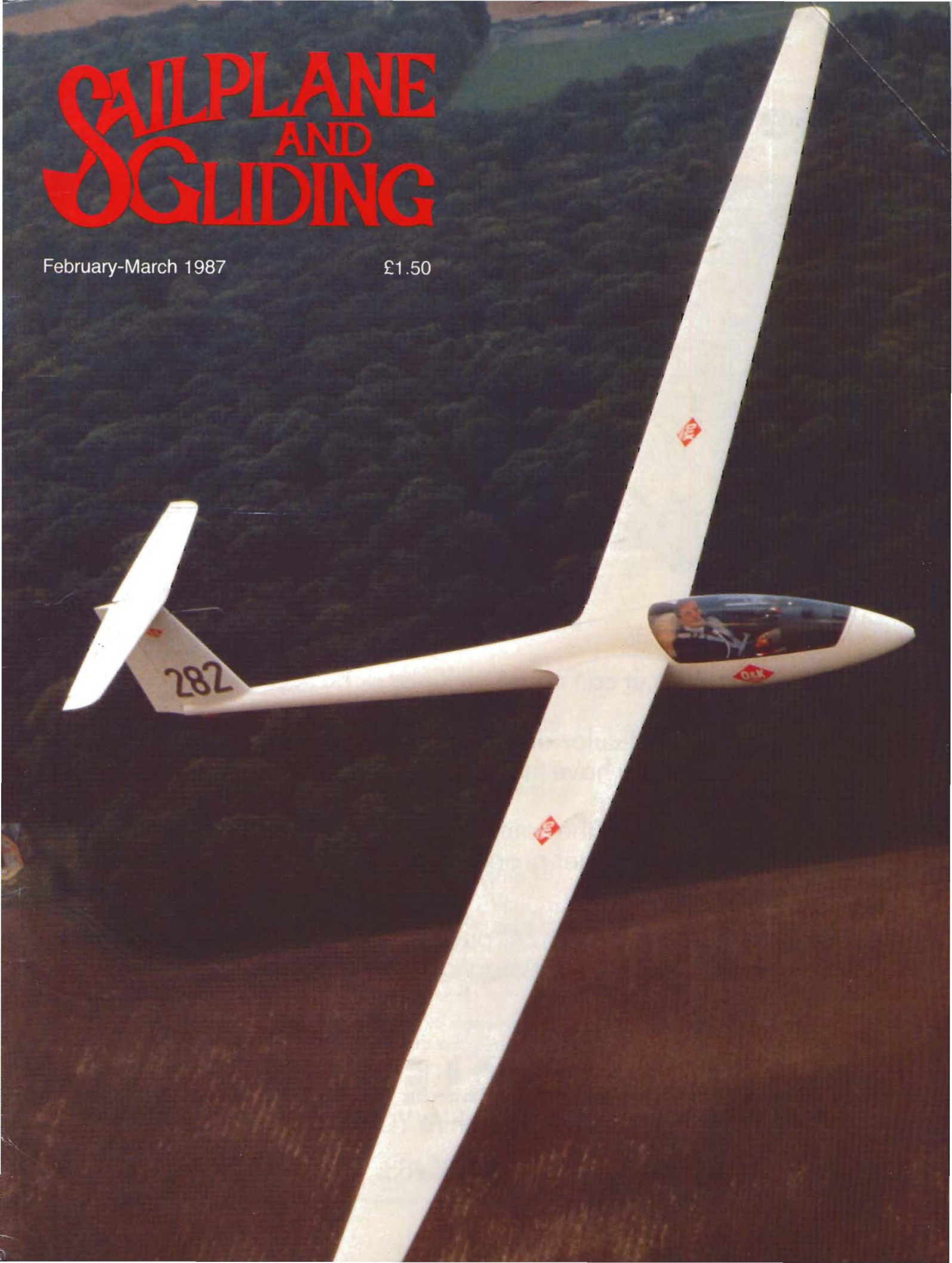
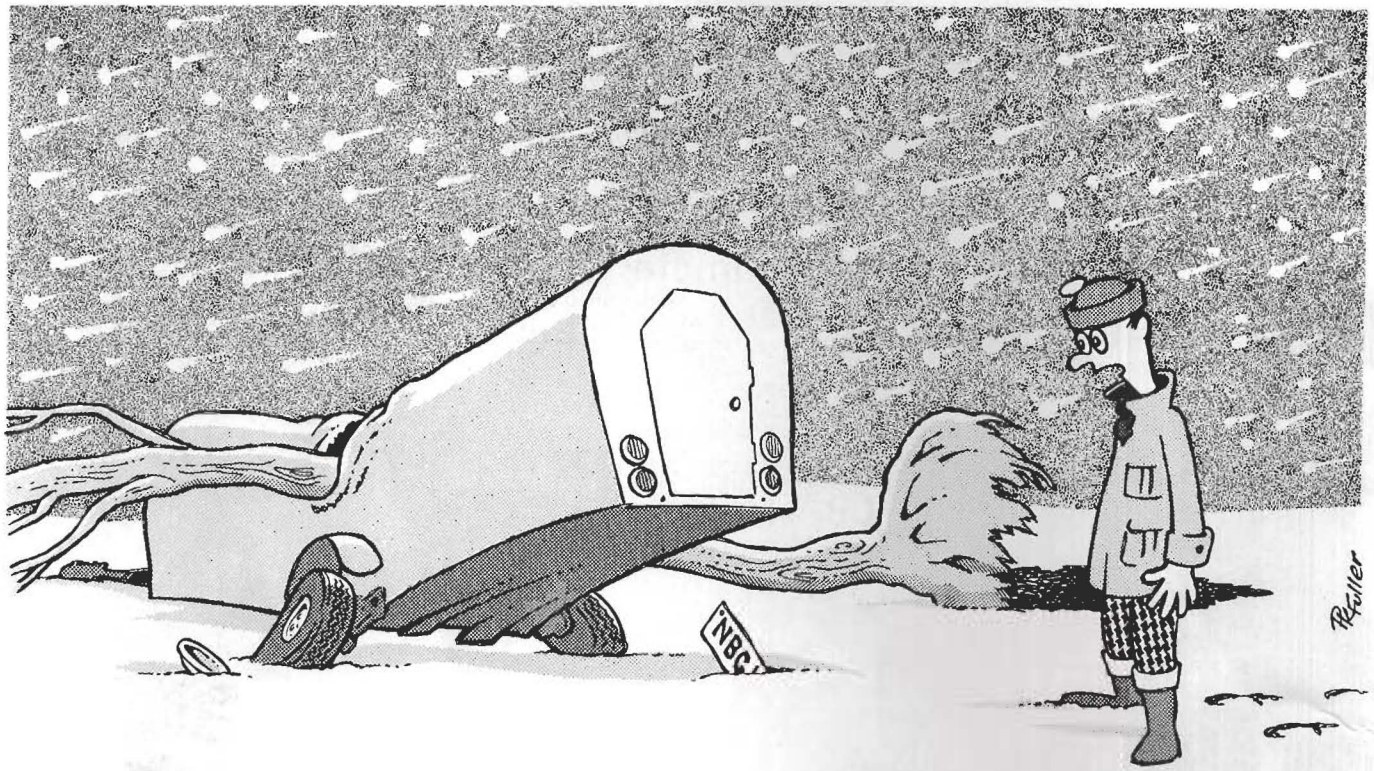
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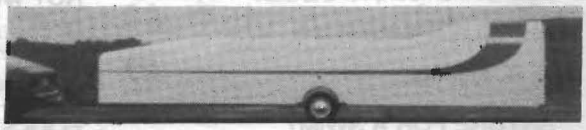
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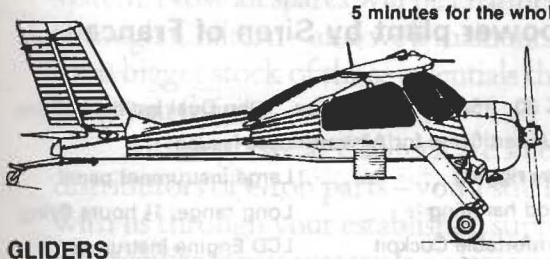
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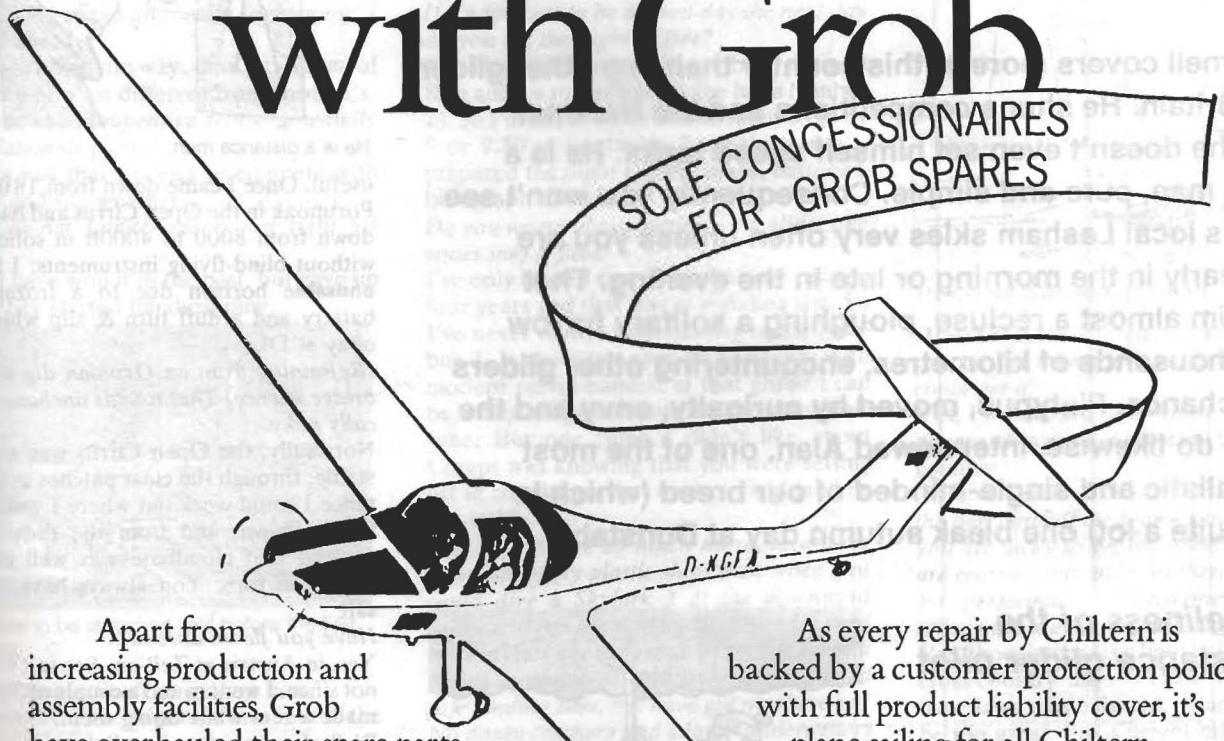
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TAIL FEATHERS

Alan Purnell covers more of this country than any other glider pilot in Britain. He shuns competitions and the National Ladder: he doesn't even set himself speed tasks. He is a distance man, pure and simple. Consequently you won't see him in his local Lasham skies very often unless you are around early in the morning or late in the evening. That makes him almost a recluse, ploughing a solitary furrow around thousands of kilometres, encountering other gliders only by chance. Platypus, moved by curiosity, envy and the desire to do likewise, interviewed Alan, one of the most individualistic and single-minded of our breed (which is saying quite a lot) one bleak autumn day at Dunstable.



He is a distance man.

The loneliness of the long-distance glider pilot

Platypus: *How did you start?*
Alan Purnell: I started in February 1956 and went solo in March.
That sounds precocious.
Not really. I was with a Cambridge University camp at the Long Mynd and got very concentrated training in a short time. It took 40 launches, the same as for most people. That was with the great Ted Warner, to whom I'm eternally grateful. Then I got my Silver C in 1957. I took 1½hrs to do the distance, so I stayed up another 3½hrs to get the duration and taught myself cloud flying.
What were you reading at Cambridge?
Maths and Natural Sciences
Have these studies helped you as a pilot?
Only with understanding weather and instruments



Platypus contemplates the meaning of life after landing in a rainsoaked field.



Assured cloudbase was well clear of mountain tops.

Those are the two things that give me the most trouble: Oxford philosophy only helps you to contemplate the meaning of life after you've landed in a rainsoaked field with the crew four hours away.
At Dunstable in the 1950s you had to solo on a Tutor, then progressed slowly through Grunau Baby, Prefect, Olympia, Skylark 2, Sky, then at last, after 90hrs and two 100km triangles, to the Skylark 3 – with a performance inferior to aircraft that people go solo in today! Very few got to that stage, in fact. Do you think that such an enormous – and compulsory – variety of flying was a good thing?
Yes, I do. But the crazy thing is that now the Tutor's controls are considered so terrible by modern standards you have to have a Silver C to be allowed to fly one at Lasham! I once found myself upended by a thermal in one and just not able to level the wings.
Do you do much cloud flying now?
No, but the experience I got years ago, when cloud flying mattered a lot more, was useful. Once I came down from 18000ft at Portmoak in the Open Cirrus and had to let down from 8000 to 4000ft in solid cloud without blind-flying instruments: I had an unusable horizon due to a frozen wet-battery and a duff turn & slip which was okay at DI.
(Refraining from an Oxonian dig at Cambridge science) That sounds uncharacteristically risky.
Not really, the Open Cirrus was nice and stable; through the clear patches in the distance I could work out where I was before letting down, and from the radio I was assured that cloudbase was well clear of mountain tops. You always have to play safe.
Have you flown abroad?
Yes, in Austria at Zell-am-See in 1971, but not since. I went round a couple of 300s and made a film while doing them.
Well of course, there's so little to occupy one while flying in the Alps one might as well do something useful with one's hands, mightn't one? Have you made any other gliding films?
Yes. I'd like to convert them to video from Super-8, but haven't found out how to get that done yet.
Have you ever been a contest pilot?



Platypus finds gaggles physically frightening.

Yes, for about six years. David Kerridge and I won League 2 in the 1961 Nationals.
Gosh, I should have remembered that since I was in League 2 in the 1961 Nationals as well, but all I remember is trying to get a K-7 across Dartmoor late in the day with an 18 stone passenger in the back, munching bulls-eyes. Anyway, you gave up the rat race.
Maybe I wasn't good enough, but I really think that competitions have deteriorated. People all fly around together in great gag-

gles and don't show any initiative. I fly for pleasure. I don't believe competition pilots enjoy themselves as much as I do.

Do you find the closeness with which some pilots fly in gaggles physically frightening? I know I do.

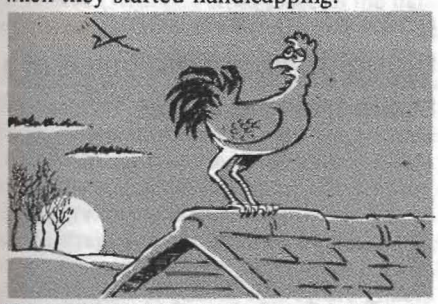
Well, worrying, anyway. One guy's idea of close can be a lot different from another's.

Are you less competitive temperamentally than Nationals pilots?

No, it's just that I prefer to compete with myself and the weather.

The National Ladder seems just right for you.

Well, I have won it in the past, but gave up when they started handicapping.



You need to be launched well before the first thermals.

What is your attitude to gliding now?

Very simply, I like to get the most out of the day.

Philip Wills said the great satisfaction was to leave on the very first thermal of the day and to glide in with nothing to spare from the top of the very last thermal of the day.

Well, to get the absolute most out of the day you need to be launched well *before* the first thermals have started.

Do you glide out on track hoping to encounter lift in the first ten miles; then if you don't get any you have to turn back to the site?

Yes, from time to time. But Chris Garton, who flew over 800km from Lasham to Durham and back in 1976 (it's still the UK close-circuit distance record) flew 15-18 miles before finding his very first thermal of the day. If he hadn't got that one he would have been on the ground and wasted the best day of the year.



Full of water and ready to go

Would you have done that?

No, I couldn't. You have to temper your enthusiasm with caution. But he was going for the record and was willing to gamble.

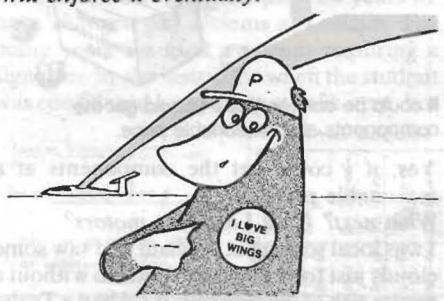
If it's forecast to be a good day the next day do you rig the night before?

No. Hugh Hilditch and I are both there at 8am and we rig each other (he has a Nimbus 2). So I'm full of water and all ready to go by 9 or 9.30 at the latest. Everything else is prepared the night before: maps, batteries, barograph and so on.

Do you worry about putting a big glider like yours into a field?

I've only landed away from Lasham once in four years and that was at a gliding site. So I've never done a field landing in the Nimbus 3. It shouldn't ever be necessary with modern performances: in that glider I can be within range of a safe airfield the whole time. But one thing I didn't like about Comps was knowing that you were setting off in conditions that made a field landing inevitable.

Yes, and they're so much more hazardous now in slippery plastic ships than when you could dive a Skylark 3 at the downwind hedge and rub the skid in the ground if need be. I myself am in favour of giving pilots a points incentive to land only at designated safe landing sites, but have got nowhere yet! No doubt crashery and Lloyds underwriters will enforce it eventually.



Platypus is a believer in TINSFOS.

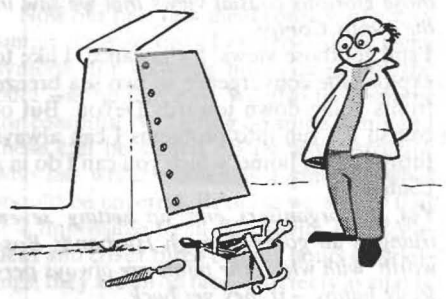
Are you a believer in TINSFOS – There Is No Substitute For Span?

Yes, I need all the help I can get! The Nimbus 3 and ASW-22 are ideal for English conditions. The only people who really like little ships are the purists who want to flip their Libelles into a turn in one and a half seconds.

Very occasionally I would find a 15 Metre tucking more quickly into a strong, narrow thermal than I could in a Nimbus 2.

Yes, but they have to fly so much faster if they have water on board. If they outclimb you you're not flying right. My Three has about half a knot better sink rate, 85ft/min against 110 to 115 for a 15 Metre. At Portmoak I can get 1000ft higher on the hill than the rest.

That ability to use weak lift can give you an extra half hour's flying time at the beginning and end of each day. (Platypus is trying to justify having bought Hans-Werner



Maybe not quite enough rudder.

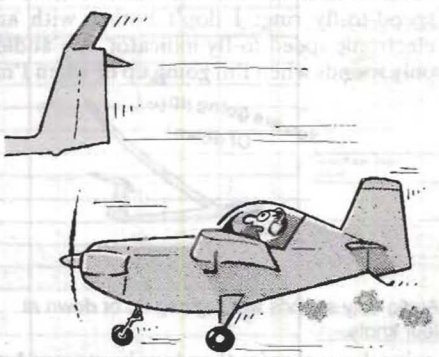
Grosse's ASW-22 last week. ED) *Would you go for even more performance if you could get it?*

Yes, I would. We're nowhere near being in danger of making it too easy to soar in this country.

As a Nationals task-setter I find that even in the best parts of the year – June to August – you are lucky to get two-thirds of days that are cross-countryable, so there is still room for performance improvements that will reduce the number of dud days.

Yes, though there is a limit to the number of cross-country days because of low cloudbase days, where the risk of landing out may be too great. I'm a height miser, and hate getting below 2000ft; so a 2500ft base means a lot of little climbs – which is the wrong way of doing things if you want to go fast.

(Thoughts after the interview: Hans-Werner Grosse would take advantage of the continuous lift offered by low cloudbases, because the lower the cloudbase the closer the thermals are to each other. On the other hand he never tried to get a record in Britain!)



"I can do 100km/h if I want to."

How fast do you cover the ground?

I can do 100km/h if I want to, but I find it a bit of a strain. I'd sooner jig around, making a detour to inspect a sea breeze front on the way.

If I set a Nationals task that took people within 20 miles of a sea breeze, I'd get lynched. So today's Comps pilots don't get those glorious coastal views that we saw in the 1960s Comps.

I still get those views: for instance, I like to explore the convergence of two sea breeze fronts going down towards Devon. But of course if I run into problems I can always turn back for home, which you can't do in a contest.

Yes, so organisers end up setting seven triangles all going through Husbands Bosworth, with which the pilots are always perfectly happy – if they get back.

How long have you had the Nimbus 3?

I've flown the Three for four seasons now and have done 950hrs in it. It's ideal for British conditions. I usually fly with half water: the handling is hardly affected and it goes better. Maybe not quite enough rudder, that's all.

Have you got any special thermalling tricks?

No special technique, though I prefer to tighten up as the lift begins to decrease rather than opening up as the lift increases, which is the common alternative way of centring.

How you fly *between* thermals is important. I unerringly fly through sink, whereas Chris Garton and Bernie Fitchett seem to fly through lift the whole time between climbs.

I imagine you fly around in radio silence like a trappist monk.

No, I don't. I like to know what's going on around the country. Though I find places like Upper Heyford a distraction, with their demands to know your destination. I tell them that I am going from Frisby-on-the-Wreak to Hazlebury Plunknett, the two TPs on a genuine 500km triangle from Lasham. They don't bother to ask me a second time.

What kinds of instruments have you got?

Basic minimum. On the vario I have a speed-to-fly ring: I don't bother with an electronic speed-to-fly indicator. My audio only sounds when I'm going up or when I'm



Audio only sounds when going up or down at four knots.

going down at more than four knots, so a lot of the time it's quiet. I don't like modern varios that bleep away the whole time.

I like that idea! Where do you get such a control?

I rig it up myself: electronics is my other interest besides gliding.

What about the thermal-centring device that was featured in S&G (June 1982, p108)?

It was also featured on TV in Tomorrow's World: there are quite a few videos of that programme at Lasham.

I did it because it was possible. But it has great potential: for instance you could leave a thermal in search of a better core and then come straight back to the original core if you weren't successful in your search.

It's not in at the moment; a five-inch square cathode ray tube and keyboard in the panel takes up too much space and too much power. I really want to make a smaller version with a flat LED display and lower power consumption.

Could it become commercial?



It could be commercial if I could get the components at a reasonable price.

Yes, if I could get the components at a reasonable price.

What next? Dare I mention motors?

I was local soaring at Lasham and saw some clouds just too far away to glide to without a severe risk of landing out. If I'd had a Turbo I'd have had a go at it. I think the Turbo is the right compromise. Motor gliders tend to be flown by power pilots.

What's your ambition in 1987?

To do the 750 that has eluded me – and to take my 300th 300. I need 20 more, which is quite demanding, but I did 29 in 1976.

Let's pray for another 1976. Thanks, Alan!

Alan Purnell: some statistics

- 5300hrs gliding in 12 logbooks
- 171 000 cross-country kilometres
- 280 flights of 300-plus kilometres
- 40 flights of 500-plus
- 6 flights of 600-plus kilometres
- 240hrs in 1986 in 45 launches (av 5hrs 20min)
- 18 flights of 300-plus kilometres in 1986
- 9 UK distance and speed records (none current)

BELT UP TIGHTLY

Derek says your life could depend on those straps and goes on to have some thoughts about the value of a basic training sheet

In any kind of flying accident **your** life may depend entirely on how tight you had your harness straps and on whether they hold under a high shock load.

Recently a visit from Mike Burns, the chief technical officer for the Gliding Federation of Australia, (The Dick Stratton of "down under"), resulted in a very wide exchange of views and experiences on everything from accidents to the future fatigue problems of the newest breed of sailplanes, and to the liability of clubs for accidents.

Many of these problems remain unsolved because the airworthiness authorities and manufacturers never hear of them. Talking to him it became obvious that our communications with these people were poor and that, in general, they were out to help and improve their machines when they heard of any problems.

Mike had been touring almost every manufacturer in Germany in the hope of getting something done quickly in the interest of safety.

He pointed out that there had been several experiences where the type of harness fitted to most training machines had slipped completely under load resulting in fatal injuries in what might otherwise have been a survivable accident. How often have you tightened up the straps in your K-7, K-8 or K-13 only to find them loose a few moments later?

Were you, like me, unaware that this problem had been overcome by fitting a small wire spring into the harness clips of later models?

May I suggest that all BGA inspectors

make a point of checking these harnesses and fitting the springs on the next C of A, or before. We have at least six gliders at Lasham unmodified and I am sure there must be many elsewhere.

I have written to the German manufacturers for a supply so that other clubs do not have to order from Germany individually. May I suggest that you check your machines now and let us know how many sets of springs are needed. They should not be expensive and they could save **your** life.

I understand (but am confirming with the manufacturers) that this mod will not fit the much earlier type of German harness with a fabricated (rivetted) cross-piece in the harness clip.

He also pointed out that the fixings for a harness in other types of glider were often the cause of fatalities because they were failing at loads of far less than the harness itself. Properly restrained the human frame can withstand shocks of up to 30*g* for very short periods but if the fixings fail at 15*g* or so the straps are not of much help in a bad crash. It seems that the requirements need to be changed to ensure that future gliders all have stronger fixings.

"There is no doubt that better seating could save many spinal injuries . . ."

On our side Dr Tony Segal was able to explain to him all about our spine saving seat cushions and we had an interesting discussion on "product liability". There is no doubt that better seating could save many spinal injuries, but that there can be no guarantee of this. For this reason many American gliding schools are reluctant to introduce such cushions or to sell them because they might be involved in a "product liability" law suit.

What a world we live in. You prove something will make flying safer and then no one dares to use it or sell it for fear of being sued!

* * *

Getting back to training and legal liabilities, I have seen a number of pilots' gliding logbooks which really do not give enough detail of the training given. Just imagine trying to convince a lawyer or coroner that the pilot had been properly trained when you can only produce a logbook with the instructor's signature and the odd comment such as C/B for cable break. Almost as bad is the situation where the club has a detailed itemised list of exercises in the logbook, or a separate training log and this is produced in court with many of the exercises unsigned for. This would certainly be the cause of some criticism of the instructors concerned, and it might be considered negligence on their part. So if you do have a system everyone must use it.

We have actually had a visiting student whose logbook was blank apart from signatures and who turned out to be very "low *g* sensitive". I often wonder how many instructors are still unaware of this kind of problem. (I still have copies of the Sub-Gravity Sensations and Gliding Accidents booklet if you have not read it at £1.50 including p&p from me at Lasham.)

Most clubs do have some kind of training syllabus but they often fall into disuse with time. In my opinion the minimum is that the instructor should write down the exercises done on each day, preferably with a comment to assist the next instructor and the student. However, when it comes to first solos this alone is far from ideal. It takes quite a lot of research to determine, for example, how many times the student has done some stalls and incipient spins, how many times he has had cable break practice and whether they were simple straight ahead or more decision requiring situations. For this reason during the past few years we have changed our systems at Lasham. For many years we used a system requiring a signature by the instructor when the student was considered competent at each item, but instructors would never sign anything until the last moment before solo, which was not much help.

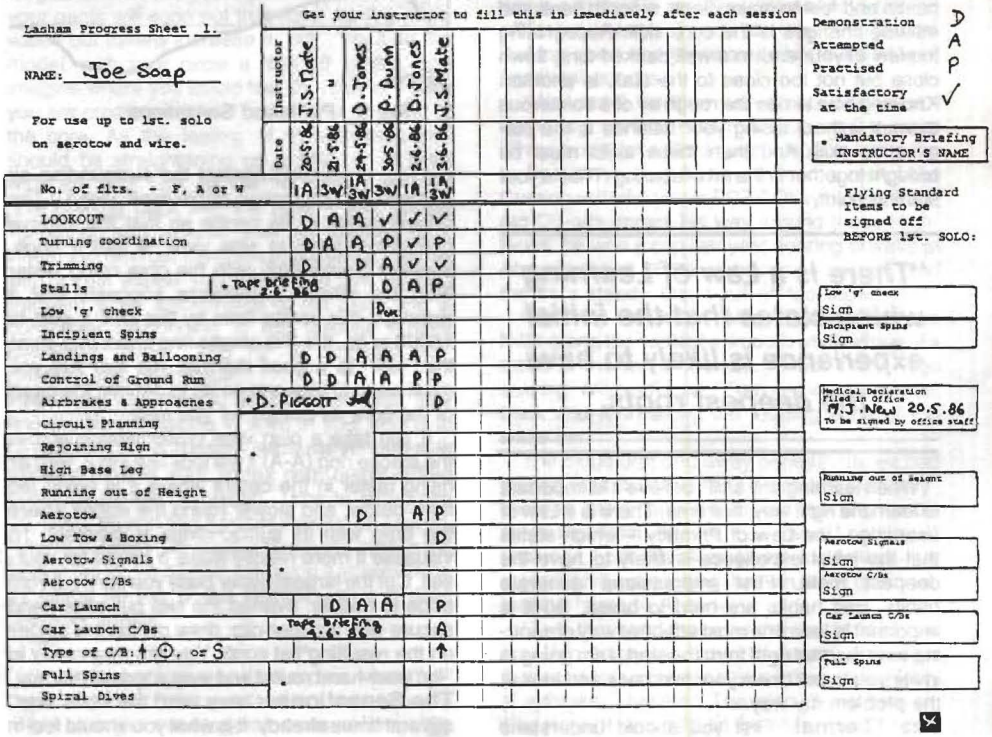
Now our progress sheet consists of a very simple daily record of exercises done using symbols for showing how competent the pilot was on that day. We also have spaces for compulsory briefing on some items and these can be signed off by any instructor who has written notes as a guide to what should be covered. Because we accept that it is impossible to sit down with every student and cover three or four hours of briefings, they are all on tape and freely available to members in the clubhouse.

Lastly, before sending someone off solo, the instructor must see that the vital pre-solo items have been signed for.

This all seems to work for us and it does guarantee that pilots get proper briefings if only from the tapes. This type of progress sheet makes analysis of the person's flying experience a matter of seconds and is not too much trouble for the instructors to keep going. It is also a help to the student who can see what still needs to be done or improved to reach the solo stage.

Our basic training sheet is reproduced on this page and I would welcome comments on it and a copy of your own club's system to compare notes and improve ours still further.

But if you are an instructor, may be you should consider just how you would explain your system, or lack of one to the coroner, or for that matter to a new member with an inquiring mind.



Lasham Progress Sheet 1.

NAME: Joe Soap

For use up to 1st. solo on aerotow and wire.

Get your instructor to fill this in immediately after each session

	Instructor	J.S.Nate	"	D.Jones	P.Dunn	D.Jones	J.S.Nate
	Date	20.5.86	21.5.86	24.5.86	30.5.86	2.6.86	3.6.86
No. of flts. - F, A or W		1A	3W	1A 3W	3W	1A	1A 3W
LOOKOUT		D	A	A	✓	✓	✓
Turning coordination		D	A	A	P	✓	P
Trimming		D		D	A	✓	✓
Stalls	• Tape briefing 2.6.86				D	A	P
Low 'g' check					Dun		
Incipient Spins							
Landings and Ballooning		D	D	A	A	A	P
Control of Ground Run		D	D	A	A	P	P
Airbrakes & Approaches	• D. Piggott						D
Circuit Planning	•						
Rejoining High							
High Base Leg							
Running out of Height							
Aerotow				D		A	P
Low Tow & Boxing							D
Aerotow Signals	•						
Aerotow C/Bs							
Car Launch			D	A	A		P
Car Launch C/Bs	• Tape briefing 2.6.86						A
Type of C/B: ↑ ⊙ or S							↑
Full Spins	•						
Spiral Dives							

Demonstration D
Attempted A
Practised P
Satisfactory at the time ✓

• Mandatory Briefing INSTRUCTOR'S NAME

Flying Standard Items to be signed off BEFORE 1st. SOLO:

Low 'g' check Sign

Incipient Spins Sign

Medical Declaration Filed in Office M.J.New 20.5.86 To be signed by office staff

Running out of Height Sign

Aerotow Signals Sign

Aerotow C/Bs Sign

Car Launch C/Bs Sign

Full Spins Sign

COME SOARING

John starts his series of articles, intended to help you get more out of gliding, by concentrating on soaring techniques.

Basic Thermalling. Every glider pilot, from Sunday doodler to hyped-up hot-rod, wants to soar. To climb away in lazy spirals, up towards the clouds, challenging gravity, one with the birds. Not all are motivated to use their precious height particularly efficiently, content to wander around the sky enjoying the view. And the occasional twinge of excitement when they look back apprehensively, from the apogee of their orbit around the base airfield, to see it rather closer to their horizon than usual. But most *do* want to progress, and the very first step is to learn to use your thermal.

The Skill. The actual skill required to fly a glider is not great. Relatively simple co-ordination of hands and feet to make clean, smooth bank and attitude changes is the core skill. Recognising the feel of your craft in a well banked turn, flown close but not too close to the stall, is another. Knowing how to ride the rough air of a boisterous thermal without losing your balance is the culminating skill. And then these skills must be brought together in the art of soaring. That is your starting point.

"There is a Law of Learning which states that the initial experience is likely to have the deepest roots."

When learning any skill I believe it is important to learn the right way, first time. There is a Law of Learning – the Law of Primacy – which states that the initial experience is likely to have the deepest roots. First impressions generate habits. Bad habits are hard to break. So it is important to learn the most effective way of centring your thermal right from the start. I am going to invite you to put down your text book and look at the problem my way.

The Thermal. First you should understand

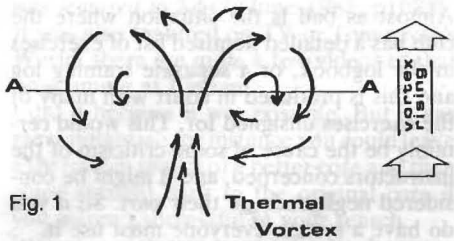


Fig. 1 Thermal Vortex

what a thermal is. It is a mass of air, warmed by contact with the heated ground, in which one spot – the trigger spot – becomes much more heated than its neighbours and is therefore buoyant. It rises, and as it does it draws in superheated surface air – to a depth of maybe a couple of feet – from all around. Maybe up to half a mile away. If it acquires sufficient mass – a typical English thermal weights tens of thousands of tons! – and is rising sufficiently

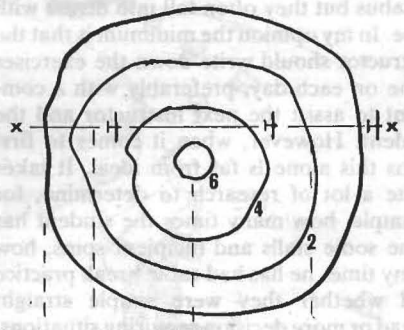


Fig. 2 Lift Contours

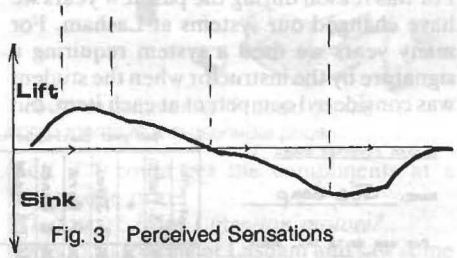


Fig. 3 Perceived Sensations

quickly, it will drag against the surrounding air and set up a circulation within itself. (Fig 1.) The bubble is fed at its centre so that the internal circulation, seen in side view, is like a huge, invisible smoke ring, with the core rising faster than the whole. Experience suggests that it develops this vortex form by the time it gets to 1500ft or so. It is this smoke ring effect that gives the "feel" to a good thermal, the feel that you must learn to interpret so as to get into the heart of the core as quickly as you may.

If you take a plan view cross-section across the smoke ring (A-A) it will look like Fig 2, with air rising faster in the centre where it is being fed from below, and slower round the edges where the drag with its surroundings is greatest. To visualise it more readily make a model for yourself. Cut the largest paper plate you can find from edge to middle; overlap the two cut edges and secure with a paper clip; draw concentric circles on the resulting flat cone. You are now ready to "fly" your hand round and over a model thermal.

The Sensations. I have used the word "feel" several times already. It is what you should feel in your thermal that leads you quickly into the fast rising core. Let's examine these feelings. First, you can't, unless you are a freak or your eustachian tubes are badly blocked, feel how fast you are rising. But you *can* readily feel when you are being accelerated upwards. Acceleration is the state of *change* of speed – in this case the speed of the glider upwards. "Fly" your hand over the model. Which direction will give maximum *change* of vertical speed? Directly from edge to centre, of course, at right angles to the "contour" circles you have drawn on the model. Do it again. Convince yourself! If you fly at any other angle to the circles (at the same "speed") the upward acceleration will be less. And if you fly past the edge of the core (x-x) the feeling of lift will change according to which part of the thermal you are in at any moment. (Fig 3.) It will increase to a maximum half way in towards the core, fall to zero as you come alongside, then change to a downwards acceleration – a *feeling* of sink, although you are still actually going up!

"No matter what expensive gimmicks your rivals can afford, you've got the beating of them right inside you . . ."

Now examine the other feeling available to you – tilt. You will recognise the tendency to be tipped up by the faster rising air to one side. Banked thus you will soon be turned away from the core. Ignore this warning and you have lost your thermal! No. Keep the wings level and *feel* the tipping tendency; analyse it; combine with it the feelings of lift and you have the makings of the world's best thermal centring device – the seat of your pants! Absolutely free, built in, infallible! Just needs to be learned. No matter what expensive gimmicks your rivals can afford, you've got the beating of them right inside you, at least as far as thermal centring is concerned. Most so-called thermal centring devices or methods call for one or more accurate circles to be flown while you (or it) assess the lift and decide which way to straighten up to get closer to the elusive core. By using the seat of your pants you can make corrections instantly on the basis of the lift and tilt *as you feel them.* No waiting for analysis and assessment.

So it's time to study the combination. First take the case of a fly-by about half way between the edge and core at 50kt. (Fig 4, a – a.) This is the perfect approach! Tilt starts moderate, builds to a maximum. Lift starts moderate, peaks momentarily then fades to nothing or to a feeling of sink. At maximum tilt and minimum lift you are immediately alongside the core. Swing quickly into a 45° banked turn towards the rising wing. You are in. Hole in one! But look at the timing required! Two seconds late and you are past the best bit. Three seconds after that and you are half in and half out of the lift. Three seconds more and you've lost it.

Next, fly through the outer edge of the thermal. (Fig 4, b-b.) Plenty of tilt but little lift. Remedy, turn through 30° or so towards the rising wing and await results. You should have converted your fly-by into a perfect approach. Hole in two! Finally, fly straight at the core. (Fig 4, c-c.) Bags

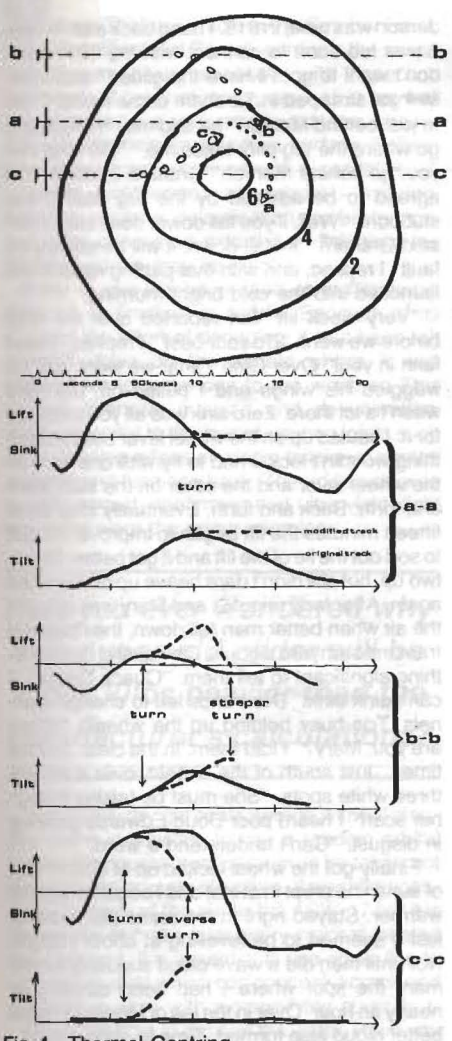


Fig. 4 Thermal Centring

of lift but no tilt. Which side is it? Answer – it isn't. It's straight ahead. So don't hesitate. Turn one way to convert to the perfect approach, then reverse your turn at the maximum tilt, minimum lift point. Hole in two! And now, for the first time, I'll let you look at your variometer, but only to confirm that you are well centred. If you can keep *that* up all day you'll soon be Champion!

The Turn. You may well need to vary the bank to optimise your radius of turn to the particular core you have located. Generally no thermal turn should be banked less than 40 or more than 60°. Your early training turns were probably less than 30°. Time to unlearn *that* bad habit. You may not find it easy. And slow down a bit. Your radius of turn is critical now, and goes up in leaps and bounds if you fly too fast. Ten knots too much and ten degrees of bank too little and your radius of turn doubles, (Fig 5) and the "thermal" turns into a vague burbling mess of turbulence instead of a solid four knots up. So practise your basic skills until they become second nature. And relax! Only then can you concentrate on the feelings. Make no mistake, they can be elusive, especially as you pull up and wave the ailerons about, masking the relatively small forces trying to guide you.

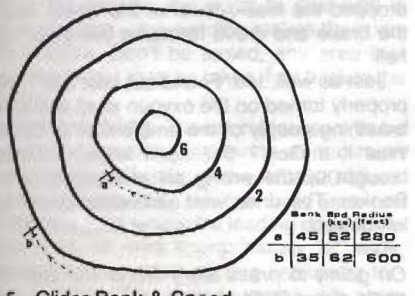


Fig. 5 Glider Bank & Speed

Re-centring. Assume you did it right and got centred. Now the trigger source way below shifts a bit and a new burst of energy pulses into your

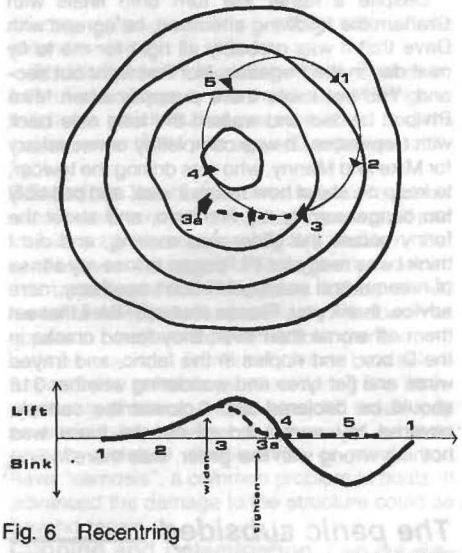


Fig. 6 Recentring

thermal, a bit to one side of your core. (Fig 6.) No longer centred, are you! Never mind, the seat of your pants will soon put that right. As you circle watch out for any *increase* in "lift". Try it on the model, with your circle a little off centre, and imagine where you would feel lift – that is, where you are crossing contour lines in the direction of the core. As the feeling of lift increases you should be straightening up a little, or at least widening your turn. As the "lift" dies – you are now coming back into the core – you should tighten up and resume your 45° banked turn. When you next get the chance to share a thermal with a real expert you will notice him making frequent small adjustments to his circle. He is constantly responding to the feelings I have described above. And he is probably out-climbing you as a result!

Pressing On. As you get better at it you may find the lift decreasing in spite of your efforts to re-centre. This is possibly because you are now sitting on top of your vortex ring, being drifted outwards by the circulation. Time to straighten up, press on and find a better thermal on course. Having successfully risen through the core in the best of the lift, no point in tolerating a slower climb by sitting on top of the fountain while it rises relatively slowly!

* * *

In my next article we will discover what happens when we *have* pressed on, and how we might optimise our progress cross-country.

MARY MEAGHER

SO EARLY IN THE MORNING...

Mary faces the challenge of Aboyne and tries for Gold

Going to Aboyne for the first time? It's important to attend the briefing where you will be told what to expect and how to behave. "Yes, the runway is narrow (17ft!) but it is nice and long", Dave Richardson told us. "Shouldn't give you any problems. You must aim to touch down half way along and roll to the end to leave room for somebody landing after you." Dave said that we must all rise early and be at the launch point before first light to beat the RAFGSA. Barographs smoked the night before. Everyone must pitch in and do their share. Be on hand when a Booker glider is ready to land to push it out of the way. Look after the tug pilot, knock politely at his door at dawn's early light and bring him mugs of tea.

Be kind to the tug pilot? Now that is a startling new idea. More often we are rude to the tug pilot. Especially when he or she has dropped you in the middle of a large blue hole. As for bringing the tug pilot a mug of tea at Booker, such an idea had never occurred to me. They were always sloping off for tea enough already, just when things were looking good and you were stuck in a queue of impatient pundits.

"Wonderful weather we've had, last week," Dave told us when we rolled up on Saturday. "Everybody got a Gold height. No, I'm not going to fly with you right away, I need a rest. Mike Cuming will take you in ECZ." Okay by me. Good old Cu-nim knows his way around these Highlands, he won a cup last year soaring in wave at Aboyne. "Wait till the air becomes smooth, and the lift is steady. Don't pull off too soon."

Presently we were rising effortlessly in the K-21 along the flank of a smooth white whale of a cloud in the lee of Morven. "Treat it like ridge soaring" Mike advised. "Turn into wind, and beat back and forth along the leading edge of the wave bar."

The cloud dropped away beneath us, we had gained 8000ft. "Time for a bit of cross-country" chortled Mike, and we toured the Highlands, streaking from bar to bar over Lochnagar, Braemar, Loch Muick and back to Morven, that splendid hill overlooking the twin lakes of Dinnet, leading home to Aboyne.

"Two thousand feet over the lochs" Mike told me "for beginning your downwind leg. One thousand feet over that little hill there, and plenty of airbrake. That's it." The wind, thank heaven, was more or less right on the nose, and I made a

decent approach and coaxed dear old ECZ down on the right spot in a reasonably straight line, and only had a spot of bother with the rollout, lurching somewhat from edge to edge of the tarmac as the on-lookers scattered. Not bad for a beginner.

Next day promised fair, with a hint of a southerly gale. At the lodge near Glen Tanar the wave bottomed out, the tree tops thrashed widly about and the wind howled down the chimney. At the airfield it was straight up and down the flagpole, not a breath! Amazing. We rolled out the Booker gliders first as usual; Ken Henderson went off with Mike Cuming as guinea-pig in the K-21; Dick Bailey in Pegasus 316 and Ian Griffiths in Pegasus 318 followed shortly after, while the lads from Bicester gazed in bleary-eyed amazement at the eager active Booker team. Safely launched, the ground crew adjourned with our little radio to breakfast at the Balnacoil. Porridge, kippers, bacon and eggs, white tablecloths and silver service, lounging laidback with our second cup of coffee while the elderly guests at neighbouring tables evesdropped happily. "Charley Zulu 12000, six up over Ballater."

By the time we got back to the airfield not a lot of gliders were left on the ground. I decided to do my bit and take a mug of tea to the tug pilot. Worked out an impromptu thermos by filling a large jar with hot sweet tea, wrapped in a sock and stuffed in a moonboot. Took along a couple of rolls as well. Ian Trail, the tug pilot, was amazed and grateful. I said I was only doing what they told us to do at the briefing. Ian said all the same it didn't happen very often.

Young Matthew Hill, who has been tugging at Booker all summer and is truly one of the best of the breed, has been curiously infected by the soaring virus (usually professional tug pilots are immune). Checked out at Aboyne by Dave, Young Matthew was strapped into the Pegasus, went up and got his Silver height, duration, Gold height and possible Diamond too, all in one go first time in a Pegasus. Piece of cake. His fingernails were a bit blue when he came down, but this was soon cured by the administration of free booze at The Boat. The proprietor was so impressed by Matthew's achievement that he awarded him a large bottle of Lochnagar.

Meanwhile, it was my turn to go up with Dave Richardson in the K-21. "Going to be a bit rough on the aerotow today". Dave advised me. "Wind from the south means there is rotor just over the field." I certainly had to devote my full attention to that aerotow. Both hands. Eventually we won through to the creamy smooth power of the surging wave, and Dave was pleased. "Keep on like that and we may have to let you go on your own" said he. Certainly the circuit was equally exciting. All over the place! Boing, boing, up we go and down we go, and open the brakes and close the brakes, and dive for the ground, line up, set her down, and keep right on to the end of the road! "It won't be any rougher than this" said Dave "or we wouldn't be flying at all." I was glad to hear that. What we had just been through was about all I could handle and a bit more exciting than I wanted without some expert company in the back seat.

Next day was a bit easier and Dave said it was time to become acquainted with the use of oxygen. "I don't want to use oxygen" I said. "If you go over 10000ft you must use oxygen" Dave insisted firmly. The moment I had been dreading had arrived. Last time I breathed into a black rubber mask it was ether. Screaming for help, in the last stages of labour. They shoved that black rubber mask down over my face and I spiralled down into infinity. Irrationally, I expected the same thing to happen now. I moaned and grumbled and struggled with the straps. Horrid thing. Once I had the mask in place I didn't pass out. But it pushed up the bifocals so all I could see was the instrument panel. Big help. "The mask in the Pegasus is a different shape, it might be more comfortable" said Dave. Not likely I'll be needing it anyway, I thought to myself. Ten thousand feet will be fine. Who needs more? Certainly I wasn't expecting to go for Gold, not likely!

Despite a rather low turn onto finals with Graham the following afternoon, he agreed with Dave that it was probably all right for me to fly next day in the Pegasus. Not first flight but second. You bet I was there promptly when Mike Philpott landed and walked the long mile back with trepidation. It was completely unnecessary for Mike and Manny, who was driving the towcar, to keep on about how rough it was, and possibly too dangerous for my first solo, and about the funny noises the glider was making, and did I think I was ready for it? I began to lose my sense of humour and snapped "I don't need any more advice, thank you. Please shut up!" Well that set them off worse than ever, they found cracks in the D box, and ripples in the fabric, and frayed wires and flat tyres and wondering whether 316 should be declared u/s. I closed the canopy, covered my ears, and of course there was nothing wrong with the glider, was there?

The panic subsided as the vario began to chirp cheerfully

There was nothing wrong with the glider, and nothing wrong with my flying, either, despite a few nervous moments streaking down under some very heavy sink to the forward edge of a frothy wave bar over Ballater. Three thousand five hundred feet didn't seem much at the moment, and I sure didn't want to land out on my first solo at Aboyne. Never hear the end of it; fortunately the panic subsided as the vario began to chirp cheerfully just in time.

Next morning Graham said "You'll be first in 316, Mary." Oh boy! Here we go! Long johns, moonboots, heavy sweater and head scarf. A quick word with the tug pilot. Every day I had brought tea in the boot to Ian, and he was more than willing to help when I asked him please to wave me off in the best spot. "I'll wait for your signal. After all, you know this place a lot better than I do." "Okay," said Ian, "I'll do my best."

Also, to baffle the bods from Bicester, we had agreed a secret code – "Quack Quack, Oink, Oink, Tweet Tweet" meant change to a prearranged channel to impart useful information. (Not that this did us much good, the Bicester bods did better than the Booker bumblers that week, anyway.)

Graham went off first in ECZ, towed to 4000ft but didn't find wave, and came down. Ken Henderson was next, in 318. I hung back a bit. Maybe it was too soon to connect with the lift? "If you don't want to go, I'll have the glider!" said Mike, so I got strapped in. Graham came round. "Tow to just behind Morven" he told me. "I'm going to go where the tug pilot takes me." "Do what I tell you, go behind Morven" Graham insisted. "I've agreed to be advised by the tug pilot" I was stubborn. "Well, if you fall down, don't blame me" said Graham. "If I fall down, it will be entirely my fault" I replied, and with that parting remark was launched into the cold bright morning.

"Very weak lift" Ian reported over the radio before we went. "Do your best", I replied, "I have faith in you!" Over Glen Tanar we went, and Ian waggled his wings and I pulled off, but there wasn't a lot there. Zero sink was all you could say for it. I hauled up on the wheel lever but the damn thing woudln't lock. I had to fly with one hand on the wheel lever and the other on the stick. Back and forth. Back and forth. Eventually after ten or fifteen minutes the lift began to improve. I began to sort out the lie of the lift and it got better. Steady two up, but still didn't dare heave up on the wheel again. After forty minutes and Mary was still up in the air when better men fell down, they began to transmit barnyard signals. Obviously I had something significant to tell them. "Quack Quack". "I can't oink oink!" (No hands left to change channels. Too busy holding up the wheel.) "Where are you, Mary?" I told them. In the clear. Several times. Just south of the airfield, over a hill with three white spots. "She must be talking through her scarf" I heard poor Doug Edwards groaning in disgust. "Can't understand a word."

Finally got the wheel locked up at 8000ft. A bit of sunshine crept in at last and I began to get a bit warmer. Stayed right in the same place until at last it seemed to be levelling at about 10000ft. Not until then did a wave cloud suddenly form to mark the spot where I had been climbing for nearly an hour. Over in the lee of Morven a bigger better cloud also formed. Time to shop around. I went down behind Morven, and sure enough passed 10000ft again in 4 up. Triumphantly announced that fact. And 11000ft. And 12000. Graham intervened. "If you go above 12000, you must go on oxygen!" Bother. Oh well. I struggled with the equipment. Turned on the valve. The only way I could manage the mask was holding it over my nose with the left hand, that way it didn't push up my bifocals. Breathing deeply, I wondered if it was possible to distinguish between panic and anoxia . . . palpitations? cold sweat? I kept on breathing through the horrid device and eventually settled down and worked my way back up to something over 13000, but by this time, alas, that morning cup of coffee insisted on a return to base. Never mind? Super flight! I dropped the mask, lowered the wheel, opened the brake and drove for home like a bat out of hell.

Just as well, too. Found out later that I hadn't properly turned on the oxygen at all and so was breathing deeply of the ambient air at 13000ft. Was it a Gold? Still don't know. Somebody brought up the wrong set of barographs from Booker. The ones with calibration charts were left behind.

On going to press Mary found she was 400ft short of her Gold height

GEL COATS

Do you realise that your gel coated glider is a flying sponge soaking up pounds of water from the atmosphere? This is the conclusion John, a BGA senior inspector, has come to as a result of advising on the refinishing of gliders

George Thelen's article in the October issue, "The Mortality of Gel Coats", confirms the suspicion of many of us associated with inspection and repair of gel coat structures – all is not well with what we have always believed to be a beautiful, virtually maintenance free, surface. Believe me, we have got problems with a capital P.

Having experienced all defects – crazing, checking, cupping, delamination and blistering – and been concerned with the re-finishing, the following advice may be helpful.

Many of you will have seen John Glossop's ASW-17, re-finished in acrylic. Because of its size and the effort of derigging, it had been left picketed down on the airfield where it was exposed for long periods to the weather. This caused extensive cupping and delamination, mainly adjacent to the manufacturing joints such as the leading edges of wings, tailplane, control surfaces and fuselage back. The underside was virtually perfect, confirming that ultra violet light and water were the prime enemies.

Have you ever wondered why a four year-old glider will be about 30lbs heavier than the manufacturer's calculations?

Fortunately dry gel coats abrade without clogging and it is possible to use a random orbital sander. Obviously great care must be taken not to abrade the primary structure. It wasn't necessary to remove all the gel on the ASW-17 but it is always vital to make sure every crack is located and dealt with. It is essential to use an air line to remove any dust which can conceal a crack and you need to work with a magnifying glass.

Now is the time to remove the water. Have you every wondered why it is that when you weigh a four year-old glider it will be about 30lbs heavier than the manufacturers' original calculations? And 30lbs is three gallons of water. A word of caution here: don't attempt to drive out four years' ingress in five minutes. You need good air circulation, gently raising the temperature over a 12hr period to around 50°C. This will ensure that no undue pressure is created which will damage the structure. Allow to cool gently. This treatment will also reveal any further defects.

An etch primer, followed by hi-build acrylic primer levelled to profile and finally finished with plasticiser added to areas subject to flexing, produces a high quality, non-permeable low drag finish.

Of all the defects, the worst to deal with is hairline cracking – the sanding makes them virtually invisible. Don't be fooled, any area that shows this defect must be taken right back to the structure.

Hairline cracking. These cracks seem to be concentrated around the points of maximum bending and twisting, *ie* on the ASW-20 chordwise for approximately two feet from each root and from the point where the leading edge starts to rack back, an area approximately 12" wide, with cracking and some crazing (indicating torsional twisting). The tipped version will show crazing approximately 4" either side of the extension joint.

To date I haven't found this on the rigid structure of a fuselage or the underside of wings or tailplanes which makes me to suspect that the gel becomes brittle with age and exposure to UV light.

Blistering. This has occurred in numerous new aircraft which are not gel coated in the mould and should not be confused with this problem. Gel coat blisters are clearly visible, gently rounded and usually about 6mm across. Lifting off will reveal a level structure beneath. It does not appear to be associated with cracking or cupping and has a random distribution. It may be a failure to bond due to contamination during the manufacturing process. A local remedial repair may be successful, however if removal of a blister reveals moisture discoloration or mould you have "osmosis", a common problem in boats. If advanced the damage to the structure could be beyond repair.

Cupping and Delamination. I am not convinced that this is the next stage on from cracking, as George Thelen suggests in his article, appearing as it does mainly over leading edges and on upper joints. The explanation could be that these areas are regularly subjected to wetting to remove flies etc. Also, since the wings are stored leading edge down, condensation would drain to the low points. I have certainly seen beads of water hanging off the entire wing length and drips on the trailer floor after a sudden rise in ambient temperatures.

So we have a problem.

Can we avoid it? On the evidence the answer in the long term appears to be no. Can we extend the life by *really* looking after our gliders? Yes we can.

1. Avoid water as much as possible.
2. Don't use wetting agents (washing up liquid) etc.
3. Use natural beeswax mixed with white spirit to clean, polish and protect.
4. Never leave the glider rigged in sun or rain for any longer than necessary.
5. Don't use covers that can sweat or retain moisture.
6. Make sure your trailer is well ventilated.
7. Insulate your trailer to protect from rapid temperature changes. It's not just coincidence that the very worst examples I have seen lived in *aluminium* trailers.

Before you go off in Sherlock Holmes' hat, pipe and magnifying glass at the ready to study your glider, be honest. Have you really looked after it? Or are you guilty of splashing on water to get rid of the flies? Put it away in the rain and left it till next week. Waxed it as an annual event? Used silicone polish? Stored it in an unventilated and uninsulated trailer? Yes, it's the portrait of us all.

If you have got cracks, do get it attended to and make sure that you select a company that has the equipment, facilities and expertise to do it properly.

Any aircraft over five years-old, unless it has been scrupiously cared for, must be suspect. Refinishing before it cracks will halve the cost and should be seriously considered.

Will acrylic finishing cure the problem: There is no evidence to suggest that acrylic finishes suffer in the same way as gel and they are relatively easy and cheap to replace. The surface is easy to maintain and abrasions can be retouched simply and virtually invisibly. And most importantly, it is totally impervious to water.

Finally, have you ever seen the gel falling off a Vega? It is finished in acrylic! It was a pity they used spot glueing to fix the foam core hence the pretty dot patterns spoiling what would otherwise be a perfect surface. Incidentally the Vega will also weigh about the same as when it was manufactured.

"SOARING"

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APPALACHIANS REVISITED

Alan returned to his favourite gliding country last spring and collected another record with his Nimbus 3, the British National goal distance, with 859km though the actual flight on April 23 from Ridge Soaring Gliderport was 945km. But the retrieve wasn't as straightforward.

No need to switch off your set. This isn't another of those dare devil ridge running sagas complete with death defying leaps between one section of ridge and the next. Just to eliminate stress and tension at the outset it can be revealed that a mere 10% of the flight used ridge lift at all, and I didn't frighten the hell out of myself once. I can't remember a more relaxed flight.

As usual, it started at four in the morning; or it should have but nobody else turned up, not even a tug pilot. Assuming that Murphy's Law had got in amongst the weather again, I went back to bed, waking at six to the unmistakable sound of a DG-400 taking off. Mike Stevenson and I had agreed to declare Chilhowee Gliderport in Tennessee as a goal and to fly together; now he was in the wave and heading south. By the time I was able to launch it was well after eight. I declared Chilhowee, but said I'd be back before long unless conditions were exceptionally good. In the event they were.

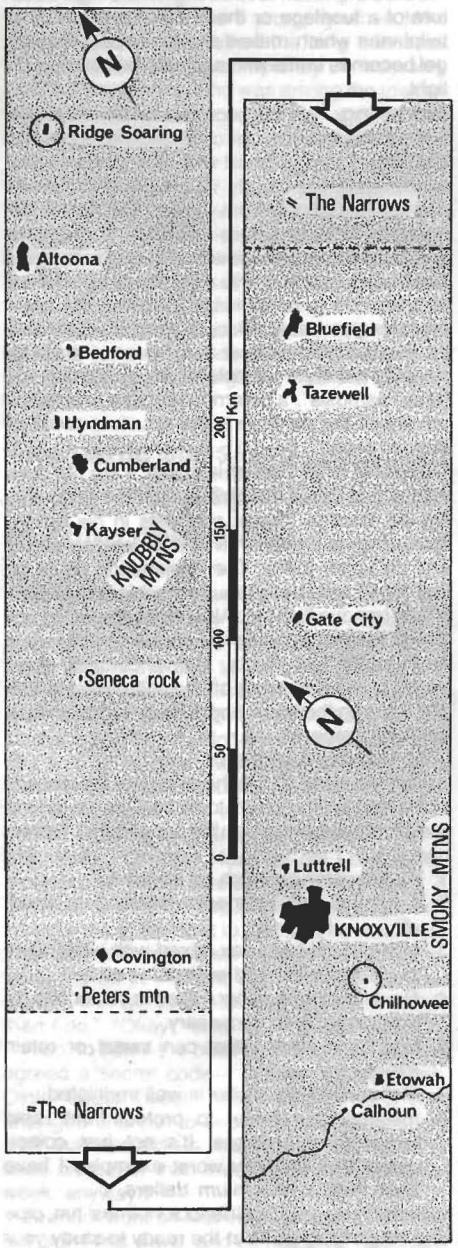
From 2500ft I didn't quite make the wave, but bumped along in rotor for 70km and over the first ridge gap at Altoona. With a strong tailwind component it wasn't worth going down on to the ridge for just 30km, so I used thermals and was soon across the Bedford gap, staying high above the ridge at Hyndman (140km out) where the wind direction was briefly parallel to it. Twenty kilometres on at Cumberland I stopped to make a determined effort to get into the wave so as to avoid the ridgeless Knobbly Mountains. Speed up to this point was 160km/h, which had risen to 166km/h by Seneca Rock, 250km out, where I transitioned to the next wave downwind at 8000ft – as it was very cold more height didn't seem like a good idea with only 10% antifreeze in the ballast.

"From here on the sky was to be completely blue for the remaining 550km."

South of Cumberland the cloud cover had become broken and cloud shadows showed that the next part of the ridge would be working strongly. From here on though the sky was to be completely blue for the remaining 550km.

Gliding down on to the ridge some way along Peter's Mountain my mind turned to the subject which recently absorbed the Platypus column for some months. I couldn't see the problem, as my tube (with the outlet cunningly positioned in an area of negative pressure) has always worked faultlessly. Now I can. I hadn't bargained on the effect of a cold-soaked airframe travelling at 120kt, which froze the tube instantly and left me holding this with one hand and that with the other (and wishing I had a third to fly with!). Before I could muster something absorbent, a surge of lift followed by the inevitable airpocket (as I think they used to be called) disposed of the problem, if not exactly solving it. In future I plan to emulate the most distinguished Appalachian pilots in the use of a Ziplock plastic bag filled with diaper liners (nappy liners to you!).

Anyway, back to the ridge. With lift this strong I had no worries about the unlandable area before Bluefield, where the Flight Service Station reported much lighter winds to the south. After the Tazewell gap (540km) I dolphined above the ridge rather than soaring it, occasionally circling after Gate City where outlanding possibilities become minimal. I left the ridge altogether before Luttrell after 715km at an average of 131km/h.



Flying south past Knoxville, I made for another section of ridge some 50km away which I hoped would offer better thermals than the flat land in between, although with the flat calm reported by Knoxville tower it wouldn't provide ridge lift. In fact the thermals were disappointing and I dumped half my ballast while admiring from afar the impressive peaks of the 6600ft Smoky Mountains – only 20km to the east and quite unattainable.

After flying SW along the 35km of this ridge, I hadn't got high enough to fly the 40km over forested hills to the ridge beside Chilhowee gliderport. I would have to detour 20km to the west and over the huge Tennessee river, hoping to find lift in the valley to its south. The valley itself is good farming country, with plenty of fields and two airfields before Chilhowee, so final gliding wouldn't be too bad.

In the event gentle lift appeared at about 1000ft and as I dumped the rest of the water, the other side of the Nimbus 3's personality returned. I haven't mentioned the glider before, but I should. Even when ballasted to the gills, it combines the docility of a club trainer and exceptional ride comfort with the performance of a cruise missile. Without ballast it will climb on the heat from a good-sized cigar (well, almost) and still glide like a magic carpet. In this guise and making use of every scrap of lift she carried me along the valley, past the railroad marshalling yard at Etowah and over the Hiwassee river to arrive over Chilhowee with 1400ft to spare.

Decision time – to land or not to land; although I could see a DG on the ground I couldn't be sure if it was Mike's or another one as I couldn't raise anyone on the radio. (In fact he had arrived just an hour earlier after quite a struggle with the weak thermals.) I had been circling lower and lower over the field and finally decided that if I could climb back up I would try for a private strip 30km on and just over the Georgia state line.

I never did spot it, but by then had enough height to go for the field at Dalton, and from there

to Calhoun, 90km from Chilhowee. For 150km each thermal had topped out lower than the last one and now it was a grudging 1500ft. With the next airfield at Cartersville 45km away over heavily wooded hills and the certainty that wherever I landed the glider would have to stay there for days, I decided to call it a day and to land at Calhoun, 945km and 9½hrs from Ridge Soaring Gliderport. I did so quickly – it was 5.30 and small airfields can get amazingly deserted in the evening.

Having successfully dodged the runway lights (a continual problem for 24m gliders!) and pushing the Nimbus on to the only taxiway lest a sleepy power pilot should land on it. I went in search of the figure I had seen moving near a hangar. It turned out to be the airfield manager, Bill Swart, who was surprised; he hadn't heard anyone landing. He peered doubtfully at the Nimbus. Where did I come from? I said "Pennsylvania" rather than "Ireland", thinking of the pilot who had landed not far from Ridge Soaring and had replied "Iceland" to this question. "My, but you must be hungry after such a long flight over the ocean," said the farmer's wife.

Bill, his wife and several others came out and looked at the glider, sleek and lean beside all the Cessnas and Pipers, and helped tie it down. Nearly 600 miles in a glorified toothpick with no motor was obviously kinda hard to believe.

Even more so was my confident assertion that I would be back in a couple of days with the trailer. They were right there. The intended flight back from Atlanta turned out to cost more than from London to New York – US Air travel is not always as cheap as we're led to believe. Dual and even triple aerotows have been discussed for straight out retrieves, but again the cost is right over the top for one glider. So, after a night in the nearest motel, it came down to a 9.30am start on the Greyhound bus to Chattanooga, and thence with occasional changes to Knoxville, Roanoke, Washington DC, Baltimore, Harrisburg etc, and all points between.

And the points between are the worst part of travelling by bus! It stops just everywhere, enabling you to see the country in great detail. (It occurred to me that I'd be seeing it again twice over in the next few days.)

In the fullness of time (27hrs, to be precise) I wound up right back where I had started and compared notes with Mike, who had flown the DG-400 back the previous day – a motor has its advantages for sure – having exceeded the motor glider world goal and distance records.

"The car got its Silver C height but I didn't pass a single place I'd want to land a glider."

As the forecast didn't look that exciting for some days ahead there wasn't any urgency to get back, so I decided to drive part of the way on the Blue Ridge parkway, joining it at Roanoke, Virginia and following it to its southern end. The parkway is purpose-engineered with gentle slopes and curves to take one through 575 miles of breathtaking scenery at up to 6000ft. The car got its Silver C height, but driving the southern 350 miles I didn't pass a single place I'd want to land a glider! Despite this the local pilots make good use of the excellent wave in the lee of Mount Mitchell (6684ft) and thermal over the Smoky Mountains when cloudbase is high enough.

When I arrived at Calhoun in the early morning, the airport's chief engineer came to help to derig. He expressed an interest in CRP construction methods, having done a little homebuilding himself, he said. "A little" turned out to have been *ten* Pitts specials.

After the inevitable proof-of-landing forms had been filled in and signed in quintuplicate, I checked the milometer (750 road miles) and set off on the long trek north, anticipating a hot and tiring drive up the freeway compared to the much cooler temperatures in the mountains. But in fact there was soon steady rainfall, increasing to a deluge around Chattanooga (the local radio station was talking about light showers – these weathermen are the same everywhere!) which persisted for 200 miles and certainly took any boredom out of driving.

And so back through Virginia and Maryland and on into Pennsylvania, six days after the flight, which had been so enjoyable I'd do it all over again tomorrow.

But every silver lining has to have a cloud; arriving back at Ridge Soaring I learned that there had been a mid-air collision (in perfect visibility) the day before, and that while one pilot had survived against all the odds having spun upside down through some trees and into the ground from 4000ft, the other person involved was Mike Stevenson, and he had not. Mike was a pilot of great character and experience (1000km, motor glider world height record etc) whom I had known since I first went over there. If it can happen to him it can happen to any of us.

FIRST SOLO SOARING FLIGHT

At 2500ft, flying at 60kt, the K-8 was not losing height. It was a situation I had not anticipated, been trained for or dreamt of. But the rest of the flight was.

My first solo was nerve-racking and the subsequent five and six minute flights had their charm. But they were also dissatisfying.

The short and unsuccessful search for "the force" proved there was still a major mystery to grasp, as yet beyond my reach. Oh for a 30 minute local soaring flight!

I applied myself. I listened and asked questions, sat in on Derek Piggott's lectures and read Bill Scull's book.

"You can learn about thermalling on a bicycle," they say. If you can, it's beyond me how you get lift. I fell off my son's racer and was banned from trying again.

"Did you feel that bump?" asked the instructor. Perhaps the seat of my pants was more insensitive than most.

On July 9 I got the K-8 into line at 3pm. The launch took me up to 1400ft into a clear blue sky. Upwind where there had been ample lift in the morning I found 2kt down. It was ever thus.

Using Murphy's Law, which states that thermals find inexperienced pilots at 400ft near the base leg, I set off in that direction.

I felt the bump at 700ft. My bottom said turn and arms and legs moved before I had time to think. It was at best 2kt up but I sat tight. By the second turn the trees were just a little further away.

At 1000ft, taking a deep breath, I took a chance to try and centre. "Leave the worst lift. Straighten for three seconds and back into the turn." It improved to 2 up and 4 up and I began to hope for 2000ft.

And up it came! It was worth one more correction. Was it possible to get even nearer the centre of this beautiful scary thermal? One more correction and there it was. Between 3 and 6kt up all the way round. I could not believe my luck. This was turning out to be a dream. The force was with me.

To find and use thermals is the essence of gliding. Without it you are left with six minute flights. But when you have it, what new horizons become possible.

At 3500ft I was higher than I had ever been in a glider. I realised I was hurting my left hand hanging on to the framework. It was time to relax and enjoy myself until I realised I had no idea how long I had been up.

I had to stay up for 30 minutes. I looked at my watch, tried to convert height lost into time, guessed the take-off time and set an objective of another 25 minutes.

Back to the instruments then at 4300ft above Lasham it was goodbye thermals. I straightened up and looked at the new horizon. Didcot cooling tower to the north, the Solent and the Isle of Wight to the south. It was magic. The pre-stall buffet reminded me to re-set the trim.

But what to do with all the height? I flew for fun, manoeuvring and visiting villages with the freedom that flight gives you until I saw I had five minutes left and it was time to get back.

It was then I realised that at 2500ft, flying at 60kt, the K-8 was not losing height. All those months of learning to conserve height creates a resistance to throwing it away. With an effort of will rather like stealing your first apple, I pulled full airbrakes, dived towards the circuit and landed.

Getting stiffly out of the cockpit, a helper told me I'd had 45 minutes. "Are you going again?"

"One day soon," I answered, "because I have to do it again. It may have been a freak flight and I want to be sure it wasn't." And there are those cooling towers to go and see.

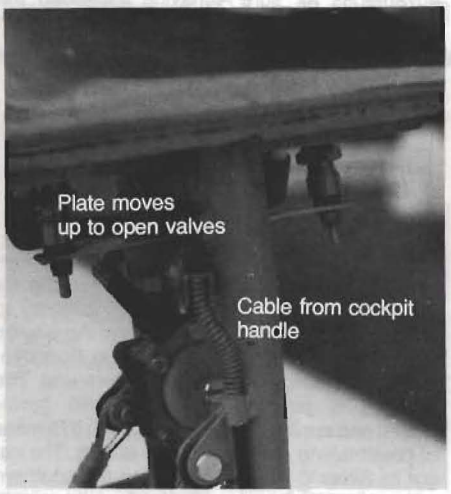
CHARLES HOLME

LATEST ON THE NIMBUS TURBO

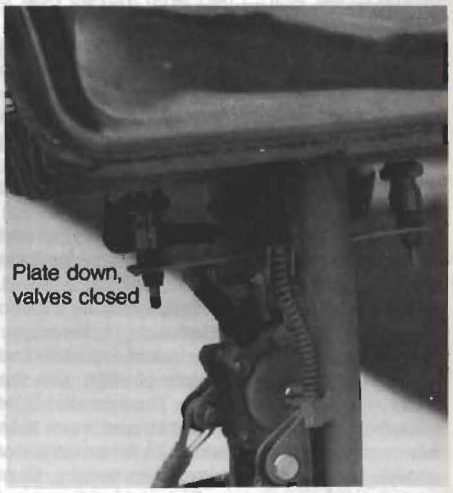
This is by way of being an update on the article in the June issue, p129, and gives an account of Schempp-Hirth's developments on the self-sustainer engine (Photo 1). Latest models now have a manual decompressor handle, a Max rpm limiter, an improved indication of engine rpm, and a stronger, metal fuel tank. The most important of these is the decompressor (Photos 2-4). Previous models had an automatic system but it required 65-70kt before the valves closed and starting became possible. With the new system I found that starting occurred at about 55kt. Height losses were therefore reduced, and were 140ft when "clean", 160ft wings level in the landing configuration and 180ft when turning "finals".



No. 1. David Innes holding the fuel tank on his Nimbus 3T.



No. 3. Decompressor valves open.



No. 4. Decompressor valves closed. Photos: Ian Strachan.

On a cross-country, you use the engine as soon as you have realised that you have "pushed it too far" and would otherwise have had to land out, but the small height losses show how low you can go if there is still a chance of soaring and you have some nice big fields selected in case there is a problem with the engine. Incidentally, I measured the glide angle with the engine out (but not running) at an incredible 1:34 at 45kt (clean), and 1:25 in the landing configuration. This shows you that you are not exactly coming down like a brick even if the engine doesn't start, and is better than the Max L/D of the gliders in which I flew my first cross-countries!



No. 2. Decompressor handle.

While you are grovelling about in your last thermal and it becomes clear that there is a distinct chance of winding up on the ground, you select your field, turn on the fuel and prime the engine by pumping the plastic primer bulb with your right thumb. Check that the engine electrics are ON and the circuit breaker is made, then turn on the ignition. You have then set yourself up for the earliest possible start, should you actually fall out of that grotty lift. If you thermal away you simply turn the fuel and electrics off.

However, if you *do* fall out of the sky, you plan your circuit to the field, lower the undercarriage, and when you are certain that your landing pattern is OK, casually stretch out your right hand and flick the engine EXTEND switch. You don't have to hold the switch on, and meanwhile you lower the nose a bit and concentrate on the field. You glance at the rear-view mirror and after 12sec you see the engine appear, then after 20-25sec a green light on the panel tells you it is fully up. You pull the decompressor handle with your left hand, lower the nose and as the speed increases, release the handle at 55kt. A satisfying roar from behind you assures you that all is well, and some 40sec after flicking the switch you are climbing away.

If it doesn't start, pull the decompressor again, increase speed and then release it. Monitor your flight path very carefully and have more fields selected in case of engine problems or downcurrents. If the engine does not run smoothly, re-prime by pumping with your right thumb (this shows the need for thorough priming in the first place). Retract the undercarriage and any flap that you had used, and don your ear defenders or headset (the engine is very noisy inside the cockpit). You have once more avoided a field landing with its attendant risks and inconvenience. You should be soaring again in 15min.

The manual decompressor gave much better control over starting, but at the cost of needing specific pilot actions at what could be a critical time. The automatic decompressor fitted to previous models was easier to operate but height losses were greater. A good compromise would be both the manual lever *and* the automatic system. However Schempp tell me that this is not technically possible. Pity. Of course the best solution would be a small starter motor, cutting in automatically when the plyon UP microswitch was actuated.

However, when I measured the rate of climb it turned out (when properly averaged over several minutes) to be only 162ft/min at 2000ft asl, and 130ft/min at 3000ft. This was very disappointing since on the earlier flight test (see reference), 237ft/min was recorded, averaged over 5½min. It is true that these figures should be treated with caution because many well-documented climbs are needed before a statistically significant result can be claimed. However they were achieved by drawing the best line through several points plotted on a graph, and should be a good guide even though not exact in a scientific sense.

I therefore rang Schempp and found out that

later models have been de-rated to climb at some 200-300rpm less than before, to comply with LBA* (the German Certification Authority) regulations in order to avoid overspeeding at higher speeds. Indeed the Flight Manual now only quotes, 134ft/min at 1500m asl (4900ft), and an incredibly low 73ft/min at Max weight. Although the latter should not be a practical case because ballast will have been jettisoned before the engine is used, I believe these figures are too low for comfort and, if downdraughts are about, for safety. The engine should be uprated to its original (or better) power and the Max speed with engine (presently 86kt) reduced. After all it's climb rate that really counts. Running the engine in level cruise is very noisy in the cockpit, reduces engine life and halves the range compared to a "saw-tooth" profile where you successively climb and then glide with engine in. The design aim should be a climb of at least 2kt when ballast is jettisoned. Another answer would be a small throttle control and an rpm gauge which, as a power pilot, I would prefer.

"I understand that my solution of keeping the high power and reducing the Flight Manual speed is not acceptable to the LBA . . ."

The source of this problem is that the engine is not certificated for continuous operation at rpm over 5500ft and at its original power this can be reached at 65kt. However, its Max rpm of 5800 (limited to short periods) corresponds to a speed of 76kt. I understand that my solution of keeping the high power and reducing the Flight Manual speed is not acceptable to the LBA because at 65kt you are still climbing, and they insist that the limit must apply to level cruising flight. Although later models have a Max rpm limiter in the form of an intermittent ignition cut, it would appear that this is not enough to satisfy the LBA at the higher engine power setting. This problem should be solved to avoid climbing at only 150ft/min or so (less in a downcurrent) when the engine is capable of being tweaked to give 200ft/min or more. I believe Schempp are working on a solution.

Despite this criticism, the concept is very exciting and there is now tremendous interest. Very few pilots I have spoken to would not like to own a Nimbus or Ventus Turbo. Two-seater cross-country training could be revolutionised by using the Janus Turbo and I hope that the BGA will purchase one for the national coaching operation. Cost, of course, is the problem. Maybe Professor Ohler's patent (held by Schempp) could be used by other manufacturers under licence, or perhaps other firms might achieve the same result in another way. Either way, it will be advantageous to the movement to see some healthy competition, and there should be spirited attempts to reduce the price. Ideally an engine should be used which is in world wide operation and for which spares are readily available at the local motor-bike shop. And I still believe in fully automatic "single switch" starting. When is the first manufacturer going to take this significant step?

*Luftfahrt BundesAmot

PETER HEARNE, DAVID INNES, PAT SWOFFER

THREE SEASONS WITH A DG-400

Have you ever fancied owning a self-launching sailplane? The Juliet Delta syndicate from Lasham give their opinions and experiences of life with their DG-400



Julian Temple, on the left, and David Innes rigging the DG-400. Photo: Ian Strachan.

A great deal has been written on flight evaluation reports on self-launching motor gliders, but this one is somewhat different.

We collected GBLJD from Glaser Dirks factory near Karlsruhe at the beginning of June 1984 and started flying the following weekend. This article describes our experiences and opinions as owners of a self-launching sailplane, happy and otherwise since that date.

Question 1

The first question everyone asks is "What is it like as a glider?" The answer is "Superb!"

In its 17m form it has all of the crisp handling of the DG-200 series. That is to say very good lateral and directional characteristics without the roll/yaw cross coupling associated with longer span aircraft and a rate of roll that appears only marginally worse than the 15m ships. Pitch feel augmented by spring trim and stick gearing is well harmonised with aileron and rudder. Airbrakes and wheel brake are extremely effective.

At the more extreme ends of the envelope it is fully aerobatic as a glider even to the extent of

Personally I still prefer the increased versatility of the self-launching machine. I note that Schleichers are advertising an ASH-22 with self-launching capability. Perhaps Schempp can be persuaded to resume production of the self-launching Nimbus (of which ten were made in the 1970s). Hopefully other manufacturers will realise that they too must offer motorised options to their designs. The motor glider, after conception in the 1930s but a prolonged and somewhat agonising gestation period, has surely finally emerged into the light of day and will in the future grow to be a mature adult, recognised by all to be a creditable addition to our soaring family and not a wayward child. After all, sports that have been around longer than us, such as sailing, have for years had outboard motors to lessen inconvenience and hazard without detracting from the main element of the sport. *The principle is no different.* The "outboard motor" is here to stay!

References

"Testing the Turbo", S&G June 1986, p129; "The Janus CM", S&G, April 1986, p76.

flick manoeuvres if you are of that mind. In this area it also seems to have a minor aerodynamic quirk which results in a slight somewhat unusual and steep spin followed by a "snappy" recovery.

In its 17m form the performance seems to be slightly better than the 20m Kestrel (itself a noticeable improvement on the usual 19m) that one of us had just left. The built in engine and fuel "ballast" of about 140lbs shows itself principally in a normal cruising gait of around 65-70kt. Good flaps allow tight circling at 48kt or so with a docile stall at 41/42kt. Indeed, the only time you are even slightly conscious that the 400 is a rather different sailplane is on landing where the non-jettisonable ballast makes an approach speed of 55-60kt desirable, rather higher than the usual "dry" glider. Climb performance in thermals with the 17m tips seems indistinguishable from other contemporaries. But, with the 15m clip ons with the engine installed on poor to medium days, at least there is a moderate but noticeable gap in rate of climb with comparable 15m sailplanes. If the engine is removed it is a highly competitive 15m as Chris Rollings has already shown in competition flying.

Translated into cross-country flying terms it means that the aircraft is an extremely good cross-country sailplane and in our hands has flown several times over 300km in the UK as well as a number of 500-600km flights in Segovia. One can also point to other DG-400 achievements against non-powered gliders which include currently holding the 300km sailplane speed record as well as victory in a number of different countries' Nationals.

Question 2

So first of all it is a really good sailplane with no adverse performance effects from the engine. But what does the engine do for you? Surprisingly, the principal answer is **not** that it does away with retrieving. Instead, we would put way ahead of any other characteristics the self-launching capabilities which make you independent of launch queues, launching facilities and other site problems. This independence has got to be experienced to be believed. We regularly do a five minute "pitstop" for a driver change. As a result we can plan for two pilots to do say, two 200km flights, when the normal type of sailplane with dependence on launch facilities etc would probably only achieve one. So we all get a lot more cross-country flying.

Secondly, it enables us to go to the part of the sky that most interests us. This is of course mostly of interest in wave conditions. A 14500ft asl altitude has been achieved on engine alone dead in line with flight manual performance.

Thirdly, it obviously eliminates the retrieve problem. However, this is more in the nature of increased pilot confidence, rather than by engine use. We tend to make it a "point of honour" not to use the engine but to rely on our thermalling skills, though we would obviously use the "donk" if these or the weather fail.

Lastly, cross-country transit flying is possible using saw tooth power climb, engine off glide techniques up to a range of 500 miles, if you can stand it.

It is also possible to fly straight and level at constant altitude to transit control zones or fly under thick overcast. Under these circumstances, the aircraft gets along at about 75-80kt but with what most of us feel to be an uncomfortably high level of noise and vibration; quite unlike the climb which is a smooth, almost armchair type of ascent. The range in straight and level flight is about one-third of the climb/glide technique and this reduction, together with associated shake, rattle and roll, makes it a method of progress which we only use when strictly necessary.

Question 3

So what about the disadvantages?

Apart from the additional first cost, engine overhauls at 25hr intervals will cost you some £75 to £100pa. Other C of A costs seem similar to an unpowered aircraft, but spares, etc seem to consume some £50-75 extra pa compared with an ordinary sailplane. Fuel consumption at around $\frac{1}{2}-\frac{3}{4}$ gallon/launch is much cheaper than aerotows, and represents a very positive saving in the balance sheet. Engine hours to date are 58 for an airframe time of some 260hrs. In good conditions 4-10min engine/launch is the standard usage.

The principal problem we have found is, we are sorry to say, in the standard of construction of the installation aspects of the power plant in the earlier models. The sailplane construction is good and solid, the Rotax engine very reliable, the electrical retract mechanism no problem, but the detailed engineering of some of the installation of the earlier models could only be described as "inadequate".

Glaser Dirks appear to have learnt by the early owners' experiences and incorporated a number of necessary modifications

In almost all cases these inadequacies stemmed from the use of domestic quality ferrous and non-ferrous materials in a very high vibration environment (2 stroke engine at 6000rpm) with no proper account taken of fatigue characteristics. However, it is only fair to stress that Glaser Dirks appear to have learnt by the early owners' experiences and that the present production model (and with an eye to eventual resale, I should add also our GBLJD), has incorporated a number of very necessary modifications which appear to have overcome the earlier problems.

Our two most worrying defects, both caught before catastrophe occurred, were a fatigue crack in the propeller shaft mounting (attributed to faulty manufacture) and two fatigue failures of the main generator and battery earth lines attachments to the power plant mounting. Both these faults have been put right by Glaser Dirks in the present series, but they could have had dire consequences. The earth cable failure resulted in generator and starting currents passing *via* the metal braiding on the fuel lines to the power plant assembly with no indication of failure on the several electrical warning systems. Other problems were a persistent air duct failure, replaced by a home built stainless steel version, and a recurring starter mount failure. A new type of starter has been introduced in current models.

Question 4

And the last question to be asked is "What do you do if it doesn't start".

When we started writing this article, that had never happened. However, subsequently a hasty relight at low altitude over Segovia in the circuit gave the pilot insufficient time to explore the choke position needed to get it going. Subsequently, we reproduced the effect again in the air and started with very little difficulty. And if you have 500ft of extra height, it will always restart in a dive/pull out if the very unusual starting failure occurs.

The flight manual recognises the need for some caution in restarting and advises a minimum height of 1400ft to allow for the possible contingency of a dive start. It also suggests that you should restart over landable territory, but our experiences would suggest that this is in the nature of a belt and braces approach. There has got to be something very seriously wrong with the engine for it not to start in a steep dive and pull out. However we always bear in mind the fact that "prop stopped, engine out" the L/D is 1:13. So give yourself some sort of margin.

For the Future

Since the DG-400 came on the market, the self-sustaining turbos have made their appearance. We cannot yet comment from experience how successful they are in the air, but they obviously lack the self-launching capabilities which have given us such excellent aircraft utilisation both on our own site at Lasham and in the UK and Continental sites which we now regularly visit (by road trailer by the way!).

One cannot stress too highly the fact that the DG-400's ability to taxi under full control with its steerable tailwheel and new improved larger wingtip wheels is a fundamental part of its independent means of airfield operation.

To be able to prepare the aircraft by oneself away from the launch point, climb in and taxi to the take-off position with no assistance from wingtip holders, ropes, tail dollies, cars and the like, takes so much sweat out of gliding that it becomes almost pleasureable.

This remark will raise all sorts of self-righteous howls of criticism from the hair shirt brigade that such attitudes will ruin the sport. All we can say is that it is unlikely that most pupils will meet a DG-400 type of machine until quite well on in their training and that we cannot see that the ability to "drag that wing, hump that tail" has got anything at all to do with the perfection of flying skills. If it had, we would have the Red Arrows' pilots pushing their aircraft out on to the runway and polishing them everytime they flew!

However, if your object is to fly frequently and far in as many different soaring conditions as possible, without dependence on the availability or goodwill of other people, then the DG-400 is the aircraft for you. They currently cost 89000DM or so *sans* flight instruments and some 200 have been delivered so far.

To the very last question we are usually asked which is "What aircraft would we buy to replace the DG-400?" – the answer is obvious – another DG-400, of course.

BILL SCULL

WHO HAS CONTROL?

One of the more common causes of accident is failure of the instructor to take control in time. Year after year it accounts for almost 10% of all accidents; in 1985 it was 13%. In this article, the first in a series, Bill Scull, BGA director of operations, looks at the critical situations and the factors involved

In the early stages of learning to glide everything is straightforward. The instructor shows the student what to do (demonstration) and gives the student control for his attempt at the exercise. It is unusual for there to be any misunderstanding; the instructor's words *"you have control"* and the student's response *"I have control"* practically guarantee that the situation is clear-cut with little or no likelihood of confusion.

Who has Control? As a student gains experience various situations will arise in which the instructor "assists" with one or more control; "assist" will be his word for it – the student may well regard this assistance as interference. The circumstances in which assistance or interference are likely need explaining. Typically such "help" will be needed during the ground run for take-off or landing.

Take a simple example. The student fails to either keep the wings level or, perhaps, to keep straight. There may not be enough time to prompt and get a reaction quickly enough for the situation to be contained. If the glider veers too far from the right line the only option will be to abandon the take-off. So the instructor supplies the necessary control input to keep the glider's take-off (or, for that matter the landing run) path within reasonable limits.

In the heat of the moment the situation will not be rationalised because the student may not know anything is wrong

Problems. The only problem in the circumstance described above is that the student may be confused by the control input which the instructor has made. In the heat of the moment he, or she, will not rationalise the situation because, of course, the student may not be aware that anything is wrong. That being so the reaction may be to resist the control input which the instructor has made – and, possibly, cancel its effect and the take-off may have to be abandoned. Alternatively the instructor applies more force to achieve the desired effect against which the student may still react and the nett effect is not to influence the glider at all.

This is the sort of confusion which leads a student to ask "Did I really do that landing?" when he has a suspicion that the instructor "helped". The instructor may admit to a slight tweak on the controls or, perhaps, claim that he didn't in the hope the student will believe that he coped and gain confidence as a result. But this is all routine stuff. More to the point, and the main purpose of this article, are the critical situations where failure to take control in time results in broken gliders.

The Landing. If an instructor hasn't flown with a particular student for sometime (or at all) then his assessment of the student depends on the evidence of logbook or training progress card and how well he flies before this critical phase. Sometimes there is no indication that the landing is going to be a bad one and it is easy to be lulled into a false sense of security. The maxim is "treat every landing as your first" but it's not easy to maintain this discipline.

But then the student fails to round out or opens the airbrake further. The consequences may be serious – at best a heavy landing without any damage and at worst a broken glider and damaged backs! The instructor should have been prepared; ready to check the descent with the elevator and to stop the change in airbrake setting. Such a state of readiness is a requirement for every landing. From a relaxed posture – arms folded perhaps – the right and left hands should be close to the appropriate controls (stick and airbrake) in readiness to make the necessary input ("assist") or take control.

One note of caution. Some students when they feel the instructor "interfere" with the control may relinquish control. They may be sufficiently drilled in the discipline of handing over control not to need the magic words "I have control". In the event if you, the instructor, want the student to go on controlling the glider say so – *"You still have control!"*

There are other potentially critical situations.

The instructor should guard against critical situations with a hand in readiness in front of the stick

The Launch Failure – on the wire. The most critical situation is probably in the first 30ft or so. Suppose your student has only had cable breaks (real or simulated) at a height where it is necessary to markedly lower the nose. What will he do in the low-level case? Lower the nose of course and, maybe, when there is neither the need nor the height. The result is a broken glider. The instructor should be guarding against such a possibility literally in this case – with a hand in readiness in front of the stick.

There is another possible risk in this situation. A student may open the airbrakes because doing so has become a reflex action (he always uses the brakes when going into land!). In some gliders (K-7, K-13) the airbrake control rod is a comfortable place to rest your arm; it also has the advantage of an immediate indication that the control is being used.

The Aerotow Launch. Often, in learning to aerotow, the student has difficulty in maintaining position. Time after time the instructor may have to take over control and put the glider in the right place behind the tug. There are two problems here. The first is that the student lacks a basic understanding of how to control the glider – he's probably over-controlling. Perhaps more critical are the take-over-control considerations.

If the glider is allowed to get too far out of position then it may prove difficult to restore it to the correct place – especially if the rope goes slack. However good you are as a pilot there are limits; in this context you should consider the places to land if the rope breaks as it may well do as it tightens. The exercise can also prove to be very exciting for the tug pilot. He may well be nervous of a glider getting too far out of position; he has every right to do so given the known risks.

If a glider is seen to get out-of-position time after time then the chances are that the instructor is over-confident and not good at fault finding either.

Spinning. Occasionally gliders are damaged in the spin recovery itself – rather than by hitting the ground. For example; the instruction "move the stick forward until the spinning stops" may result in more control movement than is necessary (relaxing the backward pressure may be sufficient). The consequence is a steeper dive (and more speed) and possibly an over-controlled recovery from the dive which may be enough to break the glider. To guard against this the instructor must be ready to limit the control movement – both forwards and then backwards; the guard in this case is literal.

Motor Gliders. Motor gliders are a very useful for training – especially for some exercises (simulated aerotow rope-breaks, field landings etc). Taking control is complicated if the engine is idling because there may be three controls to grab – elevator, spoilers and throttle. But with only two hands the order may be critical. Consider the final stage of the approach and landing; losing speed in the gradient. The motor glider is well nose-down. Applying power only hastens the descent unless you change the attitude; closing the spoilers reduces the descent rate – but will this be enough? Closing the spoilers and raising the nose may only mean a heavy landing in a level rather than a nose-down attitude (at

(Continued at the foot of the next page.)

BGA SOARING COURSES

Is there one for you? asks John and Ken, national coaches

Each year we run a number of soaring courses. Each year we meet wistful pilots. "If only I had known
– what was available."
– what it entails."
– what it could have done for me!"
Others, who have heard the whisper (or spotted our half-page ad!) are ecstatic. "The best week's gliding ever!" "Marvellous. Thoroughly recommended!" This short piece is meant to get the message to all of you, so that you can decide whether we could get *you* up and running with us this year.

Field Landing Training

Starting in March and through to May we offer one-day courses to sharpen your field selection and circuit planning skills. First a full briefing is given, then a flight of about 45 minutes in our Super Falke. We include a short triangle so an element of flight planning is necessary. TPs have to be found and "photographed". Inexperienced pilots frequently get this wrong, by being in the wrong sector! Four or five fields are selected,

(Continued from the previous page.)

least this saves the propeller). If a heavy landing is inevitable then the failure to take control was in the late stage of the approach rather than a round-out height. Compared with a glider the margin for error may be less in any given set of circumstances as far too many instructors have found out to their cost.

Safety Awareness. Failure to take control in time requires the instructor to be alert and have a good awareness of the situations which are potentially critical. Only by rehearsing them in your mind and being in a reasonable state of readiness will you be able to avoid or avert becoming a statistic. It is important to qualify reasonable in this context. Being too keyed up is both stressful and tiring and you may cope less well with a tricky situation because of it. Being poised to take control also incurs a risk. It will be easy to justify in your own mind just gently holding the controls; not interfering of course – just reasonably safeguarding the glider. It is a habit which, once formed, is seldom broken – and we all remember the instructor who never lets go don't we?

circuits planned and flown right down to the approach. We don't land, of course, but overshoot after going as low as is prudent and permitted. Then an engine-off final glide, using the calculator.

This course is valuable to everyone, and Bronze C badge pilots find it especially helpful.

Soaring and Cross Country

The only rule here is that we fly cross-country whenever and wherever we can! Days which normally might not even rate the effort of rigging turn out to be surprisngly beneficial. We all learn what *can* be done, given the initial impetus. *We* provide the impetus! And of course it's much more fun to go cross-country in small gaggles. We use lead-follow extensively. Up to three followers, who leave the initiative and navigation to the coach and just enjoy themselves. One seasoned ex-jet fighter pilot claims his out and not-quite return from Lasham to Brighton Marina in a four-glider gaggle still rates as one of his most memorable flights – and he used to be in the Treble One Squadron sixteen-Hunter Aerobatic Team!

We also have our two-seater for one-to-one instruction in soaring and advanced techniques, including cloud flying whenever possible, and the Super Falke at the start of the course to brush up field landings. Naturally the course is supported by a full range of briefings, lectures and talks.

The two courses in 1987 will be in May and August, at Husbands Bosworth and Lasham respectively.

Competition Training

This course is for those whose soaring is already developing and who are aiming at competition entry in the near future. Now the emphasis is on racing tactics and the special techniques of starting, TP photography and final gliding. Again, a mixture of lead-follow and two-seater flying is available. The young pilots in the Squad Training scheme undergo this course as the first step in their training.

The April course will be at Lasham, the May one at Husbands Bosworth.

Special in-house Courses

Many clubs have sought our help in running soaring courses at *their* sites for *their* members. All the ingredients of the normal cross-country course are available, except that usually the coach can bring only one aircraft. Lead-follow or two-seater tuition then may depend on being able to use a local aircraft in the alternative role. These courses are very good at demonstrating that many opportunities exist for cross-country flying if only there is someone to show the way.

At the time of writing (November) courses had been booked in 1987 for the Army Gliding Association and Coventry, Rattlesden, Ulster and Wellend GCS.

Mountain and Wave Soaring

This course was introduced in 1986 at Feshiebridge in the heart of the Grampian Mountains. The site offers straight hill soaring, but on the grand scale; transition from hill into wave, which isn't always as straightforward as suggested in the text books; and the possibility of really good heights once the wave is properly located.

We take our two-seater, of course, and the ASW-19 for use by course members who feel it's a bit far to take their own aircraft.

The four 7-day courses will be held in October, and inexpensive full board accommodation will be arranged by us a few minutes walk from the airfield.

Soaring Instruction

New in 1987, this course will train existing instructors to pass on the vital knowledge and skills so necessary to the soaring pilot. In this way *all* club members will indirectly benefit from the coaches' expertise.

The 1987 course will be at the end of May, at Lasham.

You and Your Equipment

For all but the Field Landing courses, and possibly Feshiebridge, you should bring a glider. Most find it ideal for two to share one glider, so that there is at least a chance of the coaches being retrieved the same day if the unthinkable happens! Your equipment should be complete; each should aim to be self-contained. Accommodation can often be obtained at the host club, but many prefer to bring a caravan. The local pubs (and some not so local!) benefit from our custom and everyone has a memorable time. Perhaps we can look forward to seeing you this year!

Drop a line to, or phone, the BGA office for more information and a booking form.

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COLIN ALDRIDGE

SOLVING CABLE PROBLEMS

Colin, now in a Pirat syndicate, is a precision engineer and after taking a critical look at his club's winch decided that improvements could be made to help eliminate cable breaks

This article is written to try and help any club operating a winch which suffers cable related problems during launching.

I began gliding in 1980 at Shalbourne Soaring Society's Rivar Hill Airfield where we now use a twin drum winch and stranded cable. We were suffering a relatively poor launch rate due mainly to cable breaks, but also a few snarl-ups. When giving the winch a DI one morning I checked over the paying-in assemblies where the cable enters the winch. What a mess! The lot looked clapped out, was poorly constructed and of inherently bad design.

The problems were identified as:

1. Insufficient attention to bearings.
2. Materials used were in their raw state, *ie* not heat treated in any way.
3. Inadequate strength thanks to the poor design.
4. The pulley grooves were too narrow to allow easy passage for cable knots.

Let's look at what happens to the revolving components in the paying-in box during a typical 50kt launch, assuming no head wind component. At some stage during the launch, and possibly for much of the launch, the winch is recovering cable at 50kt. If we assume that the pulley diameter the cable runs on is 4" (100mm) then it is revolving at 4835rpm! Now look at the vertical guide rollers in front of the pulleys. Being 1.5" (38mm) diameter they are whizzing round at 12894rpm. And the original guide rollers were only 1" (25mm) in diameter *and* running as pieces of tube straight on to shafts with no bearings. All this trying to rotate under load albeit intermitently – with inadequate lubrication at 19342rpm or nearly 323 revs/sec. No wonder then the cable wore grooves in them and on more than one occasion cut them in half when they seized on their shafts.

Thus anything less than proper ball-bearings will not do. Further due to the hostile operating environment *ie* open to the elements and the potential for the introduction of dirt and small strands of cable etc, the bearings used should be protected by rubber seals and metal guards. Bear in mind also the considerable pressures of launching a heavy two-seater with a cable that has a few lumpy knots in it and you'll begin to appreciate the need for equipment that can cope continuously with these conditions. Add intensive use and possible winch driver hamfistedness and the problems become more acute. Finally it all gets worse at 60kt!!

Being a precision engineer I began looking at ways of resolving these problems. These are my findings and the solutions to problems mentioned earlier.

1. Use a heavier cable. We now use 5mm (6/7 strands).
2. To accommodate the heavier cable and correspondingly larger knots we doubled the overall pulley width to 2" (50mm).
3. The pulleys revolved on a pair of rubber sealed ball-bearings.
4. These pulleys were designed to incorporate metal bearing shields.
5. The pulleys were recessed into their mounting plates in order to prevent the cable becoming trapped between the plates and the pulleys.
6. The pulleys were case-hardened to a depth of .030" (.76mm).
7. The vertical guide rollers were case-hardened to .030 (.76mm) and fitted with rubber sealed bearings, but the metal shields proved impractical due to size limitations.

We opted for case-hardened components instead of hardening and tempering for three reasons. First, the tempering process reduces the absolute hardness of the surface. Secondly steels which harden and temper are much more expensive than mild steel which is case-hardened. Thirdly, when wear has taken place due to cable friction a case-hardened pulley can be easily refurbished by machining through the case and then again case-hardening.

Since we introduced these measures our incidence of cable breaks has dropped to negligible proportions. We enjoy smoother launches and the paying-in boxes require virtually no maintenance. Also the life of the cable has been dramatically extended, due not only to less arduous operating conditions but also because the friction with the hardened faces tends to slightly work harden the outer surfaces of the cable.

Precision engineering is not cheap, but compared to garage servicing charges for example, it's certainly not expensive. The problem for most clubs is a lack of suitable knowledge concerning the availability of precision engineering companies willing and able to undertake such design and construction.

I would be happy to give any further advice or information should your club wish to make use of it. My address is 3 Longacre, Oaken Grove, Newbury, Berks RG14 6DX and works' telephone No. 0635 45450 and home No. 0635 32518.

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MALCOLM MURDOCH

ANYONE FOR A SWIM?

While the nation is preoccupied booking holidays the glider pilot schemes to feature flying somewhere in the family plans, though it is doubtful there are many wives as understanding as Malcolm's Margaret. She isn't a pilot and suffered an ordeal last summer that would put most women off gliding for life but is happy to do the trip all over again, though will leave out the dip in the water next time.

Margaret and I had arranged to fly to the Scilly Isles in our G109B for a few days holiday in July with Ken and Annette Barton. We flew in company with Ken's K-16, soaring the last 30 miles along the Cornish cliffs at 600ft, using the engine only briefly to cross from Gwithian Sands to St Ives.

While in the Scillies we flew several times around the very picturesque islands, over the tropical gardens of Tresco, out to the Bishop Rock lighthouse and around St Mary's.



Margaret and Malcolm.

Ken and Annette flew home a few days before us. On the day we were due to leave the weather was fair, cloudbase at 3000ft, about 6 octas, with a light north-westerly breeze. I gave a short flight to a keen pilot we had met during the holiday, then Margaret and I put on our life jackets for the sea crossing and waved farewell, saying we hoped to be back soon (not dreaming it would be in less than one hour!). We took off and climbed over the islands to 2500ft before setting course for Land's End (I knew that we would necessarily be out of glide range of land for about four minutes, but such a short period should not be critical in a reliable aircraft with only 150hrs on the clock, should it?)

I estimated the crossing time to be 16 minutes at 90kt. After eight minutes I called Scillies Air Traffic Control to advise midway, as requested . . . within seconds the engine had failed, leaving the propeller windmilling silently. Stunned for a moment by the abruptness and cruel timing of the failure, I gave the engine full throttle, full carburettor heat, switched on the auxiliary fuel pump and checked fuel "on" and sufficient. Still silence, so with a heavy heart and recognising the inevitable, since we were just out of glide range of either the Scillies or Land's End, I called Scillies ATC to advise engine failure and turned back to the islands (I could not see Land's End as the visibility was less good towards the mainland and so, given the timing of the engine failure, the urge to turn back to the islands in sight was irresistible!)

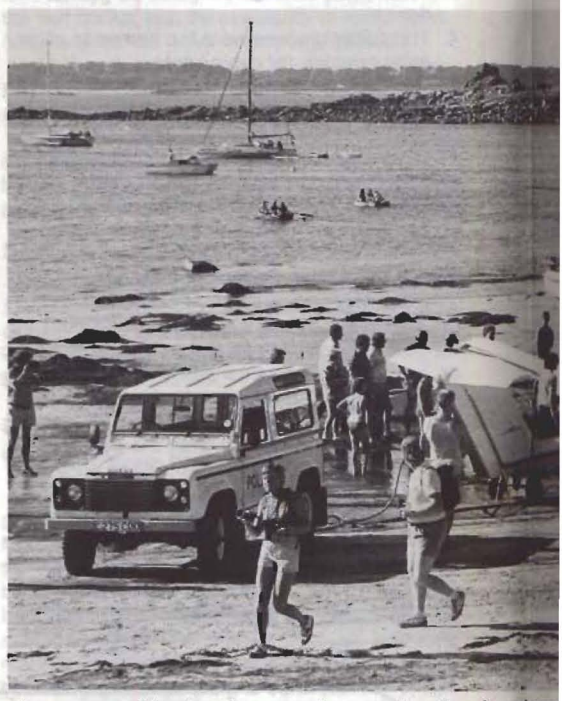
We were gliding for ten minutes and during this time kept ATC advised of our height and position. We spotted another aircraft, an Isles of Scilly Skybus, circling two miles ahead of us and gave him our relative position.

At a 100ft above the waves and about four miles from St Mary's I gave up efforts to restart the engine, feathered the propeller and told Margaret to tighten her seat harness but not to inflate her lifejacket yet. She was very calm and did not panic at any stage though naturally very frightened. All that was left to do was to make the slowest possible touchdown and avoid touching either wingtip (which could cause a violent swing and possible break-up of the aircraft). As we touched the sea, a wall of water came over the canopy, and a moment later we were upright and floating on the surface, with Skybus circling overhead.

We sat tight for a few moments to see what would happen. After about two minutes water



The lifeboat towing the aircraft into harbour.



There were willing hands everywhere as the aircraft was beac
Below, a close-up showing how well the G109B stood up to h







s beached.
up to her ordeal. *Photos:* F. E. Gibson.



began to appear around the rudder pedals but rose relatively slowly. We inflated our lifejackets then in case we had to get out quickly and Margaret started baling out with a thermos flask while I attempted to climb out on to the tail to counteract the increasingly nose-down attitude. However, the pitching of the aircraft in the four to five foot swell threw me off into the sea. I swam to the trailing edge of the wing but found it impossible to climb back on unaided. So, in the calmest voice I could muster in the circumstances, I shouted to Margaret to help me back on to the wing. With the strength of ten she hauled me in like a beached whale!

We had been 30 minutes in the water when a Royal Naval helicopter arrived from Culdrose and winched us to safety. Margaret, resourceful as ever, had the house keys and car keys clutched tightly in her hand! In moments we were back at St Mary's airport, having seen the lifeboat pass underneath on its way to the aircraft, and were whisked into hospital and a hot bath almost before we had time to thank the helicopter crew.

About two hours later I was one of hundreds of spectators on the quay as the lifeboat towed the aircraft into harbour. The local boatmen were quick to offer trips to see this unusual sight! There were willing hands everywhere as we beached the aircraft, folded the wings back to the tail and towed it the 1½ miles along the island lanes to the airport.

In the evening a marine engineer and the Fire Service worked with me for several hours to hose the salt water out of the wings, fuselage and engine and then spray all metal parts with oil. Incredibly the aircraft sustained only superficial damage and there was no visible corrosion when inspected two days later.

Maximum survival time in the waters around the Scillies is said to be one to two hours

While this was going on Margaret was recovering from hypothermia in hospital (the waters around the Scillies change temperature by only 2°C winter to summer, and maximum survival time is said to be one to two hours).

The way everyone rallied round to help us and to look after the aircraft touched us very deeply and we have developed a strong friendship with many people on the island as a result of the incident. We were very impressed with the way the rescue and hospital services worked so quickly, professionally and caringly in the emergency. I am very proud of Margaret especially, for her bravery. She wants to return to see everyone again . . . by air!

NB

- The accident was investigated by the AIB and found to be due to failure of the magneto.
- The registration of our aircraft is G-WAVE; perhaps this is tempting fate!
- It happened on the third anniversary of the British Airways helicopter crash and in the same sea area.
- I had intended to *switch off* the engine about five minutes after the time of failure, when in sight of Land's End and in comfortable gliding range, so that we could descend to soar the Cornish cliffs as we had done a week earlier.
- If the engine was destined to fail at that point of its life, and had I not given a last flight to a friend perhaps it would have failed over Land's End. But then you would not have read about it!
- G-WAVE is now back in service again, having been superbly refinished by GROB at the factory in Mindelheim. There are not many aircraft that could survive a ditching and be salvaged four miles out at sea. This must be a tribute to the construction, strength and seaworthiness(!) of the G109B.

GLIDE AID '86

For the most part, Glide Aid '86 took place over the August Bank Holiday weekend and was blessed with two good days and one not so good day. The purpose of the event was to raise money for UNICEF through sponsored flying, the sponsorship being either for distance, height gain, duration or whatever measure of skill the pilot came up with. While not all pilots took part, participation was very high and it would be unfair to single out individuals as the efforts of everyone were very meritorious.

While the stickers and posters were being distributed, a Dartmoor GC member rang up to say that she had sold the stickers sent to her for £1 each – excellent salemanship! At the Enstone Regionals a sweepstake was run as to the first TP of the Sport Class on the following day (entry fee £1). A large number of pilots and crew contributed to the fund, the prize being a straight tenner.

Articles on the event appeared in numerous papers and magazines. Some people even went canvassing on the radio. *Flight International* ran a short article for the benefit of older aviation enthusiasts, all thanks to the kind and tolerant efforts of Nikki Campbell.

How much was raised? Before costs (about £320) the fund currently stands at £1650, an excellent total. We have been criticised in some quarters for not organising more exciting publicity (admittedly suggested in the first article in the August issue, p164). We did try and now have more knowledge as to how to go about it, realising that a lot more organisers would be needed for any future event. If you have any ideas for a project for next year or would like to help on a committee, please don't hesitate to drop a line to Booker GC.

PAUL BRICE

JOHN GIBSON

UNDERSTANDING THE WINCH LAUNCH

John shows the way to safe and effective winch launching

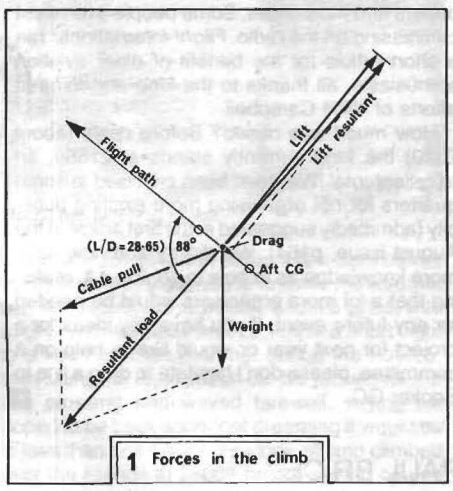
The increasing adoption of more powerful winches, and renewed interest in winching generally, has revived many old arguments about launch tactics, which range from an initial gentle climb to 200ft, a relic of ancient times, to the highly dangerous tail-scraping heave into a steep climb straight off the ground, an affront to good airmanship. Winch drivers do not always properly understand how to keep the launch under control, either. Pilots have always tended to switch to panic mode when the speed goes over the placard limit. This article explores the rotation into the climb, the safety aspects of its profile, and the effects of exceeding the placard speed with the aid of a few simple examples. It expands on parts of the wider survey given in my article in the August 1985 issue, p170, and should be read in conjunction with it.

Getting into the climb

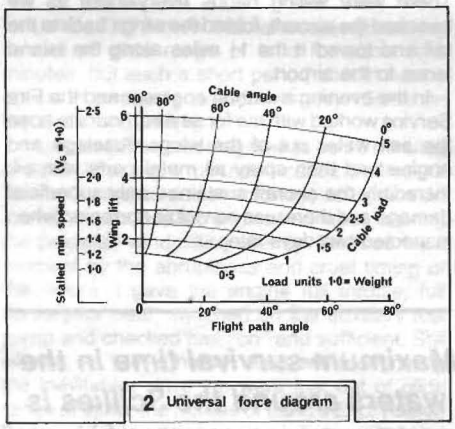
The basic technique for safe entry to the climb is simply stated. After lifting off with sufficient nose down control for level flight if possible, the nose should be allowed to rise over a period of a few seconds provided the airspeed is increasing or has reached the climb speed, never too steep for a safe recovery at any instant and reaching the climb attitude at a safe height with minimum wastage of field length. It cannot be emphasised too strongly that in a normal launch the nose wants to rise and only needs to be allowed to do so. This is so even when the initial nose up moment from the cable pull has been suppressed. Many glider pilots probably assume that aircraft in a steep climb have to be kept there with the stick back, but that is quite wrong. For other aircraft types, the stick is pushed forward in the climb.

Any aircraft trimmed for level 1*g* flight and held at constant angle of attack will start a loop if the speed is increased. If the increase is 41.4% the *g* will increase to 2 in the initial level flight. The extra lift produces a pitch rate to which is added and extra *g*'s worth in the vertical where gravity no longer opposes the lift and a further *g*'s worth in inverted flight where gravity assists. If a steady climb angle is required the lift must be reduced to half the weight at 60° or zero at 90°, the thrust partly or wholly replacing it in supporting the weight.

Similarly a glider held in level flight at the lift off speed will go into a climb without a further aft stick movement simply because the speed is increased by the winch. It will settle into a steady climb when the resultant of the lift and drag forces equals the resultant of the gravity and cable pull forces, amounting to the equivalent of some 2*g* or so (Figs 1 and 2). Pulling against the cable load is the primary reason why a glider in a winch launch climb needs the stick to be basically somewhat aft rather than forward. It is flying normally and would stall in the normal way if the stick is held fully back.



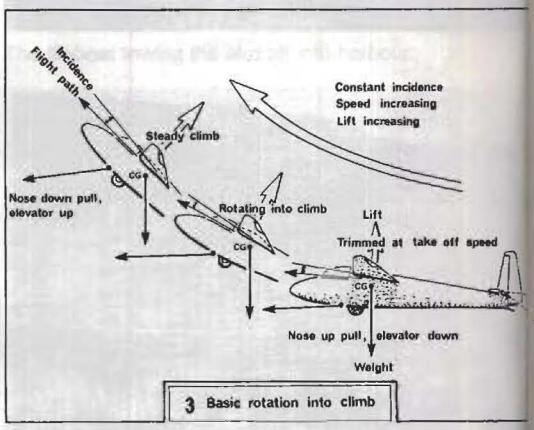
1 Forces in the climb



2 Universal force diagram

Additional stick inputs are required resulting from the cable moments. The initial nose up moment should be opposed by a nose down stick input. As the nose rises this moment reduces, usually becoming nose down in a steep climb as shown in Fig 3, so the stick has to be backed off during the rotation and may need to become nose up or even on the stop. The pitch rate in the rotation, 15°/sec or so, creates an increase in the tailplane angle of attack only counteracted by considerable up elevator. The pilot's job is to regulate the natural rotation over the required timespan into the full climb angle by balancing all the forces with the stick. As the height increases further, the increasing cable angle automatically brings the nose round again towards level flight at the top.

Some gliders are known to require the stick to be held fully forward at the start of the rotation. If the manual says so, believe it! However, the glider cannot leave the ground until it has flying speed, and it will acquire additional speed at the rate of 19kt/sec for a pull equal to its weight. Such a pull will overpower the elevator on many gliders, but then the reducing nose down cable moment and higher tail power with speed permits the nose to be held to a moderate attitude if desired. Proper winch control can provide an optimum acceleration. If the pull is weak the speed will increase slowly but then the nose can be held down. Gliders will not normally climb excessively steeply if the pilot does not wish it. Once in the climb the stick is unlikely to be much forward of neutral, but excessively aft CG may cause this and pilots who feel uncomfortable with the behaviour are advised to carry cockpit ballast as well as to check the weighing.



3 Basic rotation into climb

If the nose has been held down while the speed increases rapidly, all the needed climb lift will be provided by moving the stick back, but initially it will have been more nose down and ends up in the same position, of course. In practice the lift will usually come from a mixture of speed increase and some stick pull. If the nose will not rise at all without being pulled up there is not enough speed for a normal climb. Obviously the rotation is governed by a quite complex summation of effects, but the task boils down simply to stopping the nose from coming up too quickly.

Safety considerations

Stalling in the rotation is sometimes feared, probably because pilots cannot distinguish the angle of attack from the attitude, but they cannot in normal flight either and rely on flying at the correct speed. The launch is no different as can be seen from Fig 2. The other vital safety requirement is the ability to recover from a cable break at a low height. Decelerations of 14kt/sec in a 45° climb and 10kt/sec at 30° make it obvious that the nose must be lowered very quickly indeed to get rid of the large "gravitational drag". Aerodynamic drag is worth only ½ to 1kt/sec. Very

From a practical point of view the key points for every pilot and winch driver to understand are:

For the pilot

- *Given a safe speed the glider can be allowed to rotate into the climb sooner than has been the practice in the past. Even so, the nose will need to be restrained from its natural tendency to rise and must not be allowed to do so too quickly. The climb entry must be progressive.*
- *An increase in speed may result if the climb is not started or not steep enough; speed in excess of the placarded limit is not, in itself, as critical as most pilots believe. In any case an initial overspeed will occur from time to time.*
- *The factor which should limit the steepness of the climb in the early stage of the launch is the ability to recover if the cable breaks.*
- *From a steep nose-up attitude (40—55°) the recovery must be made quickly — probably needing full control movement; otherwise a critical loss of speed may result (14kt/sec in a 45° climb!).*
- *Having lowered the nose below the normal attitude (for the speed required) it will take time for the glider to accelerate; monitor the airspeed.*
- *Undue concern (due to a lack of understanding) of either too high a speed or too steep a nose-up attitude may cause panic action/reaction which is itself counterproductive to safe conduct of the launch or launch failure.*
- *The launch can be made a good deal safer by using the strength of weak link which is allowed (rather than the 1000lb link) so long as the cable doesn't become the weak link!*

For the winch driver

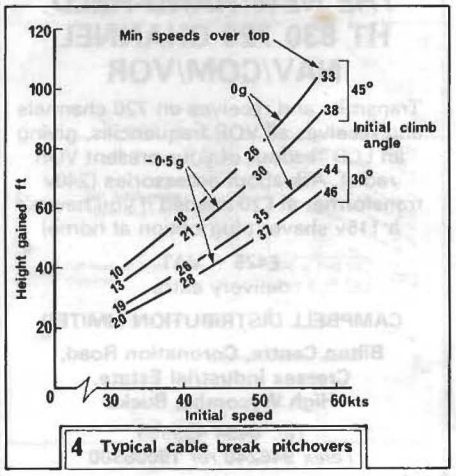
- *For an rpm-governed diesel there is an initial rpm appropriate to the wind conditions which will ensure that the glider's limiting speed will not be exceeded even if it does not climb.*
- *If a launch is too fast (the glider has signalled) then the reduction of power should be gradual because a sharp reduction will cause fuel cut off and cable back release.*
- *The speed of a *torque-governed winch is controlled by the pilot. It will accelerate to maximum if the pilot fails to climb. In this situation rpm should be reduced.*
- *The launch can be made a good deal safer by using the strength of weak link which is allowed (rather than the 1000lb link) so long as the cable doesn't become the weak link!*

*Supacat is torque-governed; note also that petrol engine winches have similar characteristics.

Bill Scull, *BGA Director of Operations*

high pitch rates can be generated at zero or negative *g* at 40kt airspeed and attitudes between 45° and level flight, *eg* some 40° to 50°/sec. Inverse with speed, they are only two thirds as large at 60kt. This is no time for half measures and the stick should be on the forward stop. It is profoundly important that the pilot should not be confused by the ensuing physical sensation, because the glider cannot be in a stall with the stick fully forward and the nose rotating downwards.

When the cable breaks, the surplus lift starts to pitch the glider up, and the pilot takes time to react to get the nose down. Assuming a simplified manoeuvre in which the climb is continued at the initial angle for 1sec followed by an immediate low *g* pitchover, the approximate height gained and the speed over the top for a range of starting speeds, climb angles and pitchover *g* are given in Fig 4. These take only 2 or 3sec altogether and anything more leisurely reduces the speed even more. So long as zero *g* or less is maintained the glider is not yet stalled, but it is at this point that things can go seriously wrong. Failure to lower the nose to well below the normal flying attitude to pick up speed is sometimes terminally compounded by the decision to attempt a circuit. The correct action is to get the nose well down, keep the left hand off the not-the-going-in-to-land lever until there is enough speed and then only if it is needed, and land ahead if there is room, but it does not assure safety if the height at the cable break is too low because the lost speed cannot all be regained.



4 Typical cable break pitchovers

At best, a descent to the cable break height in a mirror image of the ballistic climb will have lost some 5kt due to aerodynamic drag. Even a pilot prepared to put himself in a steep climb at 15ft will probably recognise that a 45° dive at this height is not a brilliant idea, and the necessity to round out reduces the speed recovery still further. The deceleration due to a wind gradient may equal the gravity induced acceleration and cut off the recovery completely. Although a wind gradient increases the speed in a slow launch while the glider is still attached to the cable in a shallow climb, it may increase the ballistic speed loss at the top of the recovery pitchover after a cable break near the ground, by steepening the flight path because it partially blows across it instead of into it. As the glider pitches over into the wind the gradient is less and imparts less speed increase.

All this can be avoided by controlling the rotation so that the full climb is reached with a sufficient safety height cushion. This does not need a gentle climb to this height, just a continuous steepening over a few seconds rather than all at once. After ensuring a safe speed to initiate rotation the pilot only needs to look for the increase in indicated airspeed rather than the exact knots. If the speed stops increasing or drops at any point the rotation is stopped or reversed accordingly. A combination of speed and climb attitude unsafe for cable break recovery cannot occur and there is no risk of stalling. The stall speed of the glider determines the safe limits, obviously, a 25kt stall and appropriate launch speed greatly scaling down the "Oops!" factor. The safety height for a steep climb cannot be judged with any great accuracy but 150ft is ample while 100ft (two wing spans) is sufficient given a good speed. If a break does occur the speed cannot be judged from the attitude and it is essential to keep an eye on the trend of the ASI.

Speed control

The pilot has no control over the power the winch driver gives him, of course. The driver has to understand the launch and how the winch should be controlled accordingly. No winch should be operated without the required information about glider limits being known by the driver. They are easy to determine. With an rpm governed diesel, selection of an initial rpm appropriate to the wind conditions will ensure that the placard limit will not be exceeded even if the pilot does not climb, and this rpm selection may by good design also be suitable for the climb. The torque depends on the error between actual and demanded rpm and the maximum can be generated by much less than "full throttle", so it should be advanced at a rate which matches the required take-off acceleration and climb rotation pattern. If the launch is too fast the driver should react to a tail-wagging glider by a reasonably gradual throttle reduction, because a sharp one will instantly cut off the fuel and drop the cable off the glider. Too low an rpm selection will also cause the cable to drop off, regardless of the power available.

The speed of a torque governed winch is controlled by the pilot. It will accelerate to maximum rpm if the pilot fails to climb, because the cable load will not match the selected torque. The driver should then reduce power to limit the rpm, or set the rpm limiter if one is fitted. A high torque giving fast acceleration may result in an overspeed during the rotation into the climb. Experience has shown that excessive acceleration can be avoided by first selecting a lower initial torque before increasing it to the climb value as the glider nose rises. At the other extreme, a reduction in torque setting or too low a selection will not cause the cable to fall off as it always tries to pull at the selected value and a normal speed can be sustained although the climb angle will be low. A low speed can only occur if too steep a climb is persisted with but the cable will not fall off.

Structure loads

Despite talk of 70° climbs, in general not much more than 45 to 55° is possible in the early part of the launch. The wing lift and bending loads are determined almost exclusively by the climb angle, controlled by the pilot but limited by the weak link strength and winch torque. The lowest wing lift to break a given weak link occurs at the start of the launch. The maximum possible wing lift occurs at the top of the launch, but here the pilot cannot control the load with any accuracy because small changes in attitude produce large changes in the lift.

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The wing stress at a given lift is higher than in free flight because the bending relief afforded by the wing mass is only the 1*g* due to gravity without the additional inertial force from the *g* manoeuvre. With a typical weak link strength of less than twice the glider weight the lift cannot exceed three times the weight, and the wing stress is then never more than the 4*g* free flight case. Such a lift requires a launch speed of more than 1.75 times the stall speed and will give a grossly steep initial climb or needs pole bending with high winch power at the top, though many winches could not pull this load. Pulling the speed down (if this can be done) reduces the maximum possible loads, 1.5 times the stall being enough for any sensible launch. Use of a weak link and launch speeds no higher than required give large safety margins.

There is little uniformity in placard speed limits. It seems that designers simply select a value adequate for the launch and for which formal certification calculations are presented. Speed variations alter the drag, but having only a slight effect on the lift and cable load for a given climb profile and insignificant effect on the wing bending stresses. The major effect of speed on gliders is associated with large tail loads and wing torsion, and it is not surprising that pilots feel that the launch placard speed is a danger limit. The system of loads is shown in Fig 5 for a glider in the level flight launch stressing attitude.

Lift acts through the fixed aerodynamic centre near the 25% wing chord position. There is also a pitching moment at the aerodynamic centre which is independent of lift, is almost invariably nose down and increases with the square of the speed. (The lift and moment can be combined into a lift force at the wandering centre of pressure, which may be more familiar to many but does not help in this discussion.) Zero or upward tail lift is required to balance the lift of the glider because the CG is at or aft of the aerodynamic centre in all tailed gliders. A downward tail lift is needed to counteract the basic pitching moment. In normal flight the total tail lift is the sum of these two and whether it is up or down depends on the

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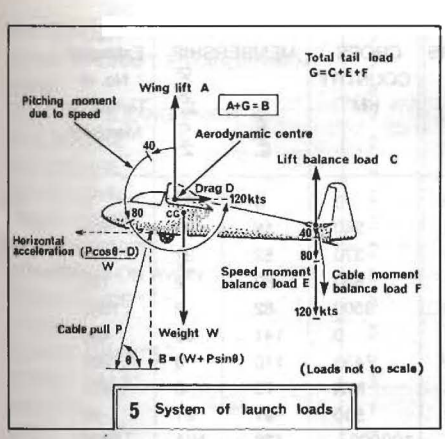
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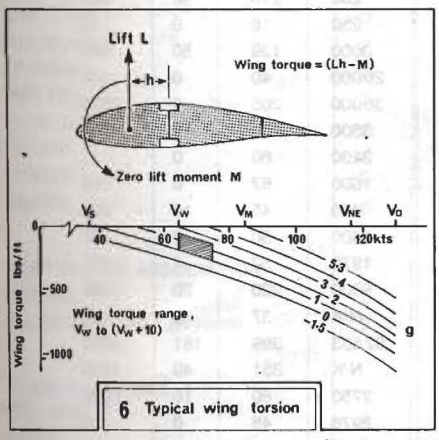
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5 System of launch loads

strength of the basic pitching moment, the CG position and the wing lift. In the launch, another downward tail lift is needed to balance the nose down pull of the cable when this passes ahead of the CG.

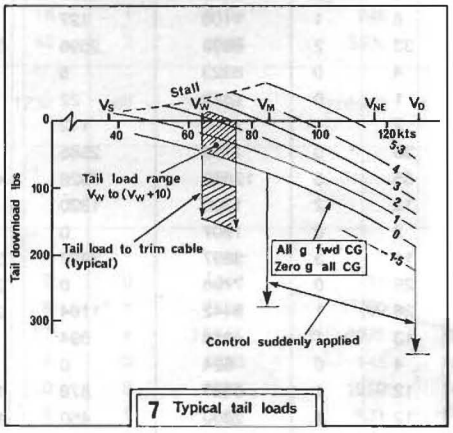
Of the seven significant forces and moments which apply loads to the glider structure in the winch launch, five depend on the weight and climbing attitude. These are the gravity force, the cable pull, the wing lift, and the two tail lift components which balance the offset of the wing lift and the cable pull from the CG. The remaining two depend on the speed. These are the basic pitching moment and the tail lift to balance it, and only these are larger than normal when the placard is exceeded. Values typical of a single-seater glider are illustrated in Figs 6 and 7. Obviously on other gliders they will vary widely with size and speed but the relative proportions will be similar. The wing lift is represented by the g value which would result in free flight, though in the launch this is replaced by the resultant of gravity and cable pull.



6 Typical wing torsion

Fig 6 shows the torsion at the root of each wing. The basic nose down moment increases to nearly 100lbs ft at Vd. Added to this is a moment equal to the lift times the distance from the aerodynamic centre to the shear centre, near enough at the spar, giving the maximum torsion of about 1100lbs ft at $-1.5g$. In the winch launch the nett moment at typical lift values lies in the shaded area in the speed range from the assumed placard limit Vw to 10kt above it. Even when well above the placard speed the load is small compared with the maximum torsion moments to which the wing is designed. Whatever the wing torison is at any speed, it is reduced by pulling up into the launch climb.

Fig 7 shows the tail loads. The download to balance the basic pitching moment reaches 200lbs at Vd. The upload to balance wing lift is zero at the 25% chord forward CG and is added for various g at aft CG. The design loads are provided by the addition of sudden control inputs at Vm and Vd. The tail trim loads lie in the shaded area for the same launch conditions as above. This represents the winch launch case if the cable pull acts through the CG. The load changes by 65lbs due to CG variation but only 18lbs as a result of the overspeed. At the aft CG the overspeed can actually reduce the tail load to zero. Generally these loads are trivial compared with the total design loads. If a normal climb attitude is maintained, the cable pull and the added tail load to balance it will also be normal, in which case the effect of the overspeed is still only the extra 18lbs. It is possible to generate a higher tail load by pulling back harder and making the climb steeper, but even at Vm it cannot exceed the design manoeuvre load. With typical glider dimensions this would break a weak link of well over twice the glider weight in any case.



7 Typical tail loads

Placard problems

There is nothing to be gained from excessive speed. It reduces efficiency and launch performance by increasing the cable drag and reducing the effect of the winch "driving away from the glider" in a wind (see my first article). Initial overspeed will occur from time to time, but living in terror of it is counterproductive and liable to lead to accidents due to precipitate action. Pilots who cannot bring themselves to allow the speed to go 1kt over the placard need not do so but should at least abandon the launch without panic. Even so, avoiding the flying cable chute and sorting out the unexpected landing is physically a higher risk than continuing. If overspeed is experienced, the normal launch profile can be begun without any serious effect on the loads. It is obviously prudent to be gentle with the stick and to maintain a less steep climb if it is gusty, as cable breaks are then more likely because gusts can temporarily increase the lift above normal limits. Although full rudder is designed for at Vm there is no point in applying larger loads than are necessary, and fishtailing with half rudder amply signals the winch driver to slow down. If the speed remains much too high then release can take place at leisure well away from the ground.

The winch placard limit as usually interpreted is an anomaly, for in no other flight phase is the glider expected to operate close to the limit throughout. For all practical purposes it is lift loads which will break the glider, not speed loads, yet the OSTIV and earlier BCAR/E requirements set no upper limit on cable strength and do not require a weak link. Only a minimum strength of 500kg is recommended for "the cable or the weak link, where employed", and the manufacturer is left to define its maximum strength and the limit speed. The speed is the least controllable element in the launch. Apart from the vagaries of the operation, gusts can take the speed well over a low Vw before the cable can be released, which is rather pointless anyway if the gust increase has already vanished again. In fact, OSTIV has no launch gust requirement at all.

Many gliders have a limit around 1.75 times the stall speed, at which they cannot be damaged even with unbreakable cable, as well as a specified weak link strength of less than twice the weight. This is like manufacturers having their cake and eating it. Pilots get egg on their face. To be consistent with the needs of normal winch operations, it would be more logical to require:

- the glider to be certified for a specified weak link, for example with a strength of twice the unballasted weight.
- the launch placard to be set at the speed where limit loads are reached in a extreme gust, or Vm if less,
- a normal launching speed range to be recommended.

Then we could get on with the routine of winch launching, unworried by needlessly tight restrictions. Even without this, no pilot should feel there is any mystery about the launch. Though great alertness is necessary, it is a simple operation in practice. It just needs to be understood.

BRIAN WEARE

GLIDER WORKS
DUNKESWELL AIRPORT
HONITON, DEVON

Tels: Luppitt 338 (9-6 pm)
Honiton 41041 (after 6 pm)

MAJOR OR MINOR REPAIRS ON WOOD, GLASS-FIBRE, OR METAL. ALSO RESPRAYS GLIDERS AND LIGHT AIRCRAFT

C of A OVERHAULS

B.G.A., C.A.A., P.F.A. APPROVALS

ANNUAL STATISTICS OCTOBER 1, 1985 TO SEPTEMBER 30, 1986

GLIDING CLUBS	AIRCRAFT				ALL LAUNCHES	NO. OF AEROTOWS	HOURS	CROSS-COUNTRY KM	MEMBERSHIP		Estimated No. of Temporary Members
	Club 2s	Club 1s	PO	Tugs					Flying	Non-Flying	
ALBATROSS	0	1	0	0	0	0	0	0	0	53	0
ALTAIR	5	0	5	0	2057	0	208	240	16	2	187
ANGUS	3	2	4	0	3022	0	449	370	52	31	200
AQUILA	2	1	6	1	1684	983	392	650	63	2	125
AVON	3	4	26	4	7200	7200	6500	3500	82	2	1500
AVRO	4	2	0	0	43	0	657	0	141	60	400
BATH & WILTS*	2	3	20	3	3999	697	1475	7435	110	9	262
BLACK MOUNTAINS	3	1	20	1	2216	2216	2965	N/A	70	0	400
BLACKPOOL & FYLDE	2	3	20	0	3564	0	1572	500	91	21	90
BOOKER	11	10	60	7	13000	13000	N/K	100000+	426	N/A	2000
BORDERS	2	1	12	1	2259	2259	1551	2360	80	10	385
BRACKLEY	1	1	6	0	5449	7	1362	1427	80	4	245
BRISTOL & GLOS	3	3	40	3	8857	5695	5370	24260	278	39	400
BRITISH AEROSPACE	1	0	0	0	21	0	19	600	12	0	5
BUCKMINSTER	2	1	11	1	3718	2143	1170	14405	84	0	725
BURN*	3	3	19	2	5967	1825	2005	6850	132		680
CAIRNGORM	2	0	6	1	1100	127	601	800	29	0	200
CAMBRIDGE	4	4	33	2	8839	2596	3952	38392	196	56	1190
CHANNEL	6	0	4	0	8323	5	944	N/K	71	12	1000
CONNEL	3	2	1	0	1673	22	400	1000	28	0	600
CORNISH*	3	2	2	1	2765	112	480	0	49	40	161
COTSWOLD	3	3	35	0	7735	2585	0	21400	201	105	590
COVENTRY	6	5	55	5	12889	7926	4833	20170	283	78	2000
CRANFIELD	1	1	12	2	1320	1320	630	1640	71	0	210
DARTMOOR	2	1	2	0	1907	0	183	0	34	0	171
DEESIDE	4	2	11	3	3897	3897	3765	N/K	111	2	426
DERBY & LANCS	3	4	26	0	7796	0	2909	4647	161	91	612
DEVON & SOMERSET	3	3	26	1	8442	1164	2492	32854	170	71	650
DORSET	3	3	13	1	4018	694	755	250	110	40	300
DUMFRIES	2	0	4	0	524	0	105	250	18	0	40
EAST SUSSEX	2	2	12	1	5487	878	1060	3000	139	50	900
ENSTONE EAGLES	2	1	12	1	2800	450	1000	20000	40	0	300
ESSEX*	4	1	30	1	8833	800	2690	36000	205	5	2370
ESSEX & SUFFOLK	2	2	12	2	2659	2659	1322	3500	100	0	500
HAMBLETONS	2	3	2	1	2049	1536	600	3100	60	0	
HEREFORDSHIRE*	3	0	10	1	1500	1500	1000	1500	67	0	155
HIGHLAND	2	3	6	0	3311	0	567	450	45	10	300
IMPERIAL COLLEGE	3	see Lasham			600	50	220	1400	50	0	50
INKPEN	2	1	4	1	1710	1710	571	1970	52	1	981
KENT	3	3	28	1	8807	3953	8980	6000	220	20	1856
LAKES	2	1	6	1	1142	1100	309	N/A	37	0	120
LASHAM	9	0	126	5	34056	13899	14250	92503	389	161	3200
LONDON	5	6	78	3	22000	4500	9000	N/K	351	49	4500
MARCHINGTON	3	0	16	1	2394	2360	1450	2750	80	10	300
MENDIP	2	2	13	0	2570	0	677	2975	46	0	0
MIDLAND	3	3	20	1	11277	141	4003	7133	215	72	894
NENE VALLEY	1	2	6	0	1493	0	159	64	28	–	30
NEWARK & NOTTS	2	2	9	0	5291	0	903	2208	64	20	535
NEWCASTLE & TEESSIDE*	2	1	5	0	1170	0			32		150
NORFOLK	3	2	30	2	3980	3607	2225	10175	163	32	615
NORTHUMBRIA	3	2	20	1	3150	504	554	500	81	16	250
NORTH DEVON	5	0	6	0	500	180	800	2000	10	0	2000
NORTH WALES	2	1	1	0	2314	1	242		38	3	136
OUSE	2	2	23	1	7365	740	1200	N/K	117	41	400
OXFORD	3	3	13	0	5257	0			90	13	879
OXFORDSHIRE	3	1	0	0	1280	0	1472	55000	45		
PETERBOROUGH	2	1	10	2	1232	1232	614	2750	65	0	275
RAE BEDFORD	0	0	7	1	700	0	120	N/K	16	4	0

RATTLESDEN	2	2	10	0	3015	149	506	2977	51	0	118
ROYAL AIRCRAFT ESTABLISHMENT	2	3	7	0	3500	30	920	2850	50	12	12
RSRE	2	2	1	0	1122	0	156	0	20	15	80
SCOTTISH GLIDING UNION	4	4	30	2	8698	5571	5903		214	0	1100
SHALBOURNE	2	1	10	0	3700	0			59	0	500
SHROPSHIRE	0	0	12	1	715	715	952	10050	29	1	25
SOUTHDOWN	2	3	25	3	6087	4567	3320	16081	204	47	442
SOUTH WALES	2	2	19	1	5235	1360	1878	15816	118	6	625
STAFFORDSHIRE	2	2	4	0	2529	0	400	100	78	4	260
STRATFORD ON AVON	3	1	6	0	2428	21	468	2256	66	10	420
STRATHCLYDE*	3	1	0	0	700	50	125	20	40	2	130
STRUBBY	3	1	6	0	1831	0	208	150	39	2	136
SURREY & HANTS	0	11			Included in Lasham's return				228	38	
SURREY HILLS*	3	2	0	0	478	0	142	0	58	1	1
SWINDON	1	1	6	1	1243	215	280	4837	33	4	224
TRENT VALLEY	2	3	19	0	5000	0	945		80	2	250
ULSTER	2	1	10	1	1281	1257	550	650	51	1	90
UPWARD BOUND	2	0	2	0	1090	0	130	81	25	0	150
VALE OF NEATH	2	0	9	1	2821	56	1086	N/K	45	0	375
VECTIS*	1	1	0	1	190	184	60	200	27	0	25
WELLAND	2	2	6	0	3018	0	461	850	37	7	260
WEST WALES	3	0	8	0	797	3	106	50	32	10	130
WOLDS	4	2	16	1	8109	946	1386	3500	171	7	1566
YORKSHIRE*	3	4	42	2	6300	3400	1100	12500	284	27	530
CIVILIAN CLUB TOTALS	221	160	1232	80	349098	116907	124814	611946	8323	1431	45199

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

RAFGSA											
ANGLIA	2	2	0	0	4246	31	537	969	62	0	200
BANNERDOWN	6	0	6	1	7339	80	1524	5500	85	31	100
BICESTER	6	7	17	4	15547	5071	5285	34157	275		500
CHILTERNS	2	3	4	0	4720	145	1041	5535	66	0	148
CLEVELANDS	2	3	0	2	3583	1910	1481	15253	82		
CRANWELL	2	3	8	1	6166	431	1489	10449	75	75	300
FENLAND	2	4	5	0	6353	35	1146	3292	92		
FOUR COUNTIES	3	3	6	0	6270	71	1385	12295	86	2	150
FULMAR	2	3	1	1	4139	111	662	980	53	0	70
HUMBER	2	3	2	0	2778	0	464	4829	45		
WREKIN	2	2	0	1	5312	420	1100	2716	116	0	300
ARMY GLIDING ASSOCIATION											
KESTREL	2	4	3	1	4500	150	700	3000	102	0	160
SOUTH WEST DIST (Wyvern)	2	4	6	1	5853	200	1124	7000	120	0	80
ROYAL NAVAL GSA											
CULDROSE	3	2	2	3	1782	1275	360	3398	50	3	200
HERON	2	2	2	2	1122	501	551	1100	50	0	100
PORTSMOUTH	6	6	6	2	4326	3136	1009	760	163	47	497
SERVICE CLUB TOTALS	46	51	68	19	84036	13567	19858	111233	1522	158	2805
CIVILIAN CLUB TOTALS	221	160	1232	80	349098	116797	124814	611946	8323	1431	45199
GRAND TOTAL	267	211	1300	99	433134	130364	144672	723179	9845	1589	48004

GLIDING FOR THE DISABLED

Robert English, a war time Stirling pilot and later a test pilot at Boscombe Down, is now disabled and giving much of his time to raising £15000 to buy a Motor Falke. The hope is that it will be used to give flights to the disabled and be shared between bases in Yorkshire and Edinburgh so that it will be available to as many as possible.

The idea for the scheme came from Dr Lesley Freeman, who is researching muscular dystrophy in Edinburgh and is a glider pilot. She discovered that a young patient was living for the day he could have a flight in a glider and so she took him up, was amazed at his clinical improvement and decided this was such valuable therapy it should be available for others. This was where Robert came in. He calls her his inspiration and has set himself the task of raising the money, though despite his hard work over the last year he is still £12000 short of the total.

Robert, who has been a glider pilot and had his last flight in June on the 50th anniversary of the day he went solo in a powered aircraft, wrote 600 letters to industry with little success. Now, to create some publicity and donations, he is considering doing a double parachute descent strapped to an instructor and hopes to persuade CAA to allow him to do a version of wing walking with his wheel chair, minus wheels, strapped to a wing.

If anyone would like to contribute or help in any way, contact Robert at The Waldernheath Hotel, Cornwall Road, Harrogate HG1 2NE, Tel 0423 521383.

OSTIV PANEL

The OSTIV Safety and Training Panel, previously known as the International Safety and Training Committee, met under the chairmanship of Bill Scull at Oostmalle near Antwerp from November 14-16 with representatives of 13 countries from Europe, Australia, Canada and the USA. The hosts were the Flemish Gliding Association.

The accidents data collected indicates that there are no grounds for complacency with generally a slight increase in the rate of fatal accident and the rate involving serious injury being much worse. The meeting gives an opportunity to exchange ideas on measures to try and improve this state of affairs.

There was a comprehensive agenda; gliding in Belgium, Accident Data and Trends, Standards for the Glider Pilot Licence, Flight Safety Programmes, Stall/Spin Awareness and Spin Training, Stall-warning Device for Gliders, Aerotowing Accidents and Prevention, Pilot Safety and Spinal Injury etc.

W. G. Scull, *director of operations*

NOBODY WANTS US!

Three requests this time from airfield operators asking us to tell you not to land there unless absolutely essential.

1. Langar – the parachuting club do not welcome gliders (specially pilots with the initials JJ).
2. Pershore – landings during the week can be unsafe as well as prohibited under the Official Secrets Act, and gliders could be impounded. Weekend landings only if the gliding club is operating.
3. South Marston – now the home of Honda motor cars which are often "nipping" along the runways as test tracks.

ROYAL COUPLE MEET THE BRITISH TEAM



The Duchess of York is photographed talking to the British team at the Royal Aero Club reception on November 28 at the Royal Aeronautical Society's headquarters at Hamilton Place, London. The British team members were also presented to the Duke of York who is president of the Royal Aero Club. Photo: Charles Milligan.

EXTRA RADIO FREQUENCY

Following representations from the BGA we are pleased to announce that the CAA have assigned an additional frequency for gliding purposes. This is **129.975** and will be for ground to air or air to ground use only and known as the "common glider field frequency". Clubs will be allowed one fixed ground installation per airfield upon application to the CAA and the frequency will be limited to use within a height of 3000ft above the airfield and 10nm range.

We strongly recommend that clubs apply to the CAA for permission to use **129.975** as an "airfield control" frequency. Whilst the new frequency will take some time to become widespread because of the fitting of additional crystals we would eventually hope to discourage the use of existing frequencies for airfield control purposes. This will help to remove some of the radio traffic from 130.1 in particular.

To remind you the BGA recommended frequency utilisation is now as follows:

130.4 MHz	Cloud flying and relating cross-country location messages only
130.125 MHz	**Primary use** Training (lead and follow). Other cross-country location messages **Secondary use** Local and other flying Competition start and finish lines
130.1 MHz	**Primary use** Competition start and finish lines, local and other flying **Secondary use** Training (lead and follow)
129.9 MHz	Ground to ground only, retrieve recovery
129.975 MHz	Ground to air and air to ground only. Airfield control and advisory service

WATCH OUT FOR THIS BAROGRAPH

Richard Swallow had his Winter barograph No. 59656 stolen from his car in a car-park in Exeter on October 7. Glider pilots are asked to be on the look out for any offer of a bargain price barograph.

GLIDING TO BE INVESTIGATED

The Sports Council has commissioned a research team from Oxford Polytechnic's Department of Town Planning to investigate

gliding, in particular the problems of site availability and use, access to airspace, the existing level of participation and future trends.

They have been working closely with the BGA and in the new year hope to poll a cross section of gliding clubs and talk to members about the various issues and problems they face and their plans for future development. If anyone has any information they think will be of interest they would be grateful for it in advance. Alternatively, if club members would like more information about their work, don't hesitate to contact them. The address is The Department of Town Planning, Oxford Polytechnic, Gipsy Lane, Headington, Oxford OX3 0BP, Tel 0865 435/452.

BRUNT TROPHY

The Brunt trophy is awarded for the greatest gain of height by a member of a university gliding club while the pilot was a genuine student. Claims to A. S. Gibson, 8 Earl's Court Square, London SW5 9DP.

GLIDING CERTIFICATES

In the mammoth haul of lenticular jewellery last September and October, the final tally was 50 Diamond heights and nearly 100 Gold. Most were gained at Aboyne, including Diamond climbs by two Danish visitors; it is not often that overseas pilots come to Britain for badges, but a regular export trade is being established between Deeside and Denmark.

Amongst the 15 pilots achieving Diamond height at Aboyne on September 30 was Annabel Lucas, who thus became the third British woman to complete "All Three".

Not all wave soaring comes from Scotland, however; Penelope Minnitt reached Gold height from a bungy launch off the Long Mynd, and at Dishforth Jane Nash gained her Diamond height one morning, then handed their PIK 20 to husband Steve to gain his in the afternoon.

In Charles Wingfield's letter in the last issue, p285, he was under the misapprehension that the BGA will refuse a height climb unless oxygen is used; although such a policy was briefly implemented about 20 years ago, there is no stipulation in the FAI Sporting Code on oxygen. Nevertheless common sense should dictate compliance with the Recommended Practice No. 26 in *BGA Laws and Rules* to use a reliable and serviceable oxygen system above 12000ft.

Gordon Camp, *FAI certificates officer*

ALL THREE DIAMONDS

No.	*Name*	*Club*	*1986*
214	Allan, M. D.	Midland (in Spain)	20.6
215	Evans, J. W.	Cambridge Univ.	28.9
216	Lucas, Annabel	Lasham	30.9
217	Cousins, R.	Kent	1.10
218	Payne, R. D.	Bristol & Glos.	12.10
219	Richards, E. W.	Bicester	12.10
220	Gorely, T. D.	Four Counties	17.10

DIAMOND DISTANCE

No.	*Name*	*Club*	*1986*
1/334	Lincoln, A. K.	Lasham	9.9
1/335	Levi, A. R.	Shropshire (in Spain)	28.7
1/336	Allan, M. D.	Midland (in Spain)	28.6
1/337	Parker, T. J.	Booker (in Spain)	24.7
1/338	Smith, D. A.	Bristol & Glos	18.6

DIAMOND GOAL

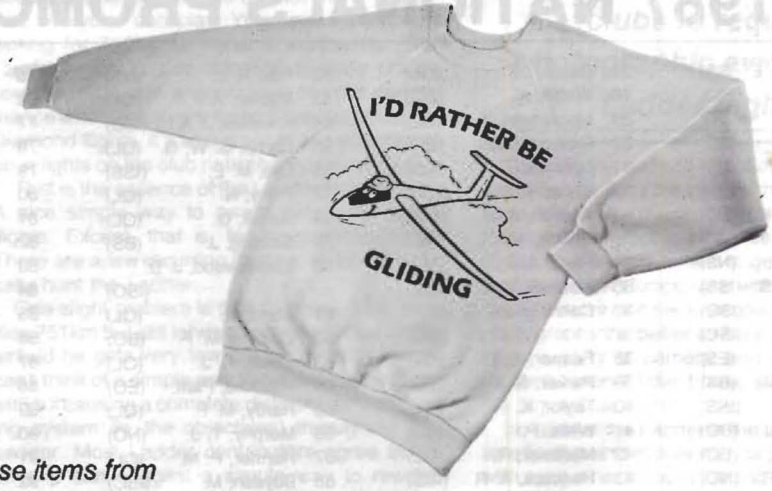
No.	*Name*	*Club*	*1986*
2/1502	Hicks, I. H.	Shropshire (in Spain)	28.7
2/1503	Morrow, W. B.	Booker (in France)	1.8
2/1504	McNair, W. R.	Ulster (in Spain)	9.8
2/1505	Downham, E. H. C.	London	31.8
2/1506	Dale, G. G.	Dorset	18.6
2/1507	Daser, W.	Oxford (in Austria)	28.7
2/1508	Reid, A. G.	Essex	24.8
2/1509	Pritchard, B. W.	in South Africa	27.12.82

DIAMOND HEIGHT

No.	*Name*	*Club*	*1986*
3/731	Allan, M. D.	Midland (in Spain)	20.6
3/732	Forrester, J.	Essex	22.9
3/733	Guard, M. J.	Coventry	28.9
3/734	Nash, Jane	Kestrel	28.9
3/735	Nash, S. R.	Kestrel	28.9
3/736	Walker, Amanda	Clevelands	28.9
3/737	Evans, J. W.	Cambridge Univ.	28.9
3/738	Baines, R. G.	Trent Valley	29.9
3/739	Lucas, Annabel	Lasham	30.9
3/740	England, P. C.	Kent	30.9
3/741	Moorman, D.	Kent	30.9
3/742	Seseman, M. J.	Lasham	30.9
3/743	Scarfe, D. H.	Wyvern	30.9
3/744	Law, M. J.	Wyvern	30.9
3/745	Gilkes, G. N.	Surrey & Hants	30.9
3/746	Molloy, P. M.	Essex	30.9
3/747	Johnson, Ann	Kent	30.9
3/748	Kemp, M. P.	Kent	30.9
3/749	Moulang, M. C.	Kent	30.9
3/750	Bull, Gillian	Essex	30.9
3/751	Davis, K. S.	Essex	30.9
3/752	Ward, M.	Trent Valley	21.9
3/753	Taylor, M. A.	Rattlesden	19.9
3/754	Ellis, M. P.	Burn	28.9
3/755	Cousins, R.	Kent	1.10
3/756	Ashurst, R.	Booker	6.10
3/757	Hyett, C.	Yeovilton	6.10
3/758	Murray, W. J.	Inkpen	9.10
3/759	Welsh, S. J.	Wyvern	22.9
3/760	Payne, R. D.	Bristol & Glos	12.10
3/761	Brown, T. H.	Bicester	12.10
3/762	Spalding, M. J.	Bicester	12/10
3/763	Macfadyen, I. D.	Bicester	12.10
3/764	Marlow, Patricia	Deeside	12.10
3/765	Bailey, R. M. C.	Booker	12.10
3/766	Richards, E. W.	Bicester	12.10
3/767	Dunthorne, P. A.	Bristol & Glos	12.10
3/768	Hyett, A. R.	Yeovilton	12.10
3/769	Woollard, M. G.	Bristol & Glos	17.10
3/770	Williams, M. D.	Bicester	17.10
3/771	Hull, J. A.	Bicester	19.10
3/772	Dash, D. J.	Deeside	22.10
3/773	Neal, R. E.	Booker	23.10

BGA MAIL ORDER

Superb gliding sweat shirts now available from the BGA Shop. Order now at only £9.95 each inclusive of post and packing. Available in yellow or royal blue, sizes S, M, L, XL.



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3/774	Chambers, V. J.	Lasham	23.10
3/775	Hartfield, L. J.	Portsmouth Naval	23.10
3/776	Hawtree, R.	Essex	2.10
3/777	Gorely, T. D.	Four Counties	17.10

GOLD BADGE

No.	*Name*	*Club*	*1986*
1172	Hicks, I. H.	Shropshire (in Spain)	28.7
1173	Guard, M. J.	Coventry	28.9
1174	Cherrill, J. G.	Lasham	2.10
1175	Walker, Jill	Surrey & Hants	6.10
1176	Stevens, F. R.	Coventry	9.10
1177	Brown, T. H.	Bicester	12.10
1178	Spalding, M. J.	Bicester	12.10
1179	Bailey, R. M. C.	Booker	7.10
1180	E. W. Richards	Bicester	12.10
1181	Burke, E. D.	Avon Soaring	12.10
1182	Stonebanks, P. J.	Bicester	23.10
1183	Reid, A. G.	Essex	24.8
1184	Pritchard, B. W.	in South Africa	27.12.82

GOLD HEIGHT

Name	*Club*	*1986*
Treadaway, P. J.	Cambridge Univ.	9.9
Minnitt, Penelope	Cambridge Univ	2.9
Crust, S. A.	Trent Valley	21.9
Cullum, A. S.	Trent Valley	21.9
Guest, B. C.	Trent Valley	22.9
Forrester, J.	Essex	22.9
Moss, S. C.	Bristol & Glos	28.9
Wilson, F. P.	Hambletons	28.9
Hopping, K. D.	Clevelands	28.9
Guard, M. J.	Coventry	28.9
Manser, D.	Kent	30.9
Garside, Julie	Kent	30.9
Moorman, D.	Kent	30.9
Driver, M. J.	Surrey Hills	30.9
Lynch, G. W.	Essex	1.10
Heath, J. N.	Southdown	2.10
Cherrill, J. G.	Lasham	2.10
Chapman, C. J.	Surrey & Hants	6.10
Walker, Jill	Surrey & Hants	6.10
Dennay, V. R.	Fulmar	7.10
Taylor, M. A.	Rattlesden	19.9
Phillips, M. J.	Trent Valley	22.9
Moulang, M. C.	Kent	30.9
Brennan, P. A.	Wyvern	30.9
Strathern, M.	Bristol & Glos	2.10
Fairston, B.	Booker	5.10
Rollason, J. A.	Essex	7.10
Stotter, Anne	Booker	9.10
Stevens, F. R.	Coventry	9.10
Morris, C.	Avon Soaring	10.10
Smith, G. J.	Fulmar	12.10
Francey, J.	Fulmar	12.10
Bardgett, A. J.	Borders	5.10
Robson, D.	Borders	5.10
Weston, R. A.	Fulmar	12.10
Gelder, D.	Fulmar	12.10
Brown, T. H.	Bicester	12.10
Spalding, M. J.	Bicester	12.10
Bailey, R. M. C.	Booker	7.10
Richards, E. W.	Bicester	12.10
Ling, G. W.	Bicester	6.10
Haseler, P. J.	Avon Soaring	9.10
Burke, E. D.	Avon Soaring	12.10
Godwin, R. B.	Inkpen	9.10
Dunthorne, P. A.	Bristol & Glos	12.10
Butt, P. G.	Enstone Eagles	13.10
Sparkes, K. W.	Enstone Eagles	15.10
Millar, J. A. K.	London	23.10
Stonebanks, P. J.	Bicester	23.10
Gill, P. J.	Staffordshire	23.10
Cooper, R. G.	London	26.10
Fellows, L.	Chilterns	31.10

GOLD DISTANCE

Name	*Club*	*1986*
Hicks, I. H.	Shropshire (in Spain)	28.7
Morrow, W. B.	Booker	1.8
McNair, W. R.	Ulster	9.8
Downham, E. H. C.	London	31.8
Daser, W.	Oxford	28.7
Reid, A. G.	Essex	24.8
Pritchard, B. W.	in South Africa	27.12.82

SILVER BADGE

No.	*Name*	*Club*	*1986*
7346	Gent, A.	Peterboro' & Spalding	13.5
7347	Browne, R. A.	643 GS	7.9
7348	Smith, D. A.	Four Counties	14.9
7349	Ling, G. W.	Bicester	19.7
7350	Mitchell, S. J. L.	Cotswold	7.9
7351	McErlean, L.	Cranwell	14.9
7352	Storry, J. G.	Strubby	16.9
7353	Beecham, R.	Southdown	10.9
7354	Joroy, W. S. R.	Cornish	14.8
7355	Symon, Allison	Deeside	1.9
7356	Duncan, Rachel	Bicester	7.9
7357	Jones, R.	Lakes	7.9
7358	Dash, D. J.	Deeside	19.9
7359	Pearce, W. R.	Bicester	24.8
7360	Karczewski, T. B.	Coventry	23.8
7361	Marriott, H. J.	Cranfield	14.9
7362	Burgess, Susan	Bicester	19.7
7363	Pirie, M. A.	Deeside	21.9
7364	Partington, B.	Lasham	31.8
7365	Bauld, A. J. W.	SGU	20.7
7366	Puttock, D. S.	Kent	4.9
7367	May, J. I.	Bicester	31.8
7368	Chicot, L.	South Wales	15.7
7369	Richardson, M. J.	SGU	30.7
7370	Thomas, C. R.	Surrey & Hants	9.9
7371	Starling, Julie	Newark & Notts	14.9
7372	Bruce, K. H.	Midland	16.8
7373	Stemercink, J.	Deeside	20.9
7374	Whittingham, Rachel	Bicester	19.7
7375	Robertshaw, S. P.	Derby & Lancs	18.9
7376	Hall, J. S.	SGU	7.9
7377	Rushbrooke, P.	Lasham	10.9
7378	Taylor, G.	Mendip	30.9
7379	Harvey, G. R.	Derby & Lancs	7.9
7380	Stembrowicz, R. K.	Ouse	11.10
7381	Johnson, J.	Fulmar	23.9
7382	Denne, J. A.	Booker	9.9
7383	Scibor-Kiaminski, J.	Lasham	11.10
7384	Dewis, A.	Avon	13.5
7385	Carver, S. J.	Derby & Lancs	7.9
7386	Guest, B. C.	Trent Valley	22.9
7387	Lynch, G. W.	Essex	29.9
7388	Truman, A. G.	RAE	10.9
7389	Bashforth, R. L.	Derby & Lancs	28.9
7390	Forrest, A. G.	Deeside	20.9
7391	Rambler, C. J. B.	Derby & Lancs	28.9

Calendars. If you didn't get that gliding calendar for Christmas, don't worry. The BGA still have a few of the excellent 1987 Soaring Calendar, which features 16 top quality photographs worthy of framing.

Alternatively, the Aerospace Information Centre of 26 Church St, Stapleford, Cambs CB2 5DS and Hobbies of 9 Knoll Rd, Fleet, Hants GU34 8PR have copies of the Segelflug Bildkalender. The 13 colour photographs are to the usual superb standard and defy being discarded as the months go by.

1987 NATIONALS PROMOTION LIST

1	McAndrew, G. E.	(ISS)	27	Bastin, J.	(QL)	52	Fox, R. L.	(NS)	75	Gildea, C. J.	(QL)
2	Miller, A. S.	(ISO)	28	Walsh, A.	(BO)	53	Mather, A.	(QL)	76	Smith, E. R.	(QL)
3	Smith, J. L. J.	(ISC)	29	Macfadyen, T. E.	(QL)	54	Knowles, J. A.	(ISC)	77	St Pierre, A. H. G.	(QL)
4	Jones, R.	(BO)	30	Costin, M. C.	(EO)	55	Camp, G. W. G.	(QL)	78	Stafford-Allen, P.	(BO)
5	Chaplin, B. M.	(ES)	31	Lyttelton, C.	(QL)	56	Lee, M. E.	(ISS)	79	Feakes, R.	(QL)
6	Aspland, W.	(BS)	32	Jones, P. R.	(ISO)	57	Parry, N.	(QL)	80	Cumner, G. M.	(EO)
7	Tanner, L. E. N.	(EO)	33	Watson, A. J.	(ISS)	58	Hamill, G.	(QL)	81	Freeman, D.	(QL)
8	Austin, D. C.	(NO)	34	Randle, M.	(QL)	59	Gidding, J.	(BS)	82	Baker, P. E.	(NO)
9	Atkin, P.	(NS)	35	Rees, A. J.	(NS)	60	Spottiswood, J. D.	(ISO)	83	Scougall, B.	(QL)
10	Billy, J./Clad, B.	(ISS)	36	Metcalfe, J. I.	(QL)	61	Bond, M.	(QL)	84	Norman, Lynn	(ISC)
11	Morris, B. C.	(ISO)	37	Cunningham, G. W.	(ISC)	62	Cuming, M. F.	(BO)	85	Brisbourne, R. P.	(QL)
12	Pobjoy, D. E.	(ISC)	38	Farmer, A. T.	(QL)	63	Baker, R. J.	(QL)	86	Young, J. R.	(ISO)
13	Dale, G.	(ES)	39	Parker, S. J. C.	(ES)	64	Hawkins, Pam	(EO)	87	Smart, A. M. B.	(ISS)
14	Buckner, G. G.	(BS)	40	Taylor, K.	(QL)	65	Hardy, M. F.	(QL)	88	Dall, R.	(QL)
15	Mitchell, K.	(ISS)	41	Wells, P.	(BS)	66	Murphy, T. J.	(NO)	89	Manwaring, A.	(QL)
16	King, Sally	(BO)	42	Mortimer, R.	(QL)	67	Harmer, P. M.	(QL)	90	Warren, J. R.	(ES)
17	Metcalfe, I. J.	(EO)	43	Hancock, A. R.	(ISS)	68	Boyden, M.	(ISC)	91	Wand, J.	(BS)
18	Gaunt, T. R. F.	(NO)	44	Ashdown, I.	(BO)	69	Charlotte-Green, J.	(QL)	92	Oswald, C.	(QL)
19	Payne, R. D.	(NS)	45	Zealley, T. S.	(QL)	70	Sheffield, R. J.	(NS)	93	Reed, J.	(EO)
20	Hutchinson, S. M.	(ISO)	46	Wright. R. H.	(EO)	71	Read, G.	(QL)	94	Curthew-Sanders, N.	(QL)
21	Logan, M. W. B.	(ISS)	47	Stingemore, G.	(QL)	72	Jones, S. J.	(ISO)	95	Austin, T.	(NO)
22	Somerville, S.	(ISC)	48	Hunt, S.	(NO)	73	Charlotte-Green, Mary	(QL)	96	Harding, R.	(QL)
23	Stuart, T.	(QL)	49	Durham, M. W.	(QL)	74	Lucas, Annabel	(ES)	97	Mitchell, T. M.	(ISS)
24	Cowderoy, R. I.	(ES)	50	Lincoln, A. K.	(ISO)				98	Stonebanks, N.	(SC)
25	Clarke, A.	(QL)	51	Rowland, C.	(QL)				99	Steiner, P.	(QL)
26	Spencer, J.	(BS)							100	Kingerlee, J.	(ES)

ISO=Inter-Services Regionals Open Class; ISS=Inter-Services Regionals Sport Class; ISC=Inter-Services Regionals Club Class; BO=Booker Regionals Open Class; BS=Booker Regionals Sport Class; EO=Enstone Regionals Open Class; ES=Enstone Regionals Sport Class; NO=Northern Regionals Open Class; NS=Northern Regionals Sport Class; QL=1986 Nationals Promotion Qualifying List.

In the last issue, p283, it should have read the 1987 Nationals Priority List and not 1986.

J. D. BENOIST,
BGA Competitions Committee

ED JOHNSTON

THE NATIONAL LADDER

Ed, National ladder steward, explains just how it works, its philosophy and scoring system as well as its problems and complications, so you can have a stab at it this coming season.

Last season Dave Nunn, the winner of the National Open Ladder, had four flights in his LS-4 covering a total of 1588km in 22hrs 22min, an average of 71km/h. There were also single flight entries which gained the pilots Silver distances.

Cross-country flying is all about enjoying the sensation of using free energy to see the countryside from the air. The whole idea of the National Ladder is to encourage pilots to apply some direction to their cross-country flying without entering a nine day Comp, helping them fly further and faster and, I hope, get more from their gliding.

To run any competition all that is needed is a system by which the competitors can be compared. In the Ladder's case there is a simple method of awarding points for the best four flights. Any cross-country over 50km or height gain over 5000ft will get a score, but some will score much better than others.

Rather than simply quoting the rules, let us look at what we are trying to achieve with the Ladder competition and how that is reflected in the scoring system. First, it is a competition because pilots achieve better results when they know their contemporaries are trying a similar flight. Glides are stretched a little further and climbs worked on a little harder.

Next, we want to make the most of our flying. That means going fast, because you can only fly an O/R from Lasham to Portmoak if you are quick. Therefore there are speed points, and plenty of them.

Popular misconception is it encourages people to dash round relatively small tasks

However, we don't want the Booker Boy Racers to go wizzing round 100km triangles at 200km/h and win the Ladder. Instead we award points for speed, but many more speed points for the same speed around a bigger task. One of the most popular misconceptions about the Ladder is that it encourages people to dash round relatively small tasks. Say a pretty competent driver takes his machine round 400km at 65km/h, another pilot in a similar glider would have to do 83.5km/h round 300km to equal his score.

The Ladder is there for everyone to join in, so it's all handicapped. And no complaining from those of you with low performance gliders. Tim Macfadyen got tired of coming second on the National Ladder when flying K-6s and SHKs, so he suggested that closed circuit tasks should be windicapped. After all, the wind does usually blow in England. For Ladder purposes if you get back the wind has been blowing at 10.75kt all day – dead across the runway at Aston Down. This gives lower performance gliders better handicaps for when they get home again. By the way, after Tim improved the lot of wooden glider owners he promptly bought an ASW-20 and it then took him until 1984 to win the competition!

Finally, the only way to really go further is to stretch yourself. That means setting an ambitious task and going for it. Before you launch you must declare where you are going (no more than three TPs) with no alternatives or fall backs. If you chicken out before you get to the Big Dipper at Great Yarmouth you don't get any speed points.

After "finally", we come to the people who don't get back, who turn back or may have just gone for a stooge about. Those honourable diehards who go on until they reach the only field they can find with a pub in one corner and a bull in the other are rewarded with a measly 2pt/km. The stoogers and those who give up are given only 1pt/km. This is because if you turn back you will never be sure of how far you could actually have gone. Also, in encounters with fields (not to mention bulls or barmaids' fathers) glider pilots all too frequently come off worse, so I am definitely not going to give any field landing bonuses.

Last of all are height points. You can claim points for a height gain greater than 5000ft, but it's only when you are up to Diamond height are the points really good. So we have a system for scoring where you have to set your own task which must be as long as you dare with up to three TPs. If you fly like a demon and get back, you get tons of points. If your mate flies pretty fast and 100km further, he will beat you. If he lands 5km short he gets the consolation of a bar story about bulls and barmaids but not many points. And everyone can play. You don't have to be aiming for 750km to make it worthwhile. The Ladder helps to give direction to early cross-country pilots and a good idea of your performance whether you are doing Silver distances or Diamond flights. It's also great to see your name up in lights on the club noticeboard and in S&G.

That is the essence of the Ladder competition. A nice simple way to award points for glider flights. Except, that is, for the complications! There are a few recurring themes which periodically hunt the Ladder.

One slight problem is that if some valiant pilot flies 751km but still lands a few miles short of the airfield he gets very few points. Unfortunately I can't think of a simple way to reward such efforts without causing a complete distortion of the scoring system (*ie* the objectives) throughout the Ladder. Most Ladder contributors agree but if anyone can suggest a simple way to reward these incomplete long distance flights I would be delighted to hear from them. These are the people who are pushing back the frontiers of our imagined limits and should have recognition for their efforts if possible.

Next, evidence of flights. Until last season the pilot's word that his declaration was made before the launch was accepted and that he had rounded all the TPs correctly. We all know just how tempting it is to cut the last few kilometres off the turn, especially if it is into wind, at about 1500ft and you have just run into a 6kt thermal. Without having to take the picture it is difficult to force yourself to go that bit further.

To set against this temptation is the sheer volume of Ladder flights. Cotswold GC generally turn in more than 80. Repeat that over each club in the country and you have a great deal of photographs to process. There is about a fifty fifty split amongst the clubs on whether photos should be required. I feel a compromise coming on.

At the moment we allow any club to require photos if they wish, but to keep it at local level. However, I feel that I can't award a National pot without photographic evidence so if you think you have a chance of winning the Ladder you must take photos. You can keep them undeveloped or get them certified in the normal way but at the end of the year I will need them from the top three pilots in both sections of the competition. Any pilot unable to supply photos can not finish in the top three places.

Hope it will encourage more clubs to require photographic evidence of Ladder flights

To make life easier I am allowing some liberties with how films are dealt with. These suggestions will, I hope, encourage more clubs to require photographic evidence of their Ladder flights as they are aimed at getting around the problem of developing films without getting them cut. The more clubs who encourage pilots to take photographs the better as it is a good discipline. I always carry a camera and go through the motions, even if I don't have any film. This year the film will be there.

So what of the Ladder in the future? I think it is an effective and simple way for pilots to compete with each other in their club and across the country and thereby improve their cross-country skills. And that is the way we intend to go on.

Think back, you cross-country pilots, to your most memorable flights. There are the long flights and the fast ones, but frequently it is the slower struggles when you know you should have turned back but didn't that end up as the most memorable. If not, just skip on to the next

paragraph. The Ladder encourages pilots to stretch themselves and on the way experience the best of cross-country flying. Every time a Ladder flight results in one of these memories, then the competition chalks up another success.

So we will keep it simple, progressive and hope to get more people interested. One way to jump forward would be to follow the lead of the Germans and Australians who incorporate their Ladders in their National rating system. That thought is still a twinkle in my eye but I hope it will prompt some comments.

Finally, to join in the Ladder competition ask your club ladder steward about it. He will have a copy of the rules. If you haven't got a ladder steward, then shame on you. Drop me a line straight away. The calculations are very easy, or if you have a BBC micro I have written a ladder scoring program in Pascal (stored TPs, gliders, pilots and all). It won't even cost you much. Then all you have to do is fly further and faster and get your submissions to me on time!

(Write to Ed c/o of the Cotswold GC.)

BOOK REVIEW

Turnpoints by Gren Seibels, available at £15.50 including p&p from Hobbies, 9 Knoll Road, Fleet, Hants GU13 8PR.

At first glance **Turnpoints** appears light reading, and so it is, but the contents are of great value to any participant in our sport. Once again he has brought together and recorded experiences and opinions on many aspects of soaring.

Instructors, computers, cross-country techniques even the psychology of those who participate in our sport are all covered in a way which makes the reader question many of his or her, perhaps long held, opinions.

Gren writes as he sees and this gives the book an immediate authority. The content, ideally illustrated by a large selection of black and white photographs by George Uveges, are so varied they make **Turnpoints** a potted history of one man's soaring life.

I can endorse the author's own suggestion that the book provides good reading for both present and potential soaring pilots.

JOHN GLOSSOP

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YOUR LETTERS

THE USE OF OXYGEN

Dear Editor,

I am surprised that you published the letter from Charles Wingfield in the last issue, p285, which suggested a more lax approach to the use of oxygen than that recommended by the BGA. The original article by Dr Murray Wilson (June issue, p122) was authoritative and sound in its advice.

Mr Wingfield's attempts to draw conclusions about the use of oxygen in gliders from his personal experiences of climbing are fatuous on several counts. First, loss of concentration and insight, apathy and a false feeling of well-being are early effects of hypoxia – one cannot decide whether one's own mental faculties are affected by hypoxia. Secondly, when climbing mountains the exercise involved tends to stimulate the circulation and also maintain body temperature whereas in gliders, especially in winter wave, one is frequently profoundly cold and virtually immobile. Thirdly, survival in these circumstances in a glider at high altitude depends on a high degree of concentration and fine judgment in several areas.

When 66 year-old bronchitic Mr Wingfield (his own description) trekked to 18000ft in the Himalayas he was almost certainly hypoxic but probably in a low risk situation. Genuine high altitude mountaineering without oxygen is the realm of dedicated specialists who do it to *enhance* the challenge of their sport and to reduce the logistic support requirements.

The risks of hypoxia do not increase linearly with height. I can remember being at 11500ft one day without oxygen. Another young and very fit non-smoking pilot was 2000ft higher also without oxygen. It took about ten minutes on the radio before I could persuade him that he was 180° disorientated and not where he thought he was. There were only three octas of cloud cover below us and we were over familiar terrain. He was not aware of having been hypoxic until we discussed it after landing.

The BGA rule that oxygen is advised at 10000ft and recommended at 12000ft is correct and Dr Murray Wilson's excellent article should be required reading for all glider pilots.

JOHN P. GALLOWAY, *Glenrothes, Fife*

(See also Gliding Certificates)

WHY DO YOU NEED OXYGEN?

Dear Editor,

The letter from Charles Wingfield ends by stating that a climb to 15000ft will probably prove safe. This is probably true and the same adjective could be applied to advice to exceed any other limit. The existing oxygen recommendations are based on physiological research and military aviation experience gained in the Second World War. Aircrew then were all selected fit young men. Ascent from sea level to above 10000ft will give a deterioration in all measured performance, and if flight is prolonged at medium altitude in unheated aircraft, can lead to falling body temperature, once called "chronic anoxia", which further impairs mental and physical processes but will not recover until rewarming.

Acclimatisation is too slow for aviators, but when operating from airfields well above sea level, the oxygen limits could be calculated from that base. Charles Wingfield probably drove up Pikes Peak from Denver, itself some 5000ft asl, so not surprisingly he was better acclimatised than his car!

It is the task of the BGA and other airworthiness authorities to recommend safe limits for competent pilots. If one has a good reason to go outside these limits, it is necessary to first research and then understand the experiences of others. Aviation can be a hard taskmaster and those of us who have been around some time have buried too many good friends to wish to see old lessons relearnt.

PETER SAUNDBY, *Ministry of Defence*

(Both letters are from medical doctors.)

RADIO AND AIRSPACE

Dear Editor,

In considering Vic Carr's letter in the last issue, p286, some facts are worthy of notice.

It is not true that the cost factor argument has no merit – £500 for a 720 channel radio is a major expense for owners of gliders such as the Olympia advertised at £1850 in the same issue. I have checked the current sailplane register and around 40% of the total gliders are wood and fabric in the £1000-£6000 range of value. Gliding is not just a rich man's sport, and many of these pilots also wish to fly cross-country.

In a recent survey we found that 78% of gliders go cross-country (the sample covered a third of the total gliders, a reasonably representative sample) but only 21% have more than six radio channels. Many have no radios at all. In the same survey we asked clubs various questions about radio and airspace and the response was four to one in favour of retaining access without the need for radio – Vic is not alone, but he is in a minority.

Until there is a major shift in ownership patterns and opinions, I believe it is still my duty to negotiate for access to airspace wherever possible without forcing pilots to increase their investment by a substantial percentage.

CHRIS NICHOLAS, *BGA Airspace Committee*

ANY ADVANCE ON 229 AND 244?

Dear Editor,

Gordon Camp's comment in the October issue, p232, on Graham Pratt having a higher Gold Badge No. (1162) than Silver (933) suggests a little competition.

Graham's difference is 229; but I can offer 942-698=244, but I am sure others can beat us. Any offers? (You don't *have* to have a Cambridge Silver to compete!)

THE ARMCHAIR PILOT

ANSWERS TO AUSTRALIAN LETTER

Dear Editor,

Having chaired the Cross-country session at the Harrogate BGA Conference last year during which Justin gave his "Gliding Ethic's" speech. I would like to comment on some of the points raised in Mike Cleaver's letter in the last issue, p285.

First, it should be said that Justin's speech was very enthusiastically received by the large audience and some of the points he raised debated by the Comps Committee this winter.

The general tone of Mike's letter is that the ban on cloud flying and the extent of the restricted airspace in force today does not represent a threat to the Australian glider pilot's perception of his freedom of the air, therefore it is acceptable for these things to be made illegal. This is a dangerous precedent to establish because if the situation deteriorates it will be hard to reverse the trend.

In the UK we have a potential example of such a problem with the imposition of the Upper Heyford mandatory radio area. Many of the pilots I have talked to are now avoiding this airspace. Instead, they should be encouraged to exercise their right to fly there just as they did before, otherwise there is a danger that the authorities will incorrectly conclude that it would not matter to the gliding movement if such airspace were prohibited to us altogether.

The CIVV debated the merits of mountain sites for World Championships at the March 1986 meeting, reported in the June issue of S&G, p139. Although our view, represented by Tom Zealley, was against mountain sites for World Championships, we are certainly not against competitive flying in the mountains. There is growing popularity for such events in Europe, *ie* the annual World Cup for Mountain Gliding at Vinon, France, and we would encourage any pilot seeking to reach British team standard to gain competitive experience in a variety of different terrains and conditions.

JOHN TAYLOR, *chairman, BGA Competitions and Awards Committee*

Dear Editor,

Contrary to Mr Cleaver's lack of imagination, Booker has obtained increases in the height of the London TMA on request during competitions etc. This is despite Booker being within 26km of Heathrow, 43km from Luton Airport and 26km from Northolt which is London's military airfield, (Bacchus March is 38km from Melbourne's Tullamarine) and the London TMA having over five times more traffic than the equivalent around Melbourne.

It is obvious from Mr Cleaver's comment regarding the "perceived need" for cloud flying that he fails to understand the concept of flying as a recreational activity as alas do most aviation bureaucrats.

BRIAN SPRECKLEY, *manager of Booker GC*

Dear Editor,

Inspector Cleaver really advances the most extraordinary arguments in favour of restriction that I have ever read. His reasons for a ban on cloud flying appear to be:

1. It is rarely necessary.
2. Not very many pilots want to cloud fly.

The same arguments are equally true of gliding as a whole; it's rarely necessary (except for the sheer pleasure of doing it – incidentally I actually enjoy cloud flying) and only a tiny fraction of the population want to glide (less than 1.3%). Doubtless some successor of Inspector Cleaver's will justify a total ban on gliding in just those terms – hopefully long after I'm gone.

Regarding the accidents to the low finishing gliders – it must be obvious that any competitive pilot will attempt to "circumvent the rule" in

that way at every opportunity; the ritual washing of hands by the D of A reduces their responsibility by the same amount as it did for Pontius Pilate.
C. C. ROLLINGS, *CFI, Booker CG*

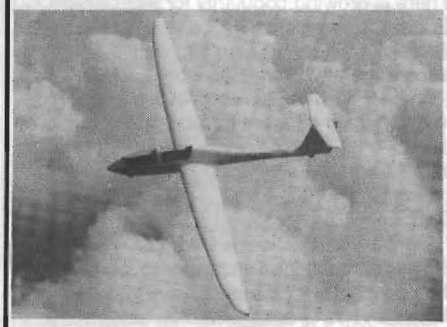
NOSTALGIA

Dear Editor,

I was intrigued by the mention in the obituary to Ken Fripp (in the last issue, p281), of his having built a biplane hang glider whilst a schoolboy at Dulwich. This sounds like the same sort of contraption that I fashioned in August 1930 from plans published in the then "Boys Own Paper", with a braced wooden framework (hopefully of ash) and laced on calico. Launching was on foot, as now, and I can confirm that with perseverance it did, briefly, actually sustain flight. Mine was eventually destroyed through lack of picketting in an increasing wind, so I had to wait until March 1935 in a nacelled Dagling along the Dunstable ridge for my old "C" (No. 381) which I have yet to improve on, without an engine!

Amid the incomprehensible complexities of the present day sport, or at least of its competitive side, it is refreshing to be reminded of the sheer exhilarations of the early days, with primitive machines, methods and aspirations. What a joy it was for *ab-initios* to make an early start on a Sunday, after kipping on the floor of the bar in the orginal wooden clubhouse, and spending the day in the company of such as Doc Slater (bless him), Dudley Hiscox, Sebert Humphries, Eric Collins, Philip Wills, Kit Nicolson, Joan Meakin, John Furlong (he of the Ottfur rings), Dan Smith, and many others. I was Sebert's air experience passenger in my photo from a Kassell two-seater in the September 1934 issue of S&G, p144.
REG RESTALL, *Taunton, Somerset*

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A COMMENT ABOUT SUNGLASSES

Dear Editor,

During the summer I bought a pair of Suntiger sunglasses, having read about them in the August issue, p184. They live up fully to all the claims made for them – the clarity is superb and the cloud definition outstanding.

However, there is one characteristic which I feel should be brought to the attention of glider pilots and that is the severe distortion that can occur to one's perception of altitude, particularly apparent below say 1000ft agl. It takes only a few flights to adjust to this phenomenon but it could catch out the unwary pilot in the early stages. Indeed, I feel it might even be advisable to take a check ride first time round.

On my first flight wearing my Suntigers I was convinced that I was at 900ft agl when my altimeter was showing 500ft. It even crossed my mind that I had failed to zero the instrument before launch, but quickly realised my error when I lifted the glasses for a quick peep to find that I was at only 500ft! Fortunately I was well within range of the circuit. On subsequent flights I confirmed that this had not been a one-off freak.

Having adjusted to my Suntigers and the distortion I must say they are the best sunglasses I have ever worn – worth every penny!
STEPHEN YOUNG, *Elgin, Scotland*

George Coppen replies: We are pleased to hear that Mr Young is very impressed with his Suntiger glasses but we cannot understand why wearing them seems to give him difficulty with height judgment. To date some 4000 pairs have been sold and nobody else has reported Mr Young's difficulty. This would suggest that the glasses do not cause distortion. The lenses are high quality and optically correct to avoid any such problem. They clarify, they do not magnify. Suntigers have an effect on colour perception and it may take an hour or two to adjust to this initially. Perhaps Mr Young has had a little more than usual difficulty with the colour adjustment.

SCORING SYSTEM CRITICISED

Dear Editor,

To follow on from Brennig James's letter in the October issue, p223, regarding competitions, here are two examples from the 1986 Standard Class Nationals of how polarised towards speed is the present scoring system.

On Day 3, with a 290.4km task set, John Cardiff won with 265.5km. Soaring conditions were difficult with heavy cloud cover and weak thermals, requiring good scratching skills and cloud flying. Because only four competitors passed "Y" the day was devalued to an almost worthless level by the current rules, giving the winner 4pts!

Day 4 had the first seven pilots whizzing round an underset task of 296.4km at speeds of over 90km/h in strong and consistent conditions, and no fewer than 38 pilots got round. Such a day is worth 1000pts to the winner.

I think the scoring system needs some revision to reward and encourage a broader spectrum of soaring skills. At the moment weak weather skills are undervalued.
MALCOLM HAYES, *London*

FEAR OF FLYING

Dear Editor,

Whilst admiring the determination of Anthony Edwards (October issue, p210) in overcoming his fear of flying and resuming his gliding activities, it was with considerable concern that I read amongst his advice on "fear reduction", a comment suggesting that ". . . the real cure is to minimise head movement whilst thermalling – move your eyes instead . . ."

I'm sorry if Mr Edwards and his fellow sufferers find it a problem to move the head under moderate *g* loadings, but it is, I consider, of vital necessity that the head should be constantly on the move, most especially during turns, if adequate look out is to be maintained. As was said in a BGA Safety Panel report on a

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double fatality following a mid-air collision "Good look out techniques should be habitual and (in turning exercises), look out is much more important than good handling."

I'm afraid that it is just not good enough for someone to circle in close proximity to other gliders but not maintain a proper look out because moving the head results in a return of a fear of flying. The only time I could condone a "Don't move the head" policy would be for a P2 in a two-seater with an instructor where the instructor is aware of the physical limitations of his pupil. Back to the drawing board or the Institute of Aviation Medicine – Mr Edwards – I might be the guy sharing a thermal with you!!

BILL TOOTELL, *Wellington, Salop*

GEL COAT ARTICLE APPRECIATED

Dear Editor,

Unlike Brennig James (see last issue, p287) I found George Thelen's article on "The Mortality of Gel Coats" (October issue, p226) both interesting and informative. But then I have much to learn and an appetite for any new insight into my existing knowledge.

On reflection there must be many like me who do not have easy access to German airworthiness publications or even an owner's handling notes for a glass glider but who still wish to feel informed on such matters. I am also convinced that there must be many would-be contributors to S&G who are dissuaded from giving utterance to their thoughts in anticipation of this sort of snobbishly disdainful put down from the "experts".

Brennig James's remarks on problems with Kevlar seem to indicate that what we really need resides with him. So why not put your pen where you mouth is B. J. and give your alternative. Don't forget to make it as interesting and as well illustrated as the object of your criticism – and woe betide you if there is some innocent flaw in it!

TONY MOSS, *Bedlington, Northumberland*

PERCY PILCHER

Dear Editor,

I was most interested in the article on Percy Pilcher by William Malpas in the last issue, p268, but was sorry to see that it contained a number of errors that clearly emanated from unreliable secondary sources.

I have been researching Pilcher for the past 14 years or so, and this spring the Smithsonian Institute Press is to publish my biography of his life and work, under the title **Another Icarus: Percy Pilcher and the Quest for Flight.** Perhaps I may be allowed to make a few comments on your article.

It is wrong to attribute the fatal crash of the Hawk to a snapped guy wire. An investigation of the circumstances of the accident and of statements by eyewitnesses reveals a very different and more complex structural failure.

The Hawk's undercarriage was primarily intended to facilitate manoeuvring of the glider on the ground and to absorb *vertical* landing shocks. It could never have withstood the type of landing described by Mr Malpas ". . . rounding out and holding off just as our gliding instructors now teach us". In fact, Pilcher used the technique still practised by hang glider pilots, of stalling the machine just above the ground and dropping to the ground with virtually no forward speed at all.

He did not make "hundreds of glides" near Eynesford. His total gliding time from 1895 to 1899 was extremely low. Certainly he made "tens of glides", but far fewer than his mentor, Otto Lilienthal.

There is not one ounce of contemporary evidence to suggest that Pilcher ever contemplated the use of "the vertical air currents which he was convinced existed higher up". He never even mentions such currents in his writings. Pilcher's prime intention was to use gliding experience as a stepping stone to powered flight. Nearly all of his flights, including the one of "270m" (estimates vary greatly as to the actual distance covered on this flight), were made entirely under tow – not just for the initial launch. He never used a seat in any of his gliders.

Pilcher's final glider, the triplane, was not Hargrave inspired. In fact it was directly inspired by the multiplane and biplane gliders tested by Octave Chanute and Augustus Herring in Indiana in 1896 and 1897.

Finally, it is really misleading to say that "He was about two years ahead of the Wright Brothers", because the comparison is false. It must be remembered that his only control was by body swinging, whereas the Wrights developed a full three-axis control system using pilot operated control surfaces. This meant that they could build a much larger machine able to carry an engine, yet still retain adequate control, while Pilcher's weight-shift system limited the size of glider or powered machine that he could manage. The key to the Wright's success was the mastery of control before the application of power. Pilcher's approach was the very opposite of this, and it severely handicapped his experiments.

What is especially interesting about his work is that, like the Wrights, Pilcher made a conscious decision to have an unstable machine that depended upon his movement for balance and control, at least as far as lateral stability was concerned.

PHILIP JARRETT, *Chessington, Surrey*

William Malpas replies: It is not surprising that after 14 years' research Mr Jarrett finds some simplifications in my one page article. None of his comments materially affect an assessment of Pilcher's work. Much more serious, however, is Mr Jarrett's confusion in comparing Pilcher's approach to that of the Wrights. The key to the Wrights' success was indeed mastery of flight control before the application of power. Pilcher's approach was exactly the same, not the very opposite as Mr Jarrett claims. It is precisely because Pilcher learned to glide before anything else that he was in the mainstream of aeronautical progress along with Cayley, Lilienthal, Chanute and the Wrights; and, incidentally, that he now finds a place in the series "Looking Back."

NOT WHAT IT SEEMED

Flying down a river that runs uphill!

On August 2, 1977, at about 1100hrs, when I was flying from Vinon in my SF-27M to Feurs, having participated in a gliding contest there, I happened to look out of the window and noticed that the ground was slowly getting nearer. I immediately experienced an acute attack of the screaming dib-dabs because I was following down the course of the Loire. Surely I wasn't 180° off track?

I took a firm grip on myself and poured myself a drink from the cocktail cabinet discreetly hidden behind the instrument panel. I took a hard look at the river and found that the water was, in fact, travelling in the correct direction, but it was only the ground which was sloping the wrong way.

I eventually arrived at Feurs which was waterlogged, and when I landed the lower six inches of cockpit filled up with water, so I had to remove my shoes and socks and paddle to the control tower for assistance. Everything got sorted out eventually and I got home in one piece.

I was reading *Nature* recently and by chance discovered the explanation for my observation (Norman S & Chase, *Nature* 322 p480–451). 5.5 million years ago, give or take a few weeks, the Mediterranean was a dry lake and the Nile and Rhône ran into it through deep gorges which have subsequently silted up.

Eventually a waterfall was established at Gibraltar which eventually cut a deep enough gulley to fill it all up. This was almost guessed at by the ancients. If you read Herodotus he observes how after the annual inundation in Egypt the level of the soil rose so that parts which in living memory had been marshy had dried out, and he concludes that it was his belief that Egypt had once been an arm of the sea.

When the Mediterranean filled up, it is now very deep in places, the immense weight of the water caused the sea-floor to descend and also caused the surrounding land to tilt, so the Loire, which originally ran down the slope of the land, slowly cut a gorge as the ground tilted, thus maintaining its original direction of flow.

The reason we know the Mediterranean was a dry lake, rather like the Dead Sea or Edward's Air Force Base, is because if you drill cores out of the deep sea-bed they are full of evaporites, namely laminations of salt and fossilised vegetation. These evaporites are about 1km thick, so the process went on for a very long time.

The authors' calculate that the weight of water would have depressed the sea-floor 0.85km, and the weight of water plus salt deposit 1.9km, quite enough to account for the tilting of the massif central. Depending on the rate of tilting, there is a possibility that some of the rivers may have reversed their direction of flow, while remaining in their existing beds.

This obviously did not happen to the Loire or it would be running into the Mediterranean and I would have landed back at Vinon.

CLUB NEWS

Copy and photographs for the April-May issue of S&G should be sent to the Editor, 281 Queen Edith's Way, Cambridge CB1 4NH, telephone 0223 247725, to arrive not later than February 10 and for the June-July issue to arrive not later than April 7.

GILLIAN BRYCE-SMITH
December 3

ANGUS (Arbroath)

It has been a good soaring season, although when the thermals were there so was the wind. Guy Davidson flew a 270km O/R, landing short at a milk bar!

As a result of hard work by Bill and Jim we are on the way to having a new winch. At the moment we achieve an average of 1700ft with the old one.

R.S.

AQUILA (Hinton in the Hedges Airfield)

The hard core (with emphasis on hard!) of the club enjoyed our most successful expedition at the Long Mynd with durations by Martin Bell, Alan Goodman and Jim Hughes and a Bronze C finally by John Rayment – 27 years after his first solo!

Congratulations also to David Alexander and Steve Williams on going solo back at base.

J.R.

AVON (Bidford-on-Avon)

We have had a good year, the best days being midweek. Our members have had too many badge claims to mention, so well done all of you. We also reached the Inter-Club League final for the second year.

Our trip to Feshiebridge in October was a great success with everyone getting a badge claim – our thanks to Cairngorm GC for their help and hospitality.

We have increased our single-seater fleet to five with an Astir CS.

D.B.M.

BATH & WILTS (Keevil Airfield)

Trophies were presented at our annual dinner in November to Joy Lynch (the Gordon Mealing trophy for outstanding service over many years in editing our newsletter and instructing) and Bob Hitchen (Keevil ladder trophy for coming 2nd in the "Tin and Timber" competition), his first contest.

Congratulations to Phil Gascoigne and Bernard McBride on their full Cat rating; to Tony McBride on going solo and to Dave Strange on gaining his aircraft inspectors' certificate.

We thank the backroom boys – Roger Slade and Merwyn Pock (tugs), Peter Higby and Cyril Needham (gliders) and Dave Strange and Richard Marsh (towing vehicles) – and all instructors who have braved the weather to keep us flying in 1986.

T.K.

BICESTER (RAFGSA Centre)

We have had some quite soarable days in October and November which has kept enthusiasm high.

The Aboyne expedition was a tremendous success with everyone gaining Gold and Diamond heights. Out of a possible 20 flying days, 17 were flyable and all were wave days. We hope, with a bit of luck, that Paddy Hogg and Martin Spalding have broken the UK two-seater height record with a climb to 27300ft. Ted Richards climbed to 29800ft but unfortunately couldn't get any higher due to icing. Congratulations to Jeff Ling, Bob Dennay, Pauline Day and Nipper Stonebanks on their Gold heights and Trevor Brown, Mike Hughes, Martin Spalding, John Hull, Mossie Williams and Ted Richards on Diamond heights. A special congratulations to Ted Richards on gaining all three Diamonds in only four months. The next expedition is to the Austrian Alps in May.

Sadly, we had to say goodbye to our resident American, Danny, who has been flying with us for three years while at Upper Heyford.

C. & G.

BOOKER (Wycombe Air Park)



Karina Hodgson who went solo after school on her 16th birthday.

All quiet on the Booker front this issue with much of the club absent – either flying or crewing at Benalla!

Fleetwise, the ASW-20 has been sold to make way for something faster, and the spare Puchacz will be up for sale just as soon as the tail is stuck back on.

Our annual records show that every single Booker prang last year – bar one – involved an instructor (the instructor has since left!).

Finally, congratulations to the Booker members of the British team (too numerous to mention individually).

M.F.C.

BORDERS (Milfield)

Our Bocian had a confrontation with a large straw bale while attempting a field landing – sadly it was written off and been replaced by a Blanik.

We hope to start full time flying during the summer, perhaps doing holiday courses and offering visiting pilots our facilities and excellent soaring.

We now have winch and aerotow launching with 1600ft from the winch on good days. Our hangar is nearing completion after many hiccups and delays.

T.P.

BRISTOL & GLOUCESTERSHIRE (Nympsfield)

A succession of enjoyable wave days have helped make up for the dismal summer. Members have exploited them to the full, soaring over the beautiful Severn valley at 9000ft.

We are preparing for the Western Regionals from July 4-12 and applications are welcome. We are building a K-13 trailer for an expedition to France this summer.

Andrew Davis left for the World Championships with his Discus and our good wishes.

N.W.

CLEVELANDS (RAF Dishforth)

The wave returned in the autumn with many badge claims. The best was by Keith Hopping who achieved a Bronze leg, duration, Silver height and Gold height simultaneously in a winch launched K-8. Not to be outdone, Terry Potter has taken to romping around 400km on wintry Sunday afternoons.

The occasional non-soarable day has prompted much hangar fettling, including a revamped kitchen and the start of the long awaited tug servicing bay.

P.W.

COTSWOLD (Aston Down)

A successful expedition in October to Feshiebridge and Aboyne resulted in Gold heights for recent Silver C pilots Vanessa Mayo and Mike Gribble (over 17000ft) and for Simon Housden. Congratulations also to Dave Johnson on a flight to 10000ft for his Bronze leg and Silver height!

The Macfadyens are going to Kenya in December/January to help its club move from Njoro to the new site at Mweiga.

Our annual dinner-dance is on January 16 when Bernard Bentley will receive the Holland trophy (best pre-Silver); Richard Furley and Alison Rumbelow, the Macfadyen trophy (two-seater cross-country); Larry Bleakin the Bleakin trophy (height gain) and Roy Pentecost the Holland trophy (club ladder) and the Daniels trophy (best flight). Roy's 520km in his Std Cirrus was the highest scoring on the National Ladder.

G.M.

COVENTRY (Husbands Bosworth)

We have had some interesting arrivals at HusBos including a Spitfire and a Dakota piloted by our ex-tug pilot, Rory Ellis. The intrepid duo, Lou Frank and Norman James, have made yet another remarkable flight in the T-21, this time to the Isle of Wight.

The weekend mini-courses are very successful. We welcome new instructors Jonathan Walker, Trevor Tilley and Phil Spencer. Following their success last year, trial instruction vouchers are again available and make an ideal gift.

Congratulations to 16 year-old Adam Rice on going solo and also to Dave Shatford.

The two or five day holiday courses start in April with a choice of mixed aerotow and winch or total winch courses. We also have a two-seater cross-country soaring course and the 15 Metre Nationals in August.

D.L.S.

CRANFIELD (Cranfield Airfield)

Tony and Ian Weatherhead have bought a Dart from Syerston and Tony has become an assistant Cat. Congratulations to Mike Briggs and Robert Hammond on going solo and to Jeff Luck and Ray Mariott on gaining their Silver Cs, Ray also completing his Bronze C last summer.

Our thanks to those who helped with the trial instruction evenings, especially to our friends who bought a T-21 from Dunstable when our Bocian had a snag; to Ken Catlin for standing in while our secretary was overseas and to Harvey Britten who gave two excellent aerobatic displays, one at Cranfield Institute's 40th anniversary.

The tug syndicates' "new" Rallye is operational after extensive refurbishment by our CFI, Derek Wilcox.

P.J.W.

CRANWELL (RAFGSA)

We held our AGM on November 29 followed by a party in the clubhouse. We looked back on a good year with lots of cross-country flying and badge gains. We hope to have more expeditions this coming season.

S.J.H.

CRUSADERS (Cyprus)

Our soaring season got off to a good start and congratulations to Jane Richardson on her 5hrs, Jock Weir on going solo and to Floyd Christofferson, Mark O'Connell and Jock Weir on gaining Bronze legs.

Our open day was a great success with our complete fleet operational including the recently acquired Falke. Silver distance routes have been planned and it is hoped that some completed Silver Cs will emerge in the near future.

P.J.

DARTMOOR (Brentor)

After a glorious Indian summer. November brought the Dartmoor monsoon though we were still able to fly thanks to all the work by a small group early in the year. To our great joy we reached the 2000 launch mark before the monsoon set in, which we feel is quite an achievement for a small weekend only club. We are firmly established here, accepted by the farmers and landowners and at last our finances are sound.

We had a presentation to Tim Parsons of the North Devon GC who has given so much of his time as acting CFI.

F.G.M.

DEESIDE (Aboyne Airfield)

The autumn invasion tested our resources and we were not found wanting! The weather was mild and breezy with little rain, so there wasn't the usual quagmire in the rigging area.



When Essex GC members Gillian Bull and Michael Jefferyes were married on October 25 both their gliders, a DG-100 and DG-202, were rigged outside the church to form a triumphal arch. Photo: Roy Elwell

October produced wave soaring on all but three days and even on one of those a barn door in the shape of Ralph Jones's trailer got airborne. On 19 days heights over 15000ft were achieved and ten of those included gains of 20000ft. It was hard work keeping the oxygen supplies going. The flying hours are still being counted but are probably in excess of 3000 for a two month period. We believe there were 21 Diamond height claims in the month.

November was less good but still enabled a few of our friends to get some satisfactory soaring.

L.E.N.T.

DEVON & SOMERSET (North Hill)

Our 1986 launch rate isn't much down on the previous year, with Competition Enterprise helping to give us a total of nearly 33000km.

Congratulations to Peter Hill on his Bronze C. As he has a PPL, we are hoping he will become a tug pilot.

The field extension is coming on slowly with the grass seed germinating.

D.A.R.

EAGLE (Detmold)

Our thanks to Andy Harkins, who leaves us on posting, for his unstinting work as CFI. Dave Campbell has taken over with Mike Heelis as DCFI.

At our AGM trophies were presented to Andy Harkins, Annie Kelly, Dave Braine and Mac Thompson.

Congratulations to Dennis Brunneye on his Bronze C and to Mac Thompson, Paul Greener and Dave Braine on completing their Silver Cs.

D.M.C.

EAST SUSSEX (Kitson's Field)

Kitson's Field is now our official address ensuring that Mike's name will be associated with the club for many years to come. Our thanks to Nikki Pelling who made the arrangements for this tribute. An ambitious 5/10 year plan will be discussed at a special meeting in January.

1986 wasn't a good year but moral is high. The special rates to encourage new members was very successful and our training fleet has been working to capacity. Congratulations to the crop of new solo pilots; to Graham Pratt on his Gold C; Mike Pierpoint and Larry Matthews on their Silver C and to the many others with Silver legs. But commisserations to Fred Bishop who missed his Gold distance by a whisker – literally a few metres.

J.S.

ENSTONE EAGLES (Enstone Airfield)

At last an informal agreement has been reached to allow us to continue flying off the main runway and we are now waiting for a formal document to process. We now expect that visiting glider pilots, UHMRA permitting, will be welcome during the week, but note that the fence on the south side of the runway has been removed up to the first crossing. Perhaps we can manage some mid-week flying ourselves in 1987!

John Halford,CFI, is moving to the south coast and we are sad to lose him. Our thanks and best wishes go to him and Jean. Geoff Dixon is our new CFI.

An encouraging proportion of our short course members have become full members.

R.J.P-B.

ESSEX & SUFFOLK (Hadleigh)

The last two months have been poor and now either the K-13 or K-21 will be out of action for their Cs of A. We welcome two more instructors, Peter Smart and Jim Harkins, the latter being an A10 pilot from USAF Bentwaters.

Members will be pleased that we have at long last a lease for our club.

V.H.

HEREFORD (Shobdon Airfield)

We have replaced our Super Cub, which was expensive to maintain, with a Rallye Commodore

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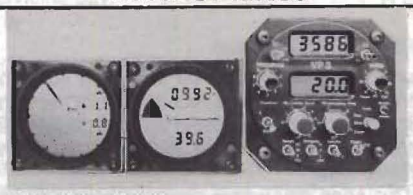
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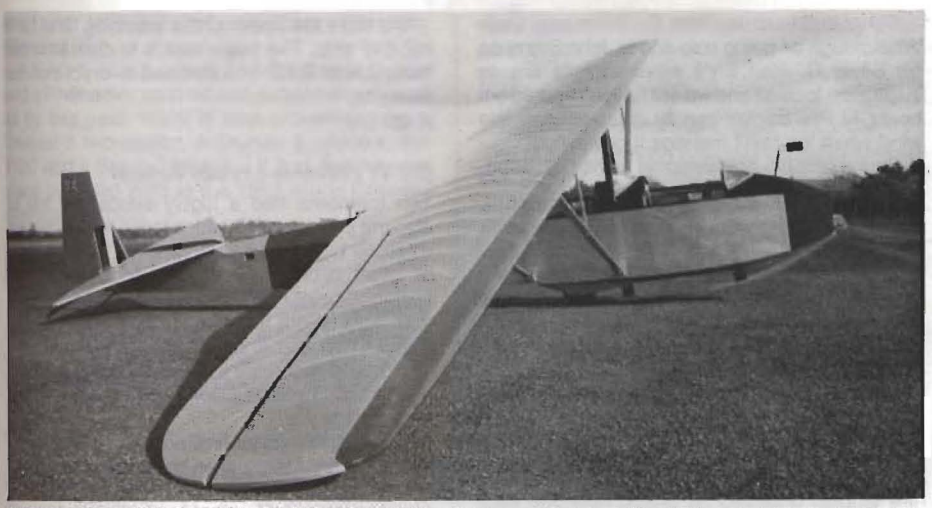
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EVENINGS



Father and son Mike and Stuart Abbott and Mike Sugars of Surrey Hills GC have put in many hours' of work to bring their T-31 to its present pristine condition. They bought it from the Ministry of Defence and it was the last T-31 Stuart flew when being taught to glide three years ago by 615 Gliding School ATC at Kenley where Surrey Hills are based.

and with the gradual increase in flying hope to acquire a second tug.

A number of clubs have been making good use of our site, particularly on week days, and we are keen to encourage even more visitors. London GC, on their second visit this year, had good wave in October with a best climb of 20000ft and a number of Gold heights.

Our best wishes to Andy Williams who is going to live in Australia and belated congratulations to Tony Maitland for a joint first in Enterprise.

M.D.

KENT (Challock)

Our annual dinner-dance in October was a huge success with trophies presented by Mollie Manser. Tony Moulang swept the board by winning the League 1 trophy, Best Flight cup, Best Four Flights from Kent cup and the Instructors' bowl and shared the Two-seater cup with Geoff Johnson and the Ridge-run trophy with Robbie Judd. The Best Flight from Kent and the Best 100km Triangle trophies went to Ron Cousins; the League 2 trophy, Davina Hoolahan; the Ladies trophy, Ann Johnson; Silver Distance cup, Ian MacLeod and the *Ab-initio* shield to Christine Bell.

John Hoye stepped down as CFI and we thank him for his three years' hard work. Mike Kemp is now CFI.

Congratulations to Bob Burden and Phil Taylor on going solo and to Ron Baker on his Bronze C.

J.G.

MENDIP (Weston-Super-Mare)

We have gained two new instructors, Peter Jones and Robert Merritt, Dave Nevill has his Bronze C and Graham Taylor his Silver C, Graham collecting the height and distance on his first cross-country. Dave Capel has gone solo and Dave McFarland and Martin Horn have Bronze legs.

Although we suffer from off shore breezes we can soar the Mendips in south-westerlies. Chris Crabb, Paul Croote, Phil Hogarth and CFI Ron Perry had some good cross-countries in 1986. We now have a clubhouse so our social side is also on the up and up.

G.T.

MIDLAND (Long Mynd)

Yet again we have broken all previous flying records as the club continues to expand and increase its activity. At the AGM in November Paul Fowler retired as secretary, his place taken by Paul Garnham, and Dave Cole from the committee, though Dave will continue to supervise the clubhouse extension. We thank them both and welcome Howard Rutherford to the committee.

N.B.

NENE VALLEY (RAF Upwood)

We held our annual group members' meeting on November 22 when Jim Rignall was elected chairman, with Roger Emms as Secretary and Richard Meayers as treasurer. The rebuilt K-7 has its C of A and congratulations to John Young on becoming an instructor.

T.S.

NORTH WALES (Pen-y-Parc, Nr Holywell)

Summer didn't arrive until October when members made hay on the badge flights. Edgar Davies, one of our oldest members, got his B, as did Mike Lloyd and Mark Roberts. Andy Deyes went solo after persevering for five years and Geoff Glazebrook has both Bronze legs.

Congratulations also to Robert Vaughan on his Silver height, to Rory McGough on becoming our second home-grown assistant Cat and to Brian Sedgewick on completing his Silver C.

D.J.

PEGASUS (RAF Gütersloh)

Eric Cooper is back from hospital fully recovered from his accident. Congratulations to Rick Fells and Chris Marsden on going solo and to all our trophy winners at the AGM in November.

Last year we achieved 5175 launches and some 740hrs despite bad weather, weekend operational flying and some unfortunate accidents.

M.S.

PETERBOROUGH & SPALDING (Crowland Airfield)

Belated congratulations to Bob Darby on his Silver height and to Peter Wilson on his Bronze C. We are looking forward to getting a winch, have marked out our planned runway extension and are refurbishing the fleet to take the unaccustomed winch forces. The Rallye back up tug is for sale.

P.N.W.

SCOTTISH GLIDING UNION (Portmoak)

One of our gliders was missing – at least for a night. A pilot caught out on Bishop Hill in orographic cloud made a safe landing but when he returned with a retrieve crew couldn't find the glider. With darkness setting in and a gale blowing the search was abandoned. The next day they were relieved to find it with only minimal damage in a narrow gulley with the wings almost supported by higher ground on both sides.

October was good with at least one Diamond, seven Gold heights and many Silver legs.

Congratulations to George Miller on his Silver C, to Vic Roberts and Peter Glennie on going solo, Peter for the second time after a 16 year break, and to those who collected trophies at the annual dinner-dance, especially Brian Scougall whose Diamond distance and other flights gave him three.

This year we have an increase in members, launches and course members and our fleet is complete with two of everything (K-13, K-8 and Sport Vega) plus the Bocian. The spare K-13 we are building is almost complete.

The bar has been given a refit. Winter flying continues on Tuesdays as well as at weekends, and from the start of the courses at the end of March we resume seven day operations and welcome visitors.

M.J.R.

SHALBOURNE (Rivar Hill, Nr Hungerford)

We had 99 club flying days, which is high for a mainly weekend operation, and 32 trial instruction evenings.

With the help of the Sports Council we are buying two training aircraft. This will reduce our debt to our patrons Monty and Wilf who have supported us since our inception in 1979 by renting us aircraft.

We will congratulate Jonathan Mills when the weather allows him to complete the flying part of his assistant Cat course.

R.S.

SHROPSHIRE SOARING (Sleap Airfield)

We have had many wave flights over the last year, some to 26000ft and cross-countries as far as the Welsh coast.

Hans and Litta Wiesenthal sadly have left us after a five year stay. Hans packed in 500hrs, coming with a Mosquito and leaving with a Ventus, and showed us what a 15m ship could do. Litta, the perfect crewperson, was a great asset

to the club and our thanks to them for all their inspiring efforts.

Hans Wiesenthal, Allan Levi and Dan Hicks went to Fuentemilanos in Spain in July and on one day flew 750, 500 and 300km respectively.

Our horizon at Sleap is now tentatively five years. Anyone got a spare airfield?

P.L.U.M.

SOUTH WALES (Usk)

Our twin-drum winch is being fitted with professionally built, re-designed boxes which we hope will give better launches. We thank Peter France and others for this work.

October gave us training days with some wave most weekends, whilst November brought 1.5 times the average rainfall, leaving an often waterlogged field. On November 15 Angelos Yorkas contacted 4-6kt wave over Hereford climbing to 19000ft.

K.A.B.

STRATFORD-ON-AVON (Long Marston Airfield)

An end of season four day task event produced very creditable cross-country flights, particularly from the wooden ships with Phil Potter (Skylark 3) completing a speed 100km triangle and Frank Jeynes a superb 180km O/R in the club K-8.

Our special thanks to retiring chairman Peter Candy for his superb leadership over the years. Tony Edlin has taken over, demonstrating his seemingly boundless commitment to the club.

Congratulations to Sharon Edlin on going solo and to Chris Morris for his Gold height at Feshiebridge. Our wave hunters are planning a return trip to Portsmouth in the spring.

C.M.

STRUBBY (Strubby Airfield)

Following a shaky start to 1986 when closure was considered, we now have a sound financial base, equipment and aircraft in good order and a solid band of keen pilots. Our thanks to those who made it possible.

Congratulations to John Bachelor and Colin Whatmough on going solo and to John Storry on his Silver C. Alan Ely's wave exploits are an inspiration to us all and we still haven't figured out how CFI Phil Becker can fly cross-country into wind when we can't manage it downwind!

Past members are welcome to visit us, especially those from the Bardney days.

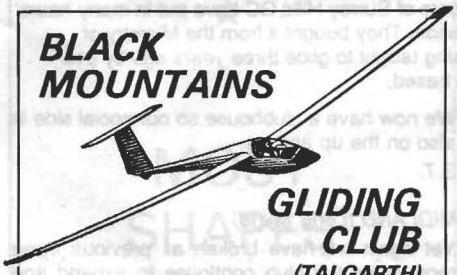
P.J.T.

SWINDON (Sandhill Farm)

We are now well established at Sandhill Farm with both winch and aerotow facilities and can look forward to the season with optimism rather than desperation.

Last year we achieved our first cross-countries from the site. Congratulations to our three new instructors, Les Clark, Steve Parsonage and Jim Whelan, and to Kevin Hale who resoloed after a two year lay-off.

BLACK MOUNTAINS GLIDING CLUB (TALGARTH)



Situated in the Brecon Beacons National Park amongst the highest mountains in South Wales, Talgarth has more soarable days than any other UK gliding club. Longest ridge routes; wave in all wind directions.

In 1985 the Club average flight duration was 1½ hours. Surely the premier location for any soaring course. Courses run from mid March to mid October and include holidays, introductory and advanced mountain flying cross country courses.

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Powys HR3 5NT
Tel: 04974-583/0874-711254

We have the use of some adjoining land for a NE-SW strip. The major task is to dismantle our hangar from South Marston and re-erect it on the new site.

P.M.

TRENT (Kirton-in-Lindsey Airfield)

Ten members had a highly successful trip to Aboyne in September which looks like becoming a regular pilgrimage. Everyone had a wave flight of over 10000ft during six good days with Diamond height for Bob Baines and Mick Ward and Gold height for Mike Phillips, Brian Guest, Steve Crust and Andy Cullum.

We have two more instructors, John Williams and Paul Holland, John being the club's youngest at 23.

Congratulations to Vin Geraghty on his Bronze C and to Earl Masztalar on going solo and quickly converting to the K-8.

L.W.

ULSTER (Bellarena)

Jim Weston and Jeremy Bryson are representing Ireland in the World Championships and we wish them every succes.

Our Citabria tug is for sale after many years' good service as well as a DG-400/17 and a PIK 20B.

James McLeod, our 73 year-old veteran who soloed last year, gained his Silver height on November 30 with a wave climb to 7000ft.

B.B.

VINTAGE

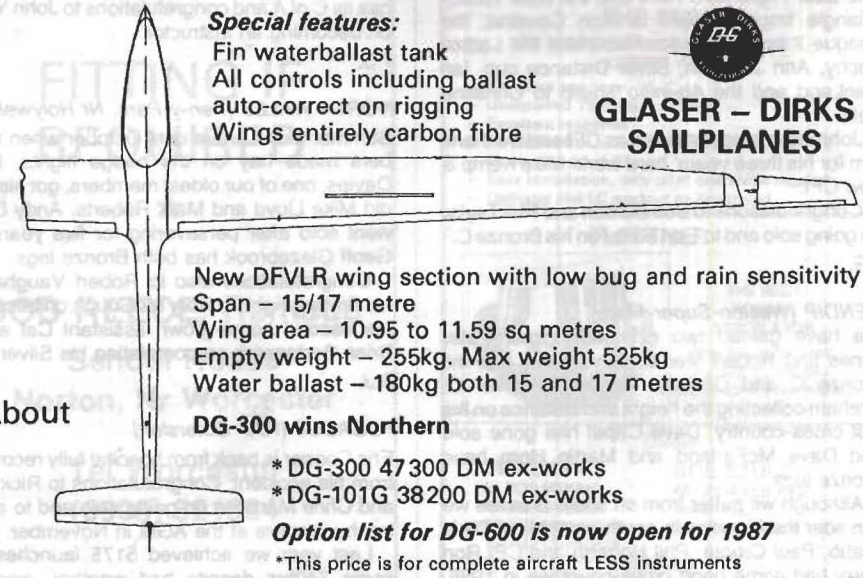
The annual Vintage Glider Club performance prizes went to Werner Tschorn (Germany) for a 310km triangle from Frechen, near Cologne, in a Weihe and Lou Frank and Norman James (T-21) for 210km from HusBos to the Isle of Wight. Restoration prizes were won by Michael Beach (Gull 3), Bill Manuel (building again his 1931 Crested Wren), David Strange (K-3), Hughes Beslier, France (Arsenel 4111), Christian Ravel and Pierre Plane, France (Air 102) and Paul Ser-

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ries and Münster Oldtimer Club, Germany (Goevier 2).

A BAC 7, Gull 3 replica and Dagling in Britain and a Rhönadler and Habicht in Germany should all fly this year. Work is also proceeding on a Grunau 8 two-seater, a Grunau 9 primary, the V-20 and a Sky in Holland – it was flown to 1st place by Philip Wills in the 1952 World Championships in Spain.

Our thanks to Peter Woodcock and Sally Shephard for selling £1600 worth of our goods at the International Rally at Lasham.

We have two International Rallies this year in Germany and Austria and our National Rally is at Camphill. Details from the secretary, Geoff Moore, Aerwa, Shootersway Lane, Berkhamstead, Herts., Tel. 04427 73258.

C.W.

WELLAND (Middleton)

Congratulations to Martin McEvaddy, Dave Strachan, Wallace Wilson and Bernard Underwood on their Bronze Cs; to Bert Creighton on going solo; to Andrew Parrish and Dave Stanbridge on resoloing and to Alan Bushnell, Barry Chadwick and Keith Scott on gaining their assistant instructor ratings to give us seven instructors.

We wish our chairman, Don Martin, a speedy recovery. Work on our new winch and general refurbishment of equipment continues during the winter.

R.H.S.

WOLDS (Pocklington)

Awards at the annual dinner-dance in November included Sue Room (most progress), Derek Roddie and Mike Thompson (most meritorious flight) and Club Ladder to Alan Hunter who also tied for the Longest Flight cup with Les Cooper.

Our annual programme of Bronze C lectures is well underway, run as usual by Roy Andrew.

We seem to have located a source for that bogey of Falke Stamo engines – pistons – and will be glad to let anyone have the information.

The Wolds Two-seater Competition will be from August 16-22 and handouts will be available soon.

D.B.

WREKIN (RAF Cosford)

The MT is improving now that we have finished the Beaver. Our thanks to Des for delivering it and a special thank you to Pete Evans and John Phillips who spent eight consecutive weekends building it.

Congratulations to M. Salt on going solo, to I. Salt on converting to the K-18 and D. Rhodes on his Bronze leg.

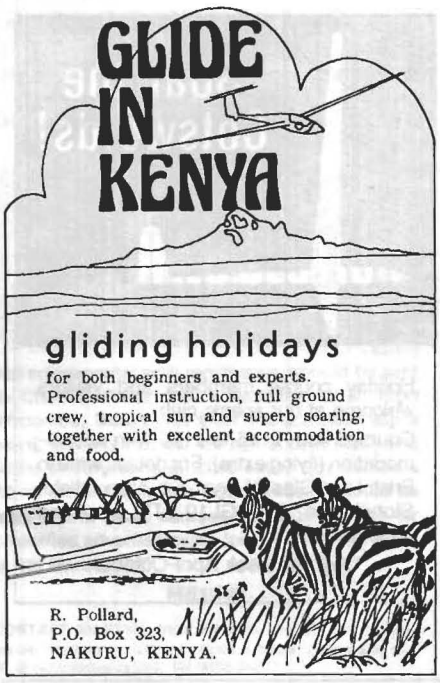
J.A.

WYVERN (RAF Upavon)

The October expedition to Aboyne was a great success. Congratulations to Steve Welch who reached 24500ft, a possible club record, to Mike Law and Don Scarfe on Diamond heights with 20050ft and 20400ft respectively and to Pete Brennen on Gold height to 15000ft. Commiserations to Pete Howarth who missed his Diamond by 100ft after climbing to 19700ft.

Best wishes to Paul Shaw who leaves for Germany in the New Year.

D.B.



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Black hedged and grey and white with snow
Winter ridge soaring with waves on high
Alone on the wind with Gold in the sky.

High on the hill I try in vain
to reach a wave, that height to gain
Slots that open and move away
Closing the gaps for another day.

High summer and climbing blind
Groping for Gold or a Diamond find
Thunder and lightning as gyros sing
Beaten by ice on perspex and wing.

High on the Mynd perchance to dream
of near miss stories of Gold agleam
Like fisherman's tales of derring-do
The yarns of the bar are (almost) true.

High in the blue of Australia fair
I went digging for Gold and Diamonds there
Blue mountains and forest and desert too
The drought and the distance but no breakthrough.

High on the downs near Cissbury Ring
The summer sun glints on a distant wing
An out and return and a hope for Gold
Ends far from home, frustration untold.

High on the launch at Sutton Bank
The tow plane out on the starboard flank
An iced up Ottfur and hailstones too
Wave slot that beckoned is lost to view.

High on the mountains of Wales I flew
Looking for wave and that Gold breakthrough
I never found it
No longer can try
Grounded for keeps when my luck ran dry.

Doug Carter

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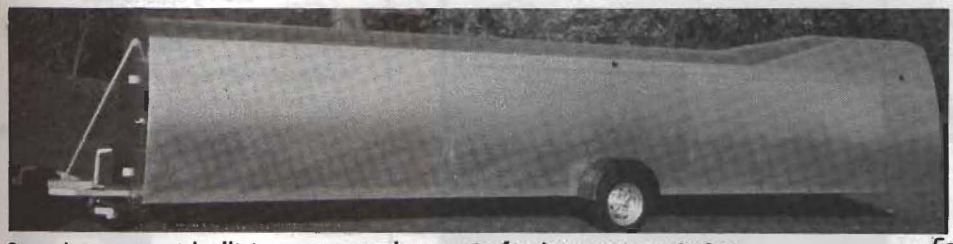
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