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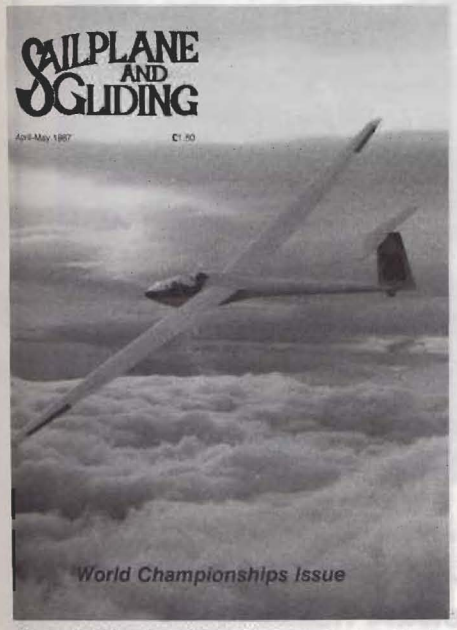
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Cover: Jack Stephen, flying a Bocian, photographed his brother Will in his DG-100 at Aboyne in wave.

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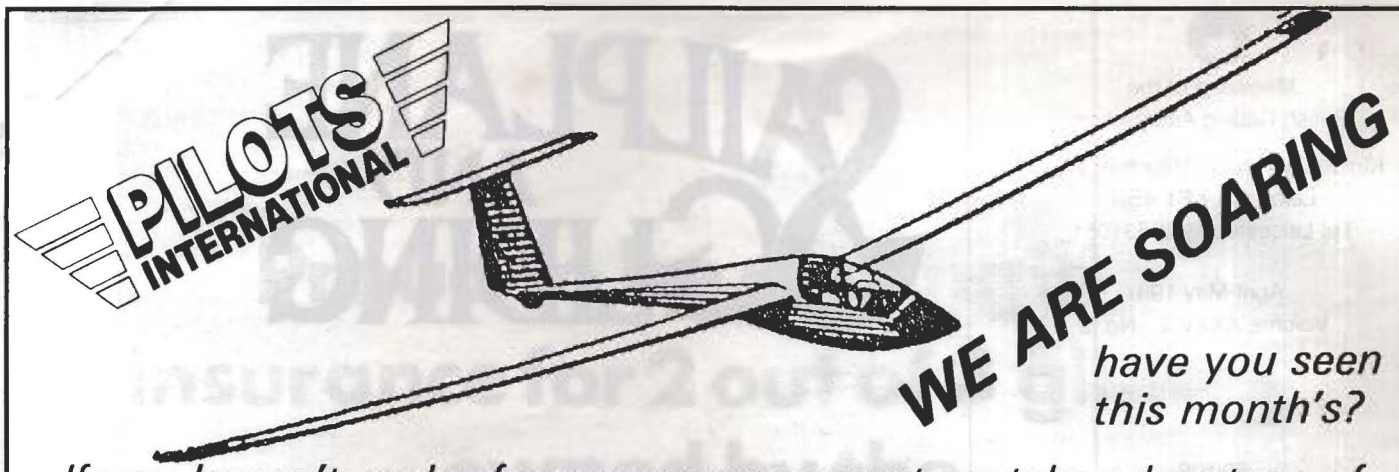
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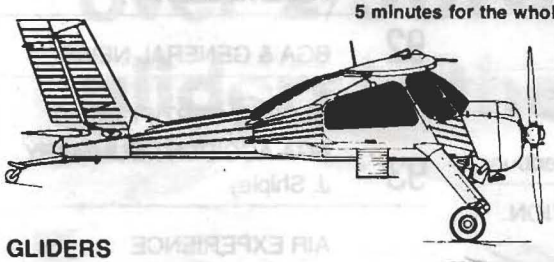
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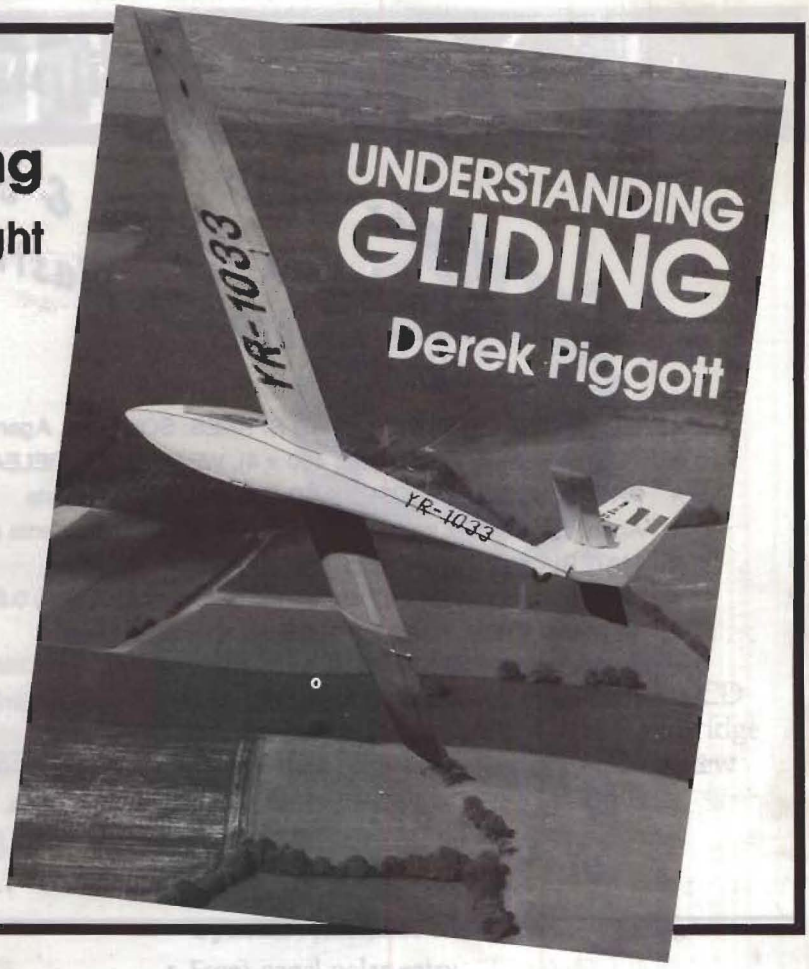
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Peter Moran

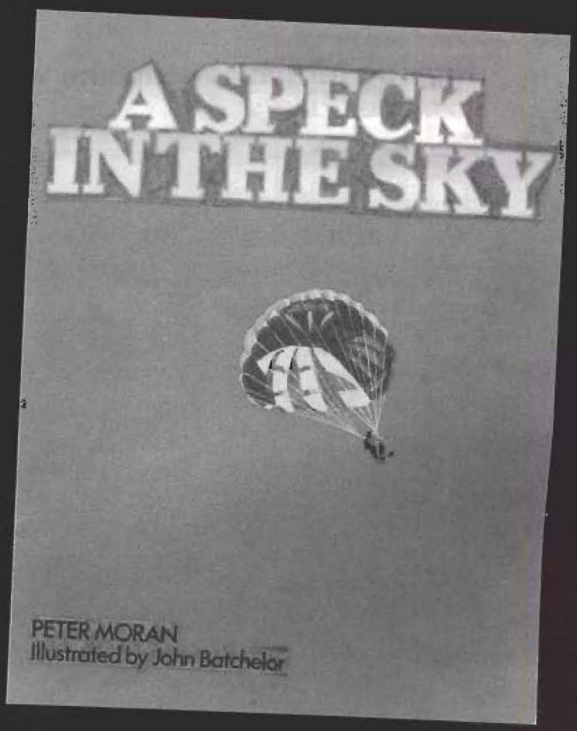
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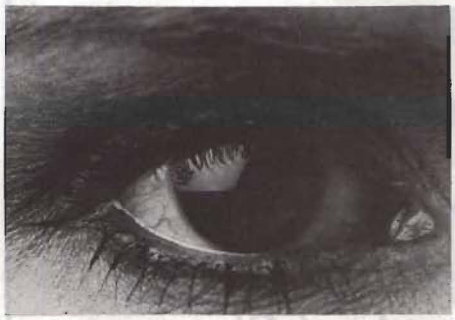
IT COULD HAPPEN TO YOU

In the February issue, p23, Bill Scull, BGA director of operations, wrote about a common cause of accident – "failure to take over control in time". In this one he looks briefly at the most likely ways you might die or kill someone else.

No one deliberately sets out to have an accident; worse still, very few believe that it can happen to them. And yet many people become a statistic – that is an accident statistic. Is there any way in which we can get the message across that "it could happen to you!" We've tried education and the shock-horror approach but the accident rate remains substantially the same.

One ray of hope in this depressing scenario is the realisation that with sufficient effort to prevent a particular sort of accident it does appear to be possible to do so. So here goes:

Collisions



Keep a good look-out.



Above and at the top of the next column, two ASW-20s after a mid-air collision during the 1984 Open Class Nationals at Lasham. The crowded situation near the gate and startline of a competition carries a higher risk than usual but most collisions take place between the only two aircraft in the vicinity.



What if you can't bale out? The chance of survival depends on the extent to which the aircraft or glider is damaged. In this case an element of luck plus a strong instinct to survive and a good deal of skill brought the Super Cub photographed below to a safe landing.

The main contributary factor – each aircraft in the others' blind spot. In 1986 there were two mid-air collisions of no consequence at all:

- Between a tug (towing a glider) and a Ventus; the glider made a slight dent on the tug's leading edge with a paintmark as witness!



Damaged Super Cub after a collision with a Nimbus 2.





Two towplane upset accidents. Left, the Condor at Portmoak is one the pilot walked away from – in haste! Right, a burnt out tug. But whether the tug catches fire or not is academic – the impact is not usually survivable.

- One glider was spinning; its rudder clipped the nose of another glider (minding its own business) below.

On the maps it says "Area of Intense Gliding Activity"; surely this warrants considerable attention to look-out. A clearing turn for spinning is only likely to ensure the airspace below is clear for a few seconds. An aircraft half-a-mile away at 60kt will pass you in 30 seconds. The airmiss statistics bear out that inadequate clearing turns/look-out are a fairly common cause of near miss – or hit!

Towplane Upsets

When did the last one occur? You've forgotten! Despite all the efforts to design an automatic hook which will release before the situation becomes critical there has not been any success so far. The only factors over which we have control are the use of **nose-hooks and longer ropes.**

Think of the implications on the aerotows you do. Are you too high? Just above the slipstream is about right – go down a bit and check it.

Launch Failures/Cable Breaks

After basic training one usually has less cable breaks or launch failures. But think about it for a moment. Of all the cable breaks you've had how often have you turned? If the answer is "more often than not" then the likelihood is you have a strong disposition towards making a turn – it's a reflex action!

The message for launch failures or cable breaks is loud and clear. The crash from a straight-ahead landing is likely to be much less serious than if you turn. Turning low down can **seriously damage your health** – and it's quicker than cigarettes. (See the photograph, bottom left.)

The factors in the K-13 accident at the Long Mynd, photographed below, bottom right, are not certain; an element of failure to take control in time, poor communication (who has control?) and, possibly, freezing on the controls. There are many accidents which don't have a single, simple, cause.

The Message

I believe the message is loud and clear! You need an antidote for your hazardous thoughts. Drilling yourself sufficiently in the "antidote" thought pattern might just stop you becoming a statistic:

Hazardous Thought!	Antidote
Cable breaks "I am a bit low but I'll get most way back to the launch point."	A long walk is much better than a broken glider – or body!
Aerotowing "I don't seem to be able to keep low enough – not to worry he's a good tug pilot."	No tug pilot is good enough to deal with a glider that gets too high and then diverges – **his life is in your hands.**
The Crowded Situation "Blast! he's disappeared in a blind spot but I can rely on Joe – he keeps a good look-out."	Don't rely on anyones' look-out – you may be in their blind spot too.
Or not so Crowded "This is a super thermal I wonder why no one has come to join me?"	A thermal turn take 20 or so seconds. "How many turns since I last looked out?"

. . . and so on!

Use your imagination. Think of the risks and the habits that mean you might become a statistic.

Below left and right relate to accidents as a result of a launch failure or cable break. Left, the instructor in this K-2 at Ripley was not sure he could land straight ahead – the site was a restricted one. So he turned at 150ft – and spun. He was seriously injured and the "student" on his first flight was killed. Right, the launch in this K-13 at the Long Mynd was abandoned at 500ft or so in a 20kt wind with more than enough room ahead. The instructor survived but, needless to say, the student was killed.





TAIL FEATHERS

Polar Exploration, or how about 100 to 1?

For nearly 30 seasons, after the low, pale sun passes the winter solstice (December 21 to the unwashed), one of my most consistent pleasures has been to sit back in an armchair with a ream of graphpaper, a glass of Taylor's vintage port by



Platypus with his graphpaper and port.

my elbow, converting those start lift/drag diagrams into summer daydreams: *"now, assuming the lift distribution is as per Admiral Goodhart's Ostiv (1965) paper, and working on a wing-loading of 7.6lbs/sqft, I should climb at 2.6kt and achieve a ground speed to Sutton Bank of 73km/h, so I shan't make it home before 1855. Hm, let's try it without water" (take another swig of port as if to emphasise the point, and starts on a virgin page of graphpaper . . .)*

This used to take days and days. As a way of numbing the brain it beats watching TV, that's for sure.

However, carefully tempering theory with practice, I also made a point of analysing the speeds of the finishers in National Championships. Oh dear me; I found in the 1960s that the achieved cross-country speeds bore little relation to the theory. Generally the pilots were getting round slower than I calculated they should. Why?

Well, there are a mass of possible reasons, one of which is that the manufacturers in those days were lying in their teeth when they published their polar curves. Nowadays it does not pay to overdo this: the pilot of a spuriously-rated glider will get a pasting in a handicapped contest – *ie* any Regionals – and will not thank the manufacturers for idle boasts about performance.



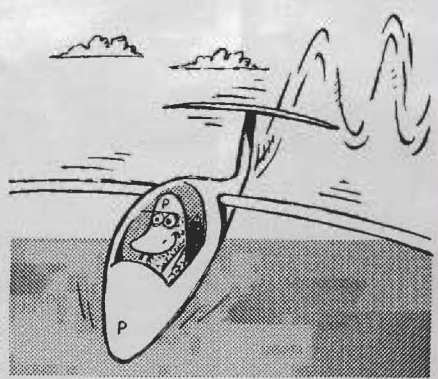
Generally the pilots were getting round slower.

However, even after allowing for this only a few pilots delivered what the theory said they should. Having to take a few weak thermals in order to cross a difficult patch has a devastating effect on groundspeed, especially on a windward leg. Deviations from track to get a useful thermal also erode the achieved speed.

Having to waste time sampling mediocre thermals before finding a good one is another penalty of lower-performance gliders. Finally there is sink between thermals, which may cover a larger area than lift between thermals, on the assumption that what goes up in the thermals has got to come down somewhere. All this conspires to push your actual achievement below the theoretical level.

Nowadays it's very different. People are covering the ground at speeds well in excess of theoretical levels, especially in the superships. For example in theory you need an average rate of climb of at least 6kt in a Nimbus 3 or ASW-22 to achieve 110km/h over the ground, but such speeds have been achieved with thermals of about 4kt or less.

The reason is simple. The theory assumes height is gained solely by circling, and that there is neither lift nor sink between thermals. We have known that not to be so for 50 years or more, but only recently does it begin to make a really big difference. The theory also assumes all thermals are the same, whereas we know there are good, bad and indifferent thermals, from which the pilot with the flattest polar is able to make the most ruthless choice, discarding all but the best and treating the weaker ones as an opportunity to top up energy by dolphining. However it is the distribution of lift and sink between climbs that is the key, or so I guess.



Top up energy by dolphining.

With the purpose of seeing how much difference this can make I modelled a very simple dolphin-flight. I have decided to update my armchairing by computerising the graphpaper – and cutting down on the port, incidentally.

In this little exercise (sums tucked away at the bottom of the page, to spare those readers whose orbs look like sheep's eyeballs in aspic the moment a row of figures appears on the page) I imagined two gliders, a modern supership and a golden oldie, to be traversing first an area of 2kt sink*, then an area of 2kt lift, each zone being a kilometre wide. (Sorry about the melange of metric and imperial measures: it isn't my fault that we mix them all up in this country.) The object is compare the height loss in each case with that achieved in still air, and to compare the gain from dolphining that their respective pilots enjoy. Each glider is assumed to be attempting to maximise its glide angle, and to be capable of dolphining instantaneously from high to low speed – which is impossible, but never mind.

BENEFITS OF DOLPHIN FLIGHT FOR MODERN GLIDERS
1950s and 1980s Open Class Gliders compared

Glider A (Supership)
Max Glide 58

	Dolphin flight *sink*	*lift*	still air
Ambient lift/sink ft/min	−200	200	0
Distance km	1.00	1.00	2.00
Speed to fly km/h	140	74	100
Duration min	0.43	0.81	1.20
Ambient gain/loss ft	−86	162	0
Glider sink/rate ft/min	−160	−98	−95
Glider gain/loss ft	−69	−79	−114
Total gain/loss ft	−154	83	−114

Dolphining net loss ft −72

Effective L/D 92

Glider B (Golden Oldie)
Max Glide 32

	Dolphin flight *sink*	*lift*	still air
Ambient lift/sink ft/min	−200	200	0
Distance km	1.00	1.00	2.00
Speed to fly km/h	100	70	74
Duration min	0.60	0.86	1.62
Ambient gain/loss ft	−120	171	0
Glider sink/rate ft/min	−220	−127	−127
Glider gain/loss ft	−132	−109	−206
Total gain/loss ft	−252	63	−206

Dolphining net loss ft −189

Effective L/D 35

Still air advantage Supership vs Golden Oldie 81%
Dolphining advantage Supership vs Golden Oldie 166%

**Remember, this is the speed of ascent/descent of the air, not the glider: your achieved rate of climb if you circled in the lift portions would only be 100 to 150ft/min. The BST (British Standard Thermal, which is the basis of our handicapping system) is assumed to take you up at around 240ft/min.*

Double your L/D!!

What emerges is that by accurate dolphining the supership loses only 72ft, whereas if it had flown at a constant Max glide speed of 100km/h, or 54kt, it would have lost 114ft (exactly the same as it would have lost in still air, since it would have spent the same amount of time in the rising air as it did in the sinking air; the two cancel out.)

Obviously to lose only 72ft instead of 114ft over a given distance is the same as increasing your glider angle by 114/72 or a factor of 1:58. You are now getting a respectable 92:1, which is satisfactory to all but the greediest of armchair pundits. All right, if you are really greedy look at ambient sink and lift of 250ft/min. The supership's effective glide angle improves to 126, more than double the still air Max glide.



Very limited speed range.

However, even without doing any further calculations you can immediately conclude that a glider with a very limited speed range will *not* enjoy that increase of its glide ratio: even if it had 58:1 at 100km/h, but was stuck at that speed, there would be no increment whatever, since dolphining would not occur.

"An unfair advantage in still air becomes positively grotesque if vertical air movements are considered."

Glider B, (excellent value for money on the second-hand market, I hasten to put in, to avoid a flood of indignant letters) is, say, a Skylark 3, delivering a glide ratio of 32. However, because of its much narrower speed range, its passage through the same sink and lift, dolphining to the best of its pilot's ability, only reduces the height loss from 206 to 189ft. This represents an improvement in effective glide ratio of only 9% to 35:1. So the supership, which started out with a glide ratio a mere 81% better, ends up with advantage of 166%. An unfair advantage in still air becomes positively grotesque if vertical air movements are considered. And it becomes more monstrous if the vertical air movements are



There ain't no justice.

increased: if they are 250ft/min the supership's advantage becomes 238%. The impossibility of dolphining instantaneously from one speed to another may reduce this gap a bit, but there is no doubt the modern glider benefits to an extent for which handicapping, based on the assumption of still air between thermals, does not compensate.

To him that hath shall be given, but from him that hath not shall be taken away even that which he hath. Which, being translated, means: there ain't no justice. Here endeth the lesson.

SOMETHING SPECIAL

Brennig describes the most enjoyable flight in his life

It's nice to do a long flight or break a record, but so much single-minded dedication is required to the task at hand that you can't soak up much of the pleasure which the environment offers. It is nice to think that the most enjoyable flight may not involve much in the way of achievement, but rather the satisfaction of a mystery solved and an appreciation of the magical qualities of flight.

At Fuentemilanos on November 2 a cu nim of modest proportions was advancing slowly on the airfield from the west, so we all got launched before it, planning to do a flight before it arrived or get back after it had passed through.

There was no trouble getting to cloudbase at 12000ft when a voice over the radio said all English speaking pilots to stay within the range of the airfield. I thought, this is plainly discriminating against us Brits, and to hell with that, so I shot off to Villatoro 50 miles to the SW. This leg was under an enormous cloud street, but hardly any of it worked and fitfully at that, but on the return leg, which was more westerly as Fuentemilanos was now under the storm, there was a solid 10kt lift all the way while I was still climbing at 140kt (=170kts true airspeed).

Swinging round to the west of the airfield I now started to think how I was going to get back in, and my initial plan was to go north to Segovia which would give a nice departure fix so I could be sure to get back to the field, even though there was poor visibility from heavy rain. But in this area there was an abundant area of weak lift, so I continued to circle in large, wide turns and after a while went towards the mountains just ahead of the front. A little beyond them I found 10kt lift to 16500ft ahead of the cloud and considered breaking through Madrid TMA to Quatros Vientos giving flight safety as my explanation, but I opened brakes and descended to cloudbase at 12000ft where there was just enough visibility to get an idea of how to fly home. As I flew under the cloud at first there was lightning to the left, then lightning to the right, which reassured me. Then a whole display in front like festoons of virginia creeper. Not being accompanied by any sound it was very pleasant to look at, like finding a lion behaving like a gentle cat.

Back over the airfield the sky was cool, clear and expansive. I did a few wide circuits in the smooth still air and landed. Everyone was fresh and cheerful as the cool air after the oppresive heat made them feel more comfortable. The squall had blown all the furniture around on the terrace and there had been a rush to secure the gliders and cover the canopies, but no damage had been done.

I remember in 1936, aged ten, when my parents took me to Dunstable and I thought "That's for me". My most fantastic dreams were more than realised.

I did not need a hot ship, hardly any skill was required. The sky just buried me in its magical riches as I drifted gently, dream-like through the rain washed air.

BRENNIG JAMES

* * *

Would anyone else like to tell us about their most enjoyable flight in not more than 750 words? We would very much like to hear from readers and will print their accounts in future issues. Ed

VICKY'S POEM

After John Williamson gave nine year-old Vicky North an 11000ft flight in the Twin Astir at Feshiebridge she was so impressed she went away and wrote this poem.

When you're in a glider
you feel as free as a bird.
Sometimes like a parrot
which is absurd.
Sometimes like an owl
which is very wise.
But mostly like an
eagle soaring in the skies.

John says he isn't sure whether the parrot was him! Vicky's parents fly at HusBos.

PRESSING ON

In my last article we discovered how to centre quickly in a thermal and how to stay centred. Now it is time to apply this skill to the business of going cross-country . . .

Setting Off. For the inexperienced the decision to turn one's back on the airfield is quite momentous. Whilst developing your thermalling skill you ventured further and further from the site, always maintaining enough height for a quick glide home if necessary. At first you will have been surprised at how little was needed, even when you had been drifted a bit far downwind. As you grew more confident in your judgment you found that two, three or even five miles was not too far. You may have used a calculator to do the sums for you – I hesitate to say "should" in case I'm accused of commercial bias! – and this practice will certainly stand you in good stead later, as we shall see. But the first time you fly deliberately out of gliding range of base is memorable indeed.

It would be foolish to take this first step without being reasonably sure that you will find another thermal. The less experienced can only gain this assurance by indulging in a little local soaring first. It is a good rule to have found at least three separate thermals before deciding to set off and to have climbed to the local cloudbase, which should be at least 4000ft agl. Three thermals within four miles of base should mean an acceptable distribution or pattern of thermals, provided the terrain on course is similar to that at base, and that the visible cloud signs are not unfavourable. The more experienced will be able to make this judgment more quickly by studying the sky – the cloud shapes and patterns – or by reference to previous flights in similar conditions.

Stepping Stones. Your decision to set off will be made easier if the proposed flight – say a Silver distance attempt – is tackled in easy stages. To set off into fifty miles of unknowns can be quite daunting. But an initial goal of, say, ten miles to an area of known good fields, or to a friendly airfield, will be much easier to contemplate. You would need advice about the field situation and need to know what joining procedures might be relevant at the airfield. But with this knowledge it is a simple matter to estimate the height needed to get to the area with a safe margin. Having arrived you can slip back into local soaring mode until you find the next thermal. "Local" soaring is much less stressful than a desperate search for lift in a totally strange area and you should stay within range of the first goal area until it is safe to press on to the next. This second decision to press on is much less traumatic than the first and in no time at all you are happily "local" soaring again and beginning to think that your ultimate goal is not so far away after all! But even taken in easy stages you still have to find the thermals, avoid undue sink, know where you are, and be ready to land out if it goes wrong.

Finding The Thermals – Sky Reading. You must learn to look both up and down in your search for thermals. The sky and the clouds are your best guide above about 2500ft. Intelligent sky reading is very important. You must learn to recognise the cloud which is growing and will still be active when you reach it. You can't usually see a cloud actually getting larger – the changes are too slow for that. But you can get a good impression by observing the clouds ahead each time they come into view as you circle. Each turn should take between 15 and 18 seconds – remember the angle of bank? – and in that time an active cloud will have changed shape noticeably.

Next you must estimate how far away it is, how long it will take you to reach it and what height you will lose getting to it. Find the shadow of your chosen cloud to make the best estimate of distance. It is very difficult to judge the distance to a cloud directly but its shadow four miles away viewed from 4000ft will appear to be about halfway to the horizon. How long to get there? Say five minutes for four miles at the sort of speed at which you would expect to fly your K-6. As for the height loss, this is where your calculator might come in handy. But you can guess about five miles per thousand feet in wood, six miles in glass, seven miles in super-glass. In still air, of course. You *would* need the calculator to make a proper allowance for significant wind.

A vigorous thermal has a life span of about thirty minutes of which probably a third is in the decaying stage

Finally you should realise that a small cumulus marking the top of a vigorous thermal has a total life span of about thirty minutes, of which probably a third is in the decaying stage. Arrival under a decaying cloud has its own peculiar problems, as we shall see in a moment. Now you can see that the decision to go to a specific cloud is subject to quite critical timing and you would be wise to be flexible in your judgment, to choose a route which gives you more than one option.

– And Trigger Spots. Below 2500ft you should turn your attention to the ground for clues to the whereabouts of your next thermal. In all but the most uniform of circumstances the ground heats unevenly, depending on the direction of any slopes, the angle of the sun, surface moisture, vegetation, soil type and the degree of drainage. The thermal derives from the heated layer of air close above the surface which will tend to be released first from the vicinity of the warmest area – the trigger spot. It then draws in all the warmed air from hundreds of yards around. As you look down try to imagine where you would feel warmest if you were down there. A sunny corner, sheltered from a cool breeze by a hillock or large wood, perhaps. Or a warm, dry ploughed field, a built-up area, a village. Look, too, for tell-tale signs in any smoke. Not that a bonfire would add significantly to the energy in your thermal – a good one involves a mass of tens of thousands of tons of air! But the smoke can often give away the presence of a thermal close by. It may look "dead", holding low to the ground, trailing away directly downwind. Or it may be billowing around, or bending suddenly crosswind, both signs that a thermal is not far away. By keeping your eyes open for these signs you stand a much better chance of finding it.

In any significant wind the base of the thermal could well migrate downwind, swinging this way and that to take in further hot spots, resulting in a sustained thermal. To have the best chance of contacting the thermal from a given trigger spot, therefore, you should approach from directly downwind, being ready to turn left or right as required.

Avoiding The Sink. It takes little imagination to realise that cross-country progress would be much more rapid if you always flew in lift. This article isn't about racing techniques so I won't go into the fine detail of street flying and dolphin soaring. Clearly, if you are able to take advantage of adjacent thermals and clouds, you should do so. Even if you can't fly always in lift you might be able to *not* fly in sink with a little foresight and route planning. All thermals have their corresponding downcurrents. These are usually relatively gentle around the thermal itself, since the displacement air which is forced to descend by virtue of the thermal's upward thrust is spread over a much greater area than the fast rising core. Thus a 6kt thermal may induce a 1kt down-current all around itself. We know that it's going to be there when we press on and we deal with it by speeding up for a few moments until we are through the worst of it.

If you cast your mind back to my last article you will realise that the way to minimise the sink surrounding each thermal is to fly directly towards it, straight across the "contours". You can't usually see the next thermal but you should have a clue in the cloud patterns above. If you think a certain cloud is still growing then fly directly beneath it, not just to one side which is where the sink is *bound* to be. If you encounter sink without any visible clue to where the thermal is then use the wing-tilt to guide you towards the lifting wing, away from the sink. And finally, beware the cascade falling from the decaying cumulus.

You will recall that as the thermal reached its condensation level the cumulus cloud formed. Formation of the water droplets released extra heat back into the air. This was the heat originally taken when the water evaporated to form water vapour in the first place and its release into the

thermal gave a boost to the lift at and above cloudbase. When the cumulus has stopped growing the droplets once more start to evaporate, using up heat in the process. When you use up heat something has to cool down. In this case it is the air itself, and cool air will descend! As it descends, it warms at the dry adiabatic rate, which you will recall is 3°C/1000ft.

But there are good thermals around, which implies that the airmass is unstable. The ambient air in an unstable airmass is cooler as you go up by slightly *more* than 3°C/1000ft. And, of course, it is warmer by the same amount as you go down.

It is this down-current that you should watch out for and avoid like the plague!

So the down-current caused by the evaporating cloud will find itself surrounded by an airmass which is becoming progressively warmer than itself. It continues downards – in extreme conditions it may even accelerate – like an un-thermal, possibly forming much the same doughnut shape as did the thermal that spawned it half an hour earlier. It is this down-current that you should watch out for and avoid like the plague! Your clue is the evaporating cloud of ten minutes previously. Be sure to have spotted it and remembered where it was. It won't be there when you fly that way but it's cascade will be!

Navigation. Along with all the problems of finding lift, avoiding sink, keeping a good look-out and generally flying your sailplane, you also have to know where you are going! The airspace in this country is too congested for you to feel free to wander where you will. You have to navigate.

Navigation in gliders is a matter of map reading, which is simple enough so long as you know where you are. The occasions when you might have to do dead-reckoning, work out vectors, estimate time of arrival, and all the things that go with power flying, are so rare as to not be worth worrying you with here. Let's stick to map reading.

The first essential is that you should be able to see where you are going. For your early cross-countries the visibility should be at least ten miles, which means that there should be a reasonable horizon and that you can see clearly most of the way to it. The worse the visibility the harder the task. Next you should, in your flight planning, have noted the significant visual features that occur on your route, such as lakes, rivers, motorways and large towns, and the positional relationship between them. You may need advice with this from someone who is experienced because features which look prominent on your map may not be so when viewed from the air. Ordinary roads all look the same, as do small towns and villages. Railways, clear enough on your map, can be very hard to see unless you are directly above them. Surprisingly, disused railways, printed as a series of insignificant dashes on the air map, are easier to spot than those that are still active because they nearly always have overgrown bushes along the length of them which stand out as bold lines across the otherwise chaotic muddle of hedges, streams and roads. Knowing what to expect, and when, gives you a better chance of spotting it when you get there.

Be sure to fly in the right general direction for your course. Accurate compass flying is rarely necessary in gliders but as you come near the top of each thermal, check and check again the direction in which you should depart. Choose a likely cloud within 30° of that direction and, as you fly, look ahead for your expected landmarks. You need to appreciate how far away things are and what they might look like. In the UK you can rarely see details at more than twenty miles. Ten miles is pretty near your normal horizon and even at that range you can't see the pattern of towns and roads because of the flat perspective. The view changes, of course, with height. A feature may look far away from 2000ft and almost under the nose from 5000ft, ten minutes later.

While you know where you are make a point of checking with your map very frequently. This may not be universal advice but, with many thousands of miles of cross-country behind me, I still find myself referring to the map every few minutes. Practical glider navigation is a matter of moving from one landmark to another, trying to pick up the next before the last is lost to view. Even over familiar country I want to cross-check the relationship of *this* town and *that* landmark, to confirm my impression of orientation with the direction of the sun, to be sure of the optimum direction in which to press on next. Even so there comes a time when one is temporarily uncertain of one's position – which means *lost!* What happens next is down to you.

First, stay calm and try to apply simple logic. Search the area around you for a feature, or combination of features, which would be shown on the map you are using. Then think back to where you were last absolutely sure of your position. Estimate about 25 to 30 miles flown (if a relative novice) for each hour since then, and then scan the map in the appropriate place for the landmark features you have seen outside. Do NOT try to do it the other way round, by "knowing" where you are, and insisting to yourself that the ground is at fault because it doesn't have the features you "know" are there somewhere!

One pilot, from a continent where the landmarks are further apart and perhaps less confusing, set off eastwards to fly to Cambridge. Not wishing to admit to any uncertainty, even to himself, he reported his position confidently every so often. Eventually, having passed "Aylesbury", "Luton", "Baldock" and "Royston", he admitted to some confusion, being unable to identify a large town with a river wiggling through it. His crew, armed with the "facts" of his previous progress, projected his flight forwards and decided it *must* be Cambridge. He followed their advice to "go a bit further in the same direction" and land at the airfield he would "soon come to." Half an hour later he landed at Biggin Hill, having failed to recognise Tower Bridge on the way!

So, by taking it in easy steps, keeping one eye on the clouds and the other on the hot-spots below, and not getting lost in the process, you will have got to your goal. But supposing the day goes "blue", or you have to land out. We will contemplate these eventualities in my next article.

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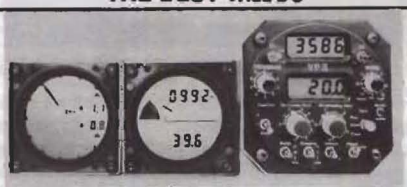
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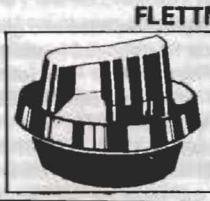
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EVENINGS

WILLIAM MALPAS

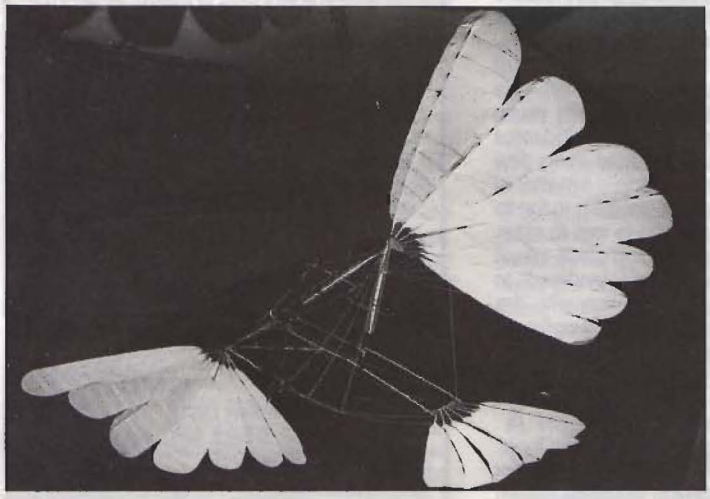
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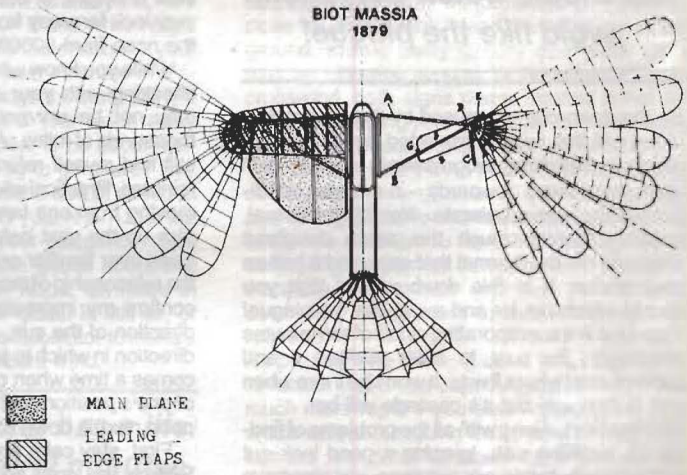
THE BIOT-MASSIA GLIDER MYSTERY

The story of what may be the oldest surviving heavier-than-air device

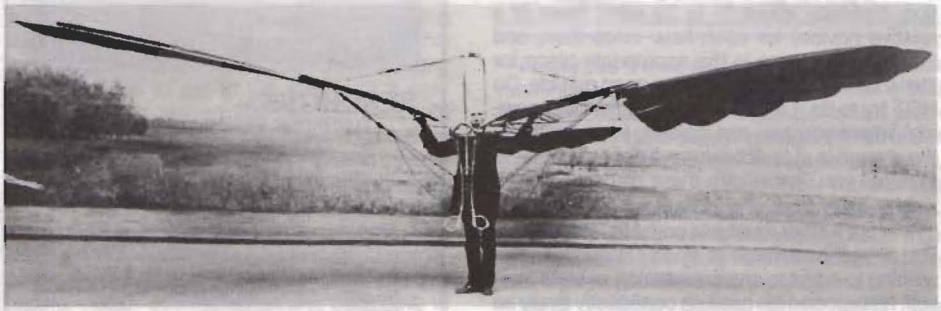
If you visited the *Musèe de l'Air* at Meudon before it moved to Le Bourget, you will remember the Biot "glider". If not, look closely at the picture. The mystery is why it was called a glider. It may well be the oldest surviving heavier-than-air device, but surely its surface area is too small to support its weight and that of a pilot! With all those "feathers" and levers and wires, I was inclined to dismiss it as just another failed ornithopter based on the flapping mode of bird flight, but prepared to admit that it was an attractive example of the bamboo, cloth and wire period of aeronautical design.

The mystery has now been unravelled by a team led by General Lissarrague, until recently director of the *Musèe de l'Air,* but now retired. We know very little about Biot. Between 1861 and 1903 he constructed and flew kites and gliders and for part of the time he attended meetings in Paris of the *Societe Française de Navigation Aerienne*. We have an autograph note by Biot describing a man-carrying kite/glider that he constructed and tried out in 1868, and which carried him aloft for a considerable distance in a gust of wind. We have a photograph of Biot (or maybe Massia) with a later device – our mystery glider. We know that he measured 1.58m and weighed 56kg and that he worked for Alfred Belvalette, a famous coach builder who stored the glider until 1925, when he donated it to the museum. We know even less about Massia, who actually built the glider.





Left: Why was it called a glider? Right, the reconstruction of the central main plane and leading edge flaps.



The mystery glider.

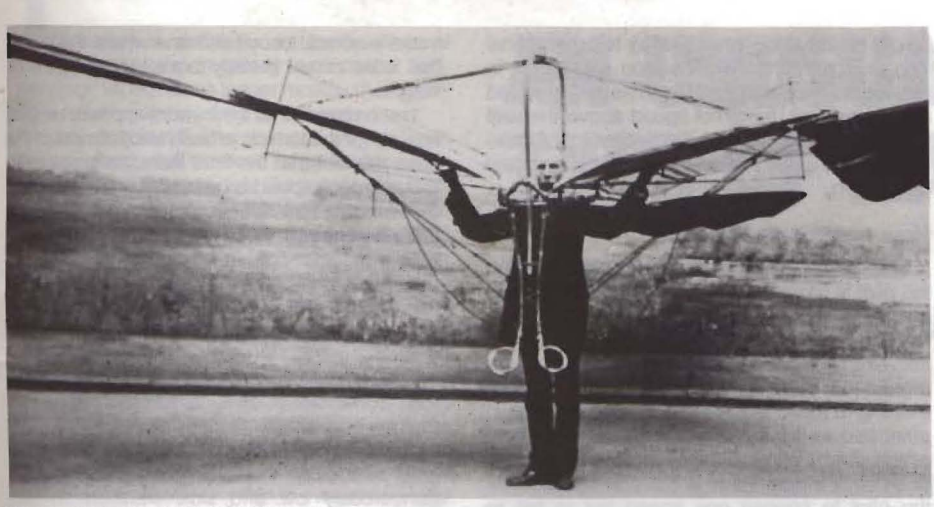
Wing feathers. We have a very short text which describes how to control the glider in the air. This text is very confusing when read in conjunction with the glider as it survives. In addition to grammatical inconsistencies, it is difficult to understand how the "first feather of each wing" can be warped in order to induce a turn. However, it is easier to see that by rotating the wing feathers about vertical axes, the supporting surfaces can be moved fore and aft in order to satisfy the "needs of vertical equilibrium". (We might say today: to control the position of the centre of pressure relative to the centre of gravity.) Apparently, the text was written by Mouillard who collaborated in the design.

In addition to the photograph and the text we have the glider itself, "restored" by the museum staff in 1963. More correctly, we should say that we *thought* we had the glider itself. In fact, as will appear, we have only part of it!

The missing surfaces. General Lissarrague's team made a careful study of Mouillard's text, the photograph and the machine. In particular, they made a number of reproductions of the original photograph, with varying degrees of contrast on the prints. Some of these prints revealed the presence of a central main plane and leading edge flaps, which were almost impossible to see on the original photograph and which were missing when the glider was donated to the museum. Perhaps these elements had disintegrated during the long storage period between 1881 and 1925 or more likely, some, at least, had been removed by Biot during the test flying stage. Nevertheless, as the new prints show, they did exist, and measurements taken from the photo and of the machine itself indicate that the central main plane increased the surface area capable of supporting weight by about 35% over that provided by the surviving surfaces.

The wing loading with the missing main plane now becomes 7.3kg/m², which makes Biot's claim to have made some glides in 1879/80 much more credible.

Leading edge spoilers. It is now possible to make more sense of Mouillard's text, because it is clear that the "first feathers of each wing" are the flaps, which were constructed to be flexible and to be used by the pilot as leading edge spoilers.



The missing surfaces revealed.

A full scale mock-up of the surviving equipment, plus the missing pieces, has been built, and a search was made for a "pilot" having the same weight and height as Biot. A young grandson of General Lissarrague fitted the specification and he demonstrated that the detective work had been well done; that Biot fitted into the framework as in the photograph and that the controls were handy and moved as described.

Heavy landings. Removal of paint that had been applied during the 1963 "restoration" revealed clear signs of minor damage from heavy landings, which tends to support the thesis that this was a real flying machine. The exciting conclusion is that we are indeed in the presence of the oldest surviving heavier-than-air flying machine and that around 1879 Biot made short glides with the machine in a quarry at Clamart near Meudon. This is not an attempt to claim precedence for a Frenchman before Lilienthal, Pilcher, Chanute and the Wrights. No one is crediting Biot with the achievements that were rightfully theirs. This is a remarkable piece of historical detective work that has restored the Biot-Massia glider to credibility. After further work with a replica, the restored glider will go back on display and General Brossier, the new director of the *Musèe de l'Air,* hopes that this will be before the next *Salon du Bourget* this year.

For this article we are indebted to Pegase, *the magazine of the friends of the* Musèe de l'Air *and to the museum for permission to reproduce the photographs.*

K-13 LIVES ON

Many visitors to Germany will be familiar with the enormously busy gliding site at Oerlinghausen at the foot of the Teutoburger Wald not far from Bielefeld. The history of this site is well known and the gliding school world famous.

Fourteen clubs fly from here and on thermic weekends the sight of the sky full of circling gliders is both magnificent and frightening. Tucked away behind a small hangar is a small, inconspicuous set of buildings which has housed Jubi Sportflugzeugbau GMBH since 1968. At first known as Brockmeyer, the firm had its present name since 1980 and from 1979 has been building the K-13 under licence from Alexander Schleicher.

Members of the Pegasus GC at Gütersloh, some 20 miles away, are frequent visitors and have two of their K-13s, the first one having notched up its 5000th launch two weeks before the second was delivered last July.

The firm have now had 50 orders for the K-13 and several have gone to the UK. Herr Krane, the business manager, says they intend building K-13s for as long as people want to buy them. Apart from the K-13s well-known flying qualities, it is valued for its relative lightness, its ease of maintenance and repair and the combination of comfort and good visibility for the instructor.

Schleicher supply the steel tube fuselage and the mechanical parts with the rest made and assembled at Oerlinghausen. Apart from modified wingtips and the option of a tail wheel, the new K-13s have hardly changed from the early models.

But this might change, Jubi have recently taken the third K-13 to be built and refurbished it to a customer's specification that Herr Krane hopes might become standard as a production type or a rebuild, or both, although at the time of writing nothing has been settled. It has standard wings but the fuselage is covered in glass-fibre and tail and nose wheels have been fitted as on the K-21. Since use of the front skid as an emergency aid for extra braking is now impossible it was necessary to fit a main wheel with a disc brake.

ALAN O. JONES

SAFETY BELOW 500FT

Derek says it's important to check the actual airspeed readings every few seconds as the top priority during the final stages of the circuit and approach and asks . . .

When should the speed be increased ready for the landing? It seems that this is still a matter of some controversy amongst instructors. I think there are a number of good reasons for doing it before turning into the base leg and very few if any for leaving it until the base leg itself. Many years ago I witnessed a particularly nasty K-13 accident where the glider became semi stalled for the turn on to the base leg. Until then I was completely open minded and just insisted that it should be at a minimum height of about 3-400ft regardless of where the glider was at the time. Certainly this accident might have been avoided if the pilot had been used to picking up speed opposite the landing area.

Normal cruising speeds are really only adequate for average angles of bank in turns at height and not when near the ground on turbulent days. At anytime when a sudden height loss would be serious, extra speed should be used to reduce the chance of an inadvertant stall in the event of an error in speed control or a loss of speed due to turbulence. It is particularly important to form the habit of checking the actual airspeed readings every few seconds as the top priority item during the final stages of the circuit and approach. But perhaps an even more important reason for extra speed is that it reduces the possible loss of height caused by flying through sinking air. You may think that you can gain speed when sink is encountered but it may be rather too late to pick up speed when the strong sink is recognised by the variometer reading.

Flying slowly there is a very real risk of losing so much height so quickly that the glider is by then too low to allow time or height to pick up speed for a safe turn in to land.

For safe flying in a glider, it should be the norm to have some height in hand for the majority of the circuit and to require the use of some airbrake

to use this excess up on the base leg. Without this reserve, the pilot is relying on normal sink at all times. If the airbrakes are going to be used on the base leg, it is obviously essential to have some extra speed so that they can be used without hesitation and without the delay needed to gain more speed. In most gliders the stalling speed is increased by about 3-4kt when the airbrakes are opened, and the effect of even a slight error allowing the nose to rise for a few seconds can result in a large loss of speed due to the drag of the airbrakes.

The only argument in favour of allowing the student pilot to delay the increase of speed any later than just before the turn on to the base leg is that it allows more time on the base leg. In smooth conditions it could also conserve a little more height. This is a poor argument because it is encouraging the student to fly slowly, exposed to the risks of flying into the sinking air or turbulence which could then result in a disastrous loss.

With the extra work load at this time there is a high probability of the student making a poorly controlled turn on to base allowing the aircraft to become rather slow or even semi-stalled. This could well be a fatal error. An experienced pilot may feel certain that he will not make errors in speed control or circuit judgment and then there is a great temptation to try to be dead accurate. But it is always a better policy to have something in reserve rather than try to be one hundred percent right. You can always use up height when you want to but you cannot regain it.

My case for increasing speed at a given height and always before turning on to the base leg is as follows:

While flying slowly, the pilot has a false idea of how much height there is because there will always be a considerable loss of height to gain speed for a well banked final turn, particularly one in turbulence. (Well banked turns are both safer and take a shorter time to complete so reducing the height loss and the effects of drift in windy conditions.) Once the speed has been increased and is being maintained, the height remaining is "real " height available for manoeuvring. If necessary a turn can be made immediately without the need for further gain of speed.

At low speed the glider is far more vulnerable to lift and sink and any sudden loss of height when flying slowly below 4-500ft could leave the glider "low and slow" and in an impossible position to both pick up the necessary speed and to make the final turn for a safe landing.

If a downwind check is being used and if it includes "speed", it cannot be left until the base leg without serious over loading so that the pilot has too many things to do in too little time. Particularly on a field landing even the most experienced pilots need all the available time and when the base leg is too short there is always the risk of poor speed control, or missing some vital action such as lowering the wheel or resetting the flaps.

Picking up the speed before the base leg reduces the work load on it. All the vital actions and downwind checks can be completed without rushing and this allows more time to retrim and settle down at the chosen speed. The base leg then only involves watching the landing area, the airspeed and deciding when and how much height needs to be thrown away to put the final turn in exactly the ideal position and height in relation to the landing area. The extra speed gives a greater margin of speed above the stall and must therefore make the turn on to the base leg far safer. This is a definite anti-stall and spin precaution.

How much extra speed?

This is very much a matter of opinion. When the pilot is more experienced he should use his own judgment. There are other details of flying technique which are similarly a matter of opinion. For example the approach speed. It can be argued that there is nothing wrong with the pilot electing to make his approaches 5kt faster than other people do. It merely means a longer float which can be allowed for by moving the aiming point back a little. What is not acceptable is for the pilot to choose one speed but to fail to achieve or maintain it because of poor speed control. This can be dangerous because sooner or later he will end up far too slow or at the wrong speed for the prevailing conditions. The pilot who "judges" his approach speeds will risk breaking the glider when landing on an uphill slope. The illusion of approaching too steeply will invariably make him reduce his angle of approach and so run out of speed for the round out.

Most pilots would agree what is too slow because it results in a heavy landing. I always suggest to my students that they use a speed which allows for a normal hold off and slight float using full airbrake throughout. This enables them to make a safe landing if they are overshooting slightly and need all the airbrake to prevent a bad overshoot. Later, I would explain the advantages and also the hazards of choosing a lower speed.

Similarly with speeding up for the last portion of the circuit, it is important to have enough speed and to understand why it is being increased early.

"Inexperienced pilots always find a shortage of time and this is made worse by higher speeds."

The actual approach speed is largely dictated by the wind gradient and turbulence existing at the time. However the speed on the base leg is a matter more, I think, of having sufficient to keep a good margin through gusts and to minimise the effects of sink. Increasing the speed up to the full approach speed of 60 or 65kt on a windy day creates some extra problems for the student. Unless there is a headwind component, at these speeds there is far less time to make judgments and adjustments on the base leg. Inexperienced pilots always find a shortage of time and this is made worse by higher speeds. Experts can also find themselves under a high work load, flying new types of glider, using waterballast, flaps, retractable undercarriages and leaving their decision height too late.

If the full approach speed is put on very early on the circuit, unless extra height is allowed for the downwind leg, the loss of height may well make a normal circuit into one where the glider has to be turned in early to avoid running out of height.

I recommend that a minimum approach speed is used for the turn on to base and for most of the base leg, but that the final increase in speed to the approach speed is better left until just before the final turn. I would criticise the pilot who did not increase speed to at least 50kt in a K-13 on a light wind day and to 55kt in windier weather. I would probably comment that 65kt is probably making things rather more difficult by leaving less time for judgments and adjustments, but that it is a matter of opinion when the pilot is more experienced. However, it would make good sense in rotor conditions or on a hill site curl over.

In my opinion any glider flying below 400-500ft at less than 50kt is at risk. If it flies into strong sink or turbulence the loss of height might leave it in a dangerously low and slow situation. In fact, below these heights any strong sink could put the glider into an unredeemable position within seconds. The incidence of this kind of situation has been greatly reduced with the higher flying speeds of modern machines. This was a common cause of accidents in the T-21/Tutor era. Numerous incidents and accidents used to occur simply because the speed was too slow on the base leg and the glider just happened to fly into sink or bad turbulence. There were no second chances with a slow glider.

As a result everyone was well aware of the dangers of continuing to fly slow at low altitude. The extra 10kt or so in the cruising speeds of modern machines has lessened the effects of sink, but the risks are still there.

In tropical conditions and other times when the lift and sink is very strong, it is common practice to require the extra speed to be put on at the start of the circuit well upwind and at a height of 8-900ft. This certainly reduces the effects of lift or sink but seems unnecessarily high for more moderate conditions. This idea probably stems from flying very low performance machines; in this country the T-21s and T-31s, and in the USA the Schweizer 2-22s and 2-33s. With the more modern machines these tactics are less necessary.

It is always desirable to form habits which will lead to safer flying. Unfortunately much of our flying becomes semi-automatic and unless we make a conscious effort to check what we are doing, things can go seriously wrong. It is essential to understand the reasons for doing everything and the need to think about the particular situation and not to just allow things to happen.

Summary.

If you want to live a long while the speed should be increased for all circuit flying below 4-500ft, when doing downwind checks or preparing for the landing and *before the turn on to the base leg.* This makes it far less likely that sink could deposit the glider low and slow; makes misjudgment of the height available for the final stages of the circuit less likely; makes the turn on to base safer because of the bigger speed margins and reduces the work load on the base leg so making accurate speed control easier.

There are no valid arguments in favour of leaving the increase in speed until just before the final turn.

TONY CROWDEN

AN UNUSUAL TYPE OF WAVE

Tony describes and tries to find an explanation for a flight with 18kt of smooth lift

This article is definitely not for the likes of those pundits who regularly experience "off-the-clock' lift, but for us lesser mortals the following account may be of some interest:-

It was early last September and we had been having a pretty duff week at Talgarth with a high pressure area situated over the country. No matter how many sacrificial pints I drank each night to placate the BBC weather gods the general situation remained horribly "settled", although the high was showing signs of being pushed away by a low pressure region centred over northern France.

All week Derek Eckley, (club chairman, site owner and local pundit) was saying it would be OK on Friday, but we didn't believe him, thinking it was an attempt on his part to bolster our flagging enthusiasm as the week progressed. On Thursday night we sank the usual amount of Welsh beer not believing that the weather would improve the next day. However we had not reckoned with local knowledge – Friday morning arrived and the weather conditions had indeed changed. There was low cloud over the site with a moderate NE wind blowing off the Black Mountains and an obvious stationary wave slot right over Talgarth. Ignoring the now customary hangover I rigged in record time and was given the first launch of the day at 1000hrs.

I was launched into a wind of about 2-3kt which indicated that something interesting was happening aloft

I was a little suspicious of being thrown into the air first, but to quote a hackneyed phrase "nothing ventured, nothing gained". I was launched into a wind of about 2-3kt from the west at ground level which indicated that something interesting was happening aloft.

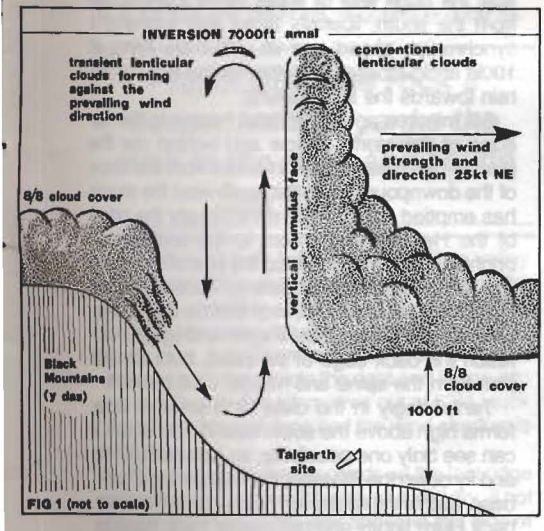
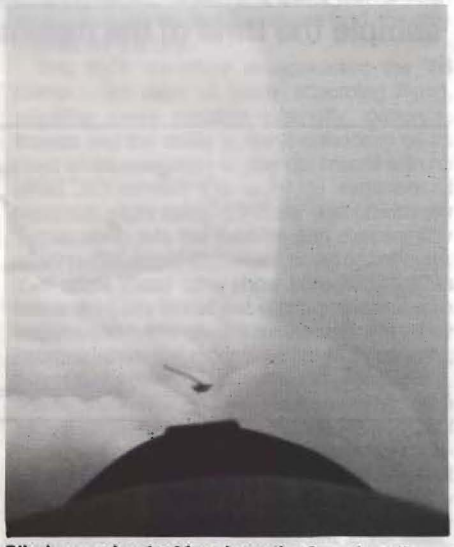


FIG 1 (not to scale)

Released above cloudbase at 1500ft agl I received an extremely swift hangover cure. Just above the murk at cloudbase the wave slot had formed with a solid looking vertical downwind cloud face which looked very promising. As I tucked my Mosquito in against the face the pointer of the mechanical vario was hard against the stop, so I switched to the ×2 scale on the electrical vario to find I had a genuine 18kt of smooth lift! To give you an idea of the lift strength, by the time the tug pilot had landed and given me a radio call I was already passing 5500ft agl. However the exceptional lift didn't last long and by 7000ft there was a solid inversion with zero sink.


Pilot's eye view looking down the Cwmdu valley showing the lenticular plumes forming back across the wave slot.

Upon exploring the area the following facts became apparent. Beyond the single wave slot over the Cwmdu valley the rest of the area was unbroken 8/8 cu with no sign of any wave activity. The wave amplitude was very narrow as a moderately banked 180° turn at the end of a beat would result in flying through sink before being able to re-establish in the optimum position on the next beat. The tops of the cu immediately downwind of the wave slot were well above the general cloud layer and showing typical signs of wave action with smooth lenticular caps, but the most significant phenomenon was the occasional plume of cloud which formed at the top of these cu and spread back across the wave slot against the prevailing wind direction. The photograph attempts to show this phenomenon happening.

Two hours into the flight the complete system suddenly collapsed, then slowly reformed into a conventional wave system with a maximum of 4-6kt lift in the primary wave and evidence of secondary and tertiary slots forming downwind. Gradually this also collapsed and after an interesting five hour flight I landed back at Talgarth.

Analysing the events of the flight, the only way I can account for the strength of the initial lift is that the wave system was blocked from moving downwind by the unstable airmass, combined with the high humidity, causing a wall of cumulus to form on the lee side of the wave slot. This resulted in the airflow rising vertically until it reached the inversion layer. At this point it couldn't rise any higher thus causing some of the airflow to curl back on itself which in turn served to reinforce the initial wave action, (see Fig 1). What else could account for such exceptional lift in an airstream of approximately 25kt?

The reason for this article is to inquire whether any other pilots have experienced this type of "self reinforcing" wave system and to invite comment. Plenty of gliding/Met text books deal with various types of wave and rotor systems etc but none I've read mentions this type of wave action.

Tom Bradbury, a meterologist and glider pilot, comments:

This is an excellent example of the type of wave flow which can develop just to lee of a steep ridge when the wind profile shows a decrease in speed with height at some level just above the ridge line. It is not a very rare event but does not seem to be described in text books.

I have flown in very similar conditions when there was a moderate north-westerly wind blowing across the Ochils. In the region near Dollar, where the lee slopes are both high and steep, the wave was marked by a strange looking cloud with a near vertical windward face and an arching overhang extending, apparently into wind, from the top of the cloud.

The cloud persisted near Dollar for several hours but never extended far towards Portmoak because the slopes of the Ochils are lower and shallower at that end. Lift was very strong close to the face of the cloud and continued, much weaker, above the cloud top. Here one could climb while circling as if in a thermal; clearly there

was practically no horizontal movement of air in that region.

The significant feature of the wind profile (measured near the RAF airfield of Leuchars) was a layer where the speed decreased with height near the cloud top.

The strength of lift depends partly on the steepness of the streamlines of wave flow. If the streamlines are almost vertical the lift can be extremely strong. The angle of the lee slope has a marked influence on the streamlines through the primary wave. A steep descent from crest to foot of the ridge may result in a steeply ascending set of streamlines on the upwind side of the primary wave. This is only true if the descending airflow can follow the shape of the ground. If it breaks away from the slope, as is likely if the wind speed is too strong or there is a sudden change in the slope, then an eddy forms and the main flow takes up a more gentle angle of descent.

If, instead of increasing, the wind speed above a certain level started to decrease with height, then the streamlines would become steeper. The combination of a steep lee slope and a decrease of wind speed some 3000ft above the mountains can produce near vertical streamlines in the primary wave.

Also possible to have another rotor turning in the opposite direction between the wave cloud and the lee slope

In these circumstances there may well be a rotor inside the wave cloud. It is also possible to have another (cloudless) rotor turning in the opposite direction situated between the wave cloud and the lee slope. The top of the wave cloud may then be pulled into the circulation of the clear rotor to give a curving overhang apparently moving against the wind.

When the upper wind does decrease with height the wave energy ceases to be trapped and it can "leak away". In this "leaky mode" each successive wave is much weaker and the primary wave may be the only one soarable.

The way in which the Talgarth wave ceased to maintain its vertical flow and then began to produce further waves downstream suggests that the wind profile was changing. An increase of speed in the light wind layer could account for the streamlines becoming less steep in the primary. A steady increase of wind speed with height would then favour the growth of a train of lee waves instead of just one.

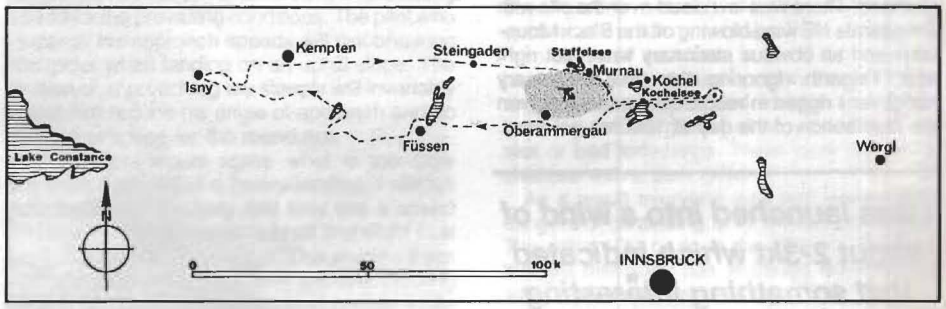
Near vertical streamlines are unlikely to develop due to the steepness of the lee slope alone. An extra factor is needed; a decrease of wind speed with height.

In most text book examples of wave flow the vertical profile of wind speed shows an increase with height. The maximum amplitude of the wave, and the steepest streamlines, normally occur within the most stable layer above the mountain top. Where the wind is very strong the streamlines tend to be almost flat. In these circumstances the wave energy becomes "trapped" below the level of maximum wind and a long train of lee waves can develop down stream.

NICK HACKETT

MOUNTAIN COMPETITION

We have had requests for articles on mountain flying and Nick is now well experienced on this technique having entered the Allgau Competition four times, last year coming second in his LS-4 in the Open Class when it was held at Füssen, Upper Bavaria. His account may tempt others to sample the thrill of the mountains.



Day 5: the task 226km – Isny in the foothills to the west of Kempten, and the skilift station at the top of the Brauneck to the east; the weather – a highly unstable and humid southerly flow up from the Mediterranean, giving 5/8 – 8/8 cover, bases 5-6000ft in the mountains, and any penetrating insolation causing at the least heavy showers, or vast thunderstorms. Flowing down the north face of the Alps on to the plain, the descending air is leaving a 10-15km band of clear dead air before weak thermals start again, giving 3/8 cu with bases at 4-4500ft. Ground level on the plain on the first and second legs varies between 2600 and 3600ft, giving a maximum operating band of 2000ft. The second TP is 5100ft high, actually above cloud tops down on the plain.

On the first leg towards Isny I have been forced to take every scrap of lift available, the best being no more than 1kt integrated, with on occasion only 800ft ground clearance above the wooded hills below, and some very weird misty air with varying bases downwind of the lake of Constance, but now passing Kempten again conditions improve to give up to 2kt lift. Nevertheless the possibility of a transition across that dead band to the mountains seems remote and I have already accepted that it will be a distance day.

My fears are reinforced beyond Steingaden by the sight of a huge thunderstorm building across track, blotting out the valley at Oberammergau and spreading out across the Murnau bog towards the Staffelsee. After three years' flying this Comp I have a healthy respect for these storms, but press on under the leading edge and for the first time can increase speed in the gathering lift. Nevertheless the base, black, smooth and menacing, is way below the mountain tops and now the huge wall of water races towards me from the south, liberally laced with lightning. I synchronise speed and lift until I am flying at 100kt at cloudbase along the leading edge of the rain towards the light beyond.

Six minutes and 20km later I come to the far edge of the storm. Below and behind me the ground has disappeared in a mist from the force of the downpour, but to the south-east the storm has emptied the sky and miraculously the ridge of the Herzogstand, 10km to the south, is in bright sunlight. I fly south up the side of the storm and as the terrain below starts to rise, so does the base. I fly forward 300m, stop to circle up to base, and repeat the manoeuvre again and again until I reach the back edge of the cloud, but I am still ½km from the spine and maybe 100ft below it.

Tantalisingly in the clear air a small cu now forms high above the south face in front of me. I can see only one possibility, so turn northwards and fly down the lift under the descending cloudbase, gathering speed as I do so. Half a kilometre back I turn tightly and retrace my track, much in the fashion of a long-jumper's run-up. This time I reach the edge of the cloud at 80kt, pull up through the lip and as the ridge reappears in

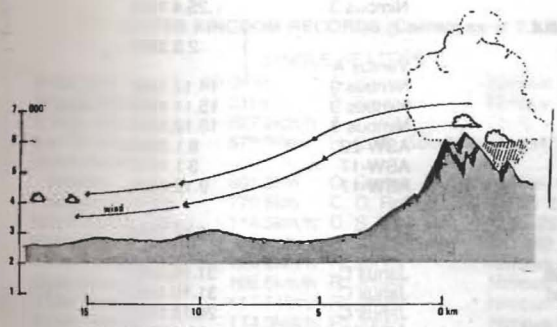


Fig 1. The transition required from the plain to the mountain tops to reach the second TP.

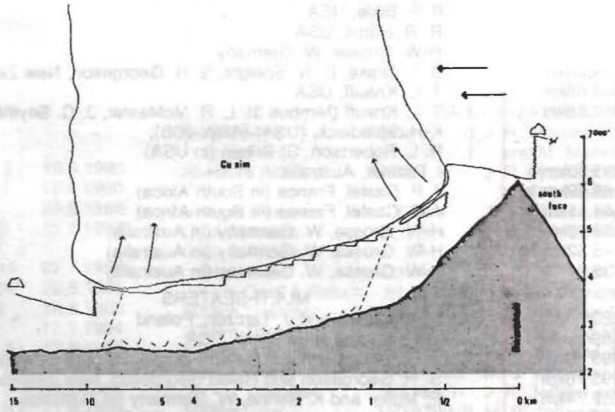


Fig 2. Schematic drawing of the transition to the mountain tops.

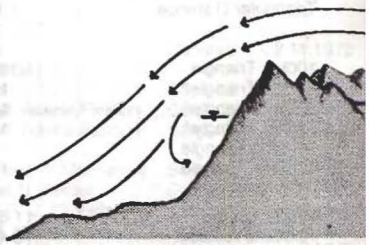


Fig 3. Coming home in the wind shadow.

front, realise that I have swung it. A minute later I cross with 20ft to spare and immediately hit 2kt lift off the rock face. The "window of opportunity" has opened and ten minutes later, at a – for the day – incredible 7000ft I set off for the TP 17km away, already programming the final glide into the Cambridge.

Rounding the TP – a quick view of blue and white tablecloths through the window – I am able to follow a line of lift back along the Benediktenwand, but short of the Kochelsee I can see that the storm – now marching off to the north – has completely killed the sky all the way back to Füssen, and I am in the last lift available. Already from the TP the computer has assessed the exact wind factor, and now gives me an absolute minimum 8100ft altitude to cover the 52km final glide. Amazingly I manage to struggle up to the magical figure and set off, but immediately hit sink and lose 50ft. I decide I can't even afford this loss and turn back to the thermal. This time I set off slightly upwind of the ridge way below and avoid the sink.

Thirty five kilometres out I am flying within 20ft of the height required in totally dead air. To avoid any height loss through unwanted control inputs from twitching muscles I am flying hands and feet off and on trim only.

Crossing just south of Oberammergau I approach the 30km long Ammergebirge ridge leading straight back to Füssen. The south face is in full sun and beckons, suggesting ridge lift,

"100m from the rock a deeper instinct yanks the stick to the right and I slide into the lee."

but if it doesn't work I am trapped in a box valley at the far end. The north face promises sink in the lee, but possible wind shadow buoyancy immediately under the crest. I lean towards the south side, but 100m from the rock a deeper instinct yanks the stick to the right and I slide into the lee. Twenty-five kilometres out at 53kt I tuck myself into the rock face and the wind shadow is working.

The whole glide now depends on the last ridge 10km out. If I can cross it I am home and dry, if not I must glide out into the sink and land this side of the Forggensee. Exactly 9½ minutes later that 50ft I went back for pays off as X7 slides sweetly over the ridge with bare feet to spare and the airfield is suddenly visible beyond the lake. Putting the nose down gently I cross low over the dinghies sailing below and have just enough energy to cross the line, turn in and land, the only finisher for the day.

This flight somehow encapsulated the '86 Comp – six days of totally absorbing flying, requiring every possible ingenuity, patience, finesse and the ability to stand orthodoxy on its head when necessary to stay up. I recall with no small amusement the sight of experienced mountain pilots being gradually and unwittingly forced down into the foothills and successfully soaring mini ridges and woods down on the plain. Two pilots could later show barograph traces below the base line of just such episodes. I also had three very low saves from the centre of valley bottoms when the mountains failed to perform, two of these off fields being spread with manure. It is not the first time I have been saved by these gliding godsends (see S&G April 1984, p74), but the aroma certainly tends to hang on in the cockpit! Other things also stick in the mind: the first day I landed out at the tiny but spectacularly beautiful club at Agathazell and was immediately offered a winch launch. Having failed to find the local lift I had to draw on local knowledge – "No problem – from the top of the launch fly west over the motorway, over the village, to the left of the church spire, to the little ridge beyond, and you will find 1m lift". Eight hundred feet off the winch seemed a bit tight for the 3km or so to the ridge, and I did get a very intimate view of the spire, but the ridge worked as promised and soon I was away again.

Some of the smallest ridges work here and they are certainly no larger than many low hills in England, but I would definitely have reservations about using them at home. Maybe it is all a frame of mind.

Another incident on the third day was later to cause much hilarity in the telling. I was flying at no small speed along a ridge at about 7000ft when, turning a corner, I had to lift my wingtip sharply and not totally unnecessarily to avoid decapitating six priests intoning round a shrine. I started imagining the consequences had I contacted – the tabloids would have had a field day – "Careless English pilot decapitates Bavarian bishop on mountain top", and was so immersed in the humorous possibilities of the situation that I flew through two thermals and actually got into some difficulties on an otherwise perfectly adequate day.

The club itself under director Willi Guggemos proved outstanding hosts once again. Perhaps not entirely fortuitously the Comp coincided with the local folk festival, which included a vast beer tent complete with band a short distance beyond the end of the field, This provided an alternative source of sustenance for the inner man in the evenings and much fun was had by all.

The 40 or so pilots, divided between Open and Sport Classes, included two current German Champions as well as a number of Nationals pilots, and it is perhaps the mixture of a high class field in a competition dedicated to having fun that makes this event so special. The venue this year is at Kempten.

Results: Open Class, 1 Robert Schröder, 2 Nick Hackett, 3 "Wack" Hofmeister; Sport Class, 1 Theo "Über" Schall, 2 Johann Strubel, 3 Hans-Dieter Wiedmann.

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ANNUAL RECORDS

INTERNATIONAL GLIDING RECORDS (Correct as at 7.2.87)

SINGLE-SEATERS

Height Gain	12 894m	P. F. Bikle, USA	SGS 1-23E	25.2.1961
Absolute Altitude	14 938m	R. R. Harris, USA	Grob- 102	17.2.1986
Straight Distance	1460.8km	H-W. Grosse, W. Germany	ASW-12	25.4.1972
Goal Distance	1254.26km	B. L. Drake, D. N. Speight, S. H. Georgeson, New Zealand	Nimbus 2	14.1.1978
Goal & Return Distance	1646.68km	T. L. Knauff, USA	Nimbus 3	25.4.1983
Triangular Distance	1362.68km	T. L. Knauff (Nimbus 3), L. R. McMaster, J. C. Seymour K-H. Striedieck, (USA) (ASW-20B); R. L. Robertson, Gt Britain (in USA)	Ventus A	2.5.1986
100km Triangle	195.30km/h	I. Renner, Australia	Nimbus 3	14.12.1982
300km Triangle*	169.49km/h	J. P. Castel, France (in South Africa)	Nimbus 3	15.11.1986
500km Triangle*	164.11km/h	J. P. Castel, France (in South Africa)	Nimbus 3	10.12.1986
750km Triangle*	158.40km/h	H-W. Grosse, W. Germany (in Australia)	ASW-22	8.1.1985
1000km Triangle	145.32km/h	H-W. Grosse, W. Germany (in Australia)	ASW-17	3.1.1979
1250km Triangle	133.24km/h	H-W. Grosse, W. Germany (in Australia)	ASW-17	9.12.1980

MULTI-SEATERS

Height Gain	11 680m	S. Josefczak and J. Tarczon, Poland	Bocian	5.11.1966
Absolute Altitude	13 489m	L. Edgar and H. Klieforth, USA	Pratt Read	19.3.1952
Straight Distance	993.76km	S. H. Georgeson and Helen Georgeson, New Zealand	Janus C	31.10.1982
Goal Distance	993.76km	S. H. Georgeson and Helen Georgeson, New Zealand	Janus C	31.10.1982
Goal & Return Distance	1052.74km	E. Müller and K. Senne, W. Germany (in Australia)	Janus C	26.12.1983
Triangular Distance*	1380km	H-W. Grosse and H. Kohlmeyer, W. Germany (in Australia)	ASH 25	10.1.1987
100km Triangle	177.26km/h	E. Sommer and I. Andresen, W. Germany (in USA)	Janus C	26.7.1984
300km Triangle	152.54km/h	E. Müller and O. Schäffner, W. Germany (in Australia)	AS 22-2	10.1.1986
500km Triangle*	155.5km/h	H-W. Grosse and H. Kohlmeyer, W. Germany (in Australia)	ASH 25	9.1.1987
750km Triangle*	142.6km/h	H-W. Grosse and H. Kohlmeyer, W. Germany (in Australia)	ASH 25	26.12.1986
1000km Triangle	129.54km/h	H-W. Grosse and H. Kohlmeyer, W. Germany (in Australia)	SB-10	21.12.1979
1250km Triangle*	143.5km/h	H-W. Grosse and H. Kohlmeyer, W. Germany (in Australia)	ASH 25	10.1.1987

SINGLE-SEATERS (WOMEN)

Height Gain	9119m	Anne Burns, Gt Britain (in South Africa)	Skylark 3B	13.1.1961
Absolute Altitude	12 637m	Sabrina Jackintell, USA	Astir CS	14.2.1979
Straight Distance	949.7km	Karla Karel, Gt Britain (in Australia)	LS-3	20.1.1980
Goal Distance	748.37km	Joann Shaw, USA	Nimbus 2	17.8.1983
Goal & Return Distance	1126.68km	Doris Grove, USA	Nimbus 2	28.9.1981
Triangular Distance	847.27km	Joann Shaw, USA	Nimbus 2	5.8.1984
100km Triangle	139.45km/h	Susan Martin, Australia	LS-3	2.2.1979
300km Triangle	138.71km/h	Inge Müller, W. Germany (in SW Africa)	Ventus B	8.12.1984
500km Triangle	133.14km/h	Susan Martin, Australia	LS-3	29.1.1979
750km Triangle	110.53km/h	Pamela Hawkins, Gt Britain (in Australia)	ASW-17	17.11.1984

MULTI-SEATERS (WOMEN)

Height Gain	8430m	Adela Dankowska and M. Mateliska, Poland	Bocian	17.10.1967
Absolute Altitude	10 809m	Mary Nurr and H. Duncan, USA	SGS 2-32	5.3.1975
Straight Distance	864.85km	Tatiana Pavlova and L. Filomechkina, USSR	Blanik	3.6.1967
Goal Distance	864.86km	Isabella Gorokhova and Z. Koslova, USSR	Blanik	3.6.1967
Goal & Return Distance	649.63km	Tamara Sviridova and V. Toporova, USSR	LAK 12DP	24.5.1986
100km Triangle	126.28km/h	Adela Dankowska and E. Grzelak, Poland	Halny	1.8.1978
300km Triangle	123.33km/h	Inge Müller and C. Müller, W. Germany (in SW Africa)	Janus C	7.12.1984
500km Triangle	95.72km/h	Daina Vilne and V. Toporova, USSR	LAK 12DP	16.5.1986

BRITISH NATIONAL RECORDS (Correct as at 7.2.87)

SINGLE-SEATERS

Height Gain	10 965m	D. Benton	Nimbus 2	18.4.1980
Absolute Altitude	11 500m	H. C. N. Goodhart (in USA)	SGS 1-23	12.5.1955
Straight Distance	949.7km	Karla Karel (in Australia)	LS-3	20.1.1980
Goal Distance	859.20km	M. T. A. Sands (in USA)	Nimbus 3	23.4.1986
Goal & Return Distance	1127.68km	M. T. A. Sands (in USA)	Nimbus 3	7.5.1985
Triangular Distance	1362.68km	R. L. Robertson (in USA)	Ventus A	2.5.1986
300km Goal and Return	153.3km/h	M. T. A. Sands (in USA)	Kestrel 19	10.5.1983
500km Goal and Return	152.7km/h	M. R. Carlton (in South Africa)	ASW-17	24.12.1980
1000km Goal and Return	105.79km/h	M. T. A. Sands (in USA)	Nimbus 3	7.5.1985
100km Triangle	143.3km/h	E. P. Hodge (in Rhodesia)	Std Cirrus	30.10.1976
300km Triangle	146.8km/h	E. Pearson (in South Africa)	Nimbus 2	30.11.1976
500km Triangle	141.3km/h	B. J. G. Pearson (in South Africa)	ASW-20	28.12.1982
750km Triangle	109.8km/h	M. R. Carlton (in South Africa)	Kestrel 19	5.1.1975
1250km Triangle	109.01km/h	R. L. Robertson (in USA)	Ventus A	2.5.1986

MULTI-SEATERS

Height Gain	9836m	T. J. Wills and B. Iggulden (in New Zealand)	Twin Astir	13.1.1982
Absolute Height	10 607m	T. J. Wills and B. Iggulden (in New Zealand)	Twin Astir	13.1.1982
Straight Distance	472.43km	M. R. Carlton and M. French (in South Africa)	Calif A-21	18.12.1979
Goal Distance	472.43km	M. R. Carlton and M. French (in South Africa)	Calif A-21	18.12.1979
Goal and Return Distance	692.02km	M. R. Carlton and C. Greaves (in South Africa)	Calif A-21	23.12.1978
Triangular Distance	762.72km	C. M. Greaves and C. Simpson (in South Africa)	Janus	28.12.1977
300km Goal and Return	105.44km/h	M. R. Carlton and C. Greaves (in South Africa)	Calif A-21	19.12.1978
500km Goal and Return	113.08km/h	M. R. Carlton and C. Greaves (in South Africa)	Calif A-21	23.12.1978
100km Triangle	137.22km/h	M. R. Carlton and Leonie Lawson (in South Africa)	Calif A-21	27.12.1978
300km Triangle	112.59km/h	M. R. Carlton and C. Greaves (in South Africa)	Calif A-21	17.12.1979
500km Triangle	108km/h	M. R. Carlton and C. Greaves (in South Africa)	Calif A-21	21.12.1978
750km Triangle	104.01km/h	C. M. Greaves and C. Simpson (in South Africa)	Janus	28.12.1977

SINGLE-SEATERS (WOMEN)

Height Gain	9119m	Anne Burns (in South Africa)	Skylark 3B	13.1.1961
Absolute Altitude	10 550m	Anne Burns (in South Africa)	Skylark 3B	13.1.1961
Straight Distance	949.7km	Karla Karel (in Australia)	LS-3	20.1.1980
Goal Distance	528km	Ann Welch (in Poland)	Jaskolka	20.6.1961
Goal & Return Distance	545km	Anne Burns (in South Africa)	Std Austria	6.1.1966
Triangular Distance	814.01km	Karla Karel (in Australia)	LS-3	9.1.1980
300km Goal and Return	107.5km/h	Karla Karel (in South Africa)	ASW-15B	1.1.1975
500km Goal and Return	102.6km/h	Karla Karel (in Rhodesia)	ASW-15B	16.10.1975
100km Triangle	110.8km/h	Karla Karel (in Rhodesia)	ASW-15B	2.11.1975
300km Triangle	125.87km/h	Karla Karel (in Australia)	LS-3	12.2.1980
500km Triangle	120.69km/h	Karla Karel (in Australia)	LS-3	20.2.1980
750km Triangle	110.53km/h	Pamela Hawkins (in Australia)	ASW-17	17.11.1984

* Subject to homologation

UNITED KINGDOM RECORDS (Correct as at 7.2.87)

SINGLE-SEATERS

Height Gain	10 065m	D. Benton	Nimbus 2	18.4.1980
Absolute Altitude	11 031m	D. Benton	Nimbus 2	18.4.1980
Straight Distance	827.9km/h	T. J. Wills	LS-6	29.5.1986
Goal Distance	579.36km	H. C. N. Goodhart	Skylark 3	10.5.1959
Goal & Return Distance	801.3km	C. Garton	Kestrel 19	22.7.1976
Triangular Distance	770.5km	C. C. Rollings	Jantar 2A	28.5.1985
300km Goal & Return	114.5km/h	D. S. Watt	ASW-22	18.8.1983
500km Goal & Return	93km/h	M. B. Jefferyes	DG-202	12.5.1984
100km Triangle	123.2km/h	R. Jones	Nimbus 3	13.8.1983
200km Triangle	108.6km/h	R. Jones	Nimbus 3	14.8.1983
300km Triangle	117.14km/h	R. Jones	Nimbus 3	28.5.1985
400km Triangle	114.3km/h	R. Jones	Nimbus 3	1.8.1984
500km Triangle	106.9km/h	R. Jones	Nimbus 3	31.5.1975
600km Triangle	88.8km/h	C. Garton	Kestrel 19	10.6.1976
750km Triangle	77.98km/h	C. C. Rollings	Jantar 2A	28.5.1985
100km Goal	150km/h	T. J. Wills	LS-4	12.5.1984
200km Goal	127.1km/h	A. H. Warminger	Vega	12.5.1984
300km Goal	132.8km/h	A. H. Warminger	Kestrel 19	24.4.1976
400km Goal	73.8km/h	T. J. Wills	Std Libelle	7.6.1976
500km Goal	90.7km/h	H. C. N. Goodhart	Skylark 3	10.5.1959

15m CLASS

Straight Distance	827.9km/h	T. J. Wills	LS-6	29.5.1986
500km Goal & Return	79.1km/h	J. D. Benoist	ASW-20	9.4.1983
100km Triangle	119.7km/h	T. J. Wills	LS-4	18.4.1981
200km Triangle	104.34km/h	T. J. Wills	LS-6	31.8.1986
300km Triangle	102.2km/h	R. C. May	ASW-20	1.8.1984
400km Triangle	95.88km/h	D. S. Watt	ASW-20FL	29.5.1985
500km Triangle	90.18km/h	D. S. Watt	ASW-20B	16.5.1986
200km Goal	127.1km/h	A. H. Warminger	Vega	12.5.1984

STANDARD CLASS

Straight Distance	718km	T. J. Wills	Std Libelle	1.8.1976
100km Triangle	119.7km/h	T. J. Wills	LS-4	18.4.1981
200km Triangle	92.2km/h	A. J. Stone	Std Cirrus	16.8.1976
400km Triangle	91.7km/h	S. J. Redman	Std Cirrus	31.5.1975
100km Goal	150km/h	T. J. Wills	LS-4	12.5.1984
300km Goal	131.1km/h	T. J. Wills	Std Libelle	24.4.1976
400km Goal	73.8km/h	T. J. Wills	Std Libelle	7.6.1976

UK 750km DIPLOMA

1. Goal & Return	801.3km	C. Garton	Kestrel 19	22.7.1976
2. Distance	761km	D. S. Watt	ASW-20L	9.5.1980
3. Triangular Distance	770.5km	C. C. Rollings	Jantar 2A	28.5.1985
4. Distance	827.9km/h	T. J. Wills	LS-6	29.5.86

MULTI-SEATERS

Height Gain	6740m	J. R. Monteith (USA) and M. Mahon	Capstan	2.11.1972
Absolute Altitude	7650m	J. R. Monteith (USA) and M. Mahon	Capstan	2.11.1972
Straight Distance	421.5km	J. S. Fielden and Valerie Fielden	Bergfalke 3	14.8.1970
Goal Distance	421.5km	J. S. Fielden and Valerie Fielden	Bergfalke 3	14.8.1970
Goal & Return Distance	429.6km	M. B. Jefferyes and P. McElarney	Silene	7.7.1985
300km Goal & Return	81.91km/h	J. R. Jeffries and N. Foster	Calif A-21	17.8.1975
100km Triangle*	106.25km/h	J. Edyvean and R. J. Crouch	Janus C	9.9.1986
200km Triangle	96.5km/h	R. Jones and M. Hackett	Janus C	10.8.1984
300km Triangle	85.87km/h	B. Fichett and A. Miller	Janus	9.5.1979
400km Triangle	86.6km/h	D. S. Watt and I. Hargrove	Janus C	1.8.1984
500km Triangle	88.4km/h	J. R. Jeffries and Gillian Case	Calif A-21	31.5.1975
100km Goal	120.87km/h	M. B. Jefferyes and J. Fricker	Silene	27.7.1986
200km Goal	113.3km/h	R. Miller and B. Tapson	Janus C	11.5.1984
300km Goal	107.4km/h	P. R. Pentecost and A. H. Pentecost	Janus C	7.5.1984

SINGLE-SEATERS (WOMEN)

Height Gain	7833m	Alison Jordan	Astir CS	8.10.1978
Absolute Altitude	8701m	Alison Jordan	Astir CS	8.10.1978
Straight Distance	454km	Anne Burns	Skylark 3B	10.5.1959
Goal Distance	309km	Anne Burns	Skylark 3B	12.4.1958
Goal & Return Distance	334.2km	Ruth Housden	Libelle	29.5.1982
300km Goal & Return	60km/h	Anne Burns	Nimbus 2	25.7.1975
100km Triangle	80km/h	Anne Burns	Cirrus	14.6.1970
200km Triangle	69.3km/h	Anne Burns	Std Austria	22.8.1964
300km Triangle	76.8km/h	Jane Randle	Kestrel 19	18.8.1976
400km Triangle	60.6km/h	Anne Burns	SHK	5.8.1967
500km Triangle	76.1km/h	Anne Burns	Nimbus 2	31.5.1975
100km Goal	89.3km/h	Vivien Haley	Pirat	4.5.1986
200km Goal	85.5km/h	Anne Burns	Olympia 419	2.6.1963
300km Goal	63.9km/h	Anne Burns	Skylark 3B	12.4.1958

MOTOR GLIDERS (+Also British National Record; †British National Record only)

SINGLE-SEATERS

Straight Distance†	652.7km	B. J. Willson (in Australia)	PIK-20E	10.1.1983
Goal Distance†	415.1km	B. J. Willson (in Australia)	PIK-20E	11.1.1983
Goal & Return Distance†	510.45km	T. J. Wills (in Norway)	DG-400	6.7.1986
100km Triangle+	76.5km/h	I. W. Strachan	PIK-20E	11.8.1984
200km Triangle	48.2km/h	I. W. Strachan	SF-27M	23.8.1976
300km Triangle+	83.1km/h	I. W. Strachan	PIK-20E	19.8.1984
500km Triangle†	71.75km/h	B. J. Willson (in Finland)	PIK-20E	22.5.1980
100km Goal	85.7km/h	I. W. Strachan	SF-27M	16.7.1971
500km Goal & Return	93.09km/h	T. J. Wills (in Norway)	DG-400	6.7.1986

MULTI-SEATERS (†Also BRITISH NATIONAL RECORD)

Height Gain†	4355m	R. I. Lloyd and J. Fox	SF-28A	22.10.1982
100km Triangle†	35.6km/h	P. T. Ross and H. Daniels	SF-28A	27.6.1976
100km Goal	76.2km/h	P. T. Ross and K. Winfield	SF-28A	22.8.1976
200km Goal	66.3km/h	P. T. Ross and P. Fletcher	SF-28A	18.7.1976
500km Triangle	78.45km	B. T. Spreckley and O. Pugh	Janus CM	16.5.1986

INTERNATIONAL MOTOR GLIDERS (Correct as at 7.2.87)

SINGLE-SEATERS

Height Gain	9935m	M. D. Stevenson, USA	DG-400	25.10.1985
Absolute Altitude	10 408m	G. Cichon, W. Germany	Nimbus 2M	27.5.1979
Straight Distance*	1040km	W. Binder, W. Germany	ASW-22M	9.5.1984
Goal Distance*	1040km	W. Binder, W. Germany	ASW-22M	9.5.1984
Goal and Return Distance	1008.89km	F. Rueb, W. Germany (in South Africa)	Nimbus 2M	7.1.1981
Triangular Distance	1028.58km	O. Wegscheider, W. Germany (in South Africa)	ASW-22M	6.1.1986
100km Triangle*	171km/h	F. Rueb, W. Germany (in South Africa)	Nimbus 3MR	3.1.1987
300km Triangle	165.51km/h	B. Bünzli, Switzerland (in South Africa)	DG-400	22.12.1984
500km Triangle*	160km/h	F. Rueb, W. Germany (in South Africa)	Nimbus 3MR	10.1.1987
750km Triangle*	162.29km/h	B. Bünzli, Switzerland (in South Africa)	DG-400	12.12.1985
1000km Triangle	139.96km/h	B. Bünzli, Switzerland (in South Africa)	DG-400	28.12.1984

MULTI-SEATERS

Height Gain*	5650m	H. Köhler, W. Germany and J-C. Batault (in USA)	Taifun 17E	28.4.1986
Absolute Altitude*	8000m	H. Köhler, W. Germany and J-C. Batault (in USA)	Taifun 17E	28.4.1986
Straight Distance	952.53km	W. Binder and K. Heimann, W. Germany	Janus M	16.5.1980
Goal Distance	646.42km	G. Jacobs and G. Hüttel, W. Germany	SF-25E	28.4.1976
Goal & Return Distance	617.95km	L. de Preter (Belgium) and D. Sohn (W. Germany) (in South Africa)	Janus CM	29.12.1981
Triangular Distance*	1250km	W. Binder and K. Senne, W. Germany (in Australia)	ASH 25MB	10.1.1987
100km Triangle	135.51km/h	W. Binder and M. Heide, W. Germany (in Spain)	ASH 25MB	13.7.1986
300km Triangle*	154km/h	W. Binder and K. Senne, W. Germany (in Australia)	ASH 25MB	3.1.1987
500km Triangle*	142.5km/h	E. Müller and K. Senne, W. Germany (in Australia)	ASH 25MB	9.1.1987
750km Triangle	119.83km/h	W. Binder and M. Heide, W. Germany (in Spain)	ASH 25MB	11.7.1986
1000km Triangle*	123.5km/h	E. Müller and W. Binder, W. Germany (in Australia)	ASH 25MB	27.12.1986
1250km Triangle*	130km/h	W. Binder and K. Senne, W. Germany (in Australia)	ASH 25MB	10.1.1987

* Subject to homologation

New records have to exceed the old ones by: Distance 10km. Heights 3%. Closed circuit speeds 2km/h. Goal speeds 5km/h.

For records, no side of a triangle may have a length less than 28% of the total distance of the course, except that for triangles of 750km or more for International and British Records, or of 500km or more for UK Local Records, no side may have a length less than 25% or greater than 45% of the total distance.

Conversion Factors: Multiply km or km/ by 0.621 to get statute miles or mph. Multiply km by 0.54 to get nautical miles or kts. Multiply metres by 3,28 to get feet.

YOUR LETTERS

BGA SQUAD TRAINING

Dear Editor,

I understand that there are minimum requirements to be accepted for BGA squad training but there does not seem to be any maximum requirements. I know that there are pilots flying in the 1987 squad who have Diamond badges, instructors' ratings and have also competed in Regionals.

I'm sure there are a number of young UK pilots of a quite high standard. Shouldn't these few places be taken by pilots who could really benefit from a week's flying with the BGA and who need to improve their cross-country speeds and distances? There are many more young glider pilots who would love the opportunity to have squad training, but the few valuable places are being taken by the very experienced.

P. J. HAMPSHIRE, *Cranleigh, Surrey*

Dear Editor,

I would like to know why the likes of Brian Spreckley and George Lee are not on this year's BGA Squad Training Scheme? I thought the scheme was aimed at young, promising pilots with little previous competition experience but – lo and behold – I see Diamond-encrusted pilots and Regionals "racers" on the list!

What chance has my club's "genuine trainee" got against these freeloaders, I ask?! Well – I hope he beats the lot of you, so there!

DAVE CLEWES, *Steyning, West Sussex*

John Williamson, manager of the BGA Squad Training Scheme, replies: The broad aim of the Squad Training Scheme is to ensure that any young pilot with proven ability and from whatever background should be offered training to accelerate him or her towards eventual selection to the British team. There is no upper level to the talent that an applicant is allowed to demonstrate and we are most anxious that no one should be missed out. With the limited financial help available the present strategy is to assist 26 pilots each year in a three-tier programme. Sixteen intake-places are available this year and there were 37 applicants. It is true that three selected pilots have three Diamonds but one has had to withdraw in order to concentrate on his A levels, (!) and a second because of business commitments. Surely we would have been wrong not to have welcomed talent like this. Other applicants may already be instructors. Mr Hampshire has the advantage of me there since the application forms do not identify them. But in any case an instructor is not necessarily an expert soaring pilot, however regrettable this may be, and we are certainly not going to exclude pilots from the scheme just because they are prepared to give their time to teach others instead of improving their own cross-country skills. To put the record straight this year's intake includes pilots from 12 different clubs. The pilots range in experience from 500 to 12000km total cross-country claimed and from 90 to 900 total gliding hours. They all have Silver Cs and 11 have one or more Diamond legs. The youngest is aged 19 and the oldest 29.

WEATHERCALL

Dear Editor,

We are all now aware that the telephone weather forecasting system has been revised. Individual forecasts for every area in the country are prepared by the Met office and made available through the Weathercall system. In the same way the Marinecall service provides information for the sailing fraternity.

It may not be generally known that promotion of these services is handled by a private company, Telephone Information Services Ltd (TIS). I found this out by phoning 01-236 3500 for a free Weathercall information card and leaving a hopeful message on the answering machine that it would be nice if a forecast could be provided for private pilots. The following day I received a letter from Roger Farrow, Network managing director of TIS, to the effect that they were already in discussion with the CAA and hopeful that a forecasting service will be provided.

I immediately phoned Mr Farrow and told him that such a service, with more specific information required for soaring flight, would be very welcome and assured him the service would be well used by the many gliding enthusiasts. I was very heartened by his enthusiasm for the idea and he has now been in touch with the BGA for more information.

Mr Farrow made the point that his company was always very willing to provide information services to the public, provided there was a definite demand and the service would be well used. I hope I may have started the ball rolling and ask that all those interested in a gliding forecast should contact TIS and express their hopes for a service. Their address is Telephone Information Services Ltd, Dewhurst House, 24 West Smithfield, London EC1A 9DL, tel 01-489 1946.

MIKE FAIRCLOUGH, *Exeter, Devon*

BUYER BEWARE

Dear Editor,

In reply to Derek Piggott's article in the December issue, p260, it is true that weighings do give rise to substantial inaccuracies – one only has to look at the conglomeration of bathroom scales and blocks of wood teetering and tottering the while to see why – but as to gliders never getting lighter and looking upon C of Gs that shift forward with the gravest suspicion, piffle!

What about the case of the foreign glider now fitted up with a lighter panel with the oxygen removed and it's early 720 radio replaced with a TM6? Or the vintage glider restored with clear fabric and the junk of ages chucked where it belongs in the bin? All these can cause C of G shifts both forwards and backwards and also large reductions in empty weight.

No doubt with his long experience of gliding Derek has seen many poor examples of second-hand gliders, but inferring the second-hand glider market is rife with crafty horse traders is grossly unfair.

MARTIN BREEN, *High Wycombe, Bucks.*

Dick Stratton, BGA chief technical officer, replies. There is absolutely no evidence that there is either widely inaccurate weighing, or that the level of accuracy achieved using bathroom scale technology is below that which is required, in connoisseur terms, to operate our gliders safely. Occasionally there are monumental mathematical blunders in applying the bathroom scale readouts to actually pinpointing the C of G. The BGA have produced a diagramatic weight and balance proforma which makes it simpler. The most consistent inaccuracy is associated with the weight of the pilot. Certain British gliders would no longer be acceptable for certification under JAR 22 airworthiness requirements because they fail to comply with JAR 22-23 which states "The C of G range must not be less than that which corresponds to the weight of each occupant including parachute, varying between 110 and 70kg." Weighings of old wooden sailplanes can vary by 40lbs between winter and summer. The only weight and balance accident trends are probably those of flying gliders below the minimum (placarded) cockpit weight (Oly 419 and Dart). The existence of a current C of A for any aeroplane or an MOT for any car is no guarantee of value or subsequent lack of problems!

Derek Piggott replies to both Martin and Dick. Of course if you remove heavy equipment you can expect the total weight to get less. But any large movement forward of the C of G needs investigation. No Martin, it will move aft if you remove instruments, and removing an oxygen bottle or two will scarcely move the empty C of G at all. Apparently there are a few unscrupulous dealers, so I still say "buyer beware".

Sorry Dick, but even one more case of believing the C of G is further forward than it is could be lethal, whereas an error the other way is of far less significance. I also used to believe our wooden gliders changed weight from summer to winter, but there are other reasons and the most likely seems to be poor weighing. If you estimate the amount of wood in an old glider, allowing for metal fittings, paint and fabric, it seems unlikely that they could get so waterlogged as we all used to believe. Try the sums yourself Dick, four gallons of water is a lot to absorb in so few cubic feet of wood.

APOLOGY AND CORRECTION

Dear Editor,

In my letter "Gliding in Australia" (December issue, p285) I referred to a mid-air collision between a DG-300 and a Discus at Benalla in January 1986 in terms of "turning right to join the Discus's left-hand thermal and claimed he did not see the Discus." These comments came from an accident summary which on

subsequent investigation by myself and an officer of our Bureau of Air Safety Investigation proved to be incorrect and at variance with the pilots' reports of the accident.

The point I was endeavouring to make is that it is very difficult to see other gliders in blue thermal conditions which are more common in Australia than in Europe, and that GFA pilot training places great emphasis on good look-out.

I wish to apologise to the pilots concerned for any wrong impression of their airmanship which may have been given. The official accident report is being amended and neither pilot is held particularly to blame.

MIKE CLEAVER, *Inspector (Sport Aviation), Department of Aviation, Canberra, Australia*

DOES ANYONE HAVE CONTROL?

Dear Editor,

While agreeing with Bill Scull that the problem of who is in control of a glider needs addressing (last issue, p23), I must take him to task over his apparent approval of some debatable instructional techniques.

In particular, his suggestion that "assisting" is an acceptable ploy fills me with dismay. There can only be one person in control of an aircraft, and instructors who insist on good handover/take over drills from flight one will always know who it is. "Assisting" is a bad habit developed by instructors who follow through when the pupil is flying. This is surely unacceptable because:

a. It causes confusion over who is in control, leading to cases which have been wrongly attributed to freezing on the controls.
b. It undermines the pupil's confidence.
c. It makes the glider feel different to the pupil.

Any instructor who believes that lightly following through will not be felt is only fooling himself. It is only a short step to subconsciously making inputs. Many is the time that an instructor I have been flying with has told me I have control, then proceeded to land the glider himself. The final irony is when I, as the pupil, am congratulated on a perfect landing!

What Bill has not said is when in general terms an instructor should take control. To my mind it is before reaching the limit of the instructor's own ability to recover the situation. Quite apart from the safety aspect, the pupil is not learning anything as he is long past the point when he has the skill to recover. Control should be taken with a clear "I have control". If instructors find that their voice has risen an octave, they should take control earlier next time!

PAUL WHITEHEAD, *Lincoln*

Bill Scull replies: All Paul's points are perfectly valid. Unfortunately in gliding we don't live in a perfect world (aircrew selection/CFS-trained instructors); many amateur instructors, however well they are trained, will, for various reasons, end up assisting/interfering with the controls (see "Value for Money", *S&G*, August 1975, p153). My aim was to deal with all the possibilities.

THE CASE AGAINST RADIOS

Dear Editor,

In the December issue, Chris Garton (p278) and Vic Carr (p286) put the case for using 720 channel radios for gaining access to otherwise prohibited airspace. That may be all well and good, but I have a number of reservations about this.

If too many pundits start doing this, the authorities may presume that most gliders have 720 channel radios and use this as an excuse for greater, or even blanket, restrictions. Obviously this would bear most heavily on the less well-heeled end of the gliding community, where the cost of such a radio may well represent 50% of the value of, say, a complete Oly 2 outfit.

In fairness to other users of aircraft radios, glider pilots would need to be trained and licenced in RT techniques, which would be yet another hurdle for the would-be cross-country pilot. Although I am the holder of an RT licence, one of the things I like about gliding at present is the relative freedom to fly around the countryside without needing to continuously monitor the radio. Also, imagine being grounded on a good soaring day because your radio is U/S!

Suppose in a competition that a few smooth-tongued airline pilots, such as Chris, were able to talk their way into good soaring conditions in restricted airspace, while the rest were denied access and were then forced to scratch or land out. Would this be fair?

I am sure that in some circumstances radios can detract from safety. I can think of at least two fatal accidents that could be attributed to the use of RT at an awkward moment. Fiddling with a radio must detract from keeping a good look-out and, in any case, why bother if that nice air traffic controller has you on his radar? I have given up expecting light aircraft to give way to me in the air, as I suspect that many of their pilots hold this view.

I think that we should maintain our present positions that airspace restrictions should be kept to the absolute minimum necessary to protect major airports and that our existing rights should be maintained or even extended.

DEREK COPELAND, *Rickmansworth, Herts.*

COMMENT ON GEL COATS ARTICLE

Dear Editor,

The article by John Scott in the last issue, p17, caused me some concern. First, I would be interested to know how John knows when all the water he assumes is in the glider structure has evaporated. This is important since applying paint of any type over a "damp" surface is a sure way of having problems from micro blistering. This may not appear immediately, but may become apparent some considerable time after the repair.

Secondly, he is suggesting using "Hi-Build acrylic primer" to "level to profile". This reads as if the primer may be laid on until up to level. In fact, most paint manufacturers recommend a maximum film thickness. A figure of 60-70um (2·5/1000in) per coat is about normal for the type of primer referred to, and a maximum of three coats. If the paint is built up much greater than this, the crazing he hoped to cure will occur again but this time it will be his refinishing that crazes.

I accept that as a senior inspector, John has considerable experience in the repair of gliders, but I urge him to be more careful in the way he describes what he may consider to be an every day task. He must remember he is using acquired knowledge and skills most people will never obtain.

MARTIN CAROLAN, *Hillingdon, Middx.*

John Scott replies: Martin appears to assume that my article is a specification for the DIY enthusiast; quite the contrary. Any improvement in care and maintenance it promotes is well worthwhile; if the worst occurs it provides a basic understanding to assist in selecting a company which has the equipment, facilities and expertise to do it properly. They will have the instruments to measure the moisture content, know about multiple coating in materials which do not chemically bond, know how to mix the materials to obtain the required flexibility and, most important, have a properly constructed, dust free, temperature and humidity controlled spray booth big enough to accommodate your glider. May I take this opportunity to stress that I have no commercial interest in, or connection with, any repair organisation and therefore cannot make recommendations or otherwise as to their ability to properly carry out the work.

SOLVING CABLE PROBLEMS

Dear Editor,

I read Colin Aldridge's article in the last issue, p25, on improving the pay on rollers on his winch with much sympathy. The point that struck was that in the original design the side rollers were rotating at 19342rpm, a very high figure indeed!

To reach this rotational speed the roller will have to be accelerated by the contact of the cable on its surface. The surface of the roller will not achieve the surface speed of the cable instantly for the roller has a mass and therefore inertia. Sliding contact will therefore take place between the steel cable and the roller. This contact will generate heat and the roller will locally soften. Even if case hardened, the metal will flow under load in these circumstances. This is shown by grooving of hardened pulleys, that can occur quite quickly in service. The generation of heat also effects the cable although at a slower rate for the cable has more effective cooling.

The four roller box design has further disadvantages: the cable moves from side to side under load touching first one vertical roller then the other, while in contact with the top horizontal roller. Also the cable may not make contact with the top roller until it is travelling quite fast at the point of take-off.

Some years ago I carried out an indepth

study of pay on rollers for the ATC. They had found in service that these rollers were wearing out very quickly in spite of being hardened by the nitriding process. A significant proportion of the cost of maintaining the ATC's winches was the replacement of these rollers.

In the course of this investigation I discovered that this problem was not new. The technology of pulleys and wire cables had been worked out years before by the mining industry. There is a British Standard 329/1957 that lays down the size of pulley for a given cable speed. For the wire speeds used on the launching winch, a suitable pulley size is 14in in diameter.

It is therefore no coincidence that the Tost, and many winches built up and down the country, use the swing pulley device. This is necessary to accommodate the single large pulley that takes the place of the four roller box. There are many advantages for this arrangement, but not least is that the cable is in contact with the roller throughout the launch and therefore heat generation through sliding contact is negligible. The pulley speed is quite low – 400-500rpm – well within the capacity of the sealed for life bearings. The cable is asked to follow around a greater radius and the cable stresses are very much reduced.

I designed such a system and it has been on the Yorkshire GC winch for some time with good results. It can be made available to clubs if they write to me. I commend this design to Colin Aldridge and the Shalbourne Soaring Society.

J. C. RIDDELL, *Wetherby, Yorks.*

SILVER AND GOLD BADGE NUMBER

Dear Editor,

Surely this is an Uncompetition for Incompetents? (See the Armchair Pilot's letter in the last issue, p39.)

I achieved Silver C No. 188 in the Cambridge University GC's Oly in 1949, gliding downwind from a Mynd wave and, incidentally, only just missing Gold height.

In 1971, after many more height fumbles, I became that rarity "Silver C and two Diamonds" (another competition?); but my first Portmoak solo in 1975 completed my Gold badge (No. 460).

The difference is 272 – nothing to be proud of, the number ought to be NEGATIVE! However "Better my hog dirty home than no hog at all" as the Good Book says.

PIGGY

ONLY A 40 YEAR GAP!

Dear Editor,

I am amused by Gordon Camp's reference to Gold Badge No. 1162, being larger than its owner's Silver, in the November issue, p232. I do hope he will be kind enough to reserve No. 1263 for me! Then I can have my Silver re-gilded, and No. 1 added to its May 1950 issue. Yes, I too have British Empire on my certificate.

Clear the skies, for I hope it will be in the coming year: my newly-tipped "20" shortly awaits: forsake the Petrel, if only for a season, and if I make it by 1990, the gap will be 40yrs!

Ah, well, back to Reichmann . . . but will it be a record?

MIKE RUSSELL, *Henham, Herts.*

KEEP YOUR HEAD STILL

Dear Editor,

I take slight exception to Bill Tootell's suggestion (last issue, p40) that I don't keep a good look-out when thermalling – but let that pass.

I am less inclined to let pass his misrepresentation of what I wrote in *Fear of Flying* (Part 2 – October issue, p210) about head movements, which was that minimising head movements whilst thermalling helps prevent *nausea*, not *fear*.

Let me quote Helmut Reichmann's advice in **Flying Sailplanes** (p40): "When circling, keep your head as still and erect as possible. This improves your piloting sensitivity, as your sense of balance is not disturbed. For look-out purposes it is often enough simply to move the eyes. Otherwise, while circling, keep your eyes on the horizon ahead and slightly to the side towards which you are turning".

ANTHONY EDWARDS, *Cambridge*

A PILOT'S PROGRESS BOOK

Dear Editor,

I should like to comment on Derek Piggott's article in the last issue, p12, about pilot progress sheets/cards/books.

I thought I'd give gliding a try with a holiday course and was bitten by the bug on my first flight. I ended up doing four courses at three clubs, losing only one full day and amassing 17hrs 28min P2 in 57 flights.

One club vaguely filled in the pilot's training programme. The second didn't put anything on the flying progress card and the third didn't offer a card, sheet or book but reluctantly put something in the first book.

The result is I have no proper record to show what progress I've made. As I travel abroad and may want to have the odd lesson, and most of my gliding in this country will probably be holiday courses and I enjoy going to different clubs, not having a standard progress report is a handicap.

While accommodation, food, instructors and instruction on the courses were excellent, some of the administration left much to be desired. On one course we had to chase around to pay for our flying.

What I'm trying to get at is while the BGA has a standard pilot's logbook, why doesn't the BGA get club CFIs to draw up a comprehensive list of requirements, sort out what is best and make a standard pilot's progress book.

While a holiday course is what it says, for some of us it is the only way we can get to glide and we would like to be taken seriously. A proper progress book would be a help.

J. AMES, *Lyndhurst, Hants.*

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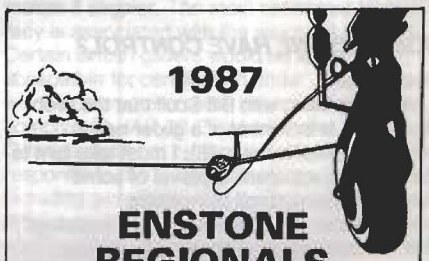
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ANN WELCH

20th WORLD GLIDING CHAMPIONSHIPS

BENALLA · AUSTRALIA · JANUARY · 1987

FIRST 15 METRE CLAS WORLD CHAMPION FOR BRITAIN

Ann reports on the World Championships in Australi us another Champion with Brian Spreckley winning t

Brian Spreckley is the new 15 Metre Class World Champion. After 12 days hard flying, and at his first attempt he won by 87pts from Holger Back of W Germany. In this closely fought contest only 355pts separated the first five pilots, two of them previous Champions. Flying an LS-6 Brian came 1st on only one day, while Holger (LS-6A) won two and Doug Jacobs, USA (LS-6B) the defending Champion and now in 3rd place, won three. Brian's success was that he avoided having any poor scoring days; although on January 27 he had a most unpleasant flight in weak, broken lift and winds so strong and gusty that he was flipped low on final glide. He just made it into the airfield between trees, delighted to find himself still alive.

In the Open Class, almost as expected, Ingo Renner, Australia (ASW-22B), successfully defended his title to become the first pilot ever to be World Champion four times. He also had the largest points margin over his nearest rivals Marc Schroeder, France, (ASW-22B) and Bruno Gantenbrink, W Germany (Nimbus 3); although they certainly did not allow Ingo to sit back and take it easy.

If there had been a team prize the French would surely have won it

The new Standard Class Champion, Markku Kuittinen, from deep frozen Finland, convincingly flew his Discus A to 1st place 143pts ahead of Michael Opitz, USA, whose father soared on the Wasserkuppe before the war. Michael also flew a Discus, adding to the success of this aircraft which took all the first six places. Jacques Aboulin was 3rd, 133pts behind, but putting the French well into the medal league; if there had been a team prize they would surely have won it.

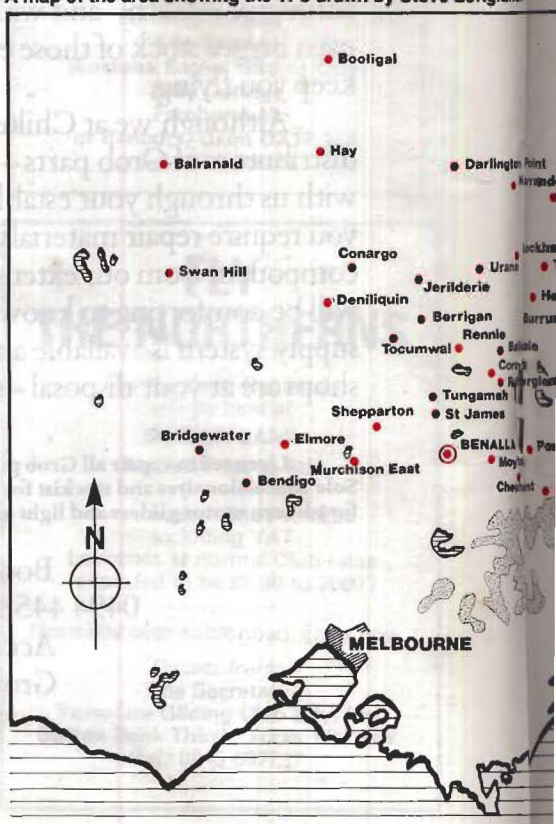
But so much for the bare bones of the 12 days of flying. To start at the beginning, a big Championships on the far side of the world – to high summer from a dark English winter – is no simple expedition. The gliders had been shipped in September, so, for the British team, Christmas was spent packing tee shirts and water bottles instead of putting up the decorations. They boarded various jets to follow the gliders – and miss the coldest January weather almost since records began.

The 30 strong team, including families, converged on Tocumwal 90km north of Benalla for 10 days serious practice, interspersed by barbecues with the Dutch, German, Finnish, French and Argentinian teams. The weather was good enough for Andy Davis, GB (Discus) to fly a 750km triangle at 110km/h, but unfortunately not quite the 2% needed for a new record; while Brian Spreckley missed a 1000km triangle by a mere 50km. Inevitably, it was Klaus Holighaus, in Australia this time as crew, who made the longest flight ever from Tocumwal of 1118km in a Nimbus 3.

Before the team moved to Benalla on January 10, they had been given special help by the Australian coach, Garry Speight, expert on the benefits of team flying in Australian weather, and on how to recognise good thermal sources – and landing places. Since the glider weight was obviously going to be fairly critical in the Championships, the British team was grateful to have their own scales, lent by Salters of Melbourne. Also at Tocumwal it had been hoped that seven British pilots could be accepted at Benalla, and Alister Kay had come out to fly his ASW-22 in the Open Class, but had to return home disappointed.

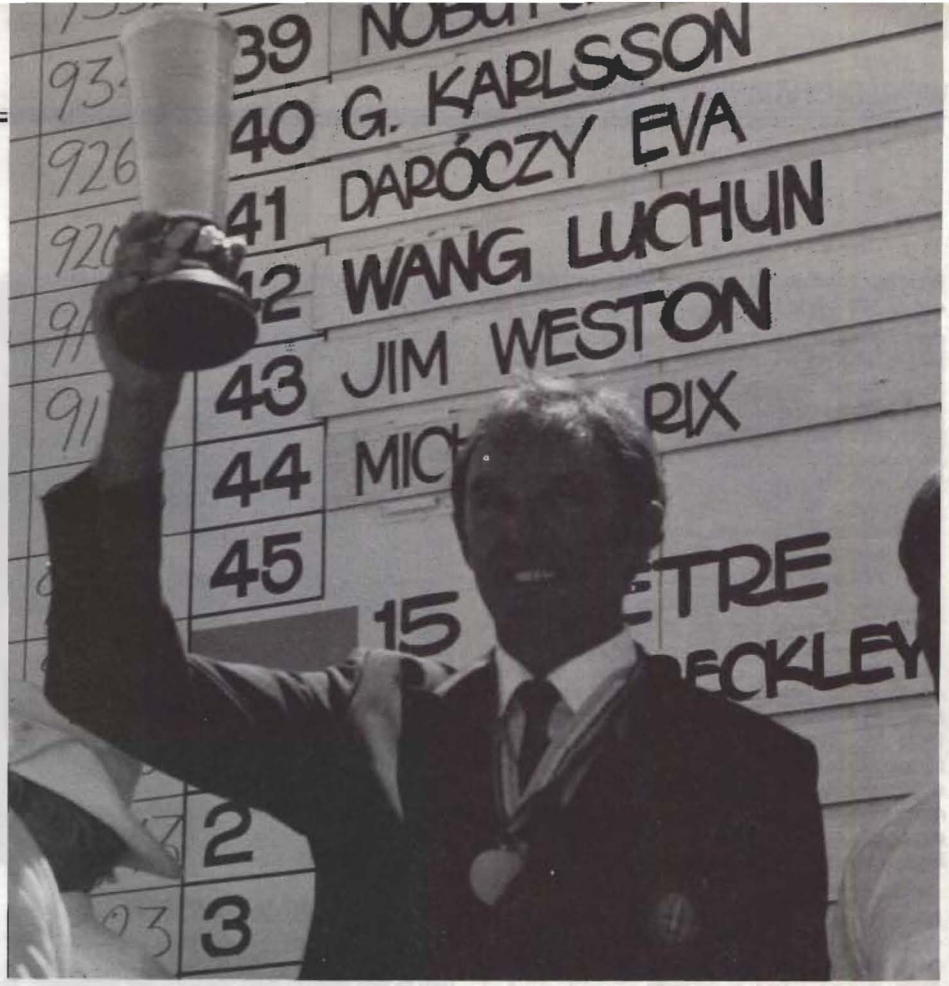
The Championship's official practice week went smoothly enough, apart from a minor mid-air between Maurice Bradney, Australia, and Jeremy Bryson, Ireland. Tasks were set and scores were produced for those who flew them. Temperatures around 29°C and very good visibility under a largely blue sky were the norm; until

A map of the area showing the TPs drawn by Steve Longland.



ASS

tralia this January which gave ing the 15 Metre Class

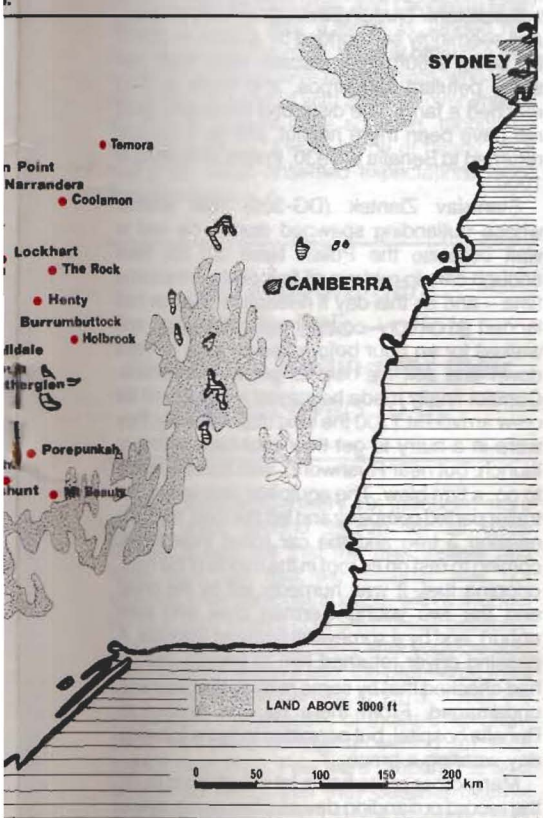


A triumphant Brian Spreckley. *Photo:* **Ann Welch.**

January 16 – hot Friday. Quite large tasks were set, although the forecast was for a trough to come through Benalla at 1600hrs with gusts of 40kt. It was a most unpleasant day with a NW wind from the central desert bringing temperatures of 38°C and stifling, blowing dust. Only six of the Open Class flew and two of them returned without going anywhere. Ten 15M took to the air, few of them top pilots. And so ended the practice period.

On January 17 the Championships were opened with the usual parades, and the State Premier, John Cain, and his wife being flown in the Nimbus 3D and ASH-25. There was a good flying display watched by 7000 people, and finally relief that all was now as ready as it ever would be for both organisers and competitors.

Big tasks were set for the first contest day, **January 18,** with excellent weather forecast. The Open was the first to go, *via* a 556.4km quadrilateral; Elmore, Swan Hill, Deniliquin. The medium and high cloud of the opening day had cleared, and the morning began blue with a few cumulus expected later at 14000ft. It was a day full of promise. The first signs of problems came when



TASKS FLOWN

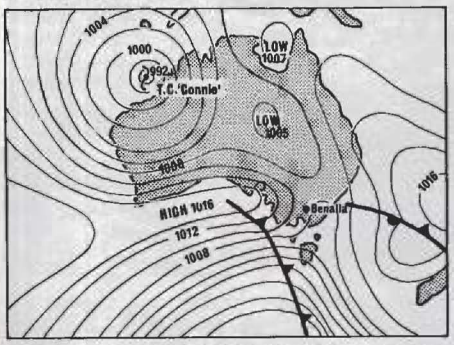
Open Class: *Day 1, 556.4km ■ Elmore, Swan Hill, Deniliquin; Day 2, 259.8km ▲ Berrigan, Balldale; Day 3, 437.7km ■ Rennie, Holbrook, Urana; Day 4, 307.1km ▲ Murchison East, Balldale; Day 5, 457km ▲ Bendigo, Balldale; Day 6, 444.6km ▲ Deniliquin, Porepunkah; Day 7, 350.7km ▲ Deniliquin, Jerilderie; Day 8, 430.5km ▲ The Rock, Jerilderie; Day 9, 621.9km ▲ Narrandera, Hay; Day 10, 512.1km ▲ The Rock, Conargo; Day 11, 839.8km ▲ Temora, Booligal; Day 12, 571.5km ■ Elmore, Deniliquin, Mt Beauty.*

15M Class: *Day 1, 444.8km ■ Elmore, Conargo, Jerilderie; Day 2, 249.4km ▲ Tungamah, Burrumbuttock; Day 3, 392.3km ▲ Lockhart, Jerilderie; Day 4, 255.7km ▲ Murchison East, Corowa; Day 5, 313.7km ▲ Shepparton, Burrumbuttock; Day 6, 405.1km ▲ Jerilderie, Porepunkah; Day 7, 385.4km ▲ Jerilderie, Lockhart; Day 8, 339.1km ▲ Lockhart, Urana; Day 9, 536.1km ■ Moyhu, Narrandera, Conargo; Day 10, 508.9km ▲ Coolamon, Jerilderie; Day 11, 754.8km ▲ Darlington Point, Balranald; Day 12, 569.9km ■ Bridgewater, Deniliquin, Cheshunt.*

Standard Class: *Day 1, 437.8km ▲ Bendigo, Deniliquin; Day 2, 250.2km ▲ Berrigan, Rutherglen; Day 3, 314.2km ▲ Henty, Rennie; Day 4, 227.4km ▲ Shepparton, Rutherglen; Day 5, 396km ▲ Bridgewater, St James; Day 6, 344.1km ▲ Urana, Cheshunt; Day 7, 368.4km ▲ Berrigan, Henty; Day 8, 367.2km ▲ Henty, Berrigan; Day 9, 501.2km ▲ The Rock, Conargo; Day 10, 518.6km ▲ The Rock, Deniliquin; Day 11, 695.4km ▲ Coolamon, Hay; Day 12, 537.8km ■ Bendigo, Tocumwal, Porepunkah.*

The logo of the British team's sponsor, Orenstein & Koppel.

Weather briefing for January 18 when 104 out of 108 landed out



Another front approaching Tasmania causing the ridge that extended into Victoria to collapse. W to NW winds were 10-15kt below 5000ft increasing to 45kt at 10000ft. But temperatures did not rise as expected and the wind increased more than forecast, making conditions difficult, especially on the windward first and second legs. Note cyclone Connie off the NW coast.

launching was delayed to await the dilatory convection, messed about by the unexpected fresh wind. This also turned the first launch of the Championships into a groundloop, and a collapsed undercarriage for Rolf Hossinger, Argentina (Nimbus 3); quickly repaired by the ever helpful Klaus Holighaus.

Convection remained unco-operative, no cumulus appeared, and because the forecast indicated that stronger thermals would develop in the afternoon, many pilots decided to leave late, in spite of the large task.

One record was broken on this day; the largest ever number of outlandings

Airborne, they found the depth of the thermal layer much shallower than forecast so into wind progress was slow. Most pilots had anticipated rounding the first TP at 1530, instead of which it was nearer 1700. As well as being lower than expected, thermals varied wildly in quality. When Brian Spreckley heard one of his team mates comment that "he thought he would take it down to 3000ft" he said he was trying hard to get UP to 3000ft. The cause of the weakness of the weather and its 35kt winds was a small trough moving quickly through at the 5000ft level. However, one record was broken on this day: the largest ever number of outlanders; 104 out of 108 gliders. The only gliders to get back were in the Open Class: Ingo, Ray Lynskey, New Zealand (Nimbus 3T), in his first flat-land Worlds, and from France, Marc Schroeder, and Gabriel Chenevoy who with Didier Hauss was flying the big ASH-25 two seater. Ingo's speed was a slow 93km/h and Chenevoy's 83.1km/h.

The last gaggle of the day was about 48km out, and this last thermal contained Standards as well as Open Class, but not having the 57:1 glide of the big ships they all landed short, though not with long retrieves. David Innes (Nimbus 3) was not among them. He had already started his five hour walk near Swan Hill to try to find a telephone. Instead of Guernsey's tiny fields he had landed in one of 1500 acres! As it grew dark he aimed for a light, then realised it could be 50 miles distant. Trudging through chest high grass, and seemingly surrounded by a canal he almost fell down a 60ft deep disused mine shaft, met some petulant kangaroos, and finally at 0130 reached a farm. The disturbed occupants could not have been more helpful, and he eventually returned to Benalla at 0930, in time for briefing at 1000.

Stanislav Zientek (DG-300) was another whose outlanding spawned drama. He had to wait because the Polish team did not have enough cars to retrieve all four pilots at the same time – and on this day it needed to! Zientek had landed in empty country near Bendigo, and walked for an hour before seeing a car to wave down and ask for help to get to a telephone. Contact finally made he stayed in a pub until his crew arrived at 1100 the next day. Naturally, they were in a hurry to get their pilot back in time to launch, but near Rushworth, with some 60 miles to go, a tyre blew. The equipage jack-knifed, the trailer parted company and left the road, narrowly missing a tree and the car rolled three times, coming to rest on its roof in the middle of the road, dripping fuel. It was hurriedly left by the driver and the two young German crew who were unhurt, and by a somewhat battered Stanislav. A passing driver returned him to Benalla after he had checked that by some miracle the glider was undamaged. From there he was whisked to Benalla hospital, but permitted to fly the following day wearing a brace.

Many other pilots had a lot of walking to do on the record outlanding day as often on reaching a



An informal shot by Robert Johnson of most of the British team before the opening ceremony.

THE WEATHER

The weather in southern Australia in January consists, generally, of anticyclones in series moving eastward between the tropical lows to the far north of the continent and the roaring forty type lows tramping along the southern ocean. Between the highs there are, so called, cool changes, with the wind mainly south-west ahead of the next approaching high, then hot spells with a north to north-east wind as the high drifts to the east.

Needless to say, in common with all World Championships, the weather was unusual. Winds were stronger than normal and the mean temperature lower — except for Friday January 16, during the practice week, when the wind roared out of the north-east, the temperature rocketed to above 38°C, the dust blew and the fire risk was 100%.

One of the problems was that the jet streams were running further south than usual — and up to 180km, and another was the presence of two tropical cyclones away to the north-west, the high cloud from which penetrated into the task area for several days.

Cloudbase was lower than expected, with few days having the 'normal' 12000ft or so. On some it was a mere 4500ft, with blue thermals broken in the strong wind. However, this was made up for by marked thermal wave on several days up to 9000ft, high above the tops of the small cumulus which developed. The thermal wave was used mainly at the start of the task to obtain the best possible advantage, though there was a certain amount of luck — as well as skill — in contacting the wave.

There was only one bad weather day, January 27, with rain from a cold front moving from the west, but at least it laid the dust!



Director Wally Wallington opening the Championships. ***Photo:*** **Robert Berry.**

house they would find it shut up with the owners on holiday. The only woman pilot, Eva Darocy (Std Jantar) of Hungary, had a language problem as well as a telephonic one, and was finally helped by the Swedish team who found her still trying to get through at 2100.

Although no one in the 15M or Standard reached home, all three defending Champions won their Class. Doug Jacobs flew 436.6km of the 15 Metre 444.8km task, and Leonardo Brigliadori's 428.6km, Italy (Discus A), landed him just 10km short of Benalla. Back at base this was a real test for the retrieve telephonists, who were not geared up to cope with such an overwhelming number of calls quite so soon, though by midnight most pilots were home or nearly so. It was a day which unsettled expectations more than somewhat.

The predominant characteristic – pilots constantly waiting for their nearest rivals to go

Day 2, Monday, January 19, produced more modest tasks; around 250km for all three Classes. It was not that the task setters had taken fright, but that the weather was not expected to be particularly good, with a thermal cut off at 1800 when a cool S wind was expected to arrive. Nevertheless, there was considerable pilot inclination to leave late; the Standards were still hanging around Benalla at 1515. It was the predominant characteristic of these Championships, with pilots constantly waiting for their nearest rivals to go. Few were prepared to lead as it simply meant that they became thermal indicators, homed in on by almost every other pilot with a later start time. As a result everyone waited for everyone else, sometimes for too long and to finally land out. Chris Garton, GB (Discus B), managed the gaggles best on this day in the Standard Class, winning 1000pts and 2nd place overall. The 15M Class was won by Ake Pettersson, Sweden (LS-6), and the Open by Bruno Gantenbrink.

On **Day 3, Tuesday, January 20,** the weather was described by meteorologist Mary Hewitt as "unusual". It was a term to be frequently repeated. A cold front moving east to the south of Victoria would cause the high to weaken and give gusty winds – and blow the cirrus along at 160kt. In addition some medium cloud was expected to stream over the area from tropical cyclones off NW Australia. In spite of this good thermals could be expected up to 6300ft at a surface temperature of 29°C, with possible thermal wave up to 10000ft. On this forecast, the task setters recovered their morale and gave 437.7km to the Open, down to 314.2km for the Standard. The difficulty was to decide when to start, it being a compromise between going early and risking loss of heating due to the cirrus, or going later and risking weakening thermals after the cirrus had gone.

Most pilots departed around 1330 but Brian Spreckley, who won, left at 1346 to sail through several gaggles ahead – most of which promptly chased after him. It was not easy. Operating heights in the blue thermals were between 2000 and 4000ft only, English style, with the wind increasing to 25kt by the end of the task. Dave Watt, GB (ASW-20B), had set off some 16min earlier than Brian and warned him that conditions were difficult and "not to rush it". Martyn Wells, GB (LS-6A), who made only a moderate speed, was heard to mutter "Trust me to follow Musters when he has an off day". In the Standard Class Justin Wills, GB (Discus) and many others started at 1358, but did not achieve such good times as the winners, Erwin Sommer, W Germany (LS-4A) and Maxwell Stevens, New Zealand (Discus B), who had departed 10mins earlier.

Day 4, Wednesday, January 21. The cool air associated with a cold front away to the south and cirrus continuing to stream overhead at 150kt was the less satisfactory part of the story. The good part was that consistent 5kt thermals were expected up to 5000ft in the afternoon with 3/8 cumulus, but the actuality was better still, and allowed some of the fastest speeds of the whole contest. Thermal wave developed over the cumulus, fed from the moister air moving out from cyclones Connie and Irma far to the NW. For many it was a day of learning quickly how best to contact the wave. Since cloud flying was prohibited the technique used was to build up speed, fly as fast as possible upwind just under the cloud and pull up into the upgoing wave air. In practice it was more difficult as the lower part of the wave was weak, needing patience to work, and luck was also needed to come out from under the cloud in exactly the right place. It was frustrating when one glider was seemingly plucked upwards to great heights leaving near neighbours in nothing. Generally, the thermal wave would give 1-3kt, with the lift increasing as the glider rose and could fly farther upwind – with the illusion of the cumulus below receding downwind.

The good speeds on this day were helped not only by a cloudbase higher than expected, but by more cumulus to act as markers and to some extent reduce the gaggling drag. However, the critical factor was to connect with the wave to get a really high start. Then the first leg could be flown without circling and cloudstreets used on the next two. The maximum climb found was 12kt, and Dave Watt was delighted with his speed of 123km/h until he discovered it only put him in 27th place. Martyn Wells was less fortunate, as he ran into unexpected heavy sink on the last leg and landed 3km short, although he had started his final glide at 5000ft with a 500ft margin. The scoring system devalued this day in the 15M Class to a maximum of 529pts, gained by Werner Meuser, W Germany (Ventus B), with Holger Back 1pt behind. Maximum points in the



Lorna Patching who has been on the finishing line for 30 years. ***Photo:*** **Ann Welch.**

Standard were 395, collected by Andy Pybus, Australia, (Discus B), while Ray Lynskey won the Open with 747pts.

The weather continued "unusual" on **Day 5, Thursday, January 22.** Met said the high had strengthened but in pushing eastward against a trough would give strong southerly winds. Overhead the SW jet was blowing at 180kt. Thermals were expected earlier than usual up to 5500ft and 5-6kt, with a cool maximum temperature of only 24°C. There would be strong thermal wave to 10000ft as well as some orographic wave. By this time the plethora of wave lift – orographic, shear, and thermal was becoming a little difficult to distinguish: it was simpler to just use whatever turned up if it benefited tactics. Mary the Met also said that the wind could be a problem, forecasting dust devils and 40kt gusts on the ground. Any small cumulus would dry out by noon.

Briefing ended on this day with a plea for more careful and slower driving on the airfield. Apart from the choking dust one car had dashed across the runway ahead of an aeroplane taking off. Then, when launching had barely started, Lindsey Stephens, New Zealand (Ventus A), came off tow, and was forced to land downwind to avoid the take off lines. Touching down like a jet fighter he stopped just short of the fence and one of Benalla's famous ditches, but without damage.



The ASH-25 flown by Gabriel Chenevoy and Didier Hauss, France, which came 4th. ***Photo:*** **Ann Welch.**

Tasks were on the large size for the forecast weather, a 457km triangle for the Open, 313.7km for the 15M and 396km for the Standard, who could not believe their ears, even though they would be the first to go. But the weather turned out to be less extreme and there was thermal wave to 9-10000ft to assist starts, though bringing the usual lack of order to those milling around at the top of the wave waiting for the best moment to go. Two opposing techniques were apparent – to fly slowly with brakes open to avoid going up into controlled airspace or to avoid this by screaming around at VNE. On this day the British did not team fly. Brian started late but caught up Martyn at Corowa, 70km out, then lost him through getting low, but came home 5th for the day – enough to stay top overall.

Chris Garton had to scrape to get home, though Dave Watt and Andy Davis fared better, though not with fast times. Steve O'Donnell, Australia (Ventus B), won this day with a big 230pt margin over Holger Back. Steve flew entirely on his own, not joining any gaggles as the thermals were broken and difficult, and he felt he could make better use of them as the only occupant.

In the Standard Class Leonardo Brigliadori was a popular 1st. Andy Pybus, known as the prime leech because of his skill in following the right pilot, came 8th for the day with 818pts; enough to hang on to top overall.

A rest day was declared for **Friday, January 23,** though free flying was permitted. Several teams drove to Mt Buffalo to see the hang gliders practising for their own Championships. Team managers were summoned to a meeting of the International Jury to deal with a claim for more points by a pilot who photographed the incorrect

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start point. He did not get them. Others attended to chores, went swimming or complained about the slowness with which the scores were appearing. It seems that a new computer programme was being used, and its troubles should encourage FAI to require full advance testing of any World Championships scoring programme. Only enormous efforts by the many volunteer helpers finally got it right before the contest ended. The rest day ended with Mary the Met saying that "Tomorrow will be warmer with E-N winds".

The "Second Half" began on **Day 6, Saturday, January 24,** with a task into the mountains for the first time. It was quite large with 444.6km for the Open, descending to 344.1km for the Standard. However, the weather was again "unusual": this time with hot N winds between two high centres and a trough over central Australia, to be followed in turn by a cold front. A rapid increase in temperature was expected with thermals up to 7800ft and 34°C by 1600, but it did not live up to the forecast. Some al-cu appeared, the organisers sensibly back-tracked to the reserve tasks, and thermals only reached 5000ft.

The TP at Porepunkah is among low hills and fairly open country, but overshadowed by Mt Buffalo and its 1000ft vertical rock cliff from which the hang gliders launch. Lift was weak near the TP and some pilots found themselves low, and unhappy that they were not flying over the familiar flat fields. Martyn Wells was heard to tell Dave Watts that he was going in all the wrong places, to be answered by "I don't know how to fly mountains; show me".

The British contingent tried team flying on this day but it did not work

Brian Spreckley had set off early on his 405km task convinced that the day would not be good. Never higher than 5000ft he spent most of the time between 2 and 4000ft, rounding the Jerilderie TP at 3000ft. His second leg was better, though having joined Kees Musters, Holland (Ventus A), Jacobs and Tug Willson, Hong Kong (Ventus B), in a gaggle they flew along the face of Buffalo without finding anything under a cirrus overcast. Finally, Brian located a weak thermal near Mt Emu, and used 3kt to get him up from 1400ft. Now flying with Holger Back and Gilles Navas, France (LS-6), he struggled home, but at 16km out they had only 1200ft. Brian finally made it with a slow time, but won the day, but Doug Jacobs landed out, scoring only 432pts. The Standard Class were not happy either. Most started too late. The British contingent tried team flying but it did not work, and they needed to divert 8km west of track to keep going at all: at one point Justin called that he was outlanding, but did not. Markku Kuittinen won the 1000pts, followed by Michael Opitz, USA (Discus B), with Chris Garton 14th. Although his day started badly, as he had not taken a photo of the control board and had to land back to do so, he was airborne again well in time to start with the others.

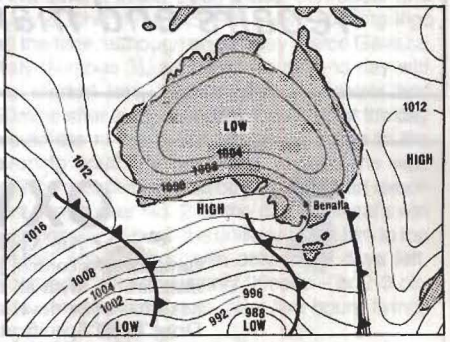


Chris Garton, Andy Davis and Justin Wills, our Standard Class men, debriefing after an exhausting day! *Photo:* Robert Johnson.

Jacques Aboulin, who came third, just better than Brigliadori, had left early with the other French pilots, but they were immediately followed by a swarm, and from then on could not escape gaggles of 20-25 gliders.

The Open Class had a new day winner, Marco Gavazzi, Italy, flying his Nimbus 3, with 27pts over Ingo. David Innes again got round the task in his turbo Nimbus, feeling a little deprived because he had had to remove the propeller and found the weather difficult to use.

Sunday, January 25, was another rest day, this time enforced by drizzle, though at least this laid the dust. A few hours were occupied with a team manager's meeting, including discussing sizes of penalties. Some given at Benalla were considered too small and therefore would not be a deterrent or encourage respect for the rules. Another point raised was that contacting thermal wave brought gliders hard up against the 10000ft airspace base, though barograph traces showed that infringements were small and infrequent.



Monday, January 26.

Day 7, Monday, January 26 was Australia Day, with a community breakfast on the civic

The Chinese team, competing for the first time. *Photo:* Ann Welch.





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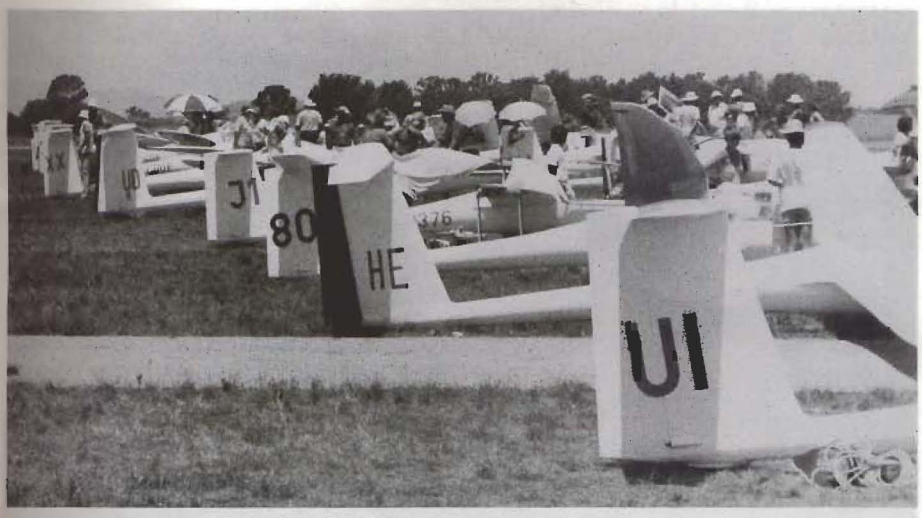
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The Standard Class grid. ***Photo:*** **Robert Johnson.**

centre lawn by the river, various other jollifications and, of course, the flying. Met briefing indicated that yesterday's high cloud had now receded well to the north, and was replaced by a weak ridge and light winds. Warm but fairly stable conditions were expected with weak to moderate thermals up to 5300ft of, at best, 4-5kt: but they could continue after 1800. Tasks were moderate to suit. 350.7km for the Open, 385.4km the 15M, and 368km the Standard. But by the time launching started the day was looking excellent, full of magnificent cumulus, so the tasks looked easy. But cat and mouse gamesmanship again resulted in late starts; for many between 1430 and 1500, making the last leg difficult against increasingly strong westerly winds.

Chris Garton stayed high and on his own as far as possible to final glide into an almost empty airfield, and win the day; his second 1000pts so far. In the 15M Brian got low on the final leg, wasting no time in weak lift, and losing to Doug Jacobs by 165pts; though this was not too much of a worry overall due to Doug's outlanding on Day 6. However, Navas was now a serious threat. Both Brad Edwards, Australia (ASW-20), and Steve O'Donnell had low points of 500ft and 800ft respectively, and were further discouraged by rain at the northern TP. Another unfortunate, but for a different reason was Tug Willson. He had one camera jam, followed shortly after by his other, and ended up with only 105pts.

A welcome visitor on **Day 8, Tuesday, January 27,** was Hans-Werner Grosse following his world record flights. He had hoped to attempt the world goal distance record by flying to Benalla, but decided that the "unusual" weather was not good enough. The day was cool with cold air below 5000ft, but thermals were expected to improve early reaching 5000ft at 1600, but at a maximum temperature of only 26°C it felt cold in the strong and gusty SW winds under a high speed cirrus cover.

Brian Spreckley did not enjoy his flight as the broken thermals were weak, up to only 4000ft, with a 35kt wind. Time was wasted climbing in unhappy gaggles losing ground almost as fast as it had been gained, and in avoiding one glider he nearly hit another. Then, on final glide he was



Martyn Wells task planning. ***Photo:*** **Robert Johnson.**

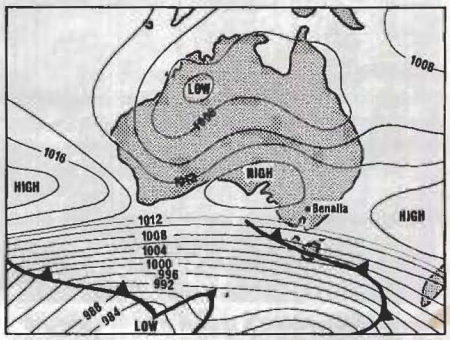
almost flipped in the turbulence and had to come in to the airfield between two trees. Eric Moser, USA (Ventus A), who also got back, had a low point of 400ft and then climbed slowly up into a gaggle from which he could not escape. Dave Watt managed to hold his 6th place overall, though Andy Davis, on his task, was somewhat depressed on this day, as almost every decision he made seemed to be a wrong one. Ingo, in the Open Class, wisely left early, almost an hour before anyone else, avoided the debilitating gaggles, and got home to win with 206pts ahead of Schroeder, his nearest rival. Gantenbrink did the opposite, hanging around for three hours before starting in the hope of better thermals, but it did not work out and he ended with 200pts less than Ingo.

The Standard Class also had its dramas on their 367km triangle, with Brigliadori outlanding near the second TP for a mere 162pts, dragging him from 2nd to 11th. Kuittinen was now well established in the lead, but Chris Garton's 6th place was still a threat – or it was until landing back on this day. To his horror, having finished the task with a good time, it was discovered that there was no film in either of his cameras, so the resultant zero score, instead of his expected 867pts, put paid to his chances.

At last, on **Day 9, Wednesday, January 28,** the "unusual" weather was expected to be replaced by "typical" Benalla conditions, with dry air and good thermals up to 6200ft. The wind would shift during the day from 240° to 190° with some shear wave. Thus encouraged, big tasks were set; 621.9km for the Open down to 501.2km for the Standard. In the event it was yet another blue day, but with a lighter wind. Gaggle flying continued to the extent that "if you put a whole Class in a DC9 and flew it round the course the results would be about the same". One gaggle contained 43 gliders – a whole Class, and was enjoyed by no one; certainly not Andy and Justin who were in it.

The French continued to do well, with Standard Class contenders Aboulin and Alain Delylle (Discus) a persistent threat to Opitz if not to the redoubtable Kuittinen; though Opitz managed, near Conargo, to break loose from the pack because he was still carrying more water than most others. In the Open Class, Schroeder and Gabriel Chenevoy (ASH-25) were pushing Ingo all the time, although on this day Marco Gavazzi, Italy (Nimbus 3), achieved his second day win. He started late, 30mins after Schroeder and 50mins after Ingo, accepting the risk that the day would die to leave him struggling home in the evening southerly headwind. Instead, he was able to race through the others to gain an excellent 8km/h over No. 2 for the day. Gavazzi's win was popular, though it is unlikely to get him to top overall against Ingo with only three days left. Schroeder's time was only 90secs – or 2-3 circles – more than Ingo's, after five hours flying.

Weather briefing for January 29, the 500km day



Light NW winds were forecast, increasing and backing with height, and influenced by the fast moving lows "the roaring forties". There would be some cumulus up to 7000ft by 1600hrs. In the event thermals were blue with average strengths of 4kt instead of the 6-7kt expected. However, there were only 15 outlandings in the 15M and Standard Classes and none in the Open.

On **Day 10, Thursday, January 29,** with excitement growing, the weather settled down. A weak ridge lay across southern Australia with

light NW winds, temperature into the low 30s, and with thermals expected to maximise at 7000ft and stay active until well after 1800 in the warm evening air. Tasks were all over 500km, and the Wagga airspace had, as usual, been raised to 10000ft to accommodate the Championships. But the morning looked less promising with a large patch of cirrus over Benalla, which it had not been expected to reach. Chris Garton even called out his trailer shortly after the start, though it was not needed. In the 15M Class the cat and mouse game was in full swing with pre-start gaggling endemic, and worsened because the extra shear wave lift was contacted by few, and in any case only went up to 6500ft, or 1600ft above the top of the convection; not much for a lot of hard work. Finally, nerves and the gaggles broke, and everyone got down to actually flying the task, but it had taken its toll and rivals Brian Spreckley and Gilles Navas both scored badly as a result. Navas actually went back for a further start to leave finally at 1350, but unable to catch up with the gaggles he scored only 460pts to drop several places. Holger Back gained on the deal and won.

The Standard Class task gave the three British (Wills, Garton and Davis) a good day, although they increasingly disliked flying over the same task area day after day in the dangerous gaggles. And this they certainly were: in one Stanislaw Witek, Poland (Discus A), suddenly saw a glider just ahead, and in pulling up to miss it cut off the right side of its T tail with the left side of his nose. The glider was Leonardo Brigliadori's Discus, which promptly went into a vertical dive through the gaggle, missing at least one other by a small margin. While Justin, Chris, and others



Leonardo Brigliadori's Discus with its damaged tail. *Photo:* **Ann Welch.**

sent out maydays, Leonardo was trying to open the canopy with one hand and regain some control with the other. But the Discus needs two hands to get rid of its canopy. It was just as well, though remarkable – that Brigliadori was able to get the Discus back to level flight with just 50% of his tail, and fortunate that he found himself just 10km short of Deniliquin airfield and lined up with its runway. Using brakes he landed safely, while Witek returned to Benalla after completing the task. Thirty-one of the 44 Standards Completed, with a speed difference of just over 6km/h be-



Leonardo discussing the mid-air collision with Smilan Cibic and Piero Moreill. *Photo:* **Ann Welch.**

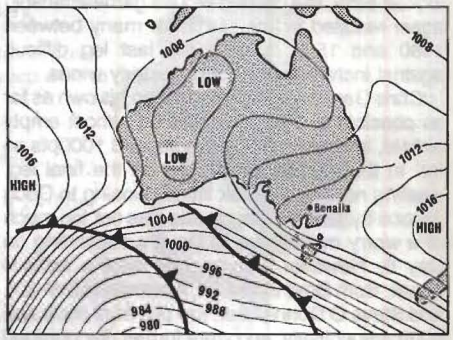
tween them; and with John Byrd, USA (Discus A), top for the day at 107.1km/h.

The Open Class on the 29th was won by Ray Gimmey, USA (Nimbus 3), ahead of Ingo. George Lee, Hong Kong, flying consistently as usual and liking his ASW-22BE with its stiffer wings, came 3rd after an 800ft low point. He had problems with a combination of cirrus above and irrigation areas below, and disappointment when a distant circling glider, which appeared to be rocketing skywards in a strong thermal, turned out to be lightly loaded and nothing to do with the Championships.

The last but one task, on **Friday, January 30,** was the largest ever, a 839.8km triangle, given to the Open Class, and the weather was expected to co-operate. The ridge over southern Australia was still giving a light WNW wind with expected thermals up to 8400ft, possibly 11000ft, to last until fairly late in the evening. The temperature would reach 32°C. But it ended up as yet another blue day, with thermals of 6-7kt, instead of the anticipated 9kt. Briefing had been brought forward to 0930, but the first launch at 1030 was delayed to 1100, when the Open Class set off. Without much gaggling they made good enough times for 16 out of the 21 to get round, fastest, at 116.3km/h, being Ingo – just 0.3km/h better than Schroeder. Much of the last leg had been a compromise between flying low with the greater risk of outlanding but with 4-6kt thermals, or staying higher but flying slower in weaker lift.

The other two Classes gaggled as usual, especially the Standard, which launched last for their 695.4km task. It was a day to just go, but after 40mins of gaggling plus the less strong weather there was no longer time to do the distance. The same applied to the 15M with their 754.8km stint. So no one got home from either

The forecast for January 30 when the Open Class were set the largest task ever of 839.8km



The Met briefing indicated a ridge over Victoria with a WNW airflow to the S. Thermals were expected to reach 5200ft by 1400hrs and 8400ft at 8-9kt by 1700hrs. However, maximum height was only 7000ft and the day ended with some abruptness at 1915. The launch had to be delayed due to dilatory convection and during the day a 1°C inversion developed at 3200ft. There were 92 outlandings.

Class, though the task had been possible, as some landed less than 30km out.

Nearest home in the 15M was Daan Paré, Holland (Ventus B), 28km short with Martyn Wells 2nd at 40km. Standard pilots Andy and Justin were joint 4th, 29.4km short, and Brigliadori with a borrowed tail made 652km. To avoid the retrieve confusions of Day 1, Ben Watson set up a relay radio on Dookie Hill, 30km out. By 2100 all six British pilots were connected with



The Open Class winners, l to r, Ingo Renner (1st), Marc Schroeder (2nd) and Bruno Gantenbrink (3rd) with the Hon Neil Trezise MP who presented the prizes. Wally Wallington is just visible. ***Photo:*** **Ann Welch.**

their trailers so that Ben needed to make only a single call to Benalla to report "all safe and sound".

The last contest day, **Saturday, January 31,** dawned with the eventual Champions already in place – Renner, Open; Spreckley, 15M, and Kuittinen, Standard. The task was to be more modest, around the 550km mark, in weather that was cautiously becoming classic Benalla. Blue skies, and with an afternoon temperature of 35°C thermals should reach 9500ft in light NW winds. Classic weather also brings a total fire ban, so although aerotow retrieves are permitted after the last task, they could be asked for only from airfields (with fire fighting equipment) but not from paddocks. And to reduce gaggling the start would be open for only 1½hrs. This brought cries of dismay at briefing, but was obviously sensible. It was a routine sort of day, without drama and without the satisfaction of unexpected achievement. In the Open Class Schroeder came 1st at 118.1km/h with Janusz Centka, Poland (ASH-25), and a relaxed Renner next at 117.3km/h, leaving Ingo 160pts in the lead to become World Champion for the fourth time.

The Standard Class was topped for the day by Brigliadori, which pleased everyone, and with Andy Davis only 1km/h slower. Twenty-three out of the 44 got home, Kuittinen, like Renner, played it safe to come 12th with 99.1km/h, and to be Champion at his fifth attempt.

Only five of the 15M Class outlanded, with Holger Back winner for the day at 121.5km/h but not fast enough to dislodge Brian Spreckley, who made it 2nd at 120.9km/h to win this toughest of Classes.

That night there was the usual final party in the double hangar which, like all the previous functions, was dominated by music so amplified that even the "goodbyes – see you in Austria in two years" – were inaudible. But it was not so important; it was a time to relax after 12 hard flying days. Days in which Benalla had become its own world under the summer sun.

A good Championships, although like any other, it leaves problems to be solved

Finally, from the red-hot pressurised computer the scores came out, and also some figures: 530 000km flown – a record, with 4800 glider hours. 145km/h was the fastest speed and 839.9km the biggest task. The 15 tugs gave 1300 launches up to 2000ft to 108 gliders normally in 56mins. The towing throughout was efficient, as were the start and finish line operations, and the marshalling. The *Daily Bulletin,* often of 28 pages, came out on time throughout the Championships, the food and drink departments worked well, and Benalla town provided a big welcome and enough bicycles for all the workers. Only the computerised scoring failed to get itself together until almost the end. It was a good Championships, although like any other, leaves problems to be solved.

There is no doubt that gaggling on the scale of Benalla takes away decisions, challenge, and enjoyment from the flying; and is dangerous. Whether or not there should be a wider variety of tasks to complement the eternal triangles does need thought. Penalties need to be looked at so that they relate better to the infringement. But these are all matters for winter, for CIVV meetings, and for the FAI General Section working group, so that the next Worlds at Wiener-Neustadt can benefit from lessons learnt.

"Man of the Match" was certainly Leonardo Brigliadori. As defending Champion he was 1st on Day 1 and did well until his unfortunate outlanding on Day 4. Undiscouraged he bounced back for 1000pts on Day 5 and into the lead – until on Day 8, when he had half his tail chopped



Ben Watson, British team manager. ***Photo:*** **Robert Johnson.**

off in the mid-air. After such a horrendous experience many pilots would have called it a day. Not so Leonardo. He flew again next day with a borrowed tail, fighting back to win again on the last day as he had on the first – in spite of a minor engine fire in the tug! Brigliadori got his new tail after a great Australian telephonic search, which finally achieved success at Narromine 570km away. At 0500 the next morning Dave Sharples, GFA president elect, took off in a Cessna 177 to collect it, arriving back after five hours' flying to be met by Klaus Holighaus who fitted it to the Discus waiting naked in the launch area. It was generous actions like this, and the organiser's welcome and friendliness, together with the warmth of the Australian sun, that will stay for a long time with all those lucky enough to be at Benalla. The 20th Worlds was a happy Championships. Thanks to all those Australian gliding friends who made it so.

* * *

In the next issue Brian and other team members will be giving their impressions of the Championships.

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OPEN CLASS

Pilot		Country	Glider	Day 1.16.1 558.4km ■	Day 2.19.1 259.8km ▲	Day 3.20.1 437.7km ■	Day 4.21.1 307.1km ▲	Day 5.22.1 457km ▲	Day 6.24.1 444.6km ▲	Day 7.26.1 350.7km ▲	Day 8.27.1 430.5km ▲	Day 9.28.1 621.9km ▲	Day 10.29.1 512.1km ▲	Day 11.30.1 839.6km ▲	Day 12.31.1 571.5km ■	Total Points
1	AS Renner, I.	AUS	ASW-22B	999	781	776	705	946	977	934	1000	974	938	1000	989	11019
2	CF Schroeder, M.	F	ASW-22B	962	726	901	742	1000	857	995	810	1000	872	994	1000	10859
3	YY Gantenbrink, B.	D	Nimbus 3	724	826	1000	651	946	992	1000	825	969	941	962	934	10770
4	KL Chenevoy, G.	F	ASH-25	949	700	894	732	985	827	762	826	923	836	949	949	10332
5	KS Gavazzi	I	Nimbus 3	737	705	764	585	959	1000	770	861	835	773	941	940	9870
6	25 Cenka, J.	P	ASH-25	748	660	920	713	824	744	831	845	865	775	899	989	9833
7	XB Lynskey, R.	NZ	Nimbus 3T	983	695	871	747	994	797	725	814	727	824	886	878	9441
8	73 Peter, E.	D	Nimbus 3T	706	722	877	655	931	855	685	827	932	760	937	490	9347
9	UP Lee, G.	HK	ASW-22BE	721	827	934	617	799	654	925	772	810	896	901	422	9278
10	VW Kuratjens, G.	NL	Nimbus 3	786	692	907	660	872	769	475	800	579	798	958	951	9247
11	7V Gimmey, R.	USA	Nimbus 3	107	884	667	704	946	300	741	831	878	1000	857	488	8403
12	TM Nurminen, R.	FIN	Nimbus 3	617	586	761	614	832	941	720	740	663	570	410	894	8348
13	BY Ax, G.	S	ASW-22BE	610	611	685	663	35	735	713	769	625	741	937	954	8279
14	SX Schult, G.	NL	Nimbus 3D	270	628	556	633	881	800	749	818	285	858	898	877	8253
15	YB Danz, W.	CH	Nimbus 3	359	664	806	573	319	968	774	815	656	626	380	845	7785
16	76 Innes, D.	G	Nimbus 3	535	571	321	459	484	576	866	678	708	746	887	796	7827
17	HW Holland, J.	IRL	ASW-22	495	607	825	587	355	295	695	605	644	670	879	481	7138
18	GB Bourgard, P.	B	Nimbus 3	392	705	560	456	642	327	784	809	877	666	346	478	7022
19	I Hossinger, R.	ARG	Nimbus 3	296	635	615	355	566	539	591	614	768	614	842	365	6800
20	IK Blitter, F.	CH	Nimbus 3	128	325	306	492	859	612	567	711	773	638	380	820	6611
21	KG Coutts, J.	AUS	ASW-22	313	231	732	365	733	579	463	686	563	603	617	381	6466

15 METRE CLASS

Pilot		Country	Glider	Day 1.18.1 444.8km ■	Day 2.19.1 249.4km ▲	Day 3.20.1 392.3km ▲	Day 4.21.1 255.7km ▲	Day 5.22.1 313.7km ▲	Day 6.24.1 405.1km ▲	Day 7.26.1 385.4km ▲	Day 8.27.1 339.1km ▲	Day 9.28.1 536.1km ■	Day 10.29.1 508.9km ▲	Day 11.30.1 754.8km ▲	Day 12.31.1 589.9km ■	Total Points
1	82 Spreckley, B.	GB	LS-6	966	943	1000	421	811	1000	835	747	979	707	942	990	10341
2	71 Back, H	D	LS-6A	972	799	721	528	870	904	925	789	797	1000	949	1000	10254
3	YS Jacobs, D.	USA	LS-6B	1000	854	924	354	842	432	1000	1000	960	891	884	936	10077
4	MS Musters, K.	NL	Ventus A	964	927	679	460	543	922	900	918	830	923	942	988	9996
5	CA Navas, G.	F	LS-6	975	986	803	449	788	989	972	891	833	468	942	890	9986
6	52 Watt, D.	GB	ASW-20B	960	662	849	345	797	941	913	808	986	869	912	870	9912
7	WM Meuser, W.	D	Ventus B	861	872	855	529	489	930	947	781	735	963	909	980	9851
8	IS Hagnander, T.	S	LS-6	898	882	809	320	757	906	742	891	957	872	949	861	9844
9	32 Wells, M.	GB	LS-6A	966	851	723	158	822	904	824	799	954	957	982	893	9833
10	NL Paré, D.	NL	Ventus B	872	987	739	420	442	664	908	824	905	704	1000	981	9446
11	HS Kristiansen, S.	NOR	LS-6	721	729	857	433	767	921	914	795	943	732	971	482	9265
12	B Pettersson, A.	S	LS-6	848	1000	696	398	364	864	789	881	976	713	866	854	9249
13	BB Bulukin, B.	NOR	LS-6	872	844	838	450	673	902	943	662	821	684	971	294	8954
14	K2 Krueger, W.	CDN	ASW-20B	850	896	714	426	674	374	747	767	798	795	893	974	8908
15	EM Mozer, E.	USA	Ventus A	916	726	280	365	664	961	641	803	821	836	883	939	8835
16	VS Ghiorzo, S.	I	LS-6	314	317	822	421	680	900	917	911	734	959	957	804	8736
17	78 Stouffs, H.	B	LS-6A	876	999	695	417	786	769	357	883	781	903	909	319	8674
18	PD Kuusisto, S.	FIN	Ventus B	73	701	806	431	717	849	844	709	768	882	909	963	8652
19	TR Riera, R.	ARG	LS-6	954	903	329	329	690	788	428	590	959	882	964	801	8615
20	GH Prat, R.	F	Ventus B	975	321	611	359	698	958	877	815	757	337	942	894	8524
21	MX Wiemberg, I.	DK	Ventus B	756	660	645	391	442	786	749	701	1000	667	971	689	8457
22	TP Newfield, T.	NZ	Ventus C	897	280	746	435	845	408	731	574	935	629	918	759	8357
23	UW Edwards, B.	AUS	ASW-20B	878	798	813	314	690	964	336	806	145	770	973	809	8296
24	HC Werneberg, U.	CDN	ASW-20	872	760	681	376	587	365	741	621	788	694	917	747	8129
25	6 Göbel, R.	A	ASW-20	881	545	753	478	350	808	752	721	788	615	884	771	8126
26	QC O'Donnell, S.	AUS	Ventus B	841	753	774	286	1000	777	336	875	757	24	908	651	7982
27	QS Bradley, M.	AUS	Ventus A	96	966	649	405	442	883	460	865	832	502	951	776	7827
28	Y Galetto, G.	I	ASW-20L	842	660	863	255	684	682	346	893	575	291	973	781	7825
29	IR Delore, T.	NZ	Ventus B	154	604	762	168	678	869	424	785	815	757	918	653	7587
30	C Starovic, V.	YUG	Ventus B	681	747	822	405	409	755	794	600	42	601	881	799	7536
31	NE Stephens, L.	NZ	Ventus A	760	748	741	410	484	379	786	570	721	294	841	718	7452
32	XF Dossing, E.	DK	ASW-20B	129	517	621	336	439	773	696	892	787	629	874	755	7448
33	C6 Haggenmüller, R.	A	LS-6	256	682	718	462	442	380	713	633	816	560	936	840	7438
34	KY Bryson, J.	IRL	ASW-20	721	796	430	277	315	605	544	685	668	773	926	632	7372
35	YD Webb, D.	CDN	ASW-20	898	407	719	298	599	347	595	567	783	723	966	339	7241
36	PI Willson, B. (Tug)	HK	Ventus B	118	711	204	337	666	773	105	898	771	822	899	671	6975
37	AD Kimura, G.	JAP	Ventus A	89	666	852	314	672	818	335	158	709	725	954	574	6866
38	MV Virtanen, M.	FIN	ASW-20B	188	333	636	439	715	640	538	117	686	889	939	671	6791
39	DW Junqueira, C.	BRA	ASW-20B	857	343	697	0	723	345	650	369	306	517	915	747	6469
40	YT Ylipaavaniemi, P.	FIN	Ventus B	717	374	656	509	598	658	692	376	483	404	883	13	6361
41	UE Kornhauser, M.	ISR	LS-3	681	0	642	312	713	347	358	450	671	337	859	140	5510
42	XR Suzuki, M.	JAP	Glasflugel 304	84	341	194	159	421	333	297	425	316	553	664	557	4344
43	DY Inamori, H.	JAP	ASW-20B	0	484	333	211	369	342	226	302	269	512	720	DNF	3768

STANDARD CLASS

Pilot		Country	Glider	Day 1.18.1 437.8km ▲	Day 2.19.1 250.2km ▲	Day 3.20.1 314.2km ▲	Day 4.21.1 227.4km ▲	Day 5.22.1 396km ▲	Day 6.24.1 344.1km ▲	Day 7.28.1 368.4km ▲	Day 8.27.1 367.2km ▲	Day 9.28.1 501.2km ▲	Day 10.29.1 518.6km ▲	Day 11.30.1 695.4km ▲	Day 12.31.1 537.8km ■	Total Points
1	XX Kuittinen, M.	FIN	Discus A	931	947	934	343	881	1000	837	954	827	978	979	925	10536
2	RO Opitz, M.	USA	Discus B	995	693	977	255	823	944	891	1000	902	972	974	967	10393
3	SJ Aboulin, J.	F	Discus	892	819	924	363	898	942	621	927	1000	945	974	976	10281
4	3D Delylle, A.	F	Discus	931	607	888	352	981	928	708	901	997	922	965	983	10163
5	FV Pybus, A.	AUS	Discus B	992	965	931	335	818	660	951	848	835	973	965	590	9863
6	BG Ottosson, C.	S	Discus B	913	683	921	173	669	845	950	915	854	932	1000	972	9827
7	SB Belen, B.	NL	DG-300	940	696	924	334	730	616	965	884	832	950	965	904	9740
8	GI Anderson, J.	DK	DG-300	959	579	939	290	741	860	863	976	918	914	878	514	9431
9	87 Wills, J.	GB	Discus	967	944	640	230	746	491	829	948	844	979	987	550	9355
10	KA Widmer, J.	BRZ	LS-4A	954	703	879	279	865	894	621	957	894	383	994	929	9352
11	30 Byrd, J.	USA	Discus A	930	579	983	326	825	270	649	978	883	999	976	951	9349
12	Y4 Schramme, R.	D	Discus A	994	834	905	324	718	781	176	896	785	896	976	979	9264
13	80 Davis, A.	GB	Discus	217	978	843	331	736	854	661	831	841	941	987	987	9207
14	LB Brigliadori, L.	I	Discus A	1000	835	979	299	1000	933	815	162	879	305	965	1000	9172
15	XN Stevens, M.	NZ	Discus B	906	739	984	225	687	472	673	879	843	942	965	855	9170
16	LS Sommer, E.	D	LS-4A	931	825	1000	270	734	526	382	888	786	899	974	908	9123
17	SO Wdek, S.	P	Discus A	789	641	842	270	528	871	720	817	828	890	966	881	9043
18	T5 Leutenegger, S.	CH	DG-300	892	840	817	221	575	744	841	737	851	938	1000	570	9026
19	A9 Simenc, I.	Y	DG-300	938	284	883	290	751	807	544	942	835	935	976	581	8566
20	NZ Binder, H.	CH	Discus B	905	693	860	199	355	841	604	617	672	975	882	940	8543
21	QK Cubley, T.	AUS	DG-300	891	471	845	248	552	594	729	853	817	946	976	501	8423
22=34	Garton, C	GB	Discus	930	1000	785	271	550	833	1000	0	599	949	970	514	8401
22=A	Pankka, A.	FIN	Discus B	810	698	856	379	640	880	807	591	239	993	984	524	8401
24	82 Øye, S.	DK	DG-300	940	554	979	329	729	875	516	962	191	925	889	497	8386
25	OD Apps, M.	CDN	LS-4	824	531	890	227	861	802	372	796	700	335	976	987	8301
26	ZE Hämmerle, H.	A	LS-4	851	557	461	257	636	800	696	703	850	981	968	523	8283
27	8Q Zientek, S.	P	DG-300	211	0	842	293	653	875	860	924	879	915	965	865	8282
28	JI Oda, M.	JAP	Discus	927	462	873	173	281	861	390	560	845	921	979	917	8189
29	PW Kolaric, I.	YUG	DG-300	905	570	537	216	672	560	605	797	821	917	976	589	8165
30	NM Curtis, P.	SIN	LS-4	901	701	842	211	498	571	492	739	774	937	976	501	8143
31	XD Rizzi, R.	ARG	Discus A	950	607	812	203	772	488	694	724	833	285	958	864	7990
32	MM Reynoso, M.	ARG	Discus B	478	677	557	133	352	868	667	906	824	958	973	523	7916
33	JA Trzeciak, J.	P	DG-300	459	524	591	296	688	690	671	888	832	335	965	845	7784
34	CE Peperko, F.	YUG	DG-300	262	454	859	176	329	828	656	843	749	938	976	560	7630
35	AI Hollestelle, E.	CDN	Discus	743	642	816	172	668	274	631	443	793	285	979	875	7321
36	53 Slögner, G.	A	LS-4	217	826	809	254	694	553	296	538	859	305	965	903	7219
37	OO Soares, R.	BRA	LS-4A	629	575	835	220	335	383	540	550	734	405	889	822	7117
38	BL Blumer, E.	CH	LS-4	32	134	823	286	377	320	764	535	844	927	962	559	6663
39	UI Horia, N.	JAP	Discus B	113	668	608	215	700	606	390	25	731	960	979	532	6527
40	EF Karlsson, G.	S	Discus	227	705	213	182	644	619	770	592	689	357	942	470	6410
41	UD Daroczy, Eva	HUN	Std Jantar	857	320	386	195	636	320	370	460	433	678	623	458	5736
42	HE Wang, L.	CHI	LS-4	0	602	498	83	23	520	539	617	596	370	962	523	5333
43	HD Weston, J.	IRL	Pegasus	259	390	484	113	355	439	383	194	504	288	776	523	4708
44	5S Rix, M.	NZ	DG-300	905	DNF	DNF	DNF	DNF	DNF	DNF	DNF	DNF	DNF	DNF	DNF	905

BGA & GENERAL NEWS

NEW PUBLIC RELATIONS OFFICER



Maxwell Fendt, who runs his own PR, publishing and advertisement agency (PIPA), has taken over from Nikki Campbell as BGA public relations officer. He says he wants to sustain Nikki's magnificent groundwork with clubs and other relevant UK media and intends to continue her method of helping clubs individually to gain publicity. Also he will concentrate on national and trade media and other PR matters, including sponsorship opportunities as relevant.

He will be contacting and visiting clubs and is happy for you to phone him on 01-579 1813 if you need any help.

He has made an excellent start by gaining considerable National coverage of the World Championships.

Many members will know Max for his stated preference of enjoying "coarse" gliding from different sites and countries. He started gliding at Kenley in the 1950s, came back to it in the 1970s, is now an assistant Cat at Lasham and has a PPL.

Max's address is 4 Shenstone House, 9-11 Culmington Road, Ealing, London W13 9NL.

WINCH BUILDING

A gliding accident in July 1986 in an Oly 460 stopped John Bourne from flying but he has taken up winch building. With another member of Burn GC, he is currently working on a winch and built the one in use at Burn.

John, a qualified commercial vehicle fitter who built breakdown trucks for British Road Services for years, is hoping to get enough orders for two drum winches to make a living. He was a keen glider pilot with 200hrs and gained a Silver C in two years.

INTER-UNIVERSITY TASK WEEK

This year the University of Surrey GC are organising the Inter-University Task Week at the Avon Soaring Centre, Bidford near Stratford-on-Avon, Warwickshire, from August 8-16. It is open to University and Polytechnic clubs. For an entry form and full details contact Tony Gee, University of Surrey GC, Students' Union, University of Surrey, Guildford GU2 5XH tel 04868-28550.

REPORTED ACCIDENTS 1985-86

John Shipley has taken over from Keith Mitchell as chairman of the BGA Safety Panel and comments on the accident rate for 1985-6 while also in this section we start printing the new BGA accident summary.

Serious injury to pilots in the last year has increased by 50% over the consistent averages for the period 1978-1984. There were four fatalities and 11 pilots sustained serious injuries. (The previous year 1984-5 was unusually free from serious accidents, with one fatality and two serious injuries.)

Minor injuries were received in five accidents last year, approximately a third the number in previous years.

The total number of reportable accidents in the year and damage to gliders was similar to the totals for the previous five years. With the following accident rates for the year, substantial accidents 0.15/1000 launches and minor accidents 0.25/1000 launches, it gives a total accident rate of 0.40/1000 launches.

For those who read **Accidents to Gliders 1985-86,** it is worth noting the following points:

- the overall variety of accidents and pilot experience levels.
- the growing number of accidents involved in both failed winch launches and aerotowing.
- the large number of field landing accidents which occur from a relatively small number of launches. Subjectively, say, from about 1% of launches by trained and otherwise experienced pilots.

For all those that fly, control and supervise flying the message is clear, "new accidents" do not occur, they have all happened before and are almost exclusively caused by pilot error.

STRUCTURE OF THE BGA

The membership structure of the BGA is now made up of 86 full member clubs, three of whom have affiliated clubs as follows: Army Gliding Association with two clubs, RAF Gliding and Soaring Association with 11 clubs and the Royal Naval Gliding and Soaring Association with three clubs.

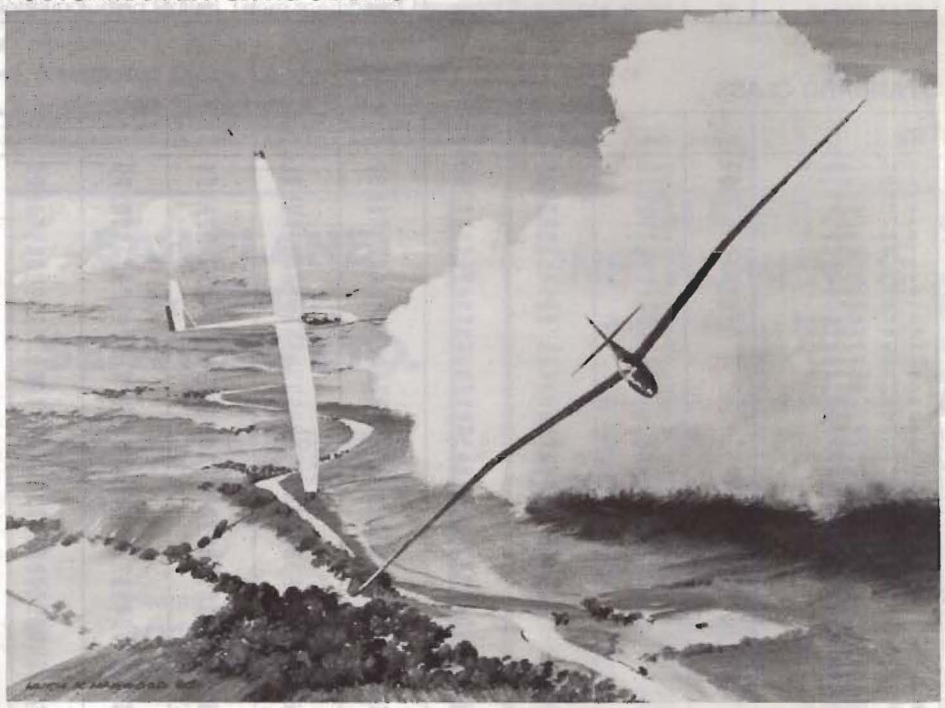
Operations. During the year ending September 30, 1986 (1985 figures in brackets), member clubs (civilian and combined services) flew a total of 144672 (152995) hours and 723179 (1024357) kilometres cross-country from 433134 (406929) launches from club sites. Club owned gliders total 478 (487) and privately owned gliders 1300 (1277).

Certificates. Certificates were issued as follows: A endorsements 1522 (1625), B endorsements 234 (230), Bronze C 384 (419), Silver C 240 (261), Gold C 54 (75), Diamond goal 43 (100), Diamond height 55 (48), Diamond distance 21 (61).

A certificates were applied for by 772 (839) holders of the ATC proficiency certificate.

A missing ballast bag. During a busy wave season at Aboyne Robin Cutts's ballast bag disappeared. If anyone borrowed it and left it in their glider/trailer over the winter she would be grateful for its return. It is lead shot in a green canvas bag with her name and 40lbs written on the outside. Robin is at 272 Holburn St, Aberdeen AB1 6DL.

POSTCARDS FEATURING GLIDING



This is one of a set of four large colour postcards featuring paintings by Hugh Harwood available from the BGA shop at £1.20 including p&p. In this, a Discus shares a thermal with a Minimoa. The others are of a Prefect, the Falcon 1 and the Sir George Cayley man-carrying glider in flight.

GLIDING CERTIFICATES

ALL THREE DIAMONDS

No.	Name	Club	1986
221	Wise, B. R.	Booker	16.5
222	Boydon, M. V.	Wrekin	27.10

DIAMOND DISTANCE

No.	Name	Club	1986
1/339	Wise, B. R.	Booker	16.5

DIAMOND GOAL

No.	Name	Club	1986
2/1510	Barker, K. D.	Bristol & Glos	17.7
2/1511	Andrews, A. D.	Two Rivers	16.5
2/1512	Whitehead, P. G.	Shropshire (in Spain)	28.8
2/1513	Ackroyd, G. D.	Anglia (in Spain)	4.9

DIAMOND HEIGHT

No.	Name	Club	1986
3/778	Parsons, R.	London	17.10
3/779	Rivers, G. D.	Newark & Notts	23.10
3/780	Bartle, P. A.	Four Counties	30.9
3/781	Armstrong, J.	Two Rivers	17.10
3/782	Davis, C. M.	Heron	12.10
3/783	Coppen, Alexandra	Lasham	16.10
3/784	Hughes, M. I.	Bicester	17.10
3/785	Boydon, M. V.	Wrekin	27.10
3/786	Gordon, H. M.	Booker	14.11

GOLD BADGE

No.	Name	Club	1986
1185	Woods, Virginia	Lasham	6.10
1186	Gordon, D. J.	Fenland	23.10
1187	Kosak, J. G.	Culdrose	5.10
1188	Ellis, D. J.	Lasham	23.10
1189	Clark, N. A.	Portsmouth Naval	10.11
1190	Thorne, L. S.	Avon	9.10
1191	Whitehead, P. G.	Shropshire	28.8

GOLD HEIGHT

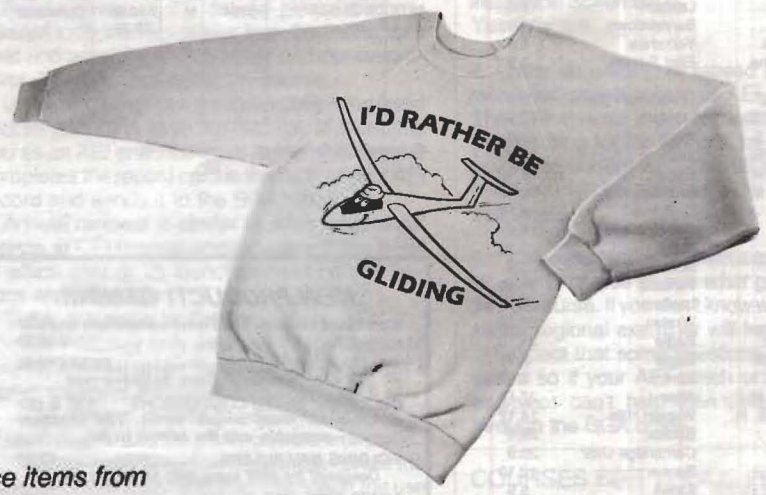
Name	Club	1986
Pirie, M. A.	Deeside	20.9
Bell, Susanne	Cambridge Univ	20.9

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

Ref. No.	Glider Type	BGA No.	Damage	Date Time	Place	Pilot/Crew Age	Pilot/Crew Injury	Pilot/Crew Pl/Hrs	Summary
1	Mini Nimbus C	2468	M	1.10.86 14.15	Leslie, Scotland	47	N	560	After a wave soaring flight the pilot made a descent through the closing wave slot. From 2000ft he could not make the airfield so selected a field. After a normal touchdown he saw several small areas of uncut grass. The glider's wing hit one of these with a loud crack and a groundloop followed. The grass concealed a concrete water board post.
2	K-7	2158	S	4.10.86 13.30	Templeton	55	M	13.5	The winch launch was commenced in a 5kt crosswind. At about 15-30ft there was a winch power failure which the pilot did not recognise prior to the aircraft stalling and dropping vertically on to the ground. Substantial damage was done to the glider and the pilot injured his back.
3	K-13	1523	M	4.10.86 16.10	Old Sarum P2	47 41	N N	382 11	At 300ft on a winch launch P2 thought there was a power failure. He released the cable and put the nose down rather sharply. The glider overtook the cable chute and the cable caught on the port wing. P1 took over and landed ahead. A new, powerful winch, not pulling smoothly may have caused the abort. Cable chute was later moved 50ft down the cable.
4	K-13	2191	M	7.10.86 11.30	Lasham P2	30 50	N M	130 –	On the second flight, after a good first landing, the pupil allowed the speed to decay on the approach and in spite of prompting by P1 no action was taken so P1 took over. This was not done in time to prevent the glider landing heavily on the main wheel from a height of about 6ft. P2's back was injured.
5	K-13	1429	N	19.10.86 12.30	Weston on the Green	34	N	17	After a normal initial approach the glider was allowed to get too slow and airbrake was not reduced until an undershoot had developed. Finally, at 50ft the brakes were closed but the speed was still much too slow. The glider just cleared the perimeter track while yawing 20° to the right. At touchdown it yawed further right and hit the control vehicle.
6	Pawnee Tug	G-AZPA	M	22.10.86 13.53	Talgarth	27	N	500 PWR	On landing after the 9th flight of the day the Pawnee tug touched down about 10ft before the normal touchdown area. Due to the upslope here and a poor roundout with low airspeed the undercarriage collapsed. The pilot had been flying in stronger wind the day before and this combined with over-confidence were considered to be factors.
7	K-7	1031	S	1.11.86 ?	Ringmer	55	N	24+ 680 PWR	Whilst soaring upwind of the field at 1500ft the pilot noticed an approaching rain squall and decided to land. However, the wind had changed and it became clear that he would not make it back to the airfield. A field ahead was selected and as the glider crossed the hedge a wing hit a small tree and caused the glider to groundloop, breaking a wing.

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Hillman, A. S.	Culdrose	6.10
Smith, J. L. J.	Culdrose	6.10
Brackstone, K. L.	Essex	6.10
Shaw, P. A.	Culdrose	7.10
Gay, R. C.	Booker	7.10
Gordon, D. J.	Fenland	23.10
Kosak, J. G.	Culdrose	5.10
Rivers, G. D.	Newark & Notts	23.10
Lowe, H.	Midland	23.10
Hartfield, L. J.	Portsmouth Naval	23.10
Ellis, D. J.	Lasham	23.10
Brocklehurst, M.	Avro	26.10
Mayo, Vanessa	Cotswold	27.10
St Clair-Gribble, M. B.	Cotswold	28.10
Housden, S. R.	Cotswold	31.10
Ellwood-Wade, R.	Chilterns	31.10
Clack, F. J.	Fenland	31.10
Lee, Alyson	Cambridge Univ	20.9
Sommersell, H. L.	Essex	29.9
Power, Michelle	Booker	30.9
McNeil, S. J.	Wolds	2.9
Whitehead, P. G.	Shropshire	18.5
Bishop, G. C.	Bristol & Glos	2.10
North, M. J.	Coventry	9.10
Cox, G. E.	Booker	9.10
Hill, M. P.	Booker	12.10
Adshead, P. N.	Shropshire	13.10
Coppen, Alexandra	Lasham	16.10
Hughes, M. I.	Bicester	17.10
Lacey, S. C.	Booker	22.10
Chappell, A. J.	Staffordshire	23.10
Edmondson, N.	Chilterns	1.11
Clark, N. A.	Portsmouth Naval	10.11
Thorne, L. S.	Avon	9.10
Duignan, Jennifer	Four Counties	15.11

GOLD DISTANCE

Name	*Club*	*1986*
Andrews, A. D.	Two Rivers	16.5
Barker, K. D.	Bristol & Glos	17.7
Whitehead, P. G.	Shropshire (in Spain)	28.8
Ackroyd, G. D.	Anglia (in Spain)	4.9

SILVER BADGE

No.	*Name*	*Club*	*1986*
7392	Tait, R. G. J.	Highland	26.10
7393	Tidball, F. G.	Swindon	9.8
7394	Caston, U.	Anglia	26.10
7395	Millar, G. C.	SGU	12.10
7396	Messenger, M. G.	Fenland	21.10
7397	Lemen, J. R.	Lasham	16.8
7398	Beedie, A. J.	Bannerdown	31.8
7399	Belford, D. S.	Yorkshire	6.9
7400	Vandenberghe, Christine	East Sussex	7.9
7401	Megson, P. J.	Portsmouth Naval	9.9
7402	Macpherson, D. J.	London	19.9
7403	England, G. S.	Avon	20.8
7404	Nunn, A. V. W.	Lasham	24.8
7405	Greener, P. M.	Eagle	26.10
7406	Greenwood, W. H.	East Sussex	30.10
7407	Wilshere, M. J.	Chilterns	8.11
7408	Ross, G. R.	Surrey & Hants	18.9
7409	Jarvis, S. R.	Avon	23.10
7410	Bloom, D. G.	Norfolk	23.8
7411	Clack, F. J.	Fenland	31.10
7412	Vaughan, R.	Lasham	20.8
7413	Arnold, J. G.	Wrekin	20.12
7414	Braine, D. R.	Eagle	25.10
7415	Thompson, M.	Eagle	8.11
7416	James, G. L.	Kent	3.12
7417	Brennan, P. M.	Altair	27.12
7418	Deacon, D. E. R.	Warren Hills	14.12
7419	Pugh, O. L.	Booker	20.8
7420	Lee, Aylison	Cambridge Univ	20.9
7421	Hill, M. P. J.	Booker	12.10
7422	Hampson, E. C.	Essex	5.9
7423	Sommersell, H.	Essex	29.9
7424	Pengelly, M. A.	Fenland	22.10

Please send contributions to S&G to the Editor, 281 Queen Edith's Way, Cambridge CB1 4NH and not to the BGA office.

Ref. No.	Glider Type	BGA No.	Damage	Date Time	Place	Pilot/Crew Age	Pilot/Crew Injury	Pilot/Crew Pl/Hrs	Summary
8	K-13	1502	M	2.11.86 13.15	Morridge P2	61 63	N N	1380 –	A field landing in crosswind conditions was being demonstrated into a confined area of the airfield. The aircraft overran the mown area into the adjoining unmown moorland. The starboard wingtip caught a raised tussock, damaging the wing box.
9	Mosquito B	2472	M	26.10.86 12.45	Lasham	37	N	150	At about 100ft on the autotow launch the glider was slow and at a steep climb angle. The cable was seen to drop away and the glider did not reach a level attitude until just before a very heavy landing. The pilot had taken off with −2 flap and was very nearly at the minimum cockpit weight. Comment – Wire launches should be done at +1 flap according to the pilot's manual.
10	K-8	2435	S	9.8.86 17.35	North Weald	25	N	2	The pilot was briefed for a hangar flight to the west end of the airfield where there had earlier been model a/c flying. In the circuit the pilot saw people in this area so elected to land on the grass by the hangar. On the approach heavy sink was encountered and the glider just cleared some tall trees but in doing so lost speed and landed heavily.
11	Blanik	1880	M	15.11.86 16.15	Perranporth P2	53 22	N N	555 –	While approaching to land into the sun P1 noticed pedestrians wandering into the touchdown area. The aircraft was turned to the right then re-aligned with the runway. Vision was lost in the glare and the glider landed without a proper roundout and with drift. The u/c attachment lugs were broken and the wheel forced up into the wheel box.
12	Nimbus 3	3130	S	19.8.86 18.00	Didbrook	52	N	3000+	During competitions the pilot had to make a field landing. The field chosen was of adequate size and had no obstructions on the approach but had long uncut grass. On landing the port wing hit a lamb, inducing a groundloop which broke the rear fuselage at the base of the fin. The farmer was compensated for the lamb.
13	Bocian 1E	1884	S	3.10.86 16.00	Pen-y-Parc P2	41 ?	N N	500+ 50	On a check flight for an early solo pilot the winch launch was aborted by P2 at about 10ft as he thought the launch was too slow. He then pulled full brake and before P1 could react the glider landed heavily breaking the aft fuselage.
14	DG-300		M	20.8.86 16.45	Dunstable	33	N	675	After completing a competition task the pilot crossed the finish line and made a right hand circuit. The intention was to land uphill and roll up to the glider's trailer. The approach was made too slow and with too much airbrake and this resulted in a heavy landing which damaged the undercarriage and it's mountings.
15	K-23	2996	M	23.10.86 13.45	Shobdon	37	N	110	The glider was on the short rope of a dual tow launch behind a Super Cub tug. The pilot chose to lift off as soon as possible to avoid the chippings being thrown up by the tug. He over rotated on lift off and ballooned, then over corrected and smashed the nosewheel on to the ground in the first of four impacts. Factors – some turbulence and distracted.
16	K-23	3164	M	7.10.86 18.20	Dunstable	42	N	147	The last flight of the day was to be landed near the hangar, across a ridge and track. The approach and landing were normal and after crossing the ridge the glider was pushed the 100 yards to the hangar. Two days later the DI found the nosewheel deflated and there was also impact damage in the nosewheel area of the fuselage.

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

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AIR EXPERIENCE INSTRUCTOR RATING

A new category of BGA instructor was introduced in October, the Air Experience Instructor or AEI, and in this article Bernie, chairman of the BGA Instructors' Committee, answers the Why? What? How? plus a few common questions in this article

During the winter of 1984 the Instructors' Committee started to formulate a long term strategy for coaching and instructing into the 1990s. Without digressing into that, suffice to say that the concept of the AEI is an integral part of that plan based upon the experience of similar schemes already in operation at Booker, Dunstable, Lasham and Odiham (notice the alphabetical order – no significance!).

The main benefits were seen to be as follows:

1. More conversions to full gliding club membership from people taking air experience lessons by introducing a proper structure including a pre-flight assessment of the pupil, pre-flight briefing, in-flight chat, abbreviated patter and demonstrations enabling the pupil to experience the thrill of controlling the speed and turning the glider followed by a post flight de-briefing and social introduction to other club members.
2. Better protection for air experience pupils and PIs by setting national training and testing standards which could be readily quality controlled and speedily amended as necessary.
3. A raising of instructional standards throughout the movement by:

(a) Eventually making the AEI rating a part of the pre-entry requirements for the assistant instructor course so that more course time could be devoted to special instructional techniques and soaring training.

(b) By training a core of amateur senior instructors as AEI coaches who in turn could influence other instructors and pilots as well as AEIs.

It took another 18 months' hard work to finalise the course and set up the organisation for introduction. The main course emphasis is threefold:

1. To raise the flying standards, safety and aspirations of the prospective AEI by briefing sessions which analyse various aspects of flying including crucial situations, and flying sessions which explore the gliders characteristics, particularly near the stall. In turn this reveals misconceptions and grey areas which can be corrected by the coach.
2. Introduce basic instructional skills in both the briefing and flying role.
3. To have a lot of fun.

The course is designed to take two full days but may take longer if the weather is unkind. There are three briefing sessions of about 1hr 15min each and three flying phases which take about six aerotows or equivalent. The courses are run by regional examiners and AEI coaches (not the national coaches) and the BGA holds a current list of them.

The minimum qualification to be considered for the AEI course are 50hrs PI plus a Bronze C and CFI's recommendation.

Write with your CFI's recommendation to the BGA office with a fee of £10 requesting an AEI record syllabus and course notes. Upon receipt complete p1 including the certificate of medical fitness and book on an AEI course. Your CFI, through the senior regional examiner, will help find you a course if you have a problem.

Before going on the course please become cleared to fly the two-seater from the instructor's seat and learn the simple patter and demonstrations. Then go and enjoy the course.

Upon returning from a successfully completed course your CFIs have the final say in accepting you as an AEI and if he does accept you then he completes the record card in the back of your AEI record and sends it to the BGA office.

Annual renewal is similar to other instructors' ratings, *ie* CFI recommendation plus 20hrs flying of which 5hrs or 25 launches must be trial lessons and 5hrs solo.

There are some limitations:

1. The AEI may only exercise the privileges of this rating whilst under the direct supervision of a higher category instructor.
2. The rating is subject to validation by the CFI of each club where the privileges are exercised.
3. The AEI may not allow the pupil to handle the controls below 500ft and may only teach the use of elevator and ailerons.

Those AEIs going on to assistant instructor courses should prepare by learning and practising all the full patters and demonstrations up to stalling in Bill Scull's patter notes – but you may not practise these on pupils!!

These questions have arisen a number of times since the AEI was introduced:

1. Can the AEI be in sole charge of flying?
Limitation 1 above answers that. The AEI course contains no elements of airfield organisation or flying supervision.

2. Can the AEI do more than one flight with a pupil?
This generally arises in the context of wire launches where flight time may be limited. The answer is that the AEI may only teach the elevator and ailerons within the scope of the patter and demonstrations given on the course. If the flights are very short or the pupil hesitant then this may take more than one flight. It must be remembered that all the exercises up to turning must subsequently be fully taught by a higher rated instructor.

3. Are AEIs covered by the BGAs Instructor Insurance Scheme?
Yes they are.

4. How do existing or lapsed assistant or full rating instructors renew as AEI only?
The CFI checks them and writes to the BGA office asking for the rating to be renewed or re-graded to current AEI. The £5 instructor insurance levy will be payable in the case of lapsed instructors.

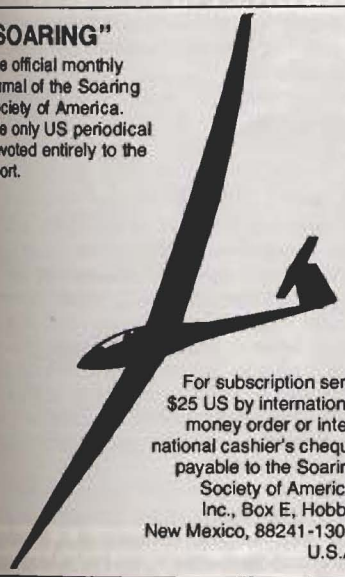
5. Can assistant or full instructors go and sit in on an AEI course to see what goes on?
Yes of course. If you don't know where, then your senior regional examiner will help.

I expect that some questions are still unanswered so if your AEI coach or senior regional examiner can't help then please contact me through the BGA office.

COURSES FOR YOUNG PEOPLE

Every year the German Aero Club's youth organisation run courses, consisting mainly of gliding, for 16 to 25 year-olds from all over Europe. They are held at Hirzenhain with Marburg, Giessen and Siegen close by, and being subsidised by the government they are very reasonably priced. If interested, write to *S&G* for a leaflet which gives more details.

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CLUB NEWS

Copy and photographs for the June-July issue should be sent to the Editor, 281 Queen Edith's Way, Cambridge CB1 4NH, Tel 0223 247725, to arrive not later than April 7 and for the August-September issue to arrive not later than June 9.

GILLIAN BRYCE-SMITH
February 11

BATH & WILTS (Keevil Airfield)

Our site committee is negotiating the purchase of our own site. After two years as CFI Stuart North has handed over to Richard Marsh. Thank you Stuart for your hard work.

We hope the Ministry of Defence will allow us two complete soaring and task weeks. Malcolm Smith and Bob Hitchen are responsible for setting tasks and keeping the ladders. Graham Callaway is looking after the cable ropes and weak links, easing the burden on Cyril Needham in charge of maintenance.

T.K.

BICESTER (RAFGSA Centre)

The weather has been bad with no flying over the Christmas period but on a good day in mid January Gary Buckner stayed airborne for over an hour.

Congratulations to our new solo pilots including seven from the Oxford University Club who were here on a week's *ab-initio* course, and to Ted Richards on winning the GSA Best Height Gain trophy and Pilot Ladder.

Mick Webb has taken over as DCFI from Roger Crouch who has been posted to Brize Norton. Bob Brownlow, who we congratulate on his marriage to Sara, had his stag night at the club bar.

C.&G.

BLACK MOUNTAINS (Talgarth)

We finished the year with an AGM on December 29 and 12 gliders in wave on New Year's Eve with heights between 10000 and 14500ft.

Despite the poor weather, 1986 has shown a 44% increase in launches. Average flight duration was 1hr 20min (including all the training and introductory flights) which must make Talgarth the most soarable site in the UK.

We wish Dave Bradley, our full-time tug pilot, good luck in his new job. The Pawnee tug has a new engine.

W.D.M.

BRISTOL & GLOUCESTERSHIRE (Nympsfield)

We had some good winter wave days with 8000ft achieved without difficulty when neighbouring clubs were clagged in with low cloud.

Our Guy Fawkes and Christmas disco parties were well supported. The seven day operation last summer ran smoothly with the assistance of our new management, Pat and Claude Armes.



Jane Goddard of the Dorset GC, who is their first member to go solo on a 16th birthday, photographed with her father, Jon, an instructor.

This season we will strengthen our team further with two full time instructors and two tug pilots available at any one time.

Our membership at 320 is the largest for many years and there are plans to improve the club fleet and expand the clubhouse. Our increased launching potential of three tugs and three winches (the third, a twin drum winch, is nearing completion) will help us give a better service.

M. & S.W.

BUCKMINSTER (Saltby Airfield)

January found the tug snow-bound and the fuel frozen in the winch, but we did autotow sledges along the runway and Phil Walsh did his first solo on skis.

Members have been away looking for wave and hill lift with some flying on trips to Talgarth but none at Sutton Bank so far.

We have been given Sports Council aid towards the new winches and we hope the second winch will be here soon.

R.N.C.

BURN (Burn Airfield)

Congratulations to George Goodenough, Hedley Foreshaw, Keith Weeks, Dave Clark and Sue Wilson on going solo and to Martin Ellis on his Diamond goal.

We have a new K-7 and our old converted K-7 and the K-8 should soon be airworthy.

Wendy Mills, CFI of Sandtoft, was the guest speaker at our annual dinner-dance. The Chairman's cup and the Pennine cup went to Martin Ellis; the 155 cup to Marilyn Dean and the Muggins cup to Dennis Fiddes.

We also had the traditional Christmas pantomime, Jack and the Beanstalk, and a Valentine's Day fancy dress disco – all three events were a great success.

S.W.

Club News reporters: There may well be some strange names in your reports because many of you sending handwritten contributions are forgetting to print names.

CAMBRIDGE UNIVERSITY (Duxford)

Our club Astir has been wintering at Dishforth for members to experience wave and Iain Baker and Rick Hurst gained their Silver heights. Alyson Lee completed her Silver C at Duxford.

A pre-Christmas party of mulled wine and mince pies organised by the social committee was enjoyable.

Our holiday courses are filling up so anyone interested should contact the course secretary, tel 0223 67589. Our CFI regrets that as Duxford is becoming rather "full up" we can no longer guarantee visitors a launch at weekends.

G.K.F.

CHANNEL (Waldershare Park, Nr Dover)

After much negotiating we have planning permission to extend our strip by 300 yards and erect a clubhouse and workshop. Dick Lukehurst has nearly finished building the winch and with this and the extended strip we are hoping for better launches.

Congratulations to Nicky Silk and Tony Minns on going solo.

L.S.

CHILTERNS (RAF Halton)

Last year was our best on record for achievements and statistics. John Harber, Ossie Constable and Les Fellows gained Gold Cs, Les getting a SLMG PPL and with Q. Oswell became a full Cat. Roger Ellwood-Wade went from *ab-initio* to Silver C with two Gold legs, Mick Wilshere from solo to Silver C and PPL and Trev Sadler from Bronze C to assistant Cat. Paul Cole became the first Malcolm Club award winner to solo. Geoff Freeman went solo and converted to the K-8 and winch.

Our AGM was successful and we have our new Discus. Terry Lacey, treasurer for three years, has resigned because of a threatened posting and our thanks to him for his hard work.

T.S.

CLEVELANDS (RAF Dishforth)

Christmas at Dishforth saw some 70 personnel and 25 gliders visiting. We only lost three flying days between December 24 and January 4 and even flew on Christmas Day. The wave didn't blow above 7000ft but everyone seemed to enjoy themselves.

The Hambletons Club which has flown with us for the last 19yrs have amalgamated with the Ouse Club at Rufforth. We wish them well in their new venture. (See Hambletons and Ouse reports.) Visitors to Dishforth will still, however, continue to be made welcome to sample our wave and excellent facilities.

J.D.B.

COTSWOLD (Aston Down)

Our excellent runways allow us to operate as usual (weekends and Wednesdays) throughout the winter. We will be operating seven days a week from June 15 until mid September. Our club competition from July 27-August 1, replacing the Tin and Timber Comp, is open to all gliders. For further details contact Ruth Housden, CFI, tel 045 383 2061, as soon as possible.

Our thanks for all his work to Tim Bennet who retired as secretary at the AGM on January 30. Robin Atkinson replaced him and Erik Black has Robin's place as the *ab-initio*/early solo representative.

Congratulations on going solo to Erik Black, Steven Cook and Ron Hurcombe.

There will be proper cross-country briefings with Met, tasks etc given by one of our pundits at 0930 from April 4. Visitors hoping to fly cross-country please turn up early to make use of this new facility.

G.M.

COVENTRY (Husbands Bosworth)

Our annual dinner and presentation of awards in December was again a great success. The guest of honour was Lou Frank who enthralled us with stories of his exploits in the T-21. Awards were made to Jane Cater, Mike Cater, Peter Meads, Dave Booth, Claude Woodhouse, Chris Thomas and team, Trevor Murphy, Frank Davies, Alan Kangurs, Alan Foxon, Lou Frank, Norman James, Barney Toulson, Neil Jones and Jim Jesty. The Clutching Hand was awarded at a special ceremony to John Endall.

Our open weekend will be on April 18/19 and our AGM on April 25. From June 6-14 there will be two dedicated soaring courses – a two-seater course for our members and a course for our neighbours at Welland GC. The task week is May 23-31 and visiting pilots are welcome. We are hosting the Vintage Glider Club's rally and annual dinner from September 25-27.

D.L.S.

CRANWELL (RAFGSA)

The Dishforth wave expedition at Christmas/New Year was disappointing weather-wise with no significant wave. We have an expedition to Talgarth and will be running another Fun Comp here in May after the success of last year's.

Our next major item is moving the hangar which will mean a lot of hard work by members.

Congratulations to Peter Retzer from Cottesmore on going solo.

S.J.H.

CRUSADERS (Cyprus)

We are half way through our soaring season and our main problem is a shortage of instructors. The new G109B has arrived, the first couple of SLMG PPLs are almost complete and Bronze and Silver legs have been gained by many.

Our new secretary, Thomo, is doing a great job and we congratulate him on going solo.

T.J.D.

DARTMOOR (Brentor)

Six of us did a fantastic salvage sweep of our site before Christmas using our cars and trailers and one gigantic trailer, selling the scrap to help club funds.

Our annual dinner-dance was a great success. The AGM this month should enliven us with new blood as committee members only serve for two years before re-election.

F.M.



A thank you presentation at the Dartmoor GC's dinner-dance to Tim Parsons (far left) of the North Devon GC for his work as acting CFI in 1986. Others in the photograph, from l to r, are John Bolt, treasurer, Alan Buxham, chairman, and Colin Sanders, technical officer.

DERBYSHIRE & LANCASHIRE (Camphill)

Congratulations to Gill Shacklady and Derek Smith on going solo and to Tim Robson on his Bronze C.

We had a riotous Christmas party; little flying since the fabulous autumn wave and our new fleet addition of a K-7 is having a K-13 conversion.

K.H.

DEVON & SOMERSET (North Hill)

Our AGM in December was well attended. Tim Parsons has taken over from Julien Hine as CFI with Chris Miller as deputy. Mike Robins has resigned as secretary due to ill health and is replaced by Joe Watts, Dave Minson is chairman and Eric Shore the president/treasurer.

A stationary cumulus over the site on New Year's day gave good soaring to the 2500ft cloudbase. In mid January several dug through six foot snow drifts and were rewarded with ridge soaring. Norman Jones started the year with 20min on the south ridge. Peter Hill joins the tug pilots and congratulations to Ian Hannah on going solo.

We learn with deep regret of the death of Ian Patterson who will be greatly missed by members and his many friends from past Enterprise competitions.

D.A.R.

DORSET (Old Sarum)

Congratulations to Jane Goddard, our first member to go solo on a 16th birthday; to all who gained solo status, Bronze and Silver legs in 1986; to G. Dale on his Diamond goal and 3rd place in the Northerns and to J. Rees who was 2nd at Enstone.

We threw down the gauntlet to all North Hillians by collecting the Tarrill trophy where it has been since our move from Tarrant Rushton six years ago and look forward to their attempts to return it to Devon.

Past and present members are invited to visit us over the weekend of May 2/3. For more information please ring Hugh Stewart on 0202 33744.

J.R.B.

DUMFRIES (Falgunzeon)

We have lost one of our valued instructors, Frank Smith, who has moved and is now at Portmoak.

Congratulations to Ian Steel our long serving CFI (25yrs) who has been awarded the Sports Personality of the Year (coaching) trophy by our local Sports Council. A well deserved award.

We welcome visitors and are keen to hear from any instructors who would be interested in some flying with us. Tel 038 785264 any time.

J.McI.

EAST SUSSEX (Ringmer)

A five to ten year plan for the club was adopted in principle at an EGM on January 5 and we are grateful to Joan Cloke who advised us on possible assistance from the Sports Council. We are now going to make every effort to utilise our assets, the ultimate aim being a seven day week operation.

Jason Green celebrated his 16th birthday on Boxing Day by going solo and our congratula-

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tions also on solo flights to Barry Laker and Lorne Rumble who have now all converted to the K-8.

J.S.

ESSEX (North Weald)

Congratulations to Chris Law, Geoff Lynch and Herman Sommersell on their Silver Cs; to Eric Couzens and Alan Mason on their Bronze Cs and to Steve Cotter on going solo.

John Wilson retires after ten years as CFI to be succeeded by Peter Molloy with Ian Barnes as DCFI. Our thanks to John for all his efforts.

We wish Sheila Corbett a speedy recovery and congratulate Jim Forrester for being selected for the BGA squad training scheme and Ralph Hawtree on being a reserve.

J.F.

FOUR COUNTIES (RAF Syerston)

Our excellent MT, well stocked bar and superb catering have kept the stalwarts going over the winter. Our thanks to those who kept the club ticking over. Our fleet is immaculate, thanks to Tony Povey and his team.

Our December instructors' course, run by CFI Ben Beniston, produced six assistant Cats. Our thanks to those clubs who loaned motor gliders and to Griff and most of Wrekin GC for their support.

Congratulations to Trev Gorley on his third Diamond and to our latest crop of solo and Bronze C pilots.

P.S.

HAMBLETONS (RAF Dishforth)

We are to amalgamate with the expanding Ouse GC at its present home at Rufforth Airfield (see the Clevelands and Ouse reports). The merger of the considerable experience and assets of both clubs will present the opportunity to enhance flying of all the members of the new club, to be known as the Ouse and Hambletons GC.

We look forward to operating in the friendly atmosphere at Rufforth and we hope the move will be finalised by the end of March.

C.A.F.

HUMBER (RAF Scampton)

We congratulate Simon Highfield on going solo and Deanna Rooke and Jo Scrase on completing their Bronze Cs. The clubhouse was redecorated in time for the AGM on December 6 when the following trophies were presented: Best progress to Mike Kelly; the Worker's pot to Tony Smith and the CFI's trophy for the fastest 100km triangle, Chris Gildea for the second year running.

The Astir went to Dishforth over Christmas and the New Year.

K.M.G.

IMPERIAL COLLEGE (Lasham Airfield)

A healthy number had trial instruction flights at the beginning of the university year and we expect quite a few solo flights on our Easter courses.

With great reluctance the K-8 was replaced with a Grob G102 giving us an all glass fleet. The new aircraft was christened with champagne by Martin Judkins minutes before he left to spend the winter instructing in Australia. We wish him and Phil Guthrie, who leaves to start research for a Texan university, good luck.

Eight members spent a bracing week's flying at the Long Mynd over the New Year holiday. We hope to leave the club Libelle there over the winter to replace the ASW-19 damaged during a field landing.

P.T.H.

LAKES (Walney Airfield)

We were pleased to welcome several guests from far afield at our annual dinner in November. Cup winners were Peter Craven (Alsfod and Leighton Hall trophy for height gain and an outstanding flight); Pauline Reeve (Duddon trophy for services to the club); Graham Sturgeon (Dodd trophy for progress) and Roy Jones and Neil Braithwaite (Lonsdale trophy for best distance from Walney). Neil also won the club ladder.

M.S.

LONDON (Dunstable)

The sudden death from a heart attack of John Hands has made all our other news sound rather hollow. A regional examiner as well as an instructor, John was one of our best loved and respected figures. An obituary will be in the next issue.

We congratulate Derek Sear on being appointed CFI. A member for 20yrs and a professional instructor for some 14yrs, Derek is also a regional examiner. He has formed a Flying Management Group to replace our Flying Committee and this has been successful in getting experienced members and professional staff working as a team to produce lots of new ideas for courses, trips and general fun. We have even had a motor glider running courses in instrument flying, navigation and field selection.

The committee is pondering the silver lining behind the statistics: a rather dismal summer crop of only about 20 flights of 300km or more is balanced by a staggering increase in launches from 15000 to 25000. Our investment in modern winching and tugs looks to have been sound.

T.G.

MARCHINGTON (Marchington Airfield)

Congratulations to our oldest pupil, 65 year-old Jim Robinson, and our youngest, 16 year-old Nicholas Bill, on going solo.

On January 10 vandals tipped six trailers on to their sides. Our thanks to the Uttoxeter police who have brought charges. We hope this will never happen to you but how secure is your glider in its trailer?

P.A.W.

MENDIP (Weston-Super-Mare)

We had a quiet winter but good ridge soaring. Our Christmas party in the new clubhouse was a great success.

There is an expedition to Portmoak in April. The approved hook modification on the syndicate Dart 17R has shown a great improvement on the winch launch and is well recommended.

G.T.

MIDLAND (Long Mynd)

We are going to run evening courses to give accelerated training to *ab-initio* and early solo pilots.

We have filled the long winter Saturday evenings with a series of lectures on a variety of gliding subjects.

Our task week is from July 25-August 2.

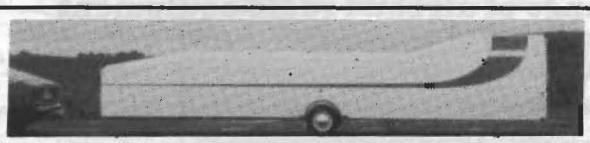
N.B.

NORTHUMBRIA (Currock Hill)

The weekend before Christmas John Westwood died of a heart attack while climbing Helvellyn in the Lake District. John was for many years a valued instructor and an active member of our social club committee. His cheerful face and spontaneous laughter will be missed by us all.

We thank Dick Stratton who was our guest

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Harry Ramsay has Silver height and Kevin Clements and Ian Surley have soloed. One of our K-7s has been overhauled and its wings recovered.

S.M.H.

OUSE (Rufforth Airfield)

We have agreed to merge with Hambletons GC and will be known as the Ouse & Hambletons GC. (See also the reports from Clevelands and Hambletons.) This is to give the Hambletons' members greater security of tenure on a site and the opportunity to fly midweek. Also it creates a new club with greater membership and capital to make more use of our facilities and allow for expansion and development sooner than expected.

At the annual dinner the Taylor family collected most of the prizes, Brian gaining three, including the Club Ladder, and his father Keith the prize for the longest Silver distance. Justin and Gillian Wills were our guests and provided us with an interesting antique gliding cartoon and a very good talk.

R.T.

OXFORD (Weston-on-the-Green)

Our new hangar now has electricity which proved of value to many C of A work parties. We kept ourselves fit during the winter flying Daisy our T-21 which recently featured on Radio Oxford. The winch engine has undergone major heart surgery – our thanks to those who work so hard on our ground equipment.

Congratulations to Neil Turner and Melvin Green on Silver distances late in 1986 and to our growing number of Bronze C and first solo pilots. Silver Cs were completed by Mark Rowland, John Hanlon, Caroline Oakes and Carole Broad. We look forward to recommencing our Friday evening trial instruction evenings which were such a success last year.

C.S.O.

PEGASUS (RAF Gütersloh)

Congratulations to Simon Clarke on re-soloing and to Chris Marsden and C. V. Jones on converting to the K-8. Alan Jones has passed his instructors' course and the T-21 has finally arrived.

There was a good turn-out on Christmas Day and New Year's Day and everyone flew despite the weather.

We hope to soon have the Astir back and a syndicate SF-27 on line. We have an expedition to Sisteron in April.

M.S.

PETERBOROUGH & SPALDING (Crowland Airfield)

Congratulations to Graham Kench and Steve Turner on going solo. The Bronze C lectures progress and we hope to get some pilots through the new AEI course so that our evenings can carry on unabated.

P.N.W.

SCOTTISH GLIDING UNION (Portmoak)

We have had a very quiet two months with January either wet and windy or snowy so we have lost about half of our potential flying days for the month. But we are looking forward to instructor and AEI courses.

M.J.R.

SHALBOURNE (Rivar Hill, Nr Hungerford)

Our CFI and founder, John Dabill, has stepped down and we thank John and his wife Judith, who was the secretary and treasurer, for their hard work over the last seven years and wish them happy hours flying their Mini Nimbus free of club commitments. Peter Harborne is our new CFI. We also thank Richard Swallow, our chairman for three years.

J.M.

SOUTH WALES (Usk)

At our AGM record numbers of cross-country kilometres and solos were reported, despite the poor season, and it was another successful financial year.

A special meeting gained the opinions of members to help the new committee formulate our future priorities which include field and fleet expansion.

K.A.B.

SOUTHDOWN (Parham Airfield)

For several months we have had an oil derrick adjacent to our site and Conoco, optimistic about finding oil and making this a commercial success, are landscaping the site with a view to a long term investment. Maybe we'll become the Dallas of Sussex!

Many pilots are working for their PPLs at Shoreham Airport before the proposed changes to the Silver C conversion rules in April.

Some members are refurbishing the Eagle trailer, a mammoth task. Bernie Morris ran a course at Parham in early February for training instructors to clear pilots for the AEI rating (see Bernie's article in this issue.)

Congratulations to Paul White on being selected for BGA squad training and to Barry Bartlett on his Bronze C and a welcome to John Ward as our new tugmaster.

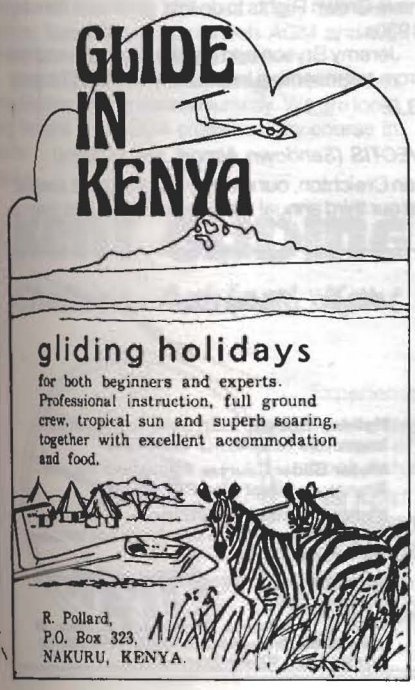
M.C.

SHROPSHIRE (Morridge)

The generally poor summer saw us busy on groundwork and maintenance. Phil Wild cut a new overshoot and cable break area on the westerly run, we put 60 tons of chippings on the perimeter track to make it fit for winter and we now have a Site Development Committee.

Lorna Wood is the first female member to go solo for ten years; 60 year-old Geoff Oultram beat an age barrier by soloing in 51 flights and Tim Caswell, Roy Goodwin, John Timms and Martin Powell have their Bronze Cs and converted to the K-18.

The annual Chetwynd expedition produced Silver distances for Dick Bowyer, Peter Gill and Ken Houghton. At Portmoak Peter Gill almost made Diamond height; Andy Chappell gained Gold height; Martin Powell, Mike Webb, Phil Wild and Joe Sharples flew Silver height and duration; Keith Ward and Richard Bills went to Silver height and Dick Bowyer got his 5hrs. Charles



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Webb, CFI, took Bob Crinean to 12000ft in the K-13, after which Phil Barnshaw flew it with Lorna Wood to 8900ft. A memorable wave!

Our thanks to Colin Ratcliffe and his team for preparing the new K-18 trailer for Portmoak.

M.J.P.

STRATFORD-UPON-AVON (Long Marston Airfield)

Even the snow hasn't kept us on the ground. Edmund Thomas, aged 16, went solo after remarkably few launches and congratulations also on going solo to Bernard Heath and Dave Tarbun. We have a steady flow of new members and are finalising plans for summer courses.

Ray "Hoppy" Hopkins notched up the year's first cross-country, landing the Blanik five miles from the airfield! February brought some welcome wave giving prolonged and interesting flying.

C.M.

SWINDON (Sandhill Farm)

We will miss our treasurer, Mary Blunt, who is going to live in the USA for several years. Our thanks and good wishes go with her.

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We brightened a dull winter with an enjoyable skittles evening which also boosted funds a little.

P.M.

TRENT VALLEY (Kirton-in-Lindsey)

Thieves walked away with the two ton engine and gearbox from our almost completed winch. Fortunately our old winch buses are still going strong after being overhauled and we have replaced piano wire with stranded cable, so cable breaks will be a thing of the past.

The club K-6 has been refurbished after its belly-flop last spring put it out of action for the season.

Congratulations to Sue Crooks and Andy Cluclas on going solo and we welcome Brian Griffin as our new CFI.

L.W.

TWO RIVERS (RAF Laarbruch)

We will have to do a lot to beat last year's statistics – 1948hrs, 27320 cross-country kilometres and 13 solos – but have already have five first solos with several more waiting for the right weather. Congratulations to Ian Skeldon, Mike Bailey, Derek Taylor, Kev Cooper and Kev Hare.

Well done to Mike Foreman on becoming an assistant instructor. Ian Petman now has a Nimbus 2. Ian Skelton, Ken Baker and John Armstrong have returned to the UK.

P.H.

ULSTER (Bellarena)

Our thanks to Laurence McKelvie for his time as CFI – he has been replaced by Alan Sands.

We have replaced our Citabria tug with a Super Cub whose 150hp engine is being replaced by a 180hp engine being flown in from America. We hope to be back in action by the middle of March with an extended runway and a more powerful tug. Meanwhile we are launching the Capstan by car from Benone Strand. We have Crown Rights to do this, granted in the early 1930s.

Jeremy Bryson and Jim Weston have returned from representing Ireland in the World Champs.

B.B.

VECTIS (Sandown Airport, Isle of Wight)

Ian Creichton, our ex CFI, was the guest speaker at our third annual dinner-dance and was given a

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The chairman of Vectis GC, John Galt, pointing out the new CFI, Neil Watts.

carriage clock and commemorative plaque for his efforts in forming the club. Trophies were awarded to D. Morgan (Chairman's cup), Mr. Colson (most improved pilot) and J. Pragnell (CFI's trophy).

Eric Fly gained a Bronze leg in November and we were still soaring sea cu in January.

Congratulations to Neil Watts on becoming CFI. After becoming sky high on paint stripped in the hangar, members filled the winter months with a "colour a glider" competition to find a new colour scheme for the Blanik.

J.E.P.

WELLAND (Middleton)

We are pleased that Don Martin, chairman, and Ray Clarke, a former chairman, are making good recoveries from their illnesses. They are both retiring from office at our March AGM and we thank them for their past services.

Work continues on our replacement winch and modifications to our second runway. We are looking forward to our BGA cross-country course in June.

R.H.S.

WOLDS (Pocklington)

Melanie and Steve Malcolm have set new heights in enthusiasm by joining in September, going solo on the same day in November and buying their own glider before Christmas.

We have a new glass single-seater – an Iris – to the delight of our Bronze C pilots. We welcome Tim Milner on to the committee as ground equipment officer.

Sadly our negotiations for an additional runway have come to nothing. Entries are coming in nicely for our two-seater competition.

D.B.

WREKIN (RAF Cosford)

Our Beaver winch finally arrived on the day of our very successful AGM and the members who spent many weekends at Bicester building it were rewarded with the Chairman's trophy. Our thanks to the Centre for the use of their facilities and especially to the soup dragons, Val and Janice.

Plans are well on the way for our 21st anniversary. Congratulations to Jon Arnold on completing his Silver C in December.

J.A.

WYVERN (RAF Upavon)

The Christmas dinner on December 13 was well supported and great fun. Our thanks to the organiser, Paul Lutley.

On the same day the BBC filmed the resolo of Denzil Connick, a disabled veteran of the Falkland's conflict. It was a busy and exciting operation with the club routine filmed from all angles, including the Christmas party. It will be screened in the spring and our congratulations to Denzil.

This year we celebrate our 25th anniversary.

D.B.

YORKSHIRE (Sutton Bank)

The winter has been spent preparing for the coming season. The club fleet is up to strength with the arrival of the third tug (a Pawnee) and a replacement Blanik to augment the two K-21s.

We congratulate Ian Stomberg on winning the De Havilland trophy (maximum gain of height in 1986) with a gain of around 31 000ft.

It looks as though our courses will again be fully booked but that still leaves room for visitors, with or without their gliders, wanting to sample our wave, thermals and ridge lift.

P.L.

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DUTCH NATIONALS

British pilots are invited to fly in the Dutch Nationals at the Dutch Gliding Centre, Terlet near Arnhem from May 18-30. There will be Open, Standard and 15 Metre Classes and anyone interested should contact H. C. Frohwein, tel 085 436435.

GERMANS SET WORLD RECORD

Four Germans set a number of world records during late December and January from Alice Springs, central Australia in conditions described as the best for at least five years. They were flying the new ASH-25 two-seater and a powered version.

On December 26 Hans-Werner Grosse and Hans Kohlmeier (ASH-25) set a new world 750km triangular two-seater record with a speed of 142.46km/h, covering 757.78km. The next day they flew 1260.2km for the longest distance around a triangle and a 1250km speed record of 137.54km/h. On January 9 they flew 507.36km at 155.45km/h to set a new world record for speed around a 500km triangle.

The following day was even better and they raised their new record for longest distance and speed around a 1250km triangle by covering 1379km at an average of 143.45km/h. This flight sets the two-seater records above the figures for a single-seater, both of which are currently held by Hans-Werner Grosse.

On January 21 Hans-Werner with his son Werner broke the world speed record around a 300km triangle with 158.7km/h.

During the same period the group with the ASH-25M were setting new records for motor gliders.

On December 26 Erwin Müller and Walter Binder flew a 500km triangle at 135km/h. The following day they became the first to set a motor glider record for a 1000km triangle, completing 1082km at 128km/h. Then on January 2 Walter Binder and Karl Senne flew a 300km triangle at 154km/h to claim another world record.

On January 9 Erwin Müller and Karl Senne completed a 500km triangle at 141.5km/h with the final record day on January 10 when Walter and Karl flew 1250km at 127km/h to break the record set on December 27 by Erwin and Walter.

The ASH-25M is the only one of its kind. To take the weight of the motor without exceeding the aircraft's weight limit, Walter Binder hand-made the fuselage, substituting carbon fibre for some of the glass-fibre. This retained the strength of the structure without increasing the weight. – *From a report by Allan Ash, Editor of Australian Gliding.*

FRENCH COMPETITIONS

British pilots are invited to enter the Plaimont competition in France this summer. It is divided into two, the first half at L'Aave (Buno-Bonnevaux) GC, 75km SSE of Paris, for the "flat part of the competition", with the mountainous section at St Auban, the National Gliding Centre in the southern French Alps. It is from July 28-August 8 with a Regionals at Buno-Bonnevaux, in which eight EEC pilots may compete, from August 8-16.

Full details from Jean-Renaud Faliu, president de L'Aave, 92 Rue Raynouard, 75016 Paris, France.

ZIMBABWE NEWS

After a ten year break we held a gliding competition last October which we hope will become an annual event and attract visiting pilots. The weather didn't live up to expectations and with the death of president Machel, we postponed the remaining days to November 7. The longest task was a 226km triangle. The team trophy went to Ron Bushby, Theo Koster and Ray Morland (K-6E) with the fastest time on handicap (95.39km/h) by Peter Graves (Cobra). The flying was fun and the atmosphere marvellous.

Our CFI, Doug Elliot, has completed his 10 000 glider tow, 4000 being in Tiger Moths. Can any reader match this?

The British Airways Bijave is rarely seen on the ground. Ted Deacon, the instigator and reason for the Bijave's presence, flew Silver distance on December 14 in the club Swallow.

Don't forget there is a big welcome at our club for anyone who is passing through – *Mike McGeorge*

BRITISH PILOTS INVITED

The Spanish club, Nimbus de Vuelo a Vela at Monflorite, Huesca, near the Pyrenees, are planning a meeting around June or July and invite British pilots to bring their gliders and fly with them. For further details contact Fernando Villuendas, Paseo Ruiseñores 16, 5A 50.006 Zaragoza, Spain.

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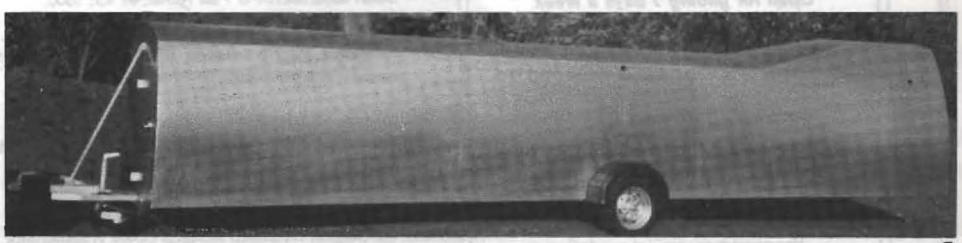
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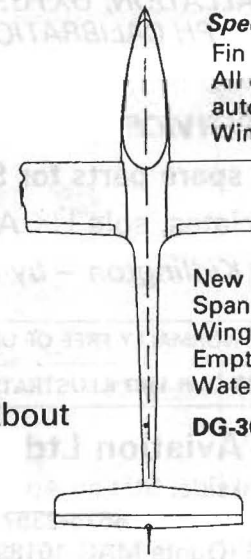
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ACCESS

VISA

MARIANNE



TWIN SEATER GLIDER



MARIANNE COCKPIT LAYOUT

TECHNICAL CHARACTERISTICS

Airworthiness rule JAR 22, U classification

Wing span: 18,54m	55,67ft
Total length: 9,00m	27,02ft
Total height: 1,40m	4,24ft
Wing area: 17,18m	52,06ft
Aspect ratio: 20	
Wing profile OAP1 and OAP2	
Empty weight (around): 440kg	880lb
Maxi weight: 655kg	1,310lb
Pay load (around): 215kg	430lb
Airspeed never to be exceeded (Vne): 135 knots	
Towing speed (Vt): 92 knots	
Maximum glide ratio measured: 40,5T at 56 knots	
Stalling speed (single): 34 knots	

Description and characteristics given for information subject to change without advance notice.

I was most impressed by the Marianne and felt the handling was very good for a two-seater glider of its performance. On the credit side the Marianne has excellent performance both in the climb and the glide certainly as good as a modern Standard Class glider.

The wing flexibility enables positive centering in thermals and provides an excellent ride which the stiffer wing two-seaters do not. I was surprised the handling was so light, also it has a better rate of roll than I expected. An excellent glider for both Basic and Advanced training.

Brian Spreckley
World Champion 1987, 15m Class

Nine Four Aviation Ltd.
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