. We had a successful AEI course in mid April, despite strong crosswinds with ratings for Trevor Miller, Mike Lynch and Julian Hitchcock.

By some extraordinary hiccup, Eddie Hahnefeld was reported to be our chairman in the last issue! Many apologies for any embarrassment caused.
P. J. H.

SOUTH WALES (Usk)
We have had an excellent start to the season with wave and thermal flights by many members.

Greg Scott is our new CFI - many thanks to the retiring CFI, Bill Mills, for all his hard work.
M. P. W.

TRENT VALLEY (Kirton in Lindsey)
Our annual dinner and prizegiving in March was very enjoyable.

Our thanks to Dishforth for allowing some of our pilots to experience their first wave flights in our club Puchacz. We have bought another K-8, bringing our single-seater fleet to three.

Colin Metcalfe and Richard Jackson have assistant Cat ratings.
J. A. T.

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A large force from Dublin with eight aircraft and other pilots from Lasham and Oxford, together with days of ridge lift and some wave to 10 000ft, gave us our best traditional Easter camp for years. In the four days of Easter itself we flew 178 aerotows and almost 264hrs.

Nightly we hangared 26 gliders, *all fully rigged*, and the tug. One night we even squeezed in a 27th rigged glider.

During Easter David Parkhill and Bernard Silke flew their 5hrs, David simultaneously gaining Silver height but mis-dating his electronic barograph.

Earlier, there was a record 86 at our annual awards dinner, including Dunstable visitors. Five days later at the AGM the entire committee was returned unopposed.

A phone number was mis-printed in the last issue; to discuss dates for your private visit or club safari to Bellarena phone 015047 50301 at weekends, or 012477 58777 other times.
R. R. R.

VALE OF WHITE HORSE (Sandhill Farm)
The year has continued well. We have managed to fly every weekend so far and, despite being a flatland site, we had a wave flight to 4300ft in a K-8 over our airfield in March from a winch launch.
G. N. T.

WELLAND (Lyveden)
At our AGM chairman Meyrick Jones and secretary Mick Esden were thanked for their past services. Robert Leacroft is now our chairman with Laura Lindell as secretary and Werner Leutfeld as CFI.

Gordon Scally has re-soloed after a four year gap. Three of our cadets are doing well. Aston and Feneley Adams have Bronze badges and Jenny Leacroft has soloed and had a 1hr soaring flight.

An Astir and Pirat are welcome additions to the field.
R. H. S.

WOLDS (Pocklington)
The welcome arrival of "the thermal" early in the season has seen a flurry of activity with numerous soaring flights and cross-countries in early March.

The Easter expedition to Portmoak was a ➡

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great success with more gliders and members than ever before. Noteworthy achievements included 5hrs for Matt Young and Duncan Bradshaw, Duncan also getting a Silver height; both Bronze legs for Colin Wiles and an endurance record for a flight without a "pee bag" by Mike Fox!
P. E.

YORK (Rufforth)
Our cross-country courses have started well with a few long wave cross-country flights before the end of March, including an O/R to Hexham in a LAK-12. Our youngest regular members, Rob Langham and Nick Joseph, have gone solo, Nick only a few months after his 16th birthday.

Two adventurous pilots took one of our motor gliders to the Isle of Man gliding club over the Easter Bank Holiday and confounded everyone by having excellent weather throughout!

Our aerobatics courses have been producing results with Tony Lee completing his standard level aerobatics certificate.
M. D. C.

YORKSHIRE (Sutton Bank)
We have had an excellent start to the season with good soaring and height gains in excess of 20 000ft. Easter weekend brought ridge, thermal and wave soaring with flights towards the Scottish Borders and the Midlands.

The DG-500 has had a comprehensive instrument refit for advanced training and the Venture has been fully reconditioned. David Watson and John Graham are full Cat instructors and Mark Irving has his AEI rating. Bary Ogleby has Diamond height and John Lynas Silver height.
C. L.

Club Directory: Please note the following corrections - Aquila GC's secretary's tel No. is 01869 338432; Cairngorm GC's clubhouse is 01540 651317 and the secretary's 01343 547701; Cambridge GC's secretary is 01279 506927 and Scottish Gliding Union's clubhouse is 01592 840543 and the secretary's tel No. is 01592 840604.

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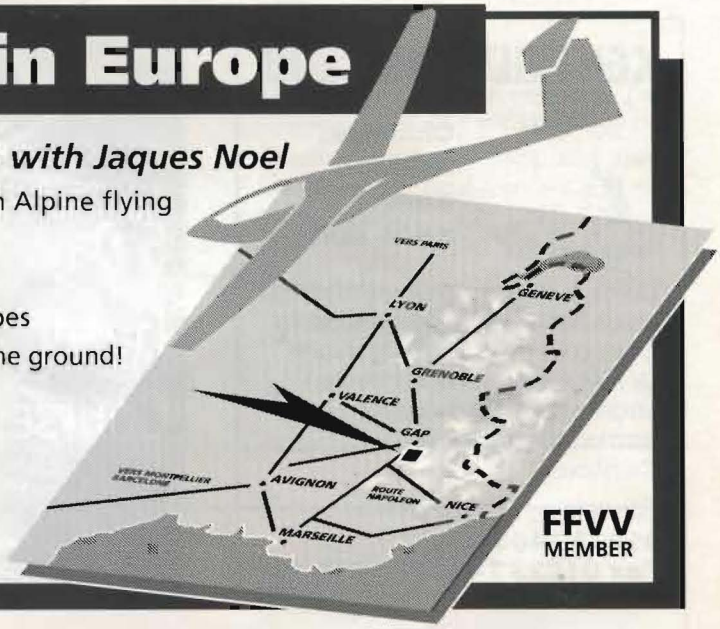
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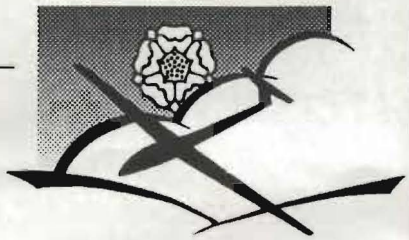
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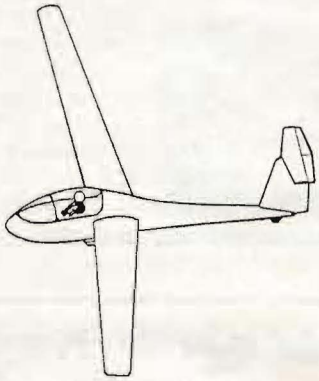
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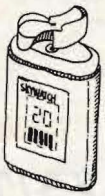
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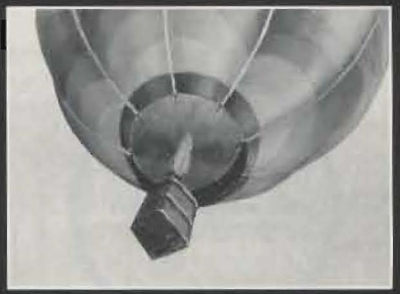
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THIS HAPPY BREED

Having flown 154 pre-solo flights with no less than ten instructors I feel I might be in a position to offer a few friendly words of advice

I hope by now all new instructors have recognised "The Instructor Stroll". This is better demonstrated than described, but given an hour on the field you will have plenty of time to observe it first hand.

For this exercise you really need two instructors so they can practise it together. First, face in the same direction, shoulder to shoulder, hands clasped behind the back Prince Philip style. Next, synchronise a six or seven pace stroll away from your "target" (*ie* the poor *ab-initio* who has just attempted to land on top of the caravan). Then as you reach the furthest point, pause, look back over your shoulder, raise your eyes, return your gaze forward and recommence the stroll. This manoeuvre really does need some practice if you are to avoid the embarrassing situation of clashing heads on the look back.

At this point I'd like to suggest the importance of having a particular personality trait. This makes it a lot easier for *ab-initio* pilots who can more clearly identify you on the field. From my own observation I would recommend that although you are actually half Cats you select a breed of dog on which to base your personality. So here is a brief guide.

1. The Jack Russell Terrier. This breed makes its presence felt from the moment it arrives on the field. It snaps at everyone's ankles and is tenacious in its attempts to get you to fly. It has the extremely good quality of making you so frightened of getting bitten that you no longer have any actual fear of flying.

2. The Spaniel. This breed will survey you with lovely big eyes and put you completely at your ease. It may not say much, but will always be ready to retrieve you the instant you attempt to nose dive into the ditch.

The Bloodhound. This breed is a little rare and may not often be seen, but due to its extensive travel experience is a wonder on cross-country chases. May produce an allergic nauseous reaction in some early solo pilots.

4. The German Shepherd. This breed is ever alert and watchful and will never fail to notice when the yaw string moves 1mm off line. Its bark is generally worse than its bite.

Finally, your most important qualification as an instructor is to ensure that you never have to buy your own drinks. There are many ways of accomplishing this feat: the first solo, Silver height, successful cable break recovery - the list of possible celebrations is endless. As a last resort you can always offer to retrieve some poor unfortunate who has landed out. (Avoid retrieving more senior rated instructors whose drink buying avoidance skills are better than yours.)

New instructors, I hope these few words will help you enjoy many happy years of tutoring.

SOMETHING SPECIAL

TONY BROWN writes about a cunning plan

Rising at the usual 6.40am in February, still undecided whether to go to work or to the club, I drew back the curtains and was welcomed by the sight of several lenticulars glinting in the light of a near full moon. Faced with such a dilemma, it took me a fully five seconds to decide that Portmoak was the best option.

The club was unusually silent as I drove in at 8.50am. The hangar doors were still closed. But I could see Kevin Hook hurriedly preparing the Scottish Gliding Association's ASH-25 for action. "Would you like a flight?" he asked.

Just before 10am we were winch launched into a moderate north-easterly wind. I marvelled at how big the cows looked as we approached Benarty Hill at 130kt and 600ft - to get a low point on the barograph I was assured.

The transition from stick lift to hill lift to wave was very smooth and progressive and 40min into the flight and at 6000ft above the airfield it was time to move on.

The wind above 2000ft was 25kt due east and the realisation of this as we approached Auchterarder, somewhat downwind of the airfield, had Kevin in field selection mode. The only lift was to be found at the extreme eastern edge of each bar. We struggled on.

In the distance above Comrie was a cloud shaped like the front end of Concorde. It was perched upon a sheer wall of ragged cloud, its sleek nose projecting over the edge and tilting down into the prevailing breeze.

For the next 40min we crept closer, the last glide being make or break with the vario needle firmly fixed on our destination - straight down! Then the vario moved to full scale up with the averager in hot pursuit and soon reading in double figures. We were in an elevator, going up and heading straight for Concorde's flight deck.

At 10 000ft the lift became weaker and more difficult to work, so having satisfied ourselves that this was sufficient height we pressed on over Loch Earn and the mountains towards Killin and beyond to Crainlarich. Flying over such seriously mountainous terrain was a first for me and it surprised me how relaxed I was, though I do recall pondering for a while at 6000ft over Killin, surrounded by 3000ft peaks, how interesting an outlanding might be.

We made Crainlarich at 6500ft, 83km downwind of the airfield, just over 2hrs into the flight and with the wind strength still at 25kt. Although in our favour we were now in smooth lift which was averaging 3kt I would be lying if I did not say I had serious doubts about our ability to make it home, but Kevin had a cunning plan which hinged on one fact I was overlooking. We were in an ASH-25 and a final glide was a possibility.

We took the climb to 14 000ft from where we moved south over Loch Lomond to Balmaha and climbed again to re-establish our height before setting off.

Thirty-five minutes later from a straight glide we arrived at Portmoak with 1000ft to spare. The cunning plan had worked.

RAFGSA'S TRIP TO CHILE

Early this year the RAFGSA again had a glider pilot exchange with the Chilean Air Force (see Pete Stratten's report in the August 1996 issue, p231, on their first visit). Terry Akerman (Clevelands GC's CFI) reports on the spectacular mountain flying, crossing active volcanoes, soaring with condors and "views of the Andes words can't describe". They returned with each member of the expedition having flown more than 50hrs and 3000km.

AEROTOW HEIGHT CHALLENGE

Adventurous glider pilots with power experience may care to volunteer for a somewhat unusual aerotow being planned by Kelly Space Technology.

It is reported that the company plans to build the Eclipse (satellite) launchers from adapted F-106 jet fighters fitted with rocket engines. Each launcher will be towed behind a conventional Boeing 747 to a height of 14km.

After the vehicle is released from the plane, its rocket engine will fire and carry it to an altitude of 125km. The launcher will then eject the final stage, which will deliver the satellite to its required orbit.

The Eclipse vehicle will return to Earth as an unpowered glider.- Spotted in the *New Scientist* by Dave Barker (Bristol & Gloucester GC).

CAA'S SILVER CELEBRATION

The CAA celebrated its 25th anniversary in April and marked the occasion with a special edition of its house journal, *Horizon*.

Make sure of getting your copy of *S&G* by taking out a subscription. See details on p156.

DAVID WRIGHT

BGA ACCIDENT SUMMARY

Ref. No.	Glider Type	BGA No.	Damage	Date Time	Place	Pilot/Crew Age	Injury	Hrs
130	K-7	–	Subst	16.8.96 1730	Kenley	39 P2 31	None None	431 0
During the training winch launch P2 under-rotated and at 60ft the cable back released. P2 lowered the nose but P1 took over as the speed was not increasing fast enough. There was insufficient height to recover before a heavy landing.								
131	Me7	4217	Subst	27.7.96	Dartmoor	78	Minor	107
The pilot was on his fourth flight on type when he made a high and fast approach. He decided he could not land on the airfield ahead so pulled up over the upwind hedge and stalled into the next field								
132	PZL Cobra	1732	Minor	24.9.96 1115	Aboyne	28	None	102
The visiting pilot was distracted from his downwind checks by other gliders in the circuit and on the ground. As a result he landed on the runway with the wheel up.								
133	SZD Puchacz	–	None	–.9.96 –	Incident Report	52 P2 –	None None	2500 Less than 1hr
P1 was returning to the field to help another crashed glider. At 65-70kt he opened the brakes and heard a slight "clunk" but didn't noticed anything untoward. When he tried to close the brakes on the downwind leg the lever had no effect. He landed safely after an abreviated circuit. The a/b torque tube operating lever had broken away.								
134	Kestrel 19	1945	Minor	25.9.96 1448	Aboyne	74	None	2400
The pilot made a circuit in turbulence and rain. Rather lower than expected for the conditions he opened the airbrakes and failed to roundout just before the glider landed heavily up the bank leading up to the runway. It hit a sloping metal fence which absorbed much of the impact.								
135	K-13	4208	Minor	20.9.96	Peniel	71	None	58
The visiting pilot had been instructed to keep upwind but allowed the glider to drift downwind. He encountered sink in an area with poor fields and had to land in a short, uphill field. Running on, he groundlooped the glider into a hedge damaging the wing and fuselage.								
136	Twin Astir	3128	Subst	6.7.96	Enstone	36 P2 38	None None	459 21min
Finding himself low in the circuit P1 decided to land on a disused runway. During the landing roll he steered the glider to one side to get clear. At about 5-10mph the mainwheel dropped into an open storm drain obscured by weeds. No damage was found and the glider was flown again. Next day the DI found significant damage to the u/c and structure.								
137	Twin Astir	–	Minor	– 9.96 –	Incident Report	–	None	–
The glider was DI'd then towed out to the launch point where the ground crew commented on the noise coming from the wheel. Inspection showed a collapsed bearing, u/c frame broken and bulkheads distorted. This glider had flown several times since dropping into a storm drain the day before. (See report No. 136.)								
138	K-7	2218	Minor	28.9.96	Seighford	54	None	2.3
The early solo pilot attempted to make a "short landing" near the airfield boundary. During the final stages of the approach a strong wind gradient was encountered and the pilot tried to stretch the glide by raising the nose but did not close the brakes. The tailplane hit the boundary fence.								
139	Motor Falke	M/G G-AZHD	Minor	14.9.96 1050	Winthorpe	68 P2 32	None None	3371+ 2750m/g 0
At about 800ft on the climbout the motor glider's engine speed suddenly increased. P1 switched it off and was surprised to see no propeller. A safe landing was made. Before the flight the prop had been removed to check an oil leak. The hub run out was on limit so it was machined true. The poor taper locking was not found during a reduced rpm test run.								
140	Pegasus 101	3593	Minor	29.9.96 1530	Dinnet	69	None	1060
The pilot had been flying for about 6hrs, one third of it on oxygen in the strong wave. At 10 000ft he suffered a partial loss of vision and could only just control the glider with one eye closed and his head tilted to one side. Unable to read the instruments, he did well to land with only minor damage to the glider. Medical tests continue.								
141 –	K-21	4024	Subst	23.3.96	Dunstable	43 P2 16	None None	403 0
During training P2 made an approach rather faster than neccessary for the conditions. During the ground run the glider ran across bumpy ground which pitched the nose down causing damage to the nosewheel.								
142	Ventus CT	S/S 3472	Subst	9.6.96 1750	Nr Dunstable	45	None	878
The pilot had to make a field landing while on the final leg of a cross-country flight. The crosswind landing was made with no problems but during the ground run the glider hit a rut and became airborne again. As it touched down again the right wing caught in the 12 to 15in high grass causing a severe groundloop.								

DICK SKERRY

CLUB NEWS AND ALL THAT

Dick calls this piece the "ravings of a club news scribe"

I recall it all started on a foggy non flying day many years ago[1] in the launch point caravan.

"Shall we start contributing to *S&G* Club News?" asked the club wit. "Yes let's" came the reply from the huddled masses. "Who'll do it?" someone asked. "I'll have a go" a voice came from the back.

Everyone turned to look and I realised that the voice was mine. I hoped no one had realised who had spoken but they had. My brain was trying desperately to send messages to my mouth to shut up but for those few seconds the control had gone[2].

Suddenly from being on the fringe of the gathered multitude I was in the centre. Every face looked at me. "Cheers Dick" someone said, then they all returned to the usual non flying day tasks of brewing tea, drinking tea, brewing more tea.

"Right," I thought "I'll use the typewriter at work on nights". This seemed a good idea until I sat down in front of it with a blank sheet of paper and an equally blank mind. Eventually though I did manage to get something down. It didn't make much sense but I sent it off anyway.

When the next issue came out I turned frantically to the club news and there it was. Me, a published author - well five lines is five lines.

Christmas came and my dear wife brought me one of those newfangled electronic typewriters. She told me I might as well do the job properly. Well I couldn't fathom it out. It didn't have all those flying arms crashing into the paper like the good old Imperial. It just whirled and chattered[3].

It still couldn't spell, but it did have a correcting ribbon. I must be the only person in the world to use three correcting ribbons to one ink ribbon. It was, however, very advanced for a person who thinks a computer is someone who goes to work every day on a train[4].

The notes kept getting sent in and most of it published, but I'm sure the manuscript was kept and sold on to a journalist college as a sub editor's exam paper.

Of course being a club news scribe I got all the flak every time I missed something, so I instituted a club achievements' book which I placed in the launch point caravan for people to keep me updated.

Have you noticed with a book used by lots of people how many different things are used to write in it? There were fountain pens, ball points

[1]Everything is years ago now and it's always foggy.
[2]Some say its never been there.
[3]Like an instructor's teeth on a cold morning.
[4]No that's a train mechanic.

of all colours, pencil licked or unlicked felt tips, brown sauce and even just scrape marks with ball points that have long since run out. All have to be read through the obligatory coffee stain.

The system seems to have worked reasonably well. Over the years I managed to get something into most issues and didn't forget too many people. The typewriter is still going strong even if it did need a new daisy wheel. The old Imperial never needed one of those.

I still get my *S&G* and the club news is still there but my initials aren't on it any more so you can blame someone else.
(Actually it's Dick's daughter and she can type! Ed.)

NB. Dick's comments give us a good opportunity to thank club news reporters for their tolerance. We just have to cut reports back to give the details in the most condensed form, sadly ruining literary styles, simply because space is a problem. If we ran them as written this section would eat up nearly twice as many pages.

In the interests of saving space we don't give such details as engagements, weddings (unless there is an unusual gliding theme), births, conversions, lists of new members and really it would be better if you thanked clubs you have visited rather than through *S&G* and to pass on your thanks to members for their work. We have saved quite a few lines by taking out the over used word "congratulations".

But we are getting far more news of interest to general readers, which is making the section more lively. It is no longer just club noticeboard material. We also welcome your colour photographs but do please limit yourself to one per issue. If several have gone solo and you want to feature them, then take a group picture.

We get good results from the prints and don't need negatives. Also, while we appreciate the offer of discs, it isn't worth it for these short reports though they are invaluable for articles. Then it is helpful if the disc (Mac or IBM) is in ASCII format and backed up by a printout of the article.

It isn't a problem if the reports are handwritten as long as you print names - don't print the entire report as some of you do. Most glider pilots seem to have good handwriting - all that training filling in your logbooks.

But it does help if you give a contact number in case there is something we don't understand. If you want photographs returned, please write your address on a label with the caption and stick it on the back of the photograph. Please don't write on the actual photograph as this often shows through and spoils the picture.

As to deadlines, they are dreadful. Again, though, our thanks to all you contributors out there who battle to get the reports to us on time. It is a great help.

Incidentally some of you complain that you haven't had your copy of the magazine so don't know the deadline. For this reason we always give the dates for two issues at the start of the club news section.

And most issues at least one contributor misses out by sending their report to the BGA office at Leicester and not to the Cambridge address. The same applies to articles.
(Ed.)

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TO PLACE AN ADVERTISEMENT IN THE CLASSIFIED SECTION, please send your remittance together with a copy of your wording to Debbie Carr, BGA, Kimberley House, Vaughan Way, Leicester LE1 4SE (Tel 0116 2531051 or Fax 0116 2515939), before July 4th for next publication. Any advertisements received after this date will be carried forward to the next edition of S&G. Rates 70p per word with a minimum of £14.00. Black & White photographs accepted £6.00 extra. Box No. £3.00 extra. Prices include VAT.

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