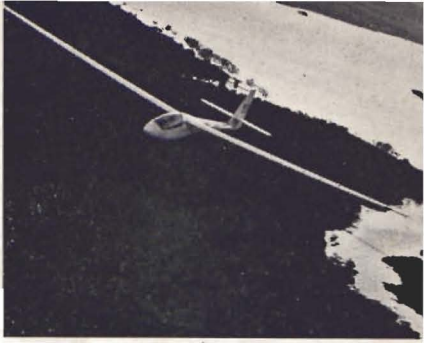
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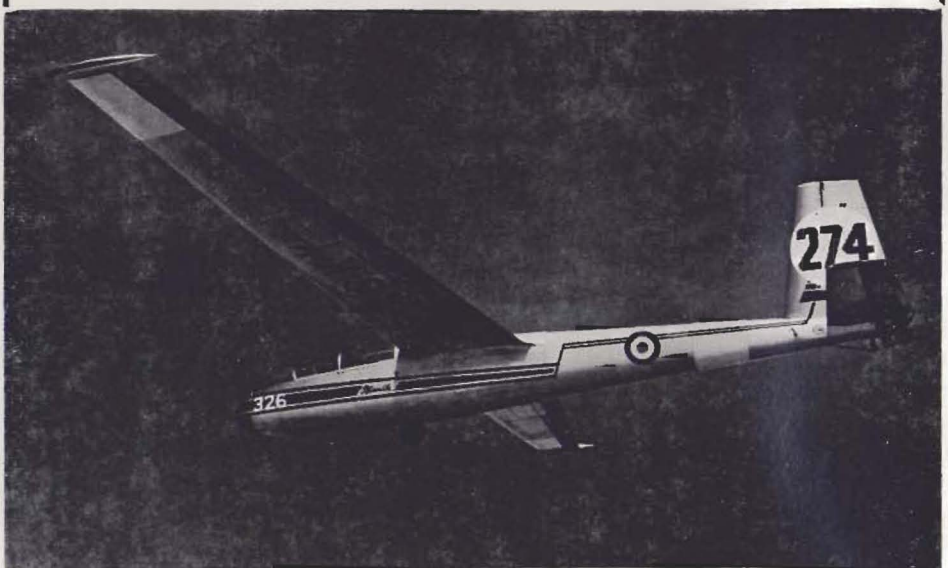




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CONTENTS

Deeside Waves	A. Middleton	2
In Search of Elysian Wave	M. P. Garrod	6
The Unfairness side of Contests	Anne Welch	9
The Grasshopper and the Square	G. W. Locke	13
Sailplane & Motor Glider News		15
Life with the ASW-17	R. H. Johnson	15
BG-135 Across Country	D. H. G. Ince	19
Mü-27 Variable Geometry Sailplane		21
Flying & Instructing		22
The BGA Approved Instructors' Course	J. Heath	22
How Much Ballast?	F. G. Irving	27
Glider "Bumping Races"	R. C. Stafford Allen	30
General & BGA News		31
New Editor for S & G		32
The Boomerang Fund	R. Q. Barrett	33
Gliding Certificates		34
Annual Statistics, 1971/72		36-37
"Sea Breeze" Over Central England	A. Diver	38
The First 18 Months	G. Leech	41
Overseas News		43
The German Alpine Gliding School	P. G. Hardie-Bick	43
The Rhodesian Nationals		46
1972 at Zell am See	R. Fortescue	48
European Pilots Excel at South African Championships		49
Obituaries: Gerald Onslow Smith: George Nunn	B. Thomas: A. W. Watson	51
Book Review	F. G. Irving	53
Correspondence	N. Cranfield: Anne Walker: P. Saundby: E Vann: Imperial College GC	54
Club News		60
Service News		68

Cover photograph: An ASW-15 on tow near Lake McIlwaine (Salisbury, Rhodesia) after an away landing during the Rhodesian Championships *Photos: Mike McGeorge*

Back cover: Wave clouds over Aboyne *Photo: M. P. Garrod*

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DEESIDE WAVES—AN INITIAL SURVEY

By ALAN MIDDLETON

On November 2, 1972, John Monteith (USA) and Mike Mahon (GB) broke the multi-seater UK absolute and gain of height records by flying a Capstan from Aboyne to 7,620m (approx 25,000ft), gain 6,705.6m (subject to homologation). The two reports below, by Alan Middleton, CFI, who was granted the 1970 Churchill Award to investigate waves at Aboyne, and Mike Garrod, whose long search for high wave flights culminated in a flight to nearly 23,000ft at Aboyne last year, will give a good idea of the existing possibilities.

SITUATED some 30 miles inland from Aberdeen, the Deeside Gliding Club's site at Aboyne on the north bank of the River Dee is almost completely surrounded by highland, thereby being in an ideal position to investigate waves in different airstreams. The Grampian Mountains consist of a highland plateau with an average altitude of 2,000ft, topped by groups of higher mountains rising to over 4,000ft, and deeply dissected by fault and glacial action. The Dee valley is an example of the latter. As airmasses tend to be typical of their direction, which is easy to establish, wave systems also are classified by wind direction, and it has been discovered that their reproduceability is very noticeable but far from complete.

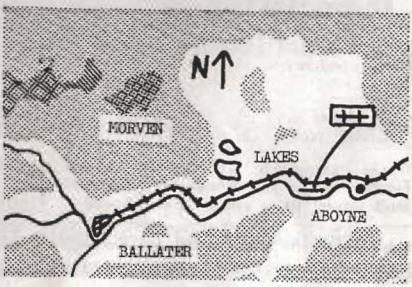
NATURE OF WAVES

Waves at Deeside occur in every month of the year, though more frequently in the periods March-April and September-October, and often in spells of 3-4 days. The normal vertical extent of waves is between 6,000 and 12,000ft; higher climbs should become more common as experience is gained. Weaker systems of the "evening thermal" variety, on the other hand, might produce lift to only 2,000ft and last half an hour.

The lower limit of smooth wave is indicated by the height of the stable layer —usually an inversion between 2,000ft and 5,000ft. Below this is an airmass whose turbulence is severe and peculiar to wave, probably, a mixture of wind shear and rotor, though the latter is not distinct at all. Instead of "cobblestone" turbulence, it resembles a series of "karate chops" which spreads the dust (and anything else) around the cockpit! Lift and sink can be very strong but fragmented; it is worth delaying release till (a) 500ft are gained in continuous lift, (b) smooth lift is encountered, or (c) cloudbase is reached.

Wind directions in the turbulent layer might be quite different from the upper wind, especially below 1,000ft. First, the lower wind tends to align with the valley, so that with a strong upper cross-wind surface winds are light and westerly. Such conditions aggravate the turbulence from ground to wave level. Moreover, the upper wind will occasionally "break through" to the surface, presenting problems to aircraft on or near the ground. Secondly, due to the rotor motion of the turbulent layer, surface winds are light or reversed under the crest, strong and "true" under the trough. These effects are more noticeable when the wavelength is increasing, and can be predicted by the position of the wave clouds.

Cloud formations associated with wave can build up extremely rapidly. Gaps are not to be trusted and the importance of knowing one's position is especially



pronounced when much of the ground is unlandable and uninhabited. Otherwise they provide ideal signposts to the position of lift which can then be worked as ridge, under the same rules. Under conditions of no cloud, or when well above it, however, other techniques have to be used.

TECHNIQUE

As wave formations in this area quite often produce isolated patches of lift, not necessarily straight nor obviously related to any particular lee slope, a centering technique has to depend on variometer readings alone.

Consider first a fairly narrow region of weak lift with no cloud indication, and a light (about 10kt) wind. On entering the region of lift, one commences a gentle turn towards the wind. When the reading starts to decrease, the direction of turn is reversed and continued till lift is again increasing, whereupon the glider is flown in a straight line. The exact position of maximum lift is noted if the ground is visible and close enough to obtain a landmark. As the lift decreases, it is assumed that the glider is leaving the lift at the downwind edge, and therefore a turn is commenced back towards the wind and the lift, whence the procedure is repeated till the end of the beat.

A tighter turn into wind avoids drifting from the region. If the points of maximum lift have been noted, it may be possible to use these, but the area might have moved relative to the ground, in which case the zig-zag procedure should be maintained. The advantages of this method are: (a) the alignment of the beat may be determined without any cloud or topographical aid; (b) the shape of the region may be plotted as the track will follow any corners; (c) the glider will follow any movement of the lift; (d) the flight may be confined to the best lift.

The same principle is employed when the wind approaches flying speed, but it becomes more important to be aware of the wind speed and direction, as these will affect the ability to stay within the boundaries of lift. If a 40kt wind is producing an area of good lift, one can use, say, 5kt lift as the threshold of the area to be explored. The first beat is made directly into wind, as nearly as can be determined by monitoring drift. On this occasion, as there is no perceivable forward motion, airspeed is increased to provide this, to perhaps 55kts. This beat into wind may take quite some time.

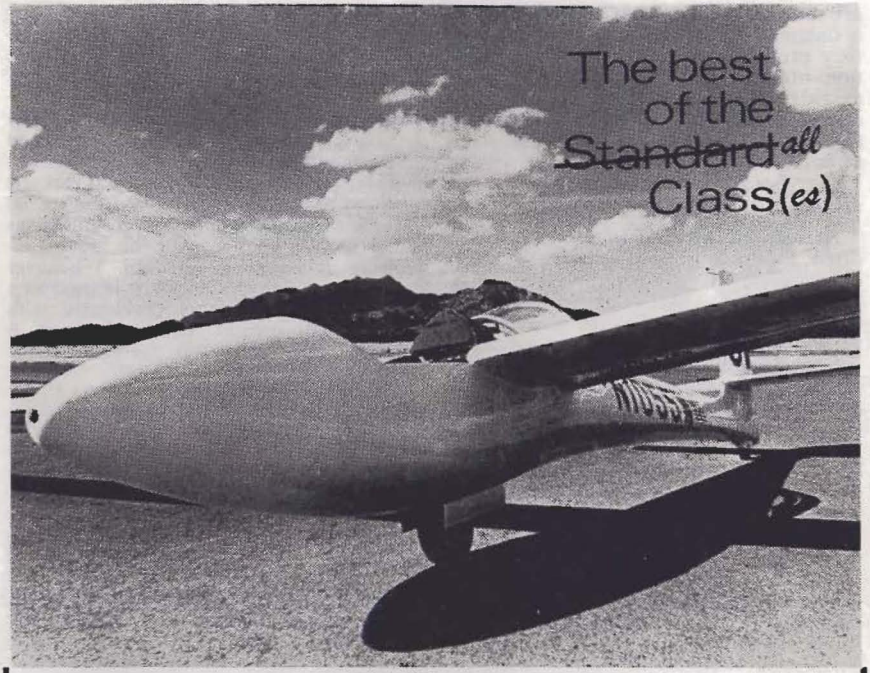
One then needs to turn some 50° only to travel downwind with a crosswind component; airspeed is kept at 55kts. As before, the turn towards the wind is made as soon as the lift decreases. Again wind direction and strength are determined as these usually change with the ascent, requiring a change in airspeed. Whenever stronger lift is experienced, it is used as a new threshold for turns. Obviously, with wind speeds greater than stall speed, it is possible to "hover" in the best lift.

WAVE DISTRIBUTIONS

The north wind (about 330°-360°) has been seen to produce three distinct patterns of wave over Deeside, usually well marked with low lenticulars or cloud edges. The first occurs when the wavelength is long, whereupon the waves extend for many miles east and west in true classical fashion. The one over Deeside is a secondary or tertiary wave, and therefore moves several miles under atmospheric changes. As the region of lift can be five miles wide, however, it is still easy to contact. This wave has been soared to 13,000ft and is probably the best for cross-countries.

More commonly, however, north waves can be related to local highland features. Orographic cloud forms on or above the high ground south of the Dee, closely following the contours. Lift in front of this is characteristically wave, and extends to at least 7,000ft. Atmospheric changes affect the strength and extent of lift, but not its position, which is fixed like ridge lift.

The whole wave system can disappear rapidly and completely, although the third system, from Morven, might persist. As Morven is only 1¼ miles in width, so is its wave pattern; but lift is weak and usually reaches 3,000ft, except when the secondary wave coincides with the "Dee valley" wave. In this case the secondary is stronger than the primary, and provides up to 10kts lift to 12,000ft. When there is a slight westerly component, waves which align N-S can form off the edge of the plateau, and an L-shaped cloud is produced.



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The effects of Morven are noticeable in the north-west wind (290°-330°) but waves in this direction are subject to a lot of interference from ranges farther upwind, so that the net result at Deeside is one of several patches of lift with no cloud formation, prone to move, appear and disappear in a fashion which so far defies classification, but not several successful climbs, including one to 17,000ft.

In contrast, westerlies produce a primary wave at the lee side of Morven and Culblean whose characteristics are strong lift, fixed location and variable cloud, and is known to exceed 20,000ft on occasions.

With the wind from the south-west, as with northerlies, there are three different patterns which are nearly always shown by cloud. Regular parallel waves are not infrequent, but their source is unknown and as many as six may pass overhead in the course of a day. More often, waves in this wind form a complicated pattern of lift distribution. It is sometimes unvarying for a day and areas of lift are then found to exist in crescent-shaped beats 2-5 miles long, in which climbs of 4kts have been abandoned at 15,000ft. The third pattern is one which exists over the Dee valley only, and is stationary. As cloud in those conditions has closed in completely on several occasions, climbs have been limited to 5,000ft.

Southerly winds are not common at Aboyne, but waves have occurred in these winds. Being light, they produce weak lift to about 6,000ft and distinct isolated rotors, sometimes with cloud. In summer, as the wind backs after a day of thermals, wave occurs without cloud for about an hour before the wind dies out completely.

South-easterlies, on the other hand, have produced wave to 12,000ft, although only once in five years; waves from the east and north-east have yet to be contacted.

CONCLUSIONS

In an attempt to explain the different patterns of waves, certain basic parameters have to be considered. Foremost is the wavelength, which has been observed to be between two and 20 miles on different occasions. Then one has to establish, wherever possible, which topographical feature or features are triggering the wave system.

Within the distributions described one can discern systems which are triggered by (a) the lee slope of a plateau; (b) an isolated mountain peak; (c) a single valley, and (d) probably the windward side of an upland region. Assuming these four features as independent sources of wave, then it is possible that the selection of the source depends on the wavelength of the airstream, which has no connection with relief. Thus the airstream with a long wavelength might be triggered by the upwind edge of the highland and remain unaffected by features whose width is much less than the wavelength. This would explain the regular, parallel waves experienced in both northerly and south-westerly winds; the passage of several waves suggests the source is well upwind and the wavelength is increasing.

As for condition (b), waves off the peak of Morven are pronounced by their position and cross-wind extent; they occur when the wavelength is between two and four miles. What was initially considered to be the primary wave off Morven with longer wavelength has been noticed to extend over the top of the mountain to the upwind side.

Since there are many such peaks, secondary waves often coincide with the effect of another, making the overall pattern very complicated and sensitive to small changes in wavelength. Such conditions are especially evident in winds from the northwest and southwest.

Waves which follow the contours of a valley are further complicated by the fact that they are "trapped". Any atmospheric effect which would tend to displace the wave therefore destroys it instead; hence perhaps the rapid filling-in of cloud as previously described. The wavelength in these conditions has not yet been ascertained.

The true "lee" wave off the downwind edge of a highland mass can presumably exist with any wavelength, but Deeside, being in the middle of highland, does not experience the normal phenomena of parallel primary, secondary, and tertiary waves obviously related to a lee slope.

FURTHER INVESTIGATIONS

This attempt to classify and explain various patterns of wave which exist over

a mountainous area compares them with only the simplest of factors—the relief and wavelength. The latter is a complex function of lapse rates and wind velocities, but is frequently determinable by the glider pilot, and hence is a more practical parameter to use. The variation with height of temperature and wind velocity, however, will determine whether waves occur or not and might give further information to triggering features. Besides an effort to confirm the theories presented, further investigations will include a collection of such data, which is not given sufficiently frequently nor from the place in question by Meteorological Office tephigrams.

The ability to predict the positions of waves over mountainous regions will greatly enhance the possibility of safe cross-country flying, provided that the knowledge of cloud formation is similarly complete.

With landing-fields at a premium, one needs to know where one's next wave is coming from!

IN SEARCH OF ELYSIAN WAVE

By MIKE GARROD

AMONG the conversation one hears at the bar, mixed with the "how-idunits", one may sometimes catch a more plaintive note—a tale of hard luck and frustration. It may emanate from any class of pilot, ranging from the chap who has flown for two years and never climbed in a thermal, to the pundit who didn't quite make it to the top in the Nationals.

The particular cross in the gliding world which I've had to bear is an extraordinary ability to miss every wave day at Dunstable for 22 years—at least, with the exception of one day, but then the variometer was disconnected!

Now I'm the first to admit that flying in cumulobumpus cloud is a bit hair-raising, especially that bit near the top when one decides it is time to "get the hell out of it." Disorientation, turbulence and icing make level flying well nigh impossible, and the rattle of hail or a flash of lightning is enough to make me call it a day! Way back in 1958 a venerable, stable old Sky got me a Gold height in a matter of minutes, but subsequent attempts to achieve a Diamond gain in a Grunau in Africa, and in a 463 in England, proved both hazardous and unsuccessful. For want of a suitable metaphor, there are easier ways of skinning a cat, and it is hardly surprising that a search began for that Elysian, smooth, clear air wave which would get me to my goal.

You would have thought that a Met man, armed with the tools of his trade, would soon find what he was looking for—but not this one! It was as if the spell cast by repeated failures at Dunstable to find our own wave was to occur wherever I went!

First of all it was Fayence. Twice in fact, and it cost quite a lot of money. This is a favourite spot for Diamond hunters from all over Europe—indeed, too popular! Too many gliders, not enough tugs, somewhat primitive accommodation and food, and last and by no means least, wave as elusive as the chamois, convinced me that the south of France was altogether far too chancy.

Somewhat lighter in pocket, my eyes turned inevitably to home pastures, and after some rumination decided that Portmoak seemed to offer reasonable chance of success. However, that cross was just as heavy, and after two visits of a fortnight apiece, failed to find any lift worth calling wave. Was it really worth having a third try?

Well, it just had to happen sometime! March 1968 was a vintage year, and the wine had been flowing for a week when I arrived. Numerous Golds and Diamonds had been done, and the flood continued for a further five days. For once my luck came up, and my first ever wave flight took me, after five long hours, to over 18,000ft in my Dart 17.

Having savoured the pleasures of smooth flight, it was natural to want to



The Elysian heights above Aboyne *Photo: M. P. Garrod*

experience it again; but as a "flat site" pilot one had to go elsewhere. And just where was the major question. What site offered the best chance of wave flying in the British Isles in a randomly chosen fortnight? My professional vocation suggested a spot of research, and though somewhat inconclusive, I decided to try Portmoak again in March 1969.

Success? Not on your life! Easterly winds, driving snow and no flying! We were lucky to escape south again, tail between legs, without being snowbound until midsummer.

A favourite site of mine is Sutton Bank. Not for its wave prospects, but for its delightful scenery, superb hill soaring, excellent weekday facilities and Yorkshire hospitality. Waves do occur, but not for this wave-starved pilot! If Neptune rules the waves of the air as well, he must have been laughing the day I returned south, painting lenticulars in the sky above the A1. Two more recent visits however, revealed where and how to contact waves in this area, starting with Gormire Lake (like something out of Pilgrim's Progress) and across to the foothills of the Pennines near Dishforth and Ripon (The Gates of Heaven). The frequency of the right type of weather, however, makes a chance of wave in a ten-day visit very tenuous indeed.

It was during 1971 that rumours filtered south from a new area of Scotland. Escaping Sassenachs told wondrous tales of wave in any wind direction, and far better conditions than at Portmoak. Could this really be true? March 18, 1972, saw my partner, Bob Smith, and I setting off on the great trek northwards for 500 miles—up the M1 and onto the M6, past Carlisle, famed for its Helm Wind (but oh so rare!), through Edinburgh (trust us to pick a Rugger International event at Murrayfield!), on past Kinross and Portmoak (deep in thick, unflyable industrial haze) to Perth, and then into the mountains and over the Devils Elbow. Descending between the snow capped peaks my gaze was drawn towards a small, but highly significant thin cloud

above the mountains, like a sentinel beckoning us towards our goal—Aboyne.

The Deeside club is a newcomer, and still with it's teething troubles. However, its small membership is very keen and determined. The airfield is alongside the river Dee, some 30 miles west of Aberdeen, and in the eastern foothills of the Grampians. All launches are by aerotow, as winching proved dangerous for passing motorists on the A93. The surface of the field was still rather rough, and flying operations somewhat interrupted at intervals by cows going to a waterhole.

Days one and two produced nothing to satisfy us wave hunters, and oxygen masks remained undonned, oxygen cylinders fully charged. Two more hopeful groups turned up, fugitives from even less promising regions to the south. While we slept on the third night there was a light fall of rain, and the wind picked up from the northwest.

Five-to-seven in the morning. Switch on radio to track down weather forecast, but Scottish version doesn't appear to reach Aboyne. Might just as well stagger out of bed and have a butchers—good grief!

No, it wasn't my back, painful as it is! Lenticulars, rosy pink lenticulars! Talk about a sight for sore eyes! "Hey! Wake up you chaps, today's the day!" Mad scramble, down to airfield, waken resident on site, kind tug pilot, rig gliders, and the first is away by 8.30am. By the end of the day we have all exceeded 10,000 and some up to 18,000ft.

Day four, however, was the day. Classic lenticulars, both low and high level, resulting in two Diamond height gains. For my part a site record high of close on 23,000ft. Days five and six were almost as good, by which time we'd been down to the local blacksmith to get our oxygen bottles refilled. Even with the wind in the south the waves were almost as good.

The weather turned colder, and snow began to fall. Time to head south. Do high waves occur in all directions at Aboyne? I couldn't prove it myself, but I know it's the best site I've come across yet. Anyone know a better one?

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THE UNFAIRNESS SIDE OF CONTESTS

By ANN WELCH

GLIDING championships are generally remarkably free from regulation infringements, which is presumably why little serious thought has been given to the subject of appropriate penalties. With, however, the increased sophistication of championships—and their high cost to competitors—there is a need to look into action which should be taken in the event of failure to abide by the rules.

The difficulty is to decide, for example, how to weight dangerous flying, or the carrying of forbidden equipment, in relation to the taking of an incorrect turn point photograph. A further difficulty is that of obtaining evidence that is conclusive in, for example, a case of alleged airspace infringement.

In the past the absence of guidance in these matters has often resulted in the guilty going free, and a minor technical error being punished out of all proportion to the magnitude of the offence.

The following is an attempt to rationalise this "unfairness" side of championships. It is based on a grouping of types of infringement or failure to comply, on the deliberateness or otherwise of the error, and on the grades of penalty which may be imposed. It is unlikely that any two directors or stewards will think sufficiently alike to impose an identical penalty for any given misdemeanour, but the existence of a simple process by which the "quality" of the failure may be assessed in relation to its "cost" should help to achieve a more balanced result as far as the pilot is concerned.

Types of infringement or failure to comply

1a) Dangerous or hazardous flying including airspace infringement.
1b) Cheating, falsification, use of forbidden equipment, etc.
1c) Failure to comply with the requirements, as occurs with photographic evidence.

Degrees of failure or infringement

2a) Those which are inadvertent.
2b) Those resulting from taking a chance, perhaps inadmissably.
2c) Those which are deliberate.

Types of action or penalty

3a) Written warning.
3b) Deduction of points.
3c) Temporary or permanent disqualification.

In this last group is the new concept of a formal written warning. It would normally be given in the case of a first offence which had been assessed as inadvertent. It could also be used in more serious cases where the evidence, although strong, was inconclusive. The receipt of a written warning would mean that no subsequent offence of a similar nature could be considered as inadvertent, and would therefore carry some penalty.

SERIOUS CASES

In serious cases where the only lack was conclusive evidence (eg, controlled airspace infringement) the issue of a written warning would mean that in any subsequent occurrence of a similar nature the infringement could be considered to be deliberate. It would, of course, be possible and indeed reasonable, to include in the written warning an indication of the likely penalty for a subsequent similar offence, or any other comment considered appropriate.

If it is apparent that as the result of an incident the perpetrator should suffer a deduction of points, it may be difficult to decide the size of the deduction. It is not particularly desirable to publish a "scale of charges" since this will simply result in some pilots deciding that it will pay to infringe the regulations and accept the scheduled reduction in their score. In fact they would be stupid to do anything else.

In cases involving technical failure to comply with the requirements, such as errors in turn point photography, the points penalty should not be large, perhaps 10-75 points (out of the maximum of 1,000). It should however, be larger than any gain in points which would result from committing the error.

Turn point photography is a subject still requiring thought about the procedures involved, but specially in terms

of the responsibility of the organisers to make it easy for the pilot to achieve the required pictures. They have to appreciate that the purpose of the championships is to find the best soaring pilot, not the best photographer.

The procedures used, therefore, should a) assist and encourage the pilot to take his photographs from the correct position and of the correct point; b) allow him reasonable room for inadvertent positioning error—although possibly with some small point deductions; c) make it clear that if this marginal region is exceeded, the pilot will be considered to have not reached the turn point.

To me, it is not logical to make a big deduction of points for turn point photography problems. Either the pilot reached the point following the set procedures, but for one reason or another did it a bit wrong, or he did not reach the point within the tolerances laid down. In the first instance he should be docked a number of points consistent with the extent of the error, and in the second case he should be scored as not having reached the point.

With misdemeanours in either the dangerous flying or "cheating" categories, if the seriousness is such that a written warning is insufficient—or has already been given—the points which could be deducted could, and should, be much larger in range; say 50-1,000. This range is wide enough to just knock a pilot from the podium at one end of the scale to effectively putting him into a permanent bottom or near bottom position at the other. (A 1,000 point deduction early in a championships could even give a negative score for a day or so.) It is impossible to suggest sample deductions as each case has to be judged on the situation and circumstances at the time.

At the severe, 1,000 point, deduction end of the range it may be difficult to decide, eg, in a case of thoroughly dangerous flying, whether it would not be better in the interests of the other pilots to disqualify the offender. But disqualification, particularly in World Championships where it could effectively send home a single-entry country, is a really last resort penalty. It has never been used in World Championships—it has not been necessary even to consider it.

The two big and ever present problems are really to decide the degree of deliberateness or otherwise of an incident, and to decide whether the evidence is sufficient or not. A false landing certificate, for example, could be the result of bribery by the pilot, or it could equally be that the pilot accepted the local's statement of his position in good faith—and they did not know where they were either; this, believe it or not, has happened.

Fortunately, gliding championships, from World right through to Regionals, are wonderfully free from any form of deliberate acts of rule infringement. There are some occasions in which a pilot chances his arm—eg, convincing himself that he is flying safely in a crowded thermal when he is not—but almost all infringement incidents are basically inadvertent. Championships are a sophisticated operation with a high stress content and it is not difficult to make a mistake. This is why it is important to try to rationalise the whole infringement and failure-to-comply situation so that pilots do not get landed with the wrong-sized penalty for the wrong reason.

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The Grasshopper and the square

George Locke

MOST prangs are sordid affairs. Even after both the glider and the pilot have recovered from the physical and mental indignities inflicted upon them, there are unpleasant aftermaths. These range from groundings and "back on the two-seaters" from the CFI through dirty looks from your partners to the total recall of the traumatic experience necessary when you fill out the BGA accident report form.

I was a hero after I made my first prang. It was while I was still at school. Although there *was* an unpleasant aspect to the affair, it was limited to one individual's unfavourable reaction. The headmaster's caning (which effect was reduced by secreting 'On being a bird' at an appropriate place in my school uniform) was more than compensated for by the adulation accorded to me by 600 of my fellows.

The Combined Cadet Force of the school had an RAF section, which was similar to an ATC unit. I initially joined it as an insurance against being drafted into the Army when I was called up to do my National Service. I associated the Army with digging trenches in the pouring rain and thunder-boxes echoing round some remote valley in Wales. The real



"me", I felt, would only find its true expression up in the clouds, a place all my masters agreed was my natural class-time habitat.

When I joined the RAF section, it was newly formed. We were thus a very keen bunch of lads. One of the brighter ones —he's probably a successful industrial spy now—managed to get hold of the document which specified what a cadet force was entitled to in the way of equipment. Among the many fascinating items available was a Primary glider—not inappropriately named the Grasshopper.

We persuaded our CO that we couldn't justifiably be called an RAF section if we didn't have at least the beginning of a genuine squadron of aircraft. In due course it arrived—two wings, a tail, a connecting bit of framework as a fuselage, a mass of tangled cable to hold it all together, a tripod to balance it on and a bungey to launch it by.

Our efforts to rig the thing were a far cry from the speed and efficiency with which my syndicate slips the SHK together when I'm not around.

One cadet would hold the rigging booklet in one hand and read sonorously from it while we all listened, each with a different bit of cable in our hands. Then, when he'd finished, he'd cry, like Olivier reading *Richard III*, "Get on with it!" We'd all nod, then rush around with our bits of cable, tripping over each other and knocking holes in the fabric. By the time the Grasshopper was fully rigged and the cadet I/C winding had finished his chore of tautening the cables, it was U/S. A week would be spent getting the poor thing back into shape.

When we finally rigged it successfully and mounted it on its tripod it wouldn't always respond to its controls for the wing balancing exercises. I recall that there was never any wind on those occasions, which indicates a lack of direction somewhere in the corridors of power.

Still, as far as I was concerned, playing with the Grasshopper was a lot better than the alternative—cricket. I personally had a deep aversion to this form of masochism masquerading as a game. I never seemed to survive at the bat long enough to do more than acquire one or two



bruises, and in the field I was always placed either a yard from the most menacing batsman or right on the boundary. There, my afternoons would consist of a very long walk from one side of the field to the other every time six balls had been bowled. The walks were made even longer by having to skirt a certain hallowed square of virgin turf, reserved for school cricket matches.

The school field was quite big enough to enable us to avoid this landing hazard when the time came for the Grasshopper to make ground slides. By this time, I, along with a number of other cadets, had managed to get my A & B certificates on a course run by an ATC gliding school.

The Grasshopper was basically designed for ground slides and low hops to be carried out without danger to limb or structure in the hands of the inexperienced. In order to prevent a loop being made straight off the bungey, the manufacturer had made it possible to insert a pin which would lock any fore and aft movement of the control column. The manufacturer and cadet force hierarchy didn't think the possibility of an inadvertent flick roll or pirouette was so likely, however, so they left the roll and yaw controls alone. When we did our ground slides, our CO always placed the elevator locking pin in position carefully. As a result, nobody achieved a hop, low or otherwise. For me, a fully qualified A & B pilot with three genuine solo flights to heights exceeding 600ft, the prospect of just sliding a few yards along the ground was a bit off.

So when my turn came to have my ground slide, I craftily removed the locking pin and stuck it in my pocket. I got strapped aboard, and while the other cadets were gathering up the bungey and spacing themselves out along it, I daydreamed of a magnificent high hop. I would catch a thermal at its apex, soar to cloud-base, and, inspired by 'On being a bird' (our Bible in those days), glide off to that hated public school, Eton. I would arrive in the middle of a ceremonial occasion. All the little darlings would be lined up bedecked in toppers and tails. I would glide along their ranks with consummate skill, artistically knocking off each topper with the wingtip before making a perfect landing . . .

"Wake up!"



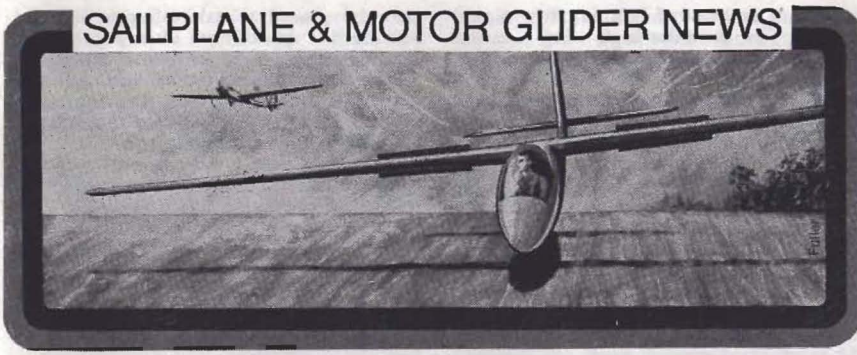
The other cadets were already marching away from me like Peter Scott's ducks positioning themselves for a V-formation take-off. The bungey tightened. The cadets strained and strained. Sweat began to bead on their foreheads. I let them suffer a long time (for interrupting my day-dream) before saying "Let go" to the chap holding us back. As the bungey whisked me forward, I yanked the stick back. . . .

"Well, sir," I told the headmaster afterwards, "I think that locking pin must have fallen out. And a gust of wind must have lifted one wing. And, well, I'm very sorry, but I couldn't stop it from crashing on to the cricket square, sir. But it wasn't really a crash, sir. After all, any landing you can walk away from is a perfect landing, isn't it, sir?" Nervous titter.

Swish!

But the rest of the school thought it was a perfect landing—even the 1st eleven, whose bowlers made excellent use of the rut I gouged out of the square—and I'm all for democracy.





LIFE WITH THE ASW-17

By RICHARD H. JOHNSON

MY first engagement with the ASW-17 occurred in March of 1972, and I was frankly apprehensive. The big beauty had just arrived in Houston the day before, and Rudy Mozer had quickly plucked it from its container and brought it to Grand Prairie, Texas, where a number of interested pilots were gathered to evaluate the elegant machine.

The first assembly was not impressive. New paint had made a tight fit of the parts, and the combination of new, insufficiently clean, fittings and the unfamiliarity with assembly procedures resulted in some frustration. The inner wing panels weigh about 220lbs each, and this by itself is manageable. But with no wing support stands and the long delay in completing the main pin insertions, the first impressions were not favourable.

Finally, the assembly was completed, and the new sailplane looked immensely proud and beautiful. Its vertical tail appeared somewhat disproportionately large, but by experience I knew it was necessary if good flying qualities were to be achieved with the large span 20m wing. The wings, though only 4.5in deep at the spar roots, showed surprisingly little droop while on the ground. This, I understand, is due to the wing spar design in which the spar's glass fibres are spread in a wide monococque form comprising the exterior skins of the wing inner panels. This stressed skin spar construction apparently avoids the wave-at-the-spar shrinkage problem that is common with conventional constructed spar glass wings.

The slender aft fuselage tail boom is graceful, but at first glance it does not appear strong enough to support the large rudder. Again, the first impression did not prove to be accurate, and the slender aft fuselage showed a surprising amount of stiffness. This is derived from the two-skin sandwich fuselage construction used where the inner and outer skins are separated by a quarter of an inch of a unique hexcell-type sandwich material.

Next to the slender fuselage boom and generous vertical tail, I was most impressed by the remarkably sensible horizontal tail design. It has a 2.9m span, which I know would provide good longitudinal stability. In addition, the fixed stabiliser portion comprised by far the major portion of the surface. and this by design would provide comfortable and safe high speed handling qualities, which some recent designs lack.

The fuselage has a distinctly pointed nose designed by Gerhard Waibel to maximise low drag laminar flow. When I later suggested to Gerhard the possibility of cutting a hole in the tip of this elegant nose to install a rain and ice resistant pitot, he was concerned that a

significant amount of laminar flow would be lost. The shoulder-high wing location is aerodynamically efficient and reduces fuselage interference effects such that no noticeable wing root airflow separation occurs while thermalling.

I have always considered the Slingsby Skylark 4 to have the best cockpit of any sailplane I have ever flown, and the ASW-17's is almost that good. It has a comfortable 24in width, adequate length for all but the tallest pilots, and a well-shaped seat contoured to fit the pilot's important posterior surfaces. The pilot is semi-reclined to about the same degree as in the Skylark, and the visibility from the pilot's seat is quite good.

The landing gear handle is located on the left side of the cockpit, as it should be, but unfortunately a pilot with even average arm length will hit his elbow against an aft cockpit fairing protuberance just before the wheel is fully retracted. After I learned to compensate by leaning to the right and holding my elbow close to my side, I had no further trouble with this. I understand that newer models will have the gear handle placed about two inches farther forward, which will correct this problem. The other somewhat minor cockpit problem was the location of the wheel brake actuation 'T' handle, which was on the right side of the cockpit. This necessitated changing hands on the control stick to actuate the brake when completing a landing. This also, I understand, is being remounted on the left side of the cockpit.

The control stick is comfortably located and remarkably free to move, considering that the stick not only provides the normal aileron motions, but also differential movement to the wing flaps. This flap-plus-aileron movement provides superior lateral control, compared to other long-span machines, during the critical take-off roll. The wings on the 20m machines are unmistakably heavier and more difficult to control than those of the 15m and 18m gliders, and all help possible is needed here. The most common error which a pilot inexperienced with long-span sailplane flaps makes is that of making the initial take-off ground roll with the flaps in other than the full up position. They should remain in that position until good lateral control at about 30kts airspeed is reached, and only then be placed to take-off position. Reversing the procedure during crosswind landings also works well.

The first take-off went better than I expected. As anticipated, the inertia of the long heavy wings was much more significant than any sailplane I had previously flown. A good sense of anticipation for lateral control requirements is needed if one is to avoid wing-tip dragging during take-off and landings. Lift-off was made at about 42kts airspeed and the tow was accomplished with unexpected ease. The big tail combined with the well-balanced lateral control system no doubt contributed greatly to the good tow characteristics.

After release, wings-level flight was investigated. Longitudinal stability was excellent, and the trim airspeed appeared to be about 54kts. Sink rate was remarkably low at that airspeed, and the glide ratio obviously very high. Increasing the airspeed to 80kts did not increase the sink rate to a large degree, and the apparent flatness of the glide angle gave credence to the advertised outstanding high speed performance.

SINK RATE LOW

Next, the low speed range was tried. At 40kts both the sink rate and cockpit noise levels were very low, and the control systems responded quite adequately. This airspeed is near that for the advertised minimum sink rate of 97ft/min.

Reducing the airspeed still further necessitated a definite back pressure on the control stick to accomplish—further evidence of fine longitudinal stability. Minimum speed in the unballasted condition I was flying was about 35kts. Light buffet was present near minimum airspeed. The stall was remarkably gentle for this class of sailplane and was similar to that of the excellent Skylark 4.

In subsequent tests of rolling manoeuvres it was apparent again that the wings were long and carrying a stout spar. It takes close to eight seconds to reverse a 45° banked turn when flying at about 45kts airspeed. This relatively low roll rate will probably disturb those used to shorter and lighter wings, but in time one gets used to it. Adverse yaw during rolls is comparatively light, and keeping

the yaw string centred was considerably easier than with my HP-13. Again, the big rudder seems to be the key.

It was well before noon still, but weak early spring thermals were rising to about 2,000ft agl, so naturally I banked the big bird up and circled to regain lost altitude. Though banked for normal thermalling the ASW-17 maintained its low sink rate, and it climbed beautifully despite its comparatively heavy 6.1lb/ft^2 wing loading. Before long other sailplanes were joining me in the thermals, and I was able to determine that its excellent thermal ability was really there and not just in my imagination. A reversal of turn direction while thermalling is somewhat difficult and time consuming because of the inertia of the big wings, and I found it best to avoid that manoeuvre if at all possible.

FIRST LANDING

After having flown the ship 2½ hours on this my initial flight, and knowing others were waiting to try it, I reluctantly returned to the airstrip for a landing. The gear came down easily, and the flaps were set to their −9° landing position. Being unfamiliar with the ship, I kept the airspeed at about 55kts during the approach. There is no tail parachute on the ASW-17, but large airbrakes extend from both the upper and lower surfaces of the wing and these provide moderately good glide path control. A high steep approach into a short field is not possible because its weight and cleanliness carries its airspeed to excessively high levels to permit reasonable ground roll distances. Instead, a moderately shallow approach must be performed so that the airbrakes can keep the airspeed at the desired approach value. The forward visibility is excellent during approach and landing, but once on the ground it does take more braking to get stopped in a short distance than with a smaller, lighter sailplane.

Flying the ASW-17 was an experience, but not love at first sight for me. Its flying characteristics took time to get used to, and its trailer and our assembly procedure needed improvements. A month later I called Rudy to ask if it would be possible to fly the 17 some more during our Region 10 Southern contest in May. I was scheduled to fly one during the coming World Championships in Yugoslavia, and I needed more practice. Rudy's 17 was in Wichita being fitted with a new trailer, and he generously consented to my using his magnificent bird provided that Roy LeCrone could get the new trailer completed in time. Roy just did and Curt McNay kindly towed it down to Dallas the evening before the contest started.

The weather was good and my ASW-17 flights numbers two through six were all good for 1,000 points each during the 5-day contest. The machine was clearly superior, and I knew it was not really a good comparison of piloting abilities. During the area distance task, a 28 nautical mile final glide in a light crosswind to an airport goal with only 3.500ft of altitude loss really impressed me (achieved L/D=48). I was also impressed when my two-man crew was able to assemble the 17 unassisted while I was attending the pilots' meeting. Their only support equipment consisted of the new LeCrone trailer and one saw horse.

After the contest Rudy kindly allowed me to keep his machine for an additional two weekends of practice before leaving for Yugoslavia. The club glider-port where I divide my time between instructing and practice flying is at Heath, Texas, 20 miles east of Dallas. We have no towplanes there and our only means of launching is by auto-tow. This gave me a chance to evaluate the 17 under new conditions.

On all the three days I flew the 17, the weather was hot and the winds near calm. This, combined with the moderately far forward tow hook location on Rudy's 17, did not allow me to climb to more than 600 to 800ft before the tow car reached the field's end. On each day I found I could quite easily climb away from these relatively low tow heights, thanks to the flat glide angle and marvellous climb characteristics of the 17.

On the last day I did not find lift after tow until I was down to 250ft and about to turn in to a landing. The relative ease with which I could get the big machine to climb at this altitude amazed me. Gerhard Waibel later told me that Rudy's 17 had the forward under-the-instrument-panel tow hook position intended for aerotow, and that he was surprised that I did at all well auto-towing with it.

Ignorance was bliss here. The German 17 I flew in Yugoslavia did have the tow hook installed farther aft on the bulkhead just behind the pilot's seat, which is the normal combination auto/winch/aero-tow hook location. I did not get a chance to fly this machine on anything but aerotow while in Europe, but it did aerotow almost as well as Rudy's

By now I had logged nine flights and 46 hours in his machine (serial number 2), and I felt moderately well prepared to start the formal practice period for the World Championships in Yugoslavia. The ASW-17 the factory had arranged for me to fly was a real beauty. It was serial number 7, and bore the contest letters AS, for the firm's founder, Alexander Schleicher. It was impeccably equipped with radio, artificial horizon, Althaus, electric vario and oxygen by its gracious owner, Edgar Kremer, test pilot and Director of Development at Schleicher's.

Two flights from the Wasserkuppe followed by six more at Hahnweide and Saulgau in Germany preceded our team's journey to Vrsac, Yugoslavia. The flights in Germany put the machine to an unusual test. The thermals contained relatively large numbers of small insects that we would call gnats here but call mosquitoes in Germany. They would deposit themselves on the leading edges of all the glider surfaces at a fairly constant rate during flight, such that one could almost log his flight time by counting the number of splattered insects per unit of span on the wing leading edges. These affected everyone's performance, but appeared to degrade the thin ASW-17 airfoil less than the thicker winged machines.

INSECTS AND AIRFOIL

According to Waibel, there are two reasons for this. One is that the thin airfoils are basically less affected by surface roughness, and the second is that such an airfoil will naturally impact fewer insects in a given time because of its sharper nose and thinner profile. Insects generally are not so populous in our USA thermals, and do not present much threat to our laminar wing performance. However, raindrops affect the airflows in much the same way, so the performance of the 17 is likely to be better than with most other machines in that environment.

During subsequent flying in Yugoslavia, I had many occasions to fly in cloud and rain, but never had a good chance for observing comparative performance with the wings wet. The 17 flew well in cloud, principally because of its good stability and docile stall characteristics. Because of these characteristics, Gerhard Waibel calls the 17 his "grandfather's ship"! I pretty much agree with Gerhard's evaluation, but I think the grandfather should be *current* and *proficient* with his K-6 or Skylark before he flies the 17.

In summary, after flying the ASW-17 for 145 hours, I feel it is a safe and superb machine, and well worth the 40,000DM price. The more I fly it, the better I like it. My own will be out of the moulds this winter, and I find myself anxious to start flying it. My 17-year-old son Nels, having recently completed his Diamond Badge in our family Skylark 4, is now talking about record attempts when he gets checked-out in Dad's 17.

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BG-135 ACROSS COUNTRY

By DAVID INCE

FRIDAY, August 11: The sprawl of Luton and Dunstable below—a classic fair-weather cumulus sky above—the end of an exhilarating fight for speed over 200kms of cracking thermals—the altimeter unwinding—the finish line ahead and in the bag. BG-135 was about to win her first race and I was nearing the end of a two-competition partnership with a really splendid little aircraft.

Five weeks and 12 contest days earlier at Compton Abbas there had been much comment and some sympathy: "13.5m in UK conditions! Lead sled! Hard luck!", and so on. But they were wrong, as one already knew from performance measurements earlier in the year at Lasham.

BG-135 has already been fully described in S&G, but how does she appear to the competition or cross-country pilot?

Starting with the trailer. The manufacturers have produced an interesting circular section design in welded steel-tube and light-alloy skinning. Thanks to the 13.5m wing it is short, light and highly manoeuvrable. With fully automated fittings, a modification which Birmingham Guild is now working on, the production version should be ideal. Not least, the circular cross-section enables the driver to see any vehicles behind the trailer.

The wings and fuselage are light and very easy to handle, although 12 loose pins and the same number of safety pins on the prototype required careful rigging and derigging if one was to avoid losing something vital. On production aircraft this situation will be much improved. 'In hub' wing fuselage pins will allow the tips to be rested on the ground and rigging will be easier and simpler than an Olympia 463 or K-6E.

The cockpit is very generous in width with low sides and a good all-round view. The seat pan, back and rudder pedals are all adjustable giving a wide choice of position and reach. Detailed changes now in hand to improve demisting and thigh support, to increase the instrument panel area and to reduce internal reflection should result in a very comfortable and well laid out cockpit. The room for stowage behind the seat is also quite remarkable. There appears to be sufficient room for barograph, radio and batteries, not to mention shoes and even a change of clothing if so desired!

There was some distortion in the prototype canopy. However, the manufacturers expect the mouldings from production jigs to be much improved. Production canopies will be extended further aft for improved visibility and will be attached to a stiffer tubular frame.

The fact that one felt perfectly at home in a contest with only 40 minutes of previous soaring is some measure of the excellent handling characteristics.



Further, that the aircraft was lying in fourth place after four days of widely variable soaring conditions should dispel any doubts about its cross-country performance.

Indeed BG-135 proved to be an excellent thermalling aircraft under all conditions. High and late in the day in weak wide thermals, circling gently at 30kts, it holds its own remarkably well against the Skylark 3 and at 55kts on the glide there appears to be no difference between them, although at higher speeds BG-135 is obviously better.

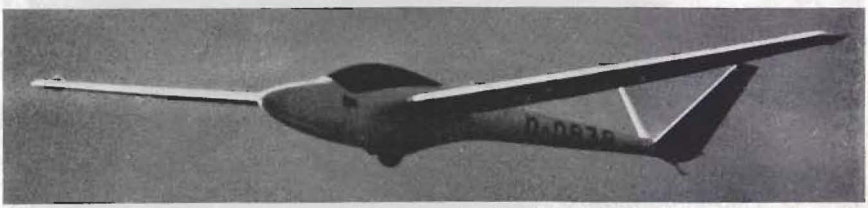
On strong thermal days the light control forces, very positive trim and good manoeuvrability combine to show the aircraft at its best. Thermals are entered rapidly and easily, winding in at 45kts with a satisfying onset of positive *g* accompanied by the 'tin canning' of metal skins. Exit from thermals is a similarly economical and satisfying manoeuvre. Under these conditions BG-135 seems to be on a par with the K-6E and there were certainly complaints at Dunstable from K-6E pilots who were unable to shake it off.

In spite of its manoeuvrability, the BG-135, once trimmed into a thermal, can be flown almost hands off. For this reason, as two climbs to nearly 10,000ft demonstrated, it is the easiest of aircraft to fly in cloud. It is possible while circling blind in slight to moderate turbulence to sort out one's maps or indulge in similar distracting activities without any difficulty whatsoever. Perhaps most important of all is the confidence which the BG-135 gives when scraping low down: The relative ease with which it can be manoeuvred to track and hold narrow shifting cores, the fact that the rate of sink seems to go up much less abruptly than on many other modern aircraft if it is flown too slowly, the very docile stalling characteristics and last but not least, the knowledge of very effective airbrakes if one does come unstuck. Ventilation, too, is noticeably good under these somewhat sweatmaking conditions!

Radio fitting proved to be a problem, and one which must be solved. Pilot and crew contrived to break a number of Bantam telescopic aerials on the prototype and to suffer line crossing and retrieving fumbles which were both irritating and inefficient. Perhaps a slot aerial in the belly or a whip aerial on the centre section fairing? Over to the experts for this one.

Coming back to the airbrakes, these are a particularly satisfactory feature. Surprisingly for trailing edge flaps hinged at approximately 50% chord, and unlike those fitted to the Vampire and early LS-1s, they are extremely powerful. They also produce no apparent change in trim or lift coefficient. With the additional benefits of a large wheel brake outlandings present no problem and quite small fields can be tackled with confidence and safety.

Pat Moore has written previously in S&G that the main aim was to produce a miniature general purpose sailplane having a performance of the order of the best of the outgoing Standard Class machines at an appreciately lower size and weight. For its design team, for Len Suter and Birmingham Guild who built the prototype and who are now putting it into production, BG-135 has handsomely achieved that first objective. That win on Friday, August 11, 1972, should be the first of many.



H-101 Salto: *Slingsby Sailplanes is now taking orders for the 13.5m Salto for delivery in August, 1973. The glider is produced by the firm Start & Flug of Saulgau, West Germany and was designed by Ursula Hänle. For further details see S&G June, 1971, p202*

Mü-27 VARIABLE GEOMETRY SAILPLANE

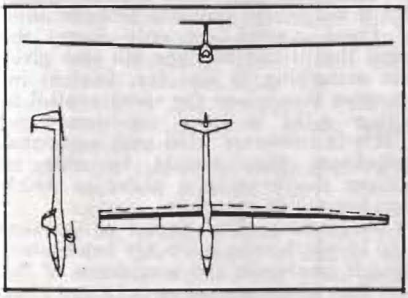
AMONG the projects currently in hand at Akaflieg München is the 22m span Mü-27 two-seater.

As the GA drawing shows, its flap system enables the sailplane to fall under the heading "variable geometry": Both the wing area and profile data can be changed in flight, with an increase in wing area of just over 35%.

The report in *Der Flieger* (December 1972) does not state how far the work on this machine has advanced or when it is due to fly, but one of the photos in the report shows the negative mould for the fuselage.

Technical data available

Span (m)	22
Wing section	FX-67-VC-170/136
Wing area (m²)	17.6 to 23.9
Aspect Ratio	27.5 to 20.2
All-up weight (kg)	700
Min sink at 66km/h (m/sec)	0.56
Stalling Speed (km/h)	60
Glide ratio at 105km/h	47:1



▲*Mü-27 GA drawing*

35m SAILPLANE?

LUDWIG BÖLKOW, of the MBB firm in Germany (Messerschmitt-Bölkow-Blohm), addressing a meeting of aviation journalists, deplored the cessation of production of the Phoebus series, which was due to shortage of money. But, according to *Luftsport*, Ludwig Bölkow "awakened a glimmer of hope" with the words: "Perhaps in three years' time, if once again we have the money, maybe we will once more produce a sailplane. But then one with 35 metres span—or so."

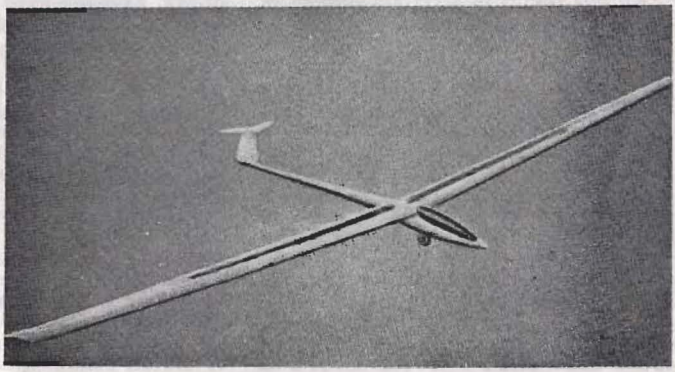
MANUEL HAWK FLIES

THE first flight of the Manuel Hawk (S&G April, 1970, p106) home-built light wind soaring sailplane took place at Cranfield on November 25, piloted by Howard Torode. Initial handling trials indicate that the sailplane had adequate stability and control in all respects apart from a shortage of rudder power.

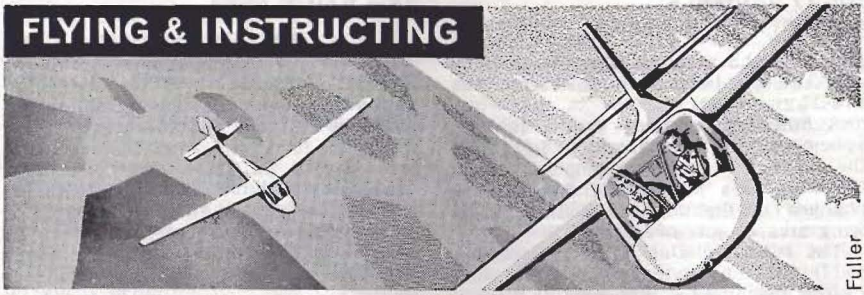
The machine had been built by William Manuel during his retirement; it was his fourth sailplane design and the first since 1935, and was completed in 1970. However, as no stressing details had been available, it had undergone extensive structural investigations at Cranfield.

Technical data

Span (m)	12.8
Wing section, FX 61-184	
Wing Area (m²)	14.07
Aspect ratio	12
Empty weight (kg)	184.58
All up weight (kg)	290.6
Glide ratio (at 38kts)	26:1
Stalling speed (kts)	31



▶*Model of the Mü-27 (Der Flieger)*



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THE BGA APPROVED INSTRUCTORS' COURSE

By JOHN HEATH

IN previous years the recommended syllabus to be covered by the student instructor before attending the course has been issued on receipt of a firm booking. This means that someone who applied within two weeks of the course had very little time to cover the syllabus while someone who applied months beforehand had a great deal of time.

The varying standards of general knowledge amongst students during the 1972 season would seem to substantiate the above. Some students had obviously burned the midnight oil learning facets of the subjects to be covered which were far too deep for the average instructor and pupil pilot while others had barely scratched the surface.

All this results in a certain amount of difficulty for the National Coach, who finds himself having to pitch his subject for discussion at an intermediate level which might be above the grasp of some initially and below the ability of others. A totally unsatisfactory situation and one that I hope will be partially, if not completely, resolved prior to the 1973 season.

Pre-instructor training can be subdivided into the following sections: a) flying; b) airmanship; c) general knowledge; d) basics of instructing.

a) *Flying* This must be accurate and one's aim must be to improve on accuracy. Occasionally one needs to fly very accurately, eg. in an emergency. One of course needs to be able to give accurate demonstrations; a fluctuating airspeed during a turn or on an approach may give a pupil the impression that this is an acceptable tolerance and of course this is not so. An accurate demonstration of speed control not only shows the pupil that it can be done but also gives him something to aim for. Student instructors should aim for speed control to within $\pm$1kt in calm conditions and $\pm$2kts in moderate wind with associated turbulence; they should be able to achieve this even in a glider in which they are out of practice.

b) *Airmanship* One aspect of airmanship in which most pilots are below standard is awareness and acceptance of the fact that others are using the same piece of sky. Lookout must be stressed and in fact over-emphasised if an adequate standard of airmanship is to be passed on to the pupil.

Student instructors should appreciate that the object of the exercise is to influence suitably the pupil pilot and one can really only do this effectively by example. It should be realised that the five hours flying aimed at during the course will probably not eradicate established habits in the student instructor, such as poor lookout, etc. Your aim should be to eradicate deficiencies prior to coming on the course.

c) *General knowledge* The course aims for 40 hours of ground instruction and covers the following subjects:

PRINCIPLES OF FLIGHT Full understanding of:

1a, Aerofoils
1b, Lift and Drag
1c, Forces acting during flight
1d, Turning
1e, Stalling
1f, Spinning
1g, Loading
2a, Effects of controls—axes
2b, Further effects of controls
2c, Stability

References:

Elementary Gliding
Gliding
Theory of Flight for Glider Pilots
BLAC Manual of Flying & Ground Training

3a, Flight limitations

Reference:

New Soaring Pilot

METEOROLOGY Full understanding of:

1a, The atmosphere (pressure distribution, heat absorption, air density, humidity, latent heat, adiabatic processes, lapse rate)
1b, Stability and instability (convection condensation levels, cloud formation)
1c, Wind related to horizontal variations of pressure (Buys Ballots Law, surface wind, geostrophic wind, gradient wind, surface friction, sea breeze, katabatic and anabatic wind, Föhn wind, gusts, squalls, air masses
1d, Icing and ice accretion (super cooled water droplets, hoar frost, rime ice, clear ice, rain ice, dangers of airframe icing, types of cloud and associated icing
1e, Fronts (warm, cold, occluded, frontal characteristics)
1f, Synoptic charts (basic understanding, weather station information, forecasting, general weather)
1g, Gliding aspects—wave, hill lift, soaring

References:

Meteorology Simplified
Know the Weather
Meteorology for Glider Pilots
The Weather Guide

NAVIGATION

1a, Maps and charts (latitude, longitude, Mercator projection, Lambert projection scales, conventional signs)
1b, Cross-country flying — effect of wind on track and ground speed
1c, Field landings
2a, Compass—deviation and variation, turning and acceleration errors
2b, Vector triangles

References:

Gliding
Flight Briefing for Pilots Vol 4
Pilot Navigation

INSTRUMENTS Full understanding of construction and principles of:

1a, ASI
1b, Altimeter
1c, Variometer
1d, Turn and slip
1e, Artificial horizon
2a, Errors
2b, Over/under-reading — causes and effects

References:

Gliding
New Soaring Pilot

AIRMANSHIP/GENERAL

1, Air Law
2, Ground handling, all aspects
3, Awareness, constructive ideas on safety/accident precautions, etc

References:

Laws and Rules for Glider Pilots
Flying Training in Gliders
Aeromedicine for Aviators

Should the preceding information on general knowledge requirements look rather frightening, the student instructor ought to appreciate that an acceptable level of knowledge can be reached without too much difficulty. Any lack of understanding prior to the course will certainly be clarified during it, and if at that stage some aspects are still causing trouble, then don't worry unduly. It is uncommon for a student to fail the course on this count alone. Although it is true to say that background know-

ledge facilitates explanation and demonstration, there is such a thing as blinding pupils with science. Consequently, one should aim for sufficient technical knowledge to satisfy most pupils at their various levels.

d) *Basics of instructing* The student instructor is required to be articulate and enthusiastic and CFIs should make every effort to stimulate their student instructors to improve their ability to communicate and to be aware that the rate of progress varies from pupil to pupil. However, each pupil pilot must be made to feel that he is all-important. Pupil pilots should be encouraged to participate actively in all exercises and the habit of self-criticism should be cultivated. Questions should be posed by the student instructor requiring thought from the pupil pilot on all aspects of the exercises in question. Better results are achieved in this fashion rather than by the instructor just making statements.

Use should be made of aids to instructing, eg, models, blackboard, diagrams, aircraft, etc, and preparation beforehand can result in a very stimulating session. The ability to gauge audience response must be cultivated otherwise one may find very blank faces after a fairly comprehensive lecture which probably should have been pitched at a lower level. Analyse as you go along and if required amend accordingly.

Student instructors would be well advised to become involved in passenger flying, at the discretion of the CFI, which will promote the ability to talk without a loss in either flying skill or judgment. Further involvement in basic ground instruction for pupil pilots will lay the foundations on which the instructors' course can build. Attending bi-monthly club instructor meetings as an observer only can be very informative and illuminating and generally promotes understanding; a quality much desired in any instructor.

I sincerely hope that the preceding information will help to clarify suggested pre-instructors' course requirements and perhaps remove concern from prospective course candidates.

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HOW MUCH BALLAST?

By FRANK IRVING

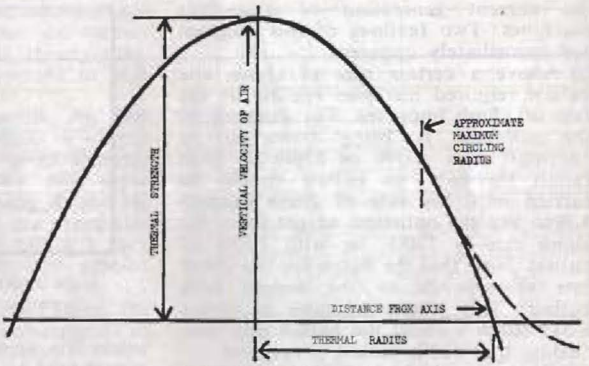


Figure 1

EVERY morning at Vrsac, the crews gathered around the water taps with their polythene jerricans like village women going to the well with their buckets, and exchanged gossip in much the same fashion. Eventually, a daily total of five tons of water was poured into the gliders—mostly into the ballast tanks, some into the bottom of the cockpits. In general, the idea was to obtain the maximum take-off weight, regardless of theoretical considerations like placarded max all-up weights. At Dunstable, something similar was to be seen on a reduced scale.

So far as one can see, the current philosophy is to fill one's ballast tanks to the bung before take-off, keeping it on board if conditions seem reasonably good and dumping the lot if they become marginal. There are, admittedly, some excuses for this crude technique: Statements of max permitted AUW with ballast are sometimes rather inscrutable and it is not always practicable to fly with partly-filled tanks. But how much ballast do we really want?

A by-product of Sigma was Nick Goodhart's splendid computer programme for calculating sailplane performance in thermals having various velocity profiles (Refs 1 and 2). For the present purposes, and by way of illustration, let us confine ourselves to thermals having parabolic velocity profiles (Fig 1) and fixed-geometry Standard Class gliders. Consider such a machine with a given aspect ratio and all-up weight, using thermals of a given core strength and radius. Then the computer will work out the radius of turn, forward speed and rate of sink through the air such that the rate of climb is a maximum. From this rate of climb, it will then calculate the average cross-country speed.

These calculations have been carried out for a wide range of aspect ratios and weights so that, for given thermal conditions, it is possible to find the optimum weight for a given aspect ratio to give the maximum cross-country speed. From the pilot's point of view, the most suitable presentation of these figures is a plot of optimum weight against achieved rate of climb (assuming he employs the optimum circling technique) at the optimum weight.

For the present purpose, only the results corresponding to an aspect ratio of 20 are considered, this representing a fairly typical Standard Class glider. In Fig 2, each line is a plot of the type described above, derived by considering thermals of various core strengths and a constant radius. Plots corresponding to radii of 400, 500 and 700ft are shown.

There is no point in displaying a plot for 300ft radius thermals since all the optimum weights are lower than are currently practicable. Likewise, for 1000ft radius thermals, optimum weights are so high (mostly over 900lb) that common sense suggests that this is an impractical situation except in a few favoured countries. Also shown are lines at W = 560lb (a likely minimum AUW for a 15m sailplane) and W = 650lb (a likely maximum AUW without ballast). The characteristics of the gliders as inserted into the computations were typical of

the current generation of glass-fibre machines. Two features of this diagram are immediately apparent:

(i) Above a certain rate of climb, the ballast required increases rapidly as the rate of climb improves. For example, if the sailplane is being flown at its "normal" max AUW of 650lb in 500ft radius thermals, no ballast should be carried until the rate of climb exceeds 3.7kts. But the optimum weight for a 5kt climb rate is 770lb, ie, with 120lb of ballast. Note that the figure for the climb rate corresponds to the weight with ballast: This is not the same as noting a 5kt climb without the ballast and concluding that 120lb ballast is required.

(ii) The amount of ballast is quite sensitive to thermal radius. Optimum weights for a 5kt climb rate are 640lb in narrow thermals (400ft radius) and 900lb in wide thermals (700ft radius).

In practice, there is a severe snag: the pilot doesn't know the thermal radius—which is, in any case, a pretty fictitious quantity. The only quantity associated with thermal size which he can judge, and then only rather vaguely, is the angle of bank at what he thinks to be the optimum climbing condition.

Under the assumed conditions, the computer kindly provides the optimum bank angle which gives the maximum rate of climb for a sailplane of a given weight in a thermal having a certain core strength and radius. So, at various points along the lines in Fig 2, we could

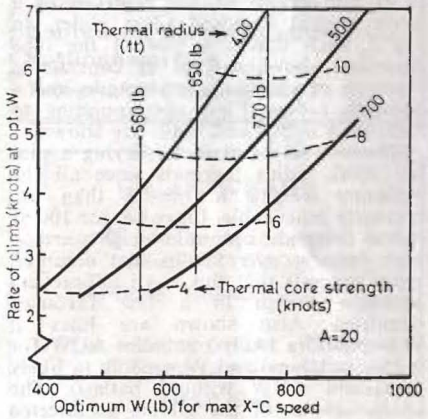


Figure 2

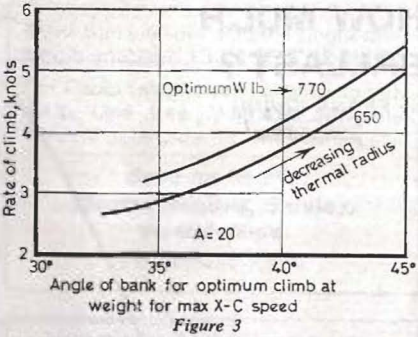


Figure 3

insert the appropriate bank angles. This would lead to a very confusing diagram, but a more meaningful plot is shown in Fig 3.

For a constant optimum weight line in Fig 2 (eg, 650lb), one can find the maximum rate of climb and optimum angle of bank at each thermal radius. Hence one can show the relationship between these two quantities for each chosen value of the optimum weight. Increasing optimum weights give lines lying further towards the top left-hand corner of the diagram. So, if one is flying at an all-up weight of 650lb and if the max rate of climb is about 3½kts, achieved at an angle of bank of 40°, conditions are about optimum. A higher rate of climb achieved at the same angle of bank, or the same rate of climb at a lower angle of bank suggests that one ought to be carrying ballast.

Similar lines can be inserted for higher weights. For example, Fig 3 also shows a line for W = 770lb, the max LBA (German airworthiness authority) figure for the Libelle. As we have previously noted, the amount of ballast required increases very rapidly as the rate of climb improves, so the two lines in Fig 3 are quite close together. At this juncture, it should be said that Fig 3 is not a particularly accurate plot since it involves two stages of interpolation. The difference in optimum bank angle for a given climb rate between the two lines in Fig 3 is small—about 2°. This is too small a difference for the pilot to be able to judge, even if he thinks he is indulging in precisely the best circling technique. In any case, his bank angle will not normally be very steady. So, while he can

judge—to some extent—whether he ought to be carrying some ballast, he cannot readily estimate how much. In any case, is accurate ballasting important in real life?

From the computer results, we can deduce the effect of departures in weight from the optimum, for a given thermal strength and radius. If we plot these figures in the manner of Fig 4, the results depend somewhat on the properties of the thermal but they all follow a very similar trend, indicated by the plotted curve.

Empirically, and in round figures, the trend indicated by Fig 4 corresponds to the following expression:

Percentage loss in average speed $= 50\ (\delta W/W)^2$

where

W = optimum all-up weight

δW = error in all-up weight relative to the optimum,

both expressed in consistent units (lb or kp).

For example, if we are flying at 750lb AUW when the optimum AUW is 650lb, $\delta W = 100$lb and the loss in average speed will be $50(100/650)^2 = 1.2\%$.

So, one concludes that the effect of flying at the incorrect weight is very small unless one is operating under extreme conditions. For example, in thermals of 700ft radius with a core strength of 10kts, the optimum AUW is about 1,050lb. So flying at an AUW of 650lb would give a loss of about 7% in average speed.

Under more normal conditions, the effect of departures from the optimum weight is likely to be insignificant compared with the effect of errors in piloting technique. So, using ballast on the all-or-nothing basis is as good a method as any.

The obvious corollary to these thoughts is: Why bother with ballast anyway? If the machine has provision for carrying ballast equivalent to 20% of its unballasted AUW, this will give a 2% improvement in average speed under the appropriate conditions. But it seems doubtful whether any lesser amount of ballast is really worth having. On the other hand, if one wants to get the best out of really strong conditions, the machine should have provision for a very large amount of ballast, say 50% or more of its unballasted AUW.

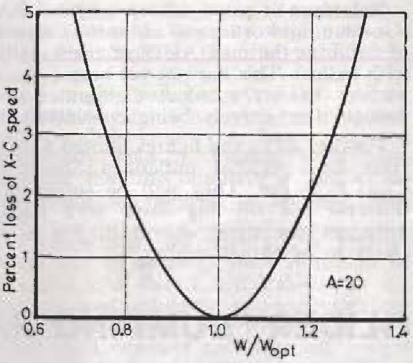


Figure 4

CONCLUSIONS

1) A rough guide as to whether ballast should be retained is given by Fig 3.
2) The effect of errors of the order of 100lb in AUW, relative to the optimum figure for the prevailing conditions, is very small under most conditions.
3) If the sailplane has provision for carrying ballast equal to about 20% of its unballasted AUW, this is probably only just worth having under the most favourable conditions.
4) If the sailplane is to operate at its optimum weight over a wide range of thermal conditions, it should have provision for carrying a very large amount of ballast.

Warnings All of the above is based on theoretical calculations. These assume a realistic sailplane, a perfect piloting technique and very idealised thermals. The conclusions are no more reliable than the initial assumptions.

When pouring in water ballast, many pilots simply fill the tanks, regardless of maximum AUW limitations. The above considerations suggest that there is no significant performance advantage to be gained by exceeding the placarded AUW. There may be a significant financial disadvantage if an accident occurs when the machine is being flown outside its C of A limitations. Admittedly, flying with partially-filled tanks may lead to problems such as sloshing, which suggests that a more sophisticated design of ballast container is required.

Reference is made above to the LBA (German airworthiness authority) figure of 770lb as the max AUW of the Libelle with ballast. This has not yet been agreed by the BGA Technical Committee although it is actively being considered.

Finally, all of the figures quoted above refer to a typical unflapped Standard Class sailplane. They will be somewhat different for the big ships with flaps, although the trend shown in Fig 4 is likely to be rather similar.

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1. Irving, F. G. "Computer Analysis of the Performance of 15m Sailplanes using Thermals with Parabolic Velocity Distributions" *Swiss Aero Revue*, May and June, 1972.
2. Irving, F. G. "Computer Analysis of the Performance of 15m Sailplanes". Paper given at the Symposium on the Technology and Science of Motorless Flight, Massachusetts Institute of Technology, October 1972.

GLIDER "BUMPING RACES"

By R. C. STAFFORD ALLEN

WHY do people glide? Some I suppose do it for the chance of getting a record, some for the purpose of gaining badges and some for the chance to get into the National Team. If you are one of these you need read no further; this is not for you.

I have a sneaking suspicion that most folk glide for one reason only, and that is the pure fun of flying and I number myself unashamedly among this happy band. Although there is no doubt that cross-country flying in gliders is the most entertaining form of gliding it suffers from the snag that only too often the glider has got to be retrieved, and organising the retrieve is always a source of worry and trouble.

Now the only form of cross-country flying that can be indulged in without the worry of the retrieve is competition flying because all the organising of the retrieve is taken off the pilot's shoulders and he is free to fly and to try to do as well as he can, with no thought for the bother that he is giving his willing crew.

Nationals used to be enormous fun some years ago. The whole set-up was very informal and lighthearted, and the emphasis was on the fun of flying. Nowadays there seems to have crept in a rather cut-throat, rat-race attitude which has taken a lot of the fun out of the flying. It would be such glorious fun if it was not for the scoring!

Would it not be possible to have a competition where there was no scoring? I admit that this would seem to be a trifle contradictory, but is it as silly as it sounds? Perhaps we would have to arrange some sort of scoring, but we could at least make sure that this was not the be-all and end-all of the contest.

My idea is that one could arrange a flying week of competitions in which the emphasis was on fun, and fun alone, and I think that this might well take the form of a sort of "Bumping Race". Before anyone goes mad and starts talking about safety, let me make quite clear what I mean. A Bumping Race is normally a rowing race in which a lot of boats start at different places in a river simultaneously and the aim of the race is to catch up the boat ahead and bump (gently) into it. Next day the boat that has bumped the boat ahead, starts in front of it, and by this means it can climb its way up to the head of the river over a period of a week.

Right, to work this in gliding terms we would need the co-operation of about six clubs for a week. Preferably they would be six clubs spaced round a large circuit in the middle of the country. The entry would be split up into six separate lots and each lot would be detailed to start from one of these clubs. The task every day would be the same; to fly round the course (the polygon formed by the six clubs) as far as possible. A glider which started from club A would not start from club A next morning. Even if it made no effective flight, it would launch from club B the next day. If it flew from club A, reached club B, flew on past club C and landed half-way between clubs C and D, it would have

two 'runs' in the bag, and would trailer on to club D for the launch next day. It would, of course, be possible to score a 'home run'—that is, a full circuit of the course in one day, or even more than a 'home run'.

Each club would have to be able to launch about six or seven gliders by aero-tow each morning. Some days there would be more and some days fewer, but this could easily be sorted out in the evening by sending a tug over to the club with the biggest gaggle of gliders from the club which had the fewest.

I admit the sleeping arrangements would be a problem but if everybody carried sleeping bags, plus a toothbrush in the case of those with indigenous chompers, all that would be needed would be a capacious bunkhouse per club.

I feel that the fun value of such a competition would be very high. Also I have the suspicion that the public relations aspect would be quite valuable. The Press might well be persuaded to take an interest, and when you consider that the round-the-country cycling races send everybody mad in France, it is quite possible that the populace in this country might be induced to respond similarly.

I know that you have got to arrange some sort of scoring, but I refuse to be dragged into this. I will leave it to the experts, and, similarly, you can work out the handicapping for yourself if you want to. I couldn't care less; all I want to do is to have some really enjoyable flying, and perhaps indulge in a tour of the country by glider. Who knows, it might even brush up my navigation.

GENERAL & BGA NEWS

PARTICIPATION BY FOREIGNERS IN BRITISH COMPETITIONS

FOREIGNERS will be permitted to compete in British regional competitions as full entrants, the BGA Executive Committee agreed at its meeting on December 6, 1972. Their positions in the results sheets would, however, be discounted for rating purposes. All full entrants to the British National Championships must be of British nationality, however; foreigners will only be permitted to enter *hors concours.*

"British nationality" is defined by the Committee as follows: "The person in question must hold a British passport or be principally resident in the UK and paying income tax to the UK."

It was also agreed that certain approved foreign competitions should be ranked as of equal standing with a British regionals when the Nationals Entry List for the following year was prepared, to enable pilots to compete abroad without jeopardising their place on the entry list. For the time being, only two are approved; those held at Angers and Hahnweide. These would be subject to periodic review.

A modified system for compiling the entry list for the British National Championships was agreed by the Executive Committee at its meeting on January 3, 1973; details of this system are being circulated.

NO ALL-CORRECT ENTRIES TO CHRISTMAS COMPETITION

NO all-correct entries were received to our competition in which pilots were invited to identify a dozen well-known gliding personalities from their "C" certificate photographs (S&G December, p500). Several identified 11 out of 12 correctly; oddly enough they were all fooled by the same photograph, lettered "A", which depicts Ken Wilkinson, immediate past chairman of the BGA, at a tender age.

The first envelope opened with 11 correct entries contained two entries from separate pilots, both of whom identified the same number of people. John Delafield and Dickie Feakes will therefore have to fight it out to decide who keeps *British Gliders and Sailplanes* and who

keeps the consolation prize of *Where No Birds Fly*.

The 12 personalities were: A) Ken Wilkinson; B) Ann Welch; C) Chris Simpson; D) Bill Scull; E) Ralph Jones; F) Jack Harrison; G) Henry Doktor; H) Naomi Christy; I) John Cardiff; J) George Burton; K) Doug Bridson; L) Tom Bradbury.

NEW S&G EDITOR APPOINTED

MRS GILLIAN BRYCE-SMITH has been appointed editor of *Saliplane & Gliding*, starting with the issue for April/May, 1973. She will be working mainly from her home address: 281 Queen Edith's Way, Cambridge, telephone number Cambridge 47725.

Dr Alan E. Slater and Mrs Rika Harwood remain in their present capacities.

Mrs Bryce-Smith writes: "In journalism more years than I like to admit, 11 of which were spent as woman's editor of the *Cambridge Evening News*. In recent years I have been a free-lance journalist and since the mid-1950s a camp-follower of the gliding world. I'm one of those gliding-conditioned wives who loiter about on airfields ready to dash off with a trailer when husbands land short of those elusive Gold C distances!

"My husband, a member of the Cambridge University Gliding Club, has trained his family well. Our seven-year-old son and younger daughter share his addiction and already are filling their log books."

JOHN DELAFIELD AND ANGELA SMITH SET RECORDS

JOHN DELAFIELD and Angela Smith set times for a number of new British National records and one feminine world record in South Africa during December.

Details are as follows:

John Delafield, Kestrel 19, December 20, 1972, 500km triangle, 118.95km/h. This flight was superseded on December 21, in the same machine, by Delafield with a speed for the triangle of 121.28km/h.

Angela Smith, machine and date not known, 300km triangle feminine British National record, 102.5km/h.



Angela Smith at briefing at the Rhodesian nationals recently *Photo: McGeorge*

Angela Smith, machine and date not known, 500km triangle feminine British National and World records, 108.9km/h. (All subject to homologation.)

Angela is the daughter of Dan Smith, a mainstay of the London Gliding Club during the earlier post-war years and CFI for many years. She started to glide in the early 'sixties and entered her first competition in 1969, at Booker, where she finished eighth with a K-6E. At the same competition in 1970, she set up a new feminine United Kingdom out-and-return record of 303km. She worked for a short time in the BGA office and, later, at BLAC before going to South Africa for a "three-month trip" late in 1971. In addition to participating in the South African Championships this year, she flew in the Rhodesian contest in October, 1972.

THE 1974 WORLD CHAMPIONSHIPS

THE British team pilots—George Burton, John Delafield, Bernard Fitchett and John Williamson—will be trying hard to break the existing UK 200km triangle record this year. Given a reasonable summer it is likely the present record of 74.7km/h, held by John Williamson, will be well and truly beaten. Concentrating on this task should be useful practice as it looks as though flying really fast is what the '74 World Championships are going to be all about.

Soaring conditions at Waikerie, a small fruit-growing town on the Murray river, are likely to be superb, though we have been warned not to expect thermals to 10,000ft *every* day! The area surrounding the airfield is semi-arid, flat plain country but 50 or so miles to the west is the southern end of the Flinders Range—lovely country with huge fields where if you have to make an outlanding your worst problem is to find a telephone. However, north of Waikerie and just outside the promised contest area, is real frontier country: Hundreds of miles of semi-desert scrub where it is impossible to land without damage unless you can find a salt pan or clearing of some kind. No-one has yet flown a glider across this territory from Waikerie and made it to Broken Hill, Gold C distance away.

It all sounds very exciting but a long way away, particularly as during the next 12 months we have to find a forbidding amount of money to enable Britain to be properly represented with a full team and with gliders that will give us the best chance of winning. We are therefore launching



(on the theory that we have to raise enough money to get everyone out to Australia and back where they started!). Team members and crews will be contributing around £2,000 but, as BGA general funds are not available for world championship events, we are still faced with raising the largest sum of money from gliding enthusiasts since Britain first entered world contests.

We are plotting various schemes that will make giving almost a pleasure (more news of these in the next issue of S&G) but in the meantime Boomerang Fund representatives are being appointed in clubs all over the country to organise local money-making activities. And if you are thinking to yourself that world championships have nothing to do with the kind of gliding you do at your club—take another look at the machines at your site: The Dart, for example, or the Skylark 3 or 4, not to mention the K-6 and the venerable Olympia. They are all examples of the tremendous stimulus sailplane development gets whenever a world championships is held and they are all gliders that have given thousands of pilots countless hours of enjoyment—simply flying for fun.

PS. If you want to see the Team in action come to the BGA annual dinner and dance on March 10 when they will be challenging all-comers in an indoor boomerang throwing contest. We understand Brennig James is training hard!

ROGER BARRETT, *Team Manager.*

LIGHT AVIATION WEATHER SERVICE

A GENERAL aviation weather forecast service has been introduced for a trial period to determine the usefulness to and demand from pilots of short range light aircraft operating at altitudes below 10,000ft asl in UK airspace. It will provide pre-recorded weather forecasts for designated areas in the UK and Continental areas on the fringe of the English Channel.

A proforma on which the forecast can be written is available from the British Light Aviation Centre, Artillery Mansions, 75 Victoria Street, London, SW1, and the forecasts can be obtained by telephoning as follows: For areas lying approximately north of a line running from Bristol to the Wash, Broughton 863686 or West Drayton 42513; areas south of that line, West Drayton 42291 or Broughton 863636.

Areas north of Carlisle and Newcastle are not included in the trial service.

NEW ASSOCIATE MEMBER CLUB

THE Kirknewton Gliding Club, at present based at Ritchie Camp, Kirknewton, Midlothian (Secretary: R. D. Carswell, Esq, 11 Ainslie Place, Edinburgh EH3 6AJ), has been approved as an associate club member of the BGA. The category of the Glasgow & West of Scotland club has, at its own request, been changed from full membership to that of associate membership.

NEW YEAR'S HONOURS

PETER SCOTT, a BGA vice-president, received a knighthood in the 1973 New Year's Honours list. Sqn Ldr Ian Strachan, an RAF pilot, received a Queen's Commendation for Flying and Acting Flt Lt Walter Hutchinson, officer commanding 632 Gliding School at Ternhill, an MBE.

PTERODACTYLS AND T-53's ON THE AIR

DR GEORGE WHITFIELD, of the University of Reading, described his work in determining how pteranodon flew and lived (S&G, December 1971, p452) on BBC 1 television on Thursday, December 7. The programme, one of a series on animal design, first discussed the gliding flight of mammals such as the flying squirrels before moving on to the pterodactyls, and included some gliding sequences with Dr Whitfield at the controls of a T-53.

GLIDING CERTIFICATES

THREE DIAMONDS

25	L. S. Poulton	(in Australia)	27.11

DIAMOND DISTANCE

1/44	L. S. Poulton	(in Australia)	27.11

DIAMOND HEIGHT

3/150	R. P. Saundby	Bicester	30.10
3/151	W. W. Dickson	Bicester	30.10
3/152	A. S. Miller	Fenland	30.10
3/153	S. A. Harris	Fenland	2.11
3/154	R. C. R. Chesters	London (in Austria)	6.6
3/155	R. J. Kerr	Deeside	30.10
3/156	C. W. S. Goodman	Wrekin	8.6
3/157	J. R. Monteith	Bicester	29.10

DIAMOND GOAL

2/433	A. B. Milne	SGU	1.5

GOLD C DISTANCE

A. B. Milne		SGU	1.5

GOLD C HEIGHT

J. R. Bissett	Deeside	24.8
G. J. Dorward	Bristol/Glos	29.10
S. P. P. Thomas	South Wales	22.10
W. W. Dickson	Bicester	25.10
A. S. Miller	Fenland	25.10
M. E. Brook	Anglia	25.10
F. Cairns	Fenland	25.10
S. Richardson	Fenland	25.10
R. J. Amor	Fenland	29.10
J. D. Peck	Fenland	2.11
S. A. Harris	Fenland	2.11
M. F. M. Hardy	Eagle	27.11
J. M. C. Manson	Chilterns	6.11
C. B. Cogger	Chilterns	6.11
E. R. Duffin	South Wales	22.10
M. A. Clarke	Eagle	27.10
K. R. Aldridge	Bristol/Glos	23.10
E. J. Lambert	Coventry	25.11
M. J. Dean	Anglia	25.10
R. J. Cunningham	Dorset F/C	23.11
G. H. N. Mealing	Bath/Wilts	22.10
R. C. R. Chesters	London (in Austria)	6.6
A. Johnson	Deeside	25.11
J. S. Ruskiewicz	Polish AFA	2.12
N. Johns	Bristol/Glos	23/10
M. A. Gates	Surrey/Hants	20/10

GOLD C COMPLETE

334	W. W. Dickson	Bicester	25.10
335	J. M. C. Manson	Chilterns	6.11
336	E. R. Duffin	South Wales	22.10
337	A. B. Milne	SGU	1.5
338	K. R. Aldridge	Bristol/Glos	23.10
339	R. C. R. Chesters	London	6.6

SILVER C

3274	R. B. Hayden	Essex	10.9
3275	D. P. White	Crusaders	15.7
3276	F. J. N. Ellis	Cornish	10.8
3277	P. S. Wood	Two Rivers	24.9
3278	C. F. Wilson	Yorkshire	5.7
3279	Carol Brookes	Midland	11.8
3280	M. Taylor-Beasley	Bath/Wilts	3.9

John Thorne (recently of Compton Abbas) is offering his Rallye Minerva Glider Tug (220 hp) for Gliding Competitions, Task Weeks, Wave Soaring and as a Replacement for your Unserviceable Aircraft.

This superb Aircraft is available by the Day, Week, or Month at very reasonable rates.

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ANNUAL STATISTICS—OCTOBER 1, 1971—SEPTEMBER 30, 1972

GLIDING CLUB (SERVICE)	Aircraft: Club MG	Club 2S	Club 1S	PO	Tug	Launches: Gliding	MG	Hours: Gliding	MG	Cross-Cty km: Gliding	Flying Days: Total	Soaring	Courses: No.	Pupils	Membership: Male	Female	Non-Flying
Albatross		1	1	1		384		123			37	11			26	4	10
Angus		2	1	1		4572		433			91	27			54	7	8
Avro		2	2			3514		359			115	32			113	7	7
Bath & Wilts (1970/71)		2	2	6	1	3480		728		2630	83	51			89	5	9
Blackpool & Fylde		2	4	3		3680		417			93	47			95	9	
Bristol & Glos		2	6	15	2	7574		2138		3488	236	133	18		186	30	55
Buckminster		2	1	4		1559		266		660	56	25	1	6	40	2	1
Burton & Derby		2		4	1	2947		687		1078	109	49			87	8	12
Cambridge U		2	4	9	1	7278		2260		9805	237	137	9	49	202	10	42
Cornish		2	2	4	1	4914		971		1110	196	58	23	151	66	8	23
Cotswold		3	2	8		4069		672		1000	83	48			100	10	19
Coventry		3	3	23	3	6155		2445		10376	202	82	23	163	273	18	43
C.I.T. (Cranfield)		1	1	7	1	1658		731		2900					89	4	
Deeside	1	1	1	2	2	1106	300	415	100	960	204	140			42	4	
Derby & Lancs		4	4	15		7178		1625			160	130	24	144	175	5	97
Devon & Somerset		2	1	14	1	7465		1419		1635	190	91	8	69	147	13	29
Doncaster & Dist	1	1	3	9	2	4601	1387	1106	517	1667	185	105	7	70	145	11	83
Dorset F/C & Av Cent	1	3	2	5	4	5750		1614					20	100	71	5	
Dorset		2	2	11	2	4809		981		2140	106	53	2	18	140	13	169
Dumfries & Dist		2		2		118		49			23	17	1	10	33	2	6
Enstone Eagles		1	1	10	1	1467		402		290	66	37			60	4	
Essex		2	2	16	1	5101		1430		4366	101	58			183	6	214
Essex & Suffolk		1	2	3	1	1405		571			66	43	2	14	62	2	
Glamorgan		1				700		81							26	1	
Glasgow & W Of Scot		1	1			89		4			84	57			18		
Hambletons		3	2	1		5729		940			153	86			79	7	6
High Easter				2	2	52		30			11	5			7	1	
Highland		1	2			2230		308		273	104	34			22	5	1
Inkpen		1	1	4	1	1449		311			61	34			48	3	2
Islay		1				352		33			27				17	1	
Kent		3	2	10	1	9592		1674		1448	251	31	32	320	173	18	40
Lakes		2	1	4	1	2063		414		1000	115	25	6	45	47	8	7
Lasham Gliding Society	2	4		77	3	24206	8555	4038	1624				100	411	225		
Imperial College			2	1		684		508		3350	135	70	2	11	68	4	2
Polish A.F.A. (1970/1)		1	3			380		270		2900					30		10
Surrey & Hants			10			4985		2389		12480					323		
Scout Association	1	1				2500		260	460						N/A		
Lincolnshire		3	1	3	1	1900		230		195	100	40	2	12	74	1	
London		4	5	47	2	14368		5732			251	180	16	161	382	16	52
Midland		3	3	16		11553		2697		1363			21	373	179		69
Milfield (The Borders)		1	2			1644		117		90	59	9	1	10	28	5	1
Newcastle & Teesside (1970/1)		1	1	1		1456		246		150	91	66	3	30	63	2	10
Norfolk	1	2	2	4		3274	824	356	251	320	112	19	2	16	98	7	18
Northumbria		2	2	13	1	6710		1088		1200	175	58	20	130	96	12	4
Norwich Soaring			1	1	1	428		162		520	97	64			12		
Ouse		2	2	9	1	5245		771		2254	127				109	14	33
Oxford		2	2	7		2664		689		2068	88				76	8	11
Peterborough & Spalding		1	1	6	2	1447		394		200	75	63	3	18	52	3	14
Rotherham & Dist		2	1	2		1701		156		170	78	26			31	2	10
Scottish Gliding Union	1	4	4	18	2	9812	1025	3847	484	800	328	203	24	175	200	17	46
Southdown		2	2	2		3691		835		128	106				127	18	41
SouthWales		1	1	6		3537		412		530	93	52	2	12	102	6	8
Staffordshire		2	2	3		2787		282		522	96	40	1	18	68	5	
Swindon		2	2	10	1	3634		800		8279	187	133			67	7	1
Trent Valley		2	1	4	1	4253		540		1000	106				63	4	3
Ulster & Shorts	1	1	3	3	1	801	343	418	184	350	87	42			45	5	
U Of Aston In B'ham		1	1			997		172		521	81	35	3	15	54	6	1
U Of Glasgow & S'clyde		1	2			892		47			41	12			23	1	
Upward Bound Trust		4	1			2935		267		80	76	31	Continuous		25		
Vale Of Neath		1	2	1		927		120			47	15			64	4	10
Welland		2				450		63		200	16	10			25		
West Wales	1	2				1024	736	145	344		188	20	18	74	36	1	83
Wolds		1	1	3		4274		384		135	132	46			62	8	10
Worcestershire	1	3	3	11	2	4873	1698	967	871	1660	242	102	20	301	121	9	5
Wycombe Gliding School											300	200	18	95	*		
Airways	1	1	4	10	3	4470	592	2786	366						180	20	
Thames Valley		2	4	12		6705	798	3554	324						220	20	
Yorkshire	1	1	2	20	2	7498	2000	800	510	600	282	47	18	150	183	8	28
Cisavia																	
Aquila		2	3	1		1613		158		65					25	5	4
RAE Farnborough		2	3	1		3108		442		692					70	5	2
RAE Pershore		1	1	2		1500		110			77	30			27	3	4
CIVILIAN TOTALS	13	125	136	487	52	267966	18258	62915	6035	88748	7634	3273	460	3171	6548	457	1404
AGA *Kestrel*		2	3	2		4500		824		7218	74	43			42	3	2
RAFGSA *South West Dist*		4	4	4	1	3745		586		3495	87	37	1	10	51	7	
Anglia		2	3	1	1	2969		677		1158	108	46			55	7	5
Bannerdown		2	2			4356		765		1200	73	14			60	5	
Bicester	1	6	13		3	14705	2054	5518	736	4800	233	110	10	150	500	50	
Chilterns		2	3		1	4112		680		2025	98	45			84	6	
Clevelands		3	5	3	2	8000		1600		5000	160	90	8	50	130	10	
Cranwell—RAF Coll		3	2	2		3776		547		435	102	35			50	5	3
East Midlands		1	3	1		4106		526		821			1	50	60	2	
Fenland		2	4	2	1	5551		903		1214	121	30			76	6	8
Four Counties		2	4	1		4706		1317		3834	116	71			80	4	
Fulmar		2	1	1		2573		343		444	116	40			52	2	9
Humber		2	2	1		4522		713		633	84	43			65	5	10
Mendips		2	1			3553		408		635	160	78	2	20	45	1	
Wrekin		2	3	1	1	4442		834		1096	153	70			65	5	
RNGSA *Culdrose*		2	2	1	1	3192		616		1106	85	29	2	23	85	5	4
Heron		2	3	2	3	3787		722		802	97	48			108	8	
Portsmouth Naval	1	3	2	1	2	3456	510	493	240	61	126	21			125	7	2
Thunderers (1970/1)		2	3			601		45			40	15			50		
SERVICE TOTAL	2	46	63	23	16	85652	2564	18297	976	35977	2033	865	25	261	1783	138	43
SERVICE & CIVILIAN TOTAL	15	171	199	510	68	353618	20822	81212	7011	124725	9667	4138	485	3432	8331	595	1447
OVERSEAS *Eagle (Army Germany) (1970/1)*		2	4		1	3967		760			91	37			60	10	
Phoenix (RAF Germany)		2	3			4859		749		660	94	37	1	8	52		
Two Rivers (RAF Germany)		2	7			10266		1574		6361	149	60	1	10	71	9	8
Crusaders (RAF Cyprus) (1970/1)		3	4		1	5080		932		1910	141	101	3	24	56	5	
OVERSEAS TOTAL		9	18		2	24172		4015		8931	475	235	5	42	239	24	8
ATC *1 Centre—28 Schools*	1	139	13			160342			800								

Key: MG=Motor gliders; 2S=Two-seaters; 1S=Single-seaters; PO=Privately owned

"SEA BREEZE" OVER CENTRAL ENGLAND

By ALAN DIVER

ON Sunday, June 13, 1971, during the Sports and Club Class National Gliding Championships at Husbands Bosworth in Leicestershire, the competitors had to fly into an almost ideal example of what Wally Wallington calls a Pseudo-Sea Breeze Front in his book "Meteorology for glider pilots". Thus, the front was observed by most of the field. Some, recognising it for what it was, used it successfully, while others, delving into the depths of the front in an effort to gain the necessary photograph of the turning point, Oundle church, plummetted to the ground. The result was a first class set of eye-witness accounts of the front.

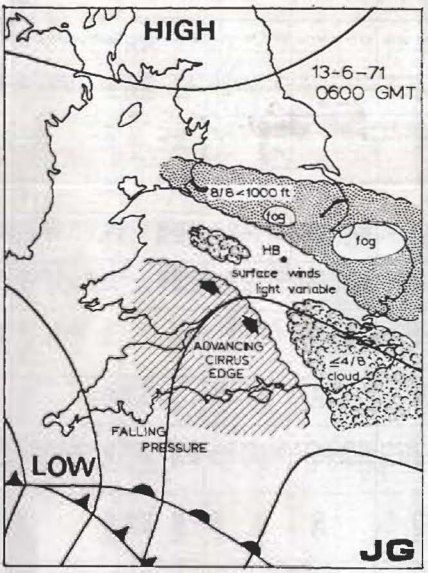


Figure 1

METEOROLOGICAL SITUATION

Figure 1 shows the synoptic situation at 06.00GMT on June 13, 1971.

Most readers will be familiar with the mechanism of the normal sea breeze. In the case of the pseudo sea-breeze situation relatively rapid heating will occur in the clear air on the south side of the stratus/fog edge, while cool, dense air will remain to the north of the front where the sun's radiation cannot pene-

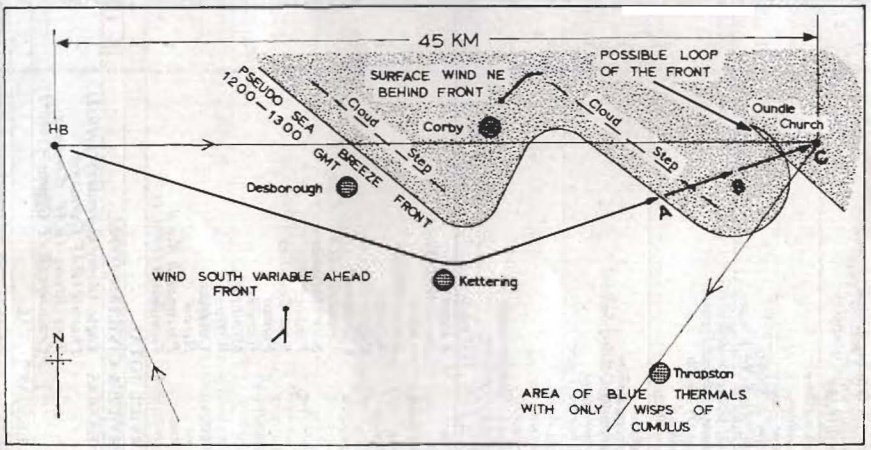


Figure 2

trate to the ground. Thus the stratus/fog edge acts like the coastline in the normal sea breeze situation.

EYE-WITNESS ACCOUNTS

The frontal position is shown for approximately 12.30GMT. It is worthy of note that, judging from pilot reports of cloud and lift, the front was composed of several "loops" or "folds". It would appear, from the reports of vigorous lift and turbulence just south-west of Oundle church, that the warm air enclosed in one of the loops might well have been lifted off the surface by the colder air on either side. The surface wind was a variable southerly to the south of the front, but a definite north-easterly to the north of the front.

Most gliders found good thermals after being dropped from the tug—and climbed normally. From their positions near the start line the edge of the frontal cloud could be readily seen by the pilots. Various "probing" attempts were made into the front, but in general their aircraft were forced to make some sort of "dog-leg" track to the church.

The cross-section shown in figure 3 illustrates and summarises eye-witness accounts of the part of the track lettered A B C in figure 2. One pilot flying from position G (figure 3) found 6kt lift over the nose of the front and also observed the typical "curtain clouds" ahead of him. He ascended in cloud to 5,500ft. The cloud step was well defined on both loops. Under the step steady lift of 3 to 6 kts was found.

Approaching Oundle church several pilots found strong lift (10kt or more) and ascents in cloud were made to as high as 10,000ft, though the lift was found to be very turbulent between 6,000 and 8,000ft. This strong lift near Oundle church is very interesting. It was probably due to a greater degree of instability being realised here than elsewhere in the warm air which might have been due to the warm air being lifted off the surface by the undercutting colder air from both sides of a loop, or to the warm air in this area being heated under the clear skies rather more than elsewhere (possibly for some local topographical reason) before being lifted by the undercutting colder air, or to a combination of both effects.

The representative tephigram ascents are reproduced in figure 4 and show the instability produced. Some pilots who found the strong lift used the height gained to take their photographs and then returned to re-utilise the lift before heading towards the second turning point, Olney church. The cloud broke on the

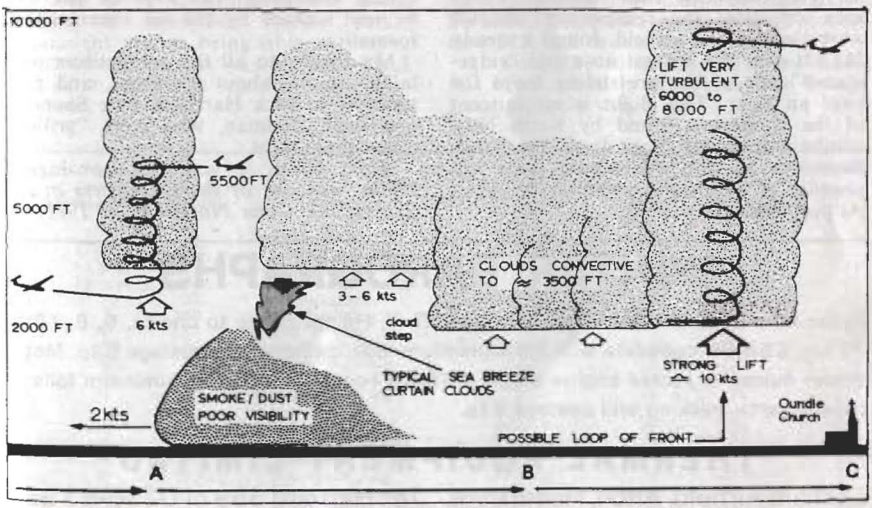


Figure 3

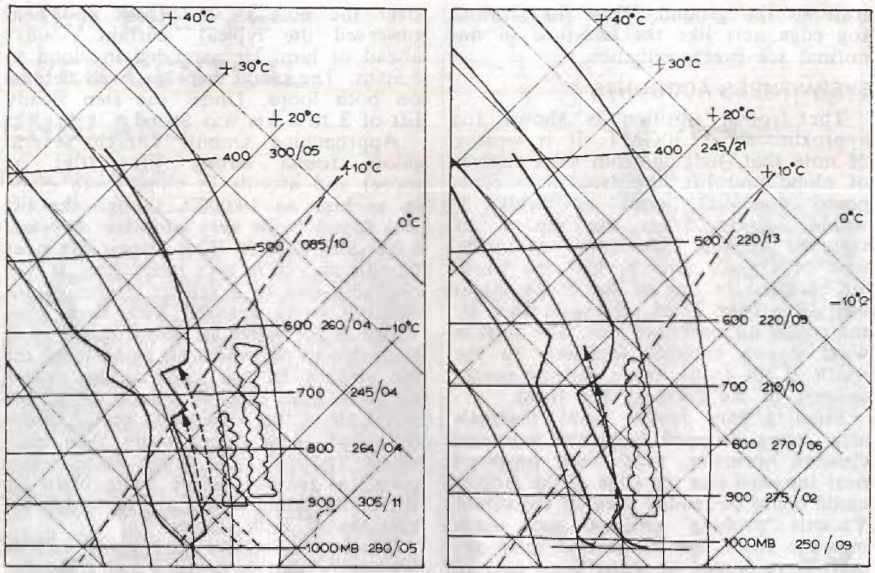


Figure 4

second leg just after Thrapston and little difficulty was found in completing the task.

It is worth mentioning that one Coventry Gliding Club member, who took off after the competition aircraft were clear of the airfield, found a steady 2kt lift over the frontal nose and "ridge-soared" one of the protruding loops for over an hour. This flight is reminiscent of the conditions found by Keith Nurcombe during his flight from Husbands Bosworth to the Wattisham area, an account of which was published in S&G, August-September 1966.

CONCLUSION

Glider pilots can make long, relatively easy, cross-country flights along the fringes of cloud sheets in pseudo sea breeze situations. The area of lift will be well marked by the sea breeze cloud formation.

My thanks to all the competitors who talked to me about the front, and particularly to Jack Harrison, Pete Saundby and John Cadman, who were "grilled" more than most.

Alan Diver, of the Meteorological Office, was one of the forecasters at the Sport/Club Class Nationals in 1971.

WINTER BAROGRAPHS

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THE FIRST 18 MONTHS

By GERRY LEECH

DURING my first 18 months of gliding, I have been asked on several occasions, as I am sure have many others, the questions: How much? How long? etc. This has prompted me to draw up the following table, as a rough guide to anyone who may be interested. It is intended merely as a note of one fairly average person's experience with no previous flying experience. Most of the early flying was performed at weekends, up to three launches on some days, and with no long breaks—ie, no more than two weeks without flying.

The first six months were spent in K-7's launched by aerotow; the club then acquired a Falke which was introduced into the training programme and proved very successful, especially during inclement weather conditions and for certain exercises.

I feel that January was a particularly good time to start as the initial manoeuvring difficulties were being overcome as the weather became more soarable. A very good spring and summer also moved progress along fairly rapidly. For one short spell during the initial training, I remember feeling rather despondent at not being able to master the aerotow, but that was the only black spot in an otherwise smooth progress to first solo.

Is progress affected by the size of the club? With no experience of other clubs this is impossible to answer with any degree of certainty; but presumably the larger the membership, the larger the fleet. The number of two-seaters and number of instructors to man them must have a great bearing on progress. At my own particular club we were very fortunate in that there was rarely a time when an instructor was not available; even in mid-winter, there were usually one or two spare to take over as each one froze solid and had to be stood in a corner to thaw out.

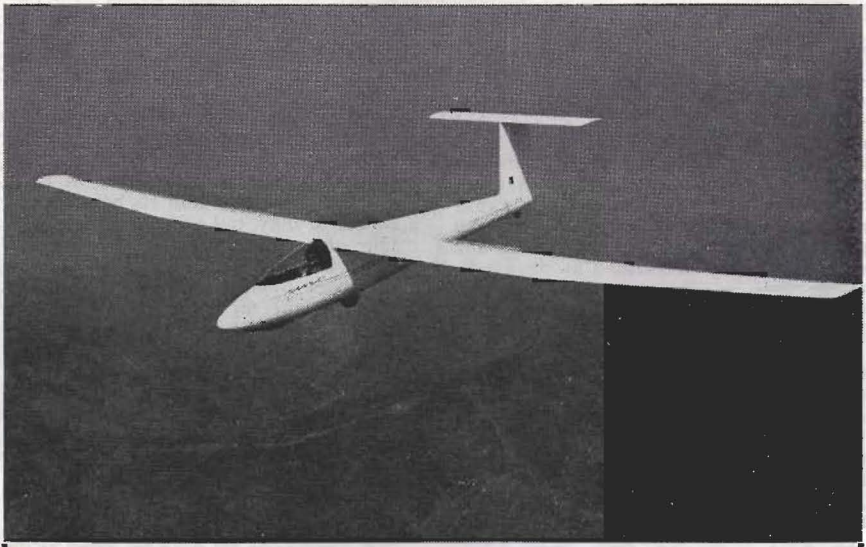
Our other tremendous asset is a completely dedicated CFI who is always eager to be flying, and to have as many aircraft in the air as possible at every moment and in all weathers. A CFI who appears to live only to fly and to teach others to appreciate the same pleasures he so obviously derives from gliding; who has enough enthusiasm to tug, sit in the back seat of a glider and fly the Falke all at the same time and who has the aptitude to encourage signs of enterprise and initiative when they show themselves.

The cost? Charges vary so much from club to club that it is impossible to give any guide on this subject. Those shown in the table are fairly low, I believe, compared with others. Also to these must be added the annual membership, in our case £15, and the initial joining fee, £7.

It would be interesting to know how this brief summary compares with flying from a purely winch site.

Date	*Time lapse (months)*	*No of launches (cumul)*	*Event*	*Hours P1 (cum)*	*Hours P2 (cum)*	*Cum cost £*
1971						
Jan	—	1	First flight	—	½	2
Apr	11 wks	20	General training	—	5	28
May	15 wks	33	General training	—	8½	44
May	15 wks	34	First solo	½	8½	45
May	4	37	C duration	1½	9	48
Jun	5	50	Bronze leg (9th solo)	4	10½	71
July	6	54	2nd Bronze leg (13th solo)	7	10½	80
Aug	6½	66	1st flight in single-seater (Skylark 3)	9½	11½	100
Sept	8	81	Silver duration	23	13½	131
Oct	9	89	Bronze C	24	15	154
Dec	11	108	1st flight K-6E	28	17½	173
1972						
Jan	12	112	1st wave flight	29	18½	183
Apr	15	131	1st cross-country 53km	43	19½	222
May	16	141	Passenger check	50	21	240
May	16	143	1st winch ride	50	21½	241
July	17	161	Silver distance	56	22	265
July	18	162	Silver height; Silver complete	58	22	268

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OVERSEAS NEWS



Please send news and exchange copies of journals to the Overseas Editor's new address: A. E. SLATER, 7 Highworth Avenue, Cambridge CB4 2BQ, England.

THE GERMAN ALPINE GLIDING SCHOOL

By P. G. HARDIE-BICK

THE Deutsche Alpensegelflugschule (DASSU) near Unterwössen is the regional centre for Bavaria and is substantially responsible for *ab-initio* training in the province. Training is also carried out at clubs but it seems to be generally accepted that the way to get a pre-cross-country licence, issued by the Government, incidentally, is to attend a fortnight's course at one of the country's four provincial centres.

At Unterwössen the setting is mountainous. The strip, narrow though comfortably long, is dominated by steep mountain slopes. One can experience here most of the conditions encountered in mountain soaring within easy gliding distance of the airfield.

Christian Gad, during one of my visits to Germany in 1971, first pointed out the enchanting opportunities offered by the soaring conditions in the northern part of the Alps. I had reached the end of a tour of duty in central Africa and having a long leave period ahead, I resolved to try an Alpine soaring holiday at Unterwössen for at least a part of the time.

It has been my experience that family life and gliding mix like oil and water, particularly with young children around. The tentative arrangement made at Unterwössen was, for this reason, for the relatively short period of two weeks initially. It must be something of a record that my own family actually spent five weeks at Unterwössen. This feat was possible, I think, by a subtle combination of the hospitality of the Müllers at Pension Stanislaus, who also provided an indoor swimming pool and two ponies in a field nearby, and a remarkable pattern of weather conditions. Thus on some days, although it was just flyable, I was



Unterwössen (gliders facing east)
Photo: P. G. Hardie-Bick

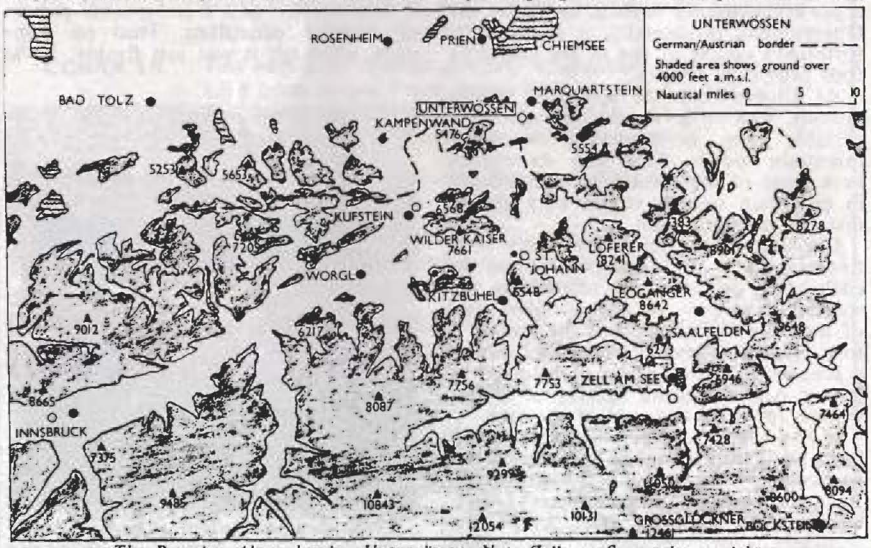
able to declare and carry out family outing programmes without a pang of conscience or a sidelong glance at the airfield. These not altogether unimportant features made the infrastructure of the gliding holiday viable for the whole family.

The arrangements at DASSU are efficient but they are carried out in an unobtrusive informal fashion. Thus on my arrival from Malawi, my medical certificate from the PPL I held in that country was accepted together with the motor-glider certificate and my 18-year-old Silver C. I was given three check flights, a circuit, a cable break practice and a short soaring flight on the slope before being sent off solo for local soaring. The cable break practice provided most interest because it is always taught at the critical height, too high to land straight ahead and too low to make a comfortable circuit. The resulting manoeuvre, in the narrow airfield operating three parallel launching and landing paths, is called a "Bayerncurve" and consists of a kind of procedure turn to arrive back on the launch path going the other way.

The importance of this manoeuvre became evident later on when two early solo pilots managed to clash wings halfway down the strip when one of them wandered a little too far over into the normal landing area after a cable break. The noise and the resulting chaos reminded me of two knights in armour charging each other on the jousting field. Fortunately neither pilot suffered any injury but the accident put two machines out of the flight line for at least a month.

The fleet's supply of K-8's dwindled during my first two weeks as a result of the incident described above and another outlanding prang on a Silver C attempt. I had therefore to transfer myself to the L-Spatz brigade. This is a delightfully sensitive little machine with not much penetration and it seemed rather cruel to load my vast bulk into such a small aircraft. However, it served me well and I became acquainted with the valley and all the mountains within five or 10 miles of Unterwössen.

I learned the part about not flying too slowly in the hill lift which tends to die out rather suddenly, leaving one longing for more aileron control to turn out into the valley for room to build up speed again. I also learned about the paradox of mountain flying, that it is almost all done close to the ground or to the rocky crags once above the tree line—and about searching for thermals in the mountains by keeping to the sunny side of the



The Bavarian Alps, showing Unterwössen. Note Zell am See at lower right

valleys and hunting close to the hillsides. In addition to all this, I practised increasing my thermalling performance to reach a maximum rate of climb for the conditions prevailing. In all this I was encouraged by Gerd Riedel, the chief instructor, who assured me that I would not stand a chance of getting round 300km without getting most of my basic manoeuvres up to a reasonable standard of efficiency.

After a week or so of charging round the valley in the L-Spatz, I discovered that my aerotow experience was too ancient to qualify me for solo tows at Unterwössen. So I had to begin to accumulate the five dual aerotows necessary to qualify before I could get myself launched into the normal cross-country thermal before midday. I felt rather fed up with this rather routine chore, but I saw the reason for their insistance on it on my second solo tow, by which time I had transferred to the SF-27.

I had been told frequently how rough Alpine aerotows could be, but nothing in fact prepares you entirely for such an experience. I had a new tug pilot whom I had not seen before and who I suppose, looking in his rear view mirror, saw a sleek yellow aircraft with a pilot of some experience in it. Anyway, whatever he saw or didn't see, that day he decided to go up the mountain the quick way. This consisted of the normal course out to the Chiemsee side of the hill and then, instead of retracing our track and flying sedately up the ridge, he turned into the valley formed by the two main ridges and flew up into the funnel.

I suppose I will find the techniques to use in such circumstances to make progress smoother, but I must confess that, without a horizon and enduring turbulence created by the combination of thermal and hill lift, I had my hand on the release more than once. The Super Cub seemed unaffected by my somewhat erratic following manoeuvres but I was greatly relieved when the turbulent lift shot us straight over the ridge near to the summit of the mountain with 600ft to spare.

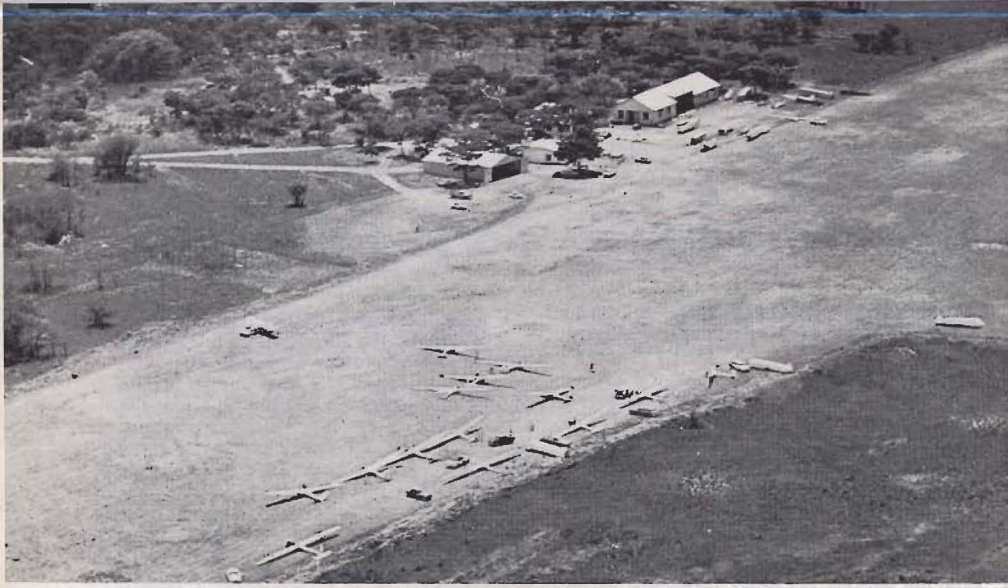
The use of motor gliders has been fully developed at DASSU and the *ab initio* course used them for circuit training, each pupil being given about 25 circuits and landings in Falke 25B's before transferring back to gliders again for completion of his pre-solo stage. The first few flights of the course are also given on pure gliders. High utilisation was being achieved by the two Falkes at Unterwössen and I was assured that they had obtained an average of 800 hours flying a year on each of them.

I used the Falke to begin to find my way about in the mountains and I think anyone visiting the Alps for the first time should spend a few hours route finding and generally getting to know the area. There is so much to learn about the mountains not easily conveyed on a map that the whole process can be speeded up tremendously by some on-the-spot demonstrations by an experienced instructor. I flew to Böckstein, a turning point for the commonest 300km triangle, to see how the track would look from a glider. It was clear that some of the leaps from one ridge to another might be rather dodgy but once one knew where the regular thermals could be found at different times of day, the tasks were probably not too difficult. I feel that more use should be made of motorgliders, particularly in mountainous country, for route exploration.

The chance which might have gained me a real opportunity to attempt a 300km flight, did not occur, although I once got as far as a genuine declaration. After much excitement, map preparation and photographs for the official observer, a whole gaggle of gliders was aerotowed to the mountain top in great style. However, within an hour, despite the optimistic weather forecasts, all but one of us were back on the ground again and the one remaining airborne was hill soaring on the home slope. Nevertheless, it was great fun to go gliding in the mountains and I can recommend it wholeheartedly to all my friends.

The total bill for 25½ hours was about £120. Falke time (4½ hours) cost about £5.50 per hour. Gliding between £2 and £3 per hour, getting cheaper if one stayed up more than an hour. Ab initio courses cost about £55 for 10-14 flying days. However, as these are conducted mainly in German, it would be essential for pupils to be reasonably fluent German speakers. Address: 8211 Unterwössen, Chiemgau/Oberbagem.

* * *



Salisbury G.C. site at Warren Hills *Photo: McGeorge*

NIMBUS 2 DOMINATES RHODESIAN CHAMPIONSHIPS

TIM BIGGS of South Africa and his new Nimbus 2 dominated the 12 consecutive contest days of the Rhodesian Nationals, held at Warren Springs, near Salisbury, from October 9 to 20. He won 11 out of the 12 days in the Open Class and finished nearly 3,000 points ahead of the Open runner-up, Barry Turner (Libelle). Ted Pearson (Std Cirrus) won the Standard Class, with Dick Bradley (Std Austria SH-1) second.

This year the entry of 19 sailplanes was the highest in the history of the Rhodesian championships, reports Jenny Small. Nine of these came from Johannesburg, and one from Cape Town.

The weather prior to the championships was neither seasonal nor encouraging, but the sun made its appearance just in time to dry the ground before the start.

The contest period in its earlier stages was plagued with thunderstorms, necessitating at times very large deviations from track in order to complete the tasks, which were the same for both Open and Standard machines. It was not record-breaking weather, although:

On the second day, after Tim Biggs had completed the 200km out-and-return, he "set off on a 100km triangle record attempt. Unfortunately, his time of 44 minutes was not good enough to improve his own record."

On the fourth day, "one nameless pilot managed with incalculable cunning to get on the wrong side of the storm front to find himself at 11,000ft 20 miles out of Warren Hills and unable to penetrate the storm. He was forced to make an ignominous full-brake descent into the nearest field to avoid being blown even further away from the airfield".

On the seventh day, a 300km triangle, "the only drop out was Johnny Battershill who wandered a little off course on the second leg. He didn't realise his error until he saw the Kariba Dam, a mere 100 miles west of the turn point. He was extremely lucky to find the only airfield in the midst of what can only be described as trackless jungle abounding in natural life. At this point, his luck deserted him. The mission which kept the airfield was one of the 'dry' order and Johnny Livingstone Battershill spent

an agonising 36 hours awaiting alcoholic sustenance."

On the ninth day, "all the competitors completed the task except Dick Bradley who literally nearly burnt his boats when he arrived very low at a grass fire which refused to support him. Luckily, an adjacent main road made a suitable runway."

On the tenth day, "the task set was the notorious run of 312km to Unniati power station and back. Notorious because if you stay on track the country is rough, with no landmarks or civilisation. Most pilots had turned when the plaintive cry was heard. This year, Dave Murchie in the BJ-4 was the luckless soul. When asked to give landmarks the best he could find were some hills in the distance and a small lake below. Well, Alf Thompson (contest organiser) said later, you can go almost anywhere in Rhodesia and see hills in the distance and a lake somewhere below. However, the story had a happy ending, and Dave was eventually shepherded home with the co-operation of Salisbury Radar. Later, Dave's ego returned and he produced a photograph of a vast area of bush surrounding a lake and asked if it could be identified for distance points."

Tasks: 1, 103km triangle; 2, 205km out-and-return; 3, 311km triangle; 4, 212km triangle; 5, 210km triangle; 6, 227km triangle; 7, 301km triangle; 8, 103km triangle; 9, 236km out-and-return; 10, 312km triangle; 11, 311km triangle; 12, 100km triangle.

Final leading results, Open: Tim Biggs (Nimbus 2), 11995; 2, Barry Turner (Libelle), 9063; 3, Dave Murchie (BJ-4), 8105; 4, Rod Yelland (BS-1), 7906.

Standard: Ted Pearson (Std Cirrus), 9127; 2, Dick Bradley (Std Austria SH1), 7795; 3, Ian Robertson (K-6E), 7344; 4, Jack Hartley (Phoebus), 6945.

EXCEPTIONAL WEATHER IN DENMARK

DENMARK had quite extraordinarily good soaring weather in the late summer and autumn of 1972, according to *Luftsport*. For instance, on September 5, near Kalundberg in Seeland, Gunnar Nielsen, aged 63 (brother of international pilot Ejvind Nielsen), achieved Gold C height without going into cloud, gaining 3,200m on a climb to 3,525m (12,303ft). The flight was "possible only through the burning-off of fields".

Then, on Sept 24, Allan Johansen flew 510km in an LS-1 from Arnborg in Denmark to Kassel in Germany.

On Sept 23, a new gliding centre at Görlöse, 30km NE of Copenhagen, was officially opened, one of the visitors being Göran Ax, Open Class World Champion. The centre has been under construction over the last few years at a cost of about £35,000.

CANADIAN AIRSPACE FOR WAVE FLYING

AN airspace reservation for gliders was specially granted for a wave camp at Cowley, Alberta, last September by the Canadian Ministry of Transport, after a consultation with Ministry officials by Dave Tustin, Chairman of the Airspace Committee of the Soaring Association of Canada.

When comments have been gathered in from all the various agencies involved, it is hoped that the outcome will be such that the reservation will become permanent and can be requested on the spur of the moment by contacting Calgary ATC. Thus, comments Mr Tustin in *Free Flight*, "We have won 'round one' and I am confident that, with perseverance on our part, and with continued understanding of the unique requirements of our sport by the MoT, we will eventually be granted unlimited use of the upper airspace."

BIG CHOPPER IS WATCHING YOU

IN the newspaper *Frankfurter Rundschau* pilot Klaus Piotowski describes how he has been hunting sailplanes which climb above the 1,500m limit allowed in the region around Frankfurt-am-Main. In a few days, he says, he found four exceeding the permitted maximum. He telephoned the gliding centre at Gelnhausen and they said: "They could not have been our pilots". But they were: the registration markings could be identified from the helicopter (*Aerokurier*).

1972 AT ZELL AM SEE

By RICHARD FORTESCUE

THE 1972 summer at Zell was not its best from the gliding point of view, but it was not as disappointing as in the UK. The best cross-country days were May 23 and June 7, on each of which six 500km flights were completed. In all, there were 16 flights of this distance, 11 being for Diamond distance claims. On June 14, a 600km triangle was completed (while your scribe was struggling to get back to the site from 125km out!) and on July 5 a 600km out-and-return was achieved.

Unusually for the summer, Diamond height was obtainable on June 6 and June 11; Ralph Chesters from the London Gliding Club getting the best height of all. Since the release has to be at about 5,000ft asl, a Diamond climb means quite a while on oxygen. At the more usual time of the year, the wave was Diamond-worthy again on October 27.

In all, 193 flying days gave 8,491 aerotows and 7,179 hours of glider flying. There were 22 Diamond legs, compared with 13 Silvers.

800km ALPINE OUT-AND-RETURN

Günter Cichon is reported in *Aerokurier* to have flown an out-and-return of 809km on the "super-day" of May 23. He flew a 17m Phoebus from Lanzen, 190km east of Zell am See, to a turning point in the Vozalberg, near the Swiss border, and back. Earlier record flights using the sites at Zell and Aigen had to include long sections over the Swiss Alps. The fast section from Aigen to the Arlberg and back can still be used with the more easterly start and finish, and it would be flown at a good time of day. On this particular day conditions deteriorated early in the west and Cichon's choice of site was particularly valuable. It seems almost certain that a 1,000km Alpine out-and-return will be flown within the next year or two. (Platypus please note; the Alps are a lot closer than the Appalachians!)

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HANNA REITSCH "WOMAN PILOT OF THE YEAR"

HANNA REITSCH, former leading German woman glider pilot and later test pilot for many forms of aircraft, completed a month's lecture tour of the United States by being declared "Woman Pilot of the Year" by the American Society of Experimental Test Pilots. At Los Angeles, before an audience of 1,700, including test pilots, astronauts and others, she showed films of her indoor helicopter flight in the Deutschland Halle in Berlin, and of war-time test flights, and received an Honorary Fellowship Award.

Her autobiography, *Fliegen mein Leben*, published in 1951 (and in English translation as *The Sky My Kingdom* in 1955), is again being marketed in Germany, with autographed copies available from *Aerokurier*, which, in its review of the book, expresses disappointment that it has not been brought up to date.

BRAZILIAN CHAMPIONSHIPS

LAST year's Brazilian National Championships were held in Ribeiro Preto and only got going after four days of bad weather, as is "normal" in our sport, comments *Aviacion e Astronautica* which adds that information about the meeting was "fragmentaria". In Class A, George Münch won with an SB-5; Ekkehard Schubert was 2nd and José Ilton Gomez 3rd, each with an Urupema. In Class B Joel Santos Costa was 1st and Paulo Roberto Garcia 2nd, each with a Grunau; 3rd was Fernando da Cruz Souza Pinto. Eight tasks were flown.

EUROPEAN PILOTS EXCEL AT SOUTH AFRICAN NATIONALS

FOR many years, South Africa has been recognised as a thermal speed soaring country second to none, and an increasing number of European pilots go there each year to compete in the Nationals (held at Tempe airfield, Bloemfontein) and to crack some of their national records.

British pilots have always enjoyed an ample measure of success, and the championships period, from December 17 to January 5, has provided a bumper crop of records.

John Delafield, who will represent Britain in the 1974 World Championships, broke the British National 500km triangle record on two consecutive days with his Kestrel 19, and Angela Smith broke the feminine British National 300 and 500 km triangle records, in the process setting a new feminine World record for the 500km triangle (further details on p32).

The championships was divided into two parts. The first, the team championships (run on the same lines as the German Hahnweide contest) was held from December 21 to 28. This handicapped competition produced the following leading results: 1, O. Schauble (West Germany), Std Cirrus; 2, F. Ragot (France), Kestrel 19; 4, Con Greaves (UK), Std Cirrus; 6, Angela Smith (UK), Libelle 301; 7, R. Feakes (UK), Kestrel 19.

The Open and Standard Class championships was held from December 29 to January 5, and achieved seven contest days. The same tasks were set for both Open and Standard Classes. There were 38 competitors, of whom a third were Europeans. Representing Britain were John Delafield in the Open (Kestrel 19) and Andy Gough in the Standard (Std Cirrus).

Delafield came second, in the Open, behind S. H. Heiriss of South Africa, flying an ASW-17. Gough finished in 6th place in the Standard class, which was won by Schauble.

Final leading results, *Open*: S. H. Heiriss (South Africa), ASW-17, 6248; 2, J. Delafield (Great Britain), Kestrel 19, 6067; 3, O. Schauble (West Germany), Std Cirrus, 5211; 4, T. Biggs (South Africa), Nimbus 2, 5122.

Standard: 1, O. Schauble (West Germany), Std Cirrus, 6372; 2, R. Clifford (South Africa), ASW-15, 5934; 3, B. Gantenbrink (West Germanyl), Std Cirrus, 5703; 4, G. Gebauer (West Germany), LS-1c, 5530.

Note: All competitors were first scored for placings in the Open class; then revised scores were worked out for those flying Standard class machines for the Standard class contest.

LOW COUNTRIES GLIDING MAGAZINE

ARY CEELEN of Holland, who for some years has been the editor of the Eindhoven Aero Club's club magazine *Q-mulus*, has relinquished this post and is introducing a new bi-monthly magazine under the name *Planeur* which is aimed to establish a sound news service for sporting aviation in the Benelux countries.

CANADIAN CHAMPIONSHIPS, 1972

THE 1972 Canadian National Championships was held at Rockton Gliderport in late July, with 22 contestants (including four from the USA). There were seven tasks from July 25 to 31 (217km triangle, two 106km out-and-returns, a 300km triangle, a Cat's Cradle with six turning points, a 253km triangle and a 129km out-and-return). The last three days were washed out by rain. Jim Carpenter (Libelle H-301) won with 5418 points and Hal Wentworth (Std Cirrus) second with 5225.

The 1973 Nationals will be held at Winnipeg over 11 days, probably beginning on July 4, but possibly later.

A regional championship, the first to be held in Canada, was held at Claresholm airport, 60 miles south of Calgary, over seven days from July 9 to 15. Eleven pilots entered with nine sailplanes, Dave Marsden (HP-14) winning with 3988 points from the seven contest days (*Free Flight*).

DENMARK TO IGNORE OPEN CLASS

AFTER 1974, Danish glider pilots are expected to take part in international contests only in the Standard Class. Per Weishaupt, writing in *Luftsport*, states that the 1973 and 1974 National Championships will be held in a "Free Class" (consisting of Open and glass-fibre Standard classes) and Club Class, the definition of which will be regulated otherwise than by price. After that, there will be only Standard and Club Class contests.

At a recent meeting of the Nordic Gliding Associations (Denmark, Finland, Sweden and Norway), it was decided to hold the next Nordic Championships in 1974. In all these Nordic countries, Weishaupt says, interest in the Open Class is waning, and they agreed on a wider promotion of the Club Class.

PAIR-FLYING WITH A MODEL

SIEGFRIED KIER, who finished sixth in last year's Austrian National Championships, describes in *Flugsport-Zeitung* how he was helped to climb out of a "witches' cauldron" (Hexenkessel) near Lienz where he got stuck after rounding two turning points on a triangular race. He was battling for every metre of height when suddenly he noticed a radio-controlled model sailplane at the same altitude as himself. With its help he was just able to hold his height in the slope wind. Soon, however, it became evident that an expert model flier was at work here, who indicated the slopes towards which he should steer. And behold, he writes, this outstanding teamwork bore fruit and together they climbed 300m (1,000ft). So, after two hours' delay, he was able to proceed on course to the finishing point.

NEARLY HALF FRENCH ACCIDENTS DUE TO FIELD LANDINGS

ALTHOUGH 72 new gliders came into service in France during 1971, 20 gliders were written off.

The largest category of accidents, accounting for 42% of a total of about 130, were due to outlandings, and included one fatality. The principal causes were bad choice of fields, choosing the field too late and changing one's choice too late. Bad landings on or outside the airfield accounted for 32.5% and bad launches for 6.5%. "Weather" accounted for 3.9% and illness for 2.6%; there were two cases of the latter, both apparently due to fatigue. Among the remainder were two spins, two aerial collisions, one due to hitting a slope and one due to blocked controls. Tug accidents averaged one per 34,031 tows (*Aviasport*).

SOARING IN SOUTH AMERICA — COLOMBIA

A SMALL but very active gliding club operates from Guaymaral airfield, near Bogota, Colombia, reports Edward Smith. The site lies on a plain at 8,500ft asl about 45 minutes' drive from Bogota, and there are 2,000ft soarable ridges on either side of the field. Conditions are very good, with strong thermals and wave as well as the ridge.

The club owns a K-13 and a Schweizer 2-22, and there are a syndicate-owned K-6E and an Austria SH-1. A K-8 is at present under repair. Launching is carried out by aerotowing (two Super Cubs are available) and the club comprises 20-30 active members.

Several 300km flights have been achieved by the K-6E and SH-1. The plain in which the site and Bogota lie is sufficiently large to accommodate these, but as it is surrounded by the generally unlandable Andes, more ambitious flights have not as yet been made because of the few landing areas available. Long flights would have to be made at high altitudes (making oxygen a necessity) and by hopping from airfield to airfield.

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NEWS FROM SOUTH WEST AFRICA

THE first Blanik in South West Africa has arrived at the Bitterwasser centre, 110 miles SE of Windhoek. Being all-metal, it has shown itself specially suited to the climate, so that the club at Osona, just outside Windhoek, is thinking of getting one and selling its K-7.

An Easter camp at Osona was spoilt by rain, and the "pan" (a dried-up lake bed) in which Bitterwasser is situated has filled up with water.

When the gliding season re-opens in October, Bitterwasser expects to get visitors from far and wide—they have already come from Germany and Colombia. The owner is Peter Kayssler, Bitterwasser, PO Rehoboth Station, South West Africa, and his winch will launch you to 3,000ft (*Wings over Africa*).

NEW AUSTRIAN ALPINE CENTRE

AN airfield has been established specially suited to those who are new to mountain flying at Scharnstein in Upper Austria, 12 miles east of Gmünden/Traunsee. Tugs and charter sailplanes for hire are laid on. The approach from the Salzburg-Vienna motorway by the Vorchdorf exit avoids crossing any Alpine pass. The airfield has excellent thermal conditions and motor-gliders are welcome (*Aerokurier*).

THIS IS GLIDING . . .

"SATURDAY afternoon was a mostly overcast day with some north-west wind. This was the day in which all pilots new to the area were given a local check in the oxygen-equipped Blanik. Little lift was evident, being of a thermal type not associated with the clouds.

"Indeed, the areas of lift were marked by a transparent cloud of ice crystals, almost as if the rising air condensed straight into ice spicules. With Reg Moore, I explored these, and with the lowering sun shining through breaks in the higher cloud cover, the sky around us was filled with horizontal lances of light. The nearest crystals flashing past appeared as elongated streaks and those further away moved slower and slower, and the distant specks drifted slowly by.

"Reg and I were spellbound by this sight of the whole sky in liquid motion around us. Towards the sun, but below the horizon, was a narrow slash of vertical light, reflecting from the ice crystals and travelling along with us. This intensified to a glaringly bright mock sun a similar distance below the horizon to that of the sun above."

Extract from "The weather factory, Kosciusko" by Barry Wrenford, an account of a wave camp in Australia published in *Australian Gliding*, April 1972.

OBITUARIES

GERALD ONSLOW SMITH

THE sudden death of Gerry Smith on November 11 at the age of 66 years severs one of the few remaining links with the commencement of gliding in the North Midlands. The exploits of the Golden Wren team in the early 'thirties read more like fantasy than fact.

Gerry joined the Matlock Gliding Club in 1930 and had his first ground slide in an open Primary on June 22. After much frustration, inseparable from learning to glide in those days, he obtained his "A" certificate (No 192) on August 30, 1931. There was little future for him with the Matlock club and its single Primary and, together with Louis Slater, he joined the London Gliding Club in September 1931. Louis, from Matlock, used to pick up Gerry in Derby on a Sunday morning and together they would hot-foot it down to Dunstable in a bull-nose Morris, a round trip of 300 miles, for the chance of a bungey launch in an open Primary. After completing their training at Dunstable, they came to another dead end. They solved this by constructing the Golden Wren, modifying the design as they went along. Louis said that they sawed up the whole lot from one tree.

It seems incredible today to think that the Golden Wren was completed in 18 months, test-flown with only a bungey-launch to six feet and taken straight to Sutton Bank to take part in the National gliding contests the following week. R. G. Robertson, the third member of the team, won the toss and had the first flight and Gerry and Louis celebrated the successful outcome by flinging their arms

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round one another. "It flies! It flies!" shouted Gerry. It did, indeed!

Up to the outbreak of war, he was the outstanding pilot at Camphill and enjoyed an international reputation. He was a member of the British team at the international competitions at the Wasserkuppe in July, 1937.

An engineer by profession, he was employed at Rolls-Royce, engaged on experimental installations of propellers and engines. Many a Spitfire pilot would have cause to be grateful to Gerry and his fellow engineers for the heroic work they did on installing the constant speed and variable pitch propellers while the Battle of Britain was at its height.

To recount the exploits of the early days, which now seem so far away, does little to recall the man. Those of us who knew him will remember him best for his puckish humour, his enormous enthusiasm and the delicate skill with which he tackled any job requiring the use of tools, and not least, for the sudden flashes of simulated temper, instantly belied by the twinkle in this eye. He was one of the props on which our club at Camphill was built. Let us hope that his name will not be too easily forgotten.

BERNARD THOMAS

GEORGE NUNN

THE death occurred on Friday, January 5, 1973, at his home in Cornwall, of Flight Lieutenant George Nunn, RAFVR(T), aged 60.

Flight Lieutenant Nunn joined the Air Training Corps gliding movement soon after it was formed in 1941 as a civilian instructor. He was one of the few who helped get the movement going in those difficult times. For many years he instructed in the solo method of training at RAF Kidbrook, Gravesend, West Malling and Detling. He was commissioned in the Royal Air Force Volunteer Training Branch in 1943, and served with Nos 141 and 615 Gliding Schools at Detling and Kenley, and was Officer Commanding of the latter for some 10 years.

During his command at Kenley he was responsible for starting air experience flying which enabled young Cadets under the age of 16 to take part in gliding activities. For over 25 years, George Nunn devoted all his leisure time to gliding with the Air Cadets and will be remembered by many for his pleasant and unselfish ways.

A. W. WATSON

BOOK REVIEW

Stuttgarter Profilkatalog I (Measurements in the Laminar Wind Tunnel of the Institute for Aerodynamics and Gas Dynamics of the University of Stuttgart, 1962-1972) by D. ALTHAUS. Published by the Institute. Price DM89. 386 pages, A4.

THIS splendid compilation is another of those fundamental documents like Abbott and von Doenhoff's book and NACA Tech Note 1945, which are quite essential to anybody who contemplates glider aerodynamics. For a long time to come, well-thumbed copies will be at the elbow of every glider-designer in the world.

It is, of course, written in German but there are relatively few words and an awful lot of diagrams and graphs, most of which are self-explanatory to readers with a reasonable knowledge of aerodynamics. The conventions of German symbolism may not be entirely familiar to English or American readers, but a list of contents, a list of symbols and a description of the experimental equipment is provided in English.

The body of the document deals mainly with the FX-series of wing sections designed by Professor Wortmann. After some introductory remarks, there are about 70 pages of theoretical velocity distributions, 36 pages of aerofoil ordinates and 42

pages showing the aerofoil shapes. Then follow about 200 pages of experimental results. In the main, these consist of the usual curves of drag and lift coefficients at various Reynolds Numbers. All the familiar FX-sections are here, with a large number of results not previously published, Flapped aerofoils are displayed in great detail, with very useful data on flap hinge-movements. A section on special aerofoils includes Sigma's and FX30/2.0, which has a 100% single-surface flap in sailcloth.

Of particular interest are the special measurements: flaps at large deflections, conventional airbrakes of assorted sizes and locations at various openings, effect of brakes on the upper or lower surfaces only, combined effects of brakes and flaps, rotating trailing-edge airbrakes and flaps-cum-airbrakes. Finally, new measurements on a few NACA sections are presented, mostly showing rather better results than the original NACA figures. In particular, our old friend 63_3-618, of Skylark fame, emerges remarkably well. It was also gratifying to see confirmation of a result obtained in some Imperial College tests and later used in the stressing of the "Dart": that in some circumstances, conventional airbrakes can produce a local negative lift coefficient which varies only slightly with incidence.

The format of many of the graphs is not above criticism. Many of them lack a grid, doubtless to avoid confusing the picture, but anyone trying to extract quantitative figures would have to insert his own. Also, some of the labelling is very small and difficult to decipher. The overall production appears to be by Xeroxing typescript, computer print-outs, and hand-drawn curves. These, however, are small criticisms in view of the enormous effort involved and the immense value of the end-product. At DM89, it is not cheap—but it is worth every Pfennig.

F. G. IRVING

CORRESPONDENCE

PETER FULLER'S ART

Dear Sir,

I would like to say how much Fuller's illustrations add to my enjoyment of reading my copy of S&G.

Coming from a family of artists I know that an occasional word of approval (or even disapproval) is a heap better than total disregard. So, well done, Fuller! I admire the humour and professionalism of your drawing. S&G would be the poorer without it.

Forest Row. N. CRANFIELD

ON GLIDING FOR THE BIRDS

Dear Sir,

May I reply to Mrs Partridge's article, in the last issue? Yes, Rhoda, I do agree with your latest agony column; it is difficult for young women, especially with a family, to continue gliding. But do look out, I am close behind you—child rearing and all to slow me down!

But seriously, I'd like to encourage girls to keep on gliding after they are married and even during the period of babies and toddlers.

There are four points to follow, all pretty essential, if a young mum is going to continue with the sport.

First, and most important, one must marry a chap who, as well as being keen on gliding, will be prepared to help with the youngsters and also share the available money. (Thank you, Richard.)

Secondly, one must have determination! This is very necessary for a woman pilot, as pregnancy will cause her to become a home-loving cabbage (interested only in knitting and decorating the spare room). This natural mental state must be fought

or you will find it very difficult to return to gliding, and you'll be starting from scratch again. Keep in practice; on the two-seater latterly.

Thirdly, for babies and toddlers on the field, a nice big estate car is an advantage, and a handy tow rope to tie the child to, and plenty of food, toys, etc, etc. It is really necessary to be able to take the car to the launch point, if you have little 'uns with you. Which brings me to the fourth requirement:

A sympathetic club. We can't possibly get there at 6.30am with the tribe. My thanks to both Cambridge and Doncaster clubs, where this was hardly ever a problem for us.

So girls—don't give up, all is possible. And once you and your husband get into a syndicate, life becomes plain sailing; or should I say driving!

Cambridge. ANNE WALKER

TEACHING AEROTOWING

Dear Sir,

As an instructor who has always taught my pupils to use the rudder when being aerotowed, your article in the December S&G, p488 forces me to defend my methods. In aerotowed flight the forces acting on the glider include both control inputs and the pull exerted by the tow rope. Assuming a nose-hook forward of the centre of gravity and a glider with normal spiral instability characteristics, if the glider is laterally displaced from its central flight path the tow rope will have a sideways component of pull. Uncorrected, this will induce yaw and roll towards the centre line of the tug. If it is desired to hold an abnormal lateral position it is necessary to apply both rudder and aileron to oppose the yawing moment of the rope. If the aircraft is left to itself with the controls held central it will turn through the centre line of the tug. The cause of a lateral divergence, apart from a cross-wind on take-off, is flying the glider with its wing other than parallel with the wings of the tug. At towing speeds a very small difference in bank angle causes the two aircraft to follow very different rates of turn, producing a rapid lateral divergence.

When pupils become displaced to one side they instinctively turn towards the centre line. Ignorant of the added yawing moment of the rope they inevitably overshoot and repeating the manoeuvre from the other side induce a Dutch roll of larger amplitude. My practice in such a situation is to teach the pupil to hold the abnormal lateral position momentarily by application of rudder and aileron to oppose the yawing moment of the tow rope. Although apparently flying with unusual controls, these control inputs simply oppose the external yawing moment and the glider is in balanced flight. I then demonstrate the yaw and roll that will occur if the controls are centralised. After returning to the lateral position it is easy to demonstrate a slow return to the centre line by progressive reduction of rudder and aileron.

Vertical station keeping is a function of the elevator. Here the trim is pre-set, not to prevent the aircraft from climbing but to ensure that it is controllable after take-off. The advice to hold the stick fully back is not valid for tail-skidded aircraft which should be gently rotated on to the main wheel. Some gliders are helped by a positive lift off at a predetermined speed. In the air, I teach slow vertical movement rather than a stepped adjustment of height but here I suspect our differences are more theoretical than real. Pupils should be shown the effect of descending into the slipstream to avoid the surprise they could have on encountering the large rolling turbulence found therein. There should also be a rigid rule that if ever the glider pilot loses sight of the tug he must release.

Aerotowing can be taught by these instructions:

1) Always control the angle of bank with aileron so that the wings of the glider are parallel to the wings of the tug. When applying aileron use rudder with the aileron in the normal manner to oppose adverse yaw.

2) With the wings of the glider held parallel with the wings of the tug, movement in the yawing plane is controlled by the towrope and the rudder. If displaced laterally, oppose the yawing moment of the towrope with rudder, then slowly relaxing the pressure on the rudder, allow the glider to move across to the centre line.

3) Vertical positioning is controlled by the elevator, only very slow adjustments are required and hence only very small stick deflections.

Boscombe Down, Wilts. R. P. SAUNDBY

DEREK PIGGOTT writes: In answer to Wing Commander Saundby's interesting comments, I agree that some of the problem is caused by the pull of the tow rope. However, even without this yaw, the beginner attempting to get back into line is bound to overshoot the centre line unless he turns back slightly the other way in the form of a gentle S. Otherwise the longitudinal axis of the glider is still pointing off to the side, when the wings have been levelled.

The main thing which causes trouble is the student's inability to spot when his wings are not parallel with the tug's. If they are held parallel using the controls quite normally, there is no problem and the glider will always tend to move itself back into line.

In fact we are both advocating very similar methods of stopping the oscillation —that is, by telling the student to bring the wings level and stay out to the side for a few moments rather than attempt to get back straight away.

In my explanation, I refer to perfectly normal control movements of stick and rudder. The instructors I was criticising were the ones who merely say that you should keep behind the tug with rudder alone.

The advantage of suggesting that the student should make vertical moves a little at a time is that most beginners seem very slow to spot the changes and this prevents them from going quite so far from one extreme to another.

Of course, as they become more skilled they cease to do this and they learn to be competent to use a very gentle but normal turn to get back to the centre line instead of sitting out to one side for such a long time.

There were very many points which I did not cover as it was not intended to be a fully comprehensive article on the art of aerotowing.

CONTEST BRIEFINGS

Dear Sir,

Each year a large number of people make tremendous efforts to run competitions, and we are all grateful that this is so. However, drawing on experiences of myself and others, it seems that there is one facet of British competitions which could be improved. I refer to briefings held before the meteorological situation has clarified sufficiently for a definitive task to be set so that alternatives are proposed or a new task announced on the grid.

This potential source of confusion might be avoided by directing pilots to rig and tow out if there is any possibility of a task that day. Briefing could then be held when the task had been fixed and the first take-off could follow the end of briefing as close as 15 minutes. Bonuses might be a reduction of pressure on the Met man and greater flexibility for the task-setters.

I trust everyone will read this in the intended spirit of constructive suggestion.

Haversham, Bucks. E. J. C. VANN

IMPERIAL COLLEGE GC HISTORY

Dear Sir,

Imperial College Gliding Club has now been in existence for over 40 years, and we have decided to try to trace its history. We already have some information, but a great deal more is required, and we would be most grateful for any interesting photographs, relics or anecdotes, however trivial, which your readers might be able to provide. Also, we would be interested to hear from any former members of I.C.G.C.

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WEST WALES GLIDING, Withby Bush Airfield, Pembrokeshire. Resident Holiday Course Instructor, May to September 1973 inclusive. Must be full rates and for M. G. Falke or PPL. Free caravan accommodation. Write stating experience and remuneration required to T. G. Phillips, Clarence, Esplanade, Tenby, Pembs.

COURSE INSTRUCTOR to assist resident instructor required by MIDLAND GLIDING CLUB from April 1 to October 31, 1973. Free meals and accommodation on site. Salary negotiable in the region of £22 per week. Apply: Chairman, Mosterley Farm House, Cound, Nr. Shrewsbury SY5 6BH.

COURSE instructors, full BGA or assistant rating, and tug pilots required for 1973 summer season. Apply giving full details and dates available, to Manager, Worcestershire Gliding Club, Bidford on Avon, Worcestershire.

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CLUB NEWS



CONTRIBUTORS PLEASE NOTE

Copy and photographs for the April/May issue should reach the Editor, S&G, 281 Queen Edith's Way, Cambridge, telephone Cambridge 47725, not later than February 14.

Copy and photographs for the June/July issue should be sent to the Editor not later than April 18.

December 11, 1972

ANGUS—second year's progress

THE club has had a good second year. Although operating from an east coast seaside site, we have done well for thermal soaring and have had a little wave soaring. Financially we are well in the black. With only one two-drum winch we made over 4,500 launches during the year and Bill Buchan is now building a second two-drum winch.

Club gliders comprise a T-21, a Bocian and an Olympia. We are now thinking of buying another, higher-performance solo glider. In addition, Ian Jamieson has brought his Falke from Aboyne for the winter, and it is being well used by club members. The Club's first syndicated glider, a K-6E, has appeared.

During the first year, flights of about half an hour were considered noteworthy. However, this year has produced so many good flights that 30 minutes produces little comment.

Our dinner dance was held in the Viewfield Hotel, Arbroath, in November.

It was, like last year's do, a great evening. We were pleased that our friends from Deeside Gliding Club and the Tayside Flying Club could attend.

J.S.

CIVIL SERVICE (AQUILA)—derigging by lamplight

DESPITE having to derig each evening (planning permission for our hangar has still not arrived) it is most encouraging to note that our launch rate has increased during the past year, although, in common with most clubs restricted to weekend flying, bad weather has caused a slight drop in number of hours flown. The recent addition to our equipment of a twin-drum diesel winch will, we hope, enable us to fully utilise our fleet of five gliders and the syndicate Grunau.

Twenty members of the club visited Camphill in September. Although wind conditions were calm for the greater part of the week, most members tried their hands at ridge soaring on the Friday.

Back at Hinton, the members who could not go to Camphill did some sterling work on the winch. This resulted in our obtaining some very good launches.

The president, chairman, committee and all members sympathise with our CFI on his abortive Gold triangle. However, although the flight may not have been outstanding the retrieve certainly was and indirectly proved that lady members *can* derig T-21s by lamplight.

E.A.C.

COVENTRY—the finer points

THE winter is upon us at Husbands Bosworth and we have all become accustomed to circuits and bumps; a time to brush up the finer points of our flying. The membership continues to expand and recruitment begins for helpers at the Nationals for 1973. Instead of spanners and tow-rope splicing, paint brushes and broom manipulators have become the order of the day to make the buildings look spick and span. Everyone is looking forward to the new season with vigour and enthusiasm.

1973 promises to be a very important year at HB, with the possibility of the arrival of a motor glider and the beginning of the construction of the bunkhouse.

All efforts have gone into making the winter pass as quickly as possible with several social evenings. We have shown many full-length flying films and included an instructional film on "How to Murder Your Wife". All proceeds will go towards new kitchen equipment.

V.G.

DEESIDE—Aladdin's cave

"QUIET American?" quoth I, "there's no such thing!" But I was wrong, for during an October visit to Aboyne John Montieth, a quiet American from Ohio, met Mike Mahon from RAF Marham—also on a visit. While frustrated club pilots were blinkered by employers against the wondrous displays of lenticulars and chained to the chattels of their honest week-day toil, these two, chuckling into their oxygen masks, rode the Deeside wave to 25,000ft in our club Capstan. Having climbed around 22,500ft from the release point, they are claiming a new UK two-seater height record.

Also visiting in October, a group of lads from Bicester found Deeside a veritable Aladdin's Cave filing, as they did, eight Gold and five Diamond height claims while Stuart Harries, from Australia, flew our aged Swallow to 26,000ft.

Not all the wave has been used up by visitors, however; Roy Wilson achieving the first 5-hour leg in wave from Deeside and two others missing it by less than 15 minutes. Five club members have notched up Gold heights, all this high altitude flying more than justifying the installation earlier this year of oxygen equipment in the club gliders.

At Deeside we launch only by aerotow while our "neighbours" of the Angus club use only winch launching. A reciprocal membership arrangement has been working very much to the mutual advantage of members of both clubs, while Norman Middleton's Auster, our standby tug, has spent some weeks at Milltown.

Affiliated clubs from Aberdeen University and Robert Gordon's College of Technology have brought in some *ab-initio* faces. These are most welcome, as are the new members who joined as a result of recent publicity efforts.

J.S.

DERBYSHIRE & LANCASHIRE—CFI Boyle retires

DAVID PILLANS has now taken over the flying helm at Camphill, being appointed CFI with effect from January 1, 1973. Alan Beckett is to be his deputy. Our thanks go out to Eric Boyle, who has worked so hard and enthusiastically over the past few years, giving up so much of his time in this exacting and responsible position. We are assured that he will still be much in evidence at Camphill and will be able to spend more time flying his own aircraft now he has handed over to David.

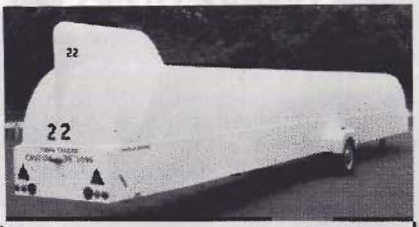
One of our instructors, Andy Miller, recently attained his Diamond height on a trip he made to Aboyne with the Fenlands club.

The Army have now moved in on the airfield with an assortment of bulldozers, earth-movers and sundry six-wheelers and are busily tearing away at wall roots and uneven patches of ground. Extra care has to be taken not to drop cables and/or gliders on to them in cross-winds. It all makes life and flying a little more interesting.

The new caravan park is coming to life with members digging, levelling and cementing their own plots.

Our summer courses are being filled and various task weeks are being arranged. All we are waiting for is a summer oozing with thermals.

P.H.



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DEVON & SOMERSET—pilot motivation

IT is surprising sometimes to find what motivates glider pilots. I have just returned from a not very promising weekend at the site when the line-up at launch point was so great that the CFI had to ask private owners who had already flown to withdraw. There does seem to be a pattern which produces a heavy demand to get airborne after a few weeks of unflyable weather and one can only suppose that flying a glider is addictive and demands satisfaction!

Despite the lack of a tug aircraft, ours being under repair, our launches for the months of October and November topped 800. The recent gales of wind and rain have tested the club structures and the equipment to the limit and we are grateful that the access lane is still navigable. The members who put in so much hard work, and hardcore, on this project must be pleased. The cost exercise on meal vending machines, mentioned in the last issue, indicated that this method of feeding would not be economic so we still rely on the "faithful female" brigade.

A.E.R.H.

ENSTONE EAGLES—join together, solo together

IN common with most clubs we have to report a rather disappointing soaring season, but although cross-countries were somewhat few and far between some Silver and Bronze legs were obtained. Our task week at the beginning of the season was, once again, washed out (or should it be 'blown out'?), but being suckers for punishment we will try again in 1973.

Our launch rates have shown some improvement, due mainly to our most successful auto-towing operations using nylon tow rope. We have found this type of rope very easy to handle and obtain upwards of 300 launches from each length. We regret to report that in our first ever accident we lost our T-21, fortunately without serious injury, but were able to obtain a replacement aircraft (another T-21) within a week and this machine has already done more than 300 launches. We are also pleased to welcome three new syndicate machines to Enstone

—another Olympia, a K-6 and the first syndicate formed by members trained within the club with their Swallow.

Our training programme is going ahead well with flying continuing throughout the winter months. Congratulations to all 'first solos', particularly to the four members who, after joining the club on the same day, soloed together over one weekend. Our CFI, John Thorne, regrettably announced his resignation from this post which he has held for a long time and we would like to take this opportunity to thank him most sincerely for all his good work in the past. We are pleased to report that he is remaining in the club and hope he will be able to find more time to enjoy his Foka 5 this coming season. Our new CFI is Dave Benton, well known in gliding circles at Lasham and at the Mynd.

Our AGM was held on November 18 and our future policy was fully discussed. It would appear that our operations are reasonably secure for the foreseeable future and we now look forward to better weather and better soaring during 1973.

C.E.H.

LAKES—where did that wave come from?

IF the weather now becomes unseasonably warm, and canopy interiors resemble portable greenhouses, it will no doubt be because we have purchased a Capstan to replace our excellent but very draughty T-21B. Our instructors look forward to sweating out the remainder of the winter in cushioned comfort, and *ab-initios* to sampling our soaring ridges in their own aircraft with some hope of getting back to the site.

Our fleet of club and privately-owned gliders at present musters eight—quite an impressive array for a site with little but wet to the west, and a sparse population at all other points of the compass.

More wave in September and October, with a best height by Roger Bull of 13,000ft; the climb was abandoned at 6kts lift due to a closing gap. This was in a 300°/25kt wind at ground level. The nearest high ground with this bearing from Walney is the Isle of Man, but the usual veer would probably put the upper wind in line with Western Scotland. The high climb was over Duddon Bay and was most likely from Black Coombe, but Tom Wearing in the Skylark was at 5,000ft about three miles due west, in a gap that must have stretched 10 miles out to sea—so where did that come from?

Although a number of the members can almost smell the proximity of wave in most unlikely wind directions, Pete Gillett, no doubt inspired by the S&G wave statistics, has produced a report sheet based on a local map reproduction, on which each wave flight is to be detailed, thus building up a picture of precisely what our local sky produces.

R.R.H.

LONDON—costs 20% up in 1973

ALTHOUGH the summer season has been a poor one, the late autumn and early winter was reasonably good and has permitted a fair amount of flying. In November there were even some strong thermals on several days, which is pretty rare. In spite of this, the Lasham/Dunstable Plate has remained at the 'other place'.

The annual awards reflect the poor

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season. The Foster Boomerang was won by John Cardiff with a 250km out-and-return, while the Dent Trophy went to Mike Garrod with a 300km triangle. This was the only completed 300km distance throughout the season. The Dunstable trophy, for the best flight in a club glider, was awarded to Geoff Bailey with a 100-mile flight in a K-8. There was no award this year for the best *ab-initio*.

This winter we are faced with having to rewire the clubhouse and outbuildings, this now being about 40 years old. It seems likely to cost at least four figures to put right. Inflation and VAT between them look like adding 20% to our annual costs in 1973, and under these circumstances holding prices level is virtually impossible for any length of time. The only brief breather is the fact that annual subs will not be 'Vatted' if paid before April—perhaps this year members will pay up before the AGM!

After two years as resident tug pilot, Dick Sherwin is leaving us to seek out a commercial pilot's job in the United States. Dick has worked extremely hard to get us motorless pilots into the air, and his efficient, business-like approach to the operation, coupled with a high standard of pilotage, should offer good prospects for his future. Good luck, Dick!

M.P.G.

MIDLAND—airfield becoming congested

WE have been looking at the numbers of gliders now on the Mynd. There has been a surge of members into private ownership—a positive mushrooming of syndicates in fact—over the last few months, and more aircraft than ever are in the air at weekends. With our relatively small field, there is obviously a limit to the numbers we can fly at any one time, and this limit we are fast approaching. Even now it may not be possible to take all the visiting pilots who wish to sample our site. May we therefore remind anyone thinking of bringing their own aircraft to the Mynd in 1973 to write or telephone (Shrewsbury 4131; 24-hour answering service) as far in advance as possible.

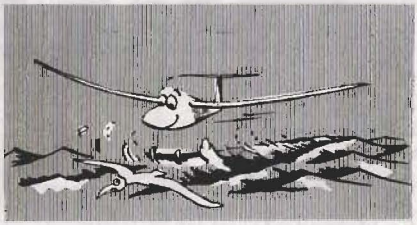
At the AGM on December 10, Gerry Edwards succeeded John Jefferson as vice-chairman, and Louis Rotter and Norman Kimberley were elected to the committee.

October 22 was our best day since the last notes. Low cloud kept us grounded in the morning, but then a good wave developed in the very strong west wind. The best climb, to 13,000ft above the site, was by Ken Rylands and there were silver heights for Pam Roberts, Nigel Palmer and Norman Kimberley. Three pilots—and no names here—got too far behind the hill and landed out. One, sitting in the field with his retrieve car keys in his pocket, had plenty of time to contemplate the booming lenticulars above.

W.J.T.

NORFOLK—the reason why?

NORFOLK is flat, very flat. The nearest ridge is probably 100 miles away and the only wave flying we could offer would be at low level over the North Sea. We



are, therefore, essentially a thermal-soaring club—which explains our lack of achievements last year. It would be interesting to know the connection, if any, between annual rainfall and convection. Records for East Anglia, from April to October, over the last 60 years, show total rainfall of 13.7 inches, compared with the 1972 total of 8.96 inches.

It was a good year for flying training, resulting in several new solo pilots, the last being 17-year-old Lynda Hall.

C.E.H.

OUSE—tug stimulates flying

THE club has acquired a tug and the advent of the Condor has resulted in our best year's flying yet—nearly 800 hours having been logged so far. Coincident with this record number of hours, membership has reached an all-time high of 170.

Despite the poor year with regard to



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Howard Mersey (Ouse) about to take his first flight in the Cobra 15 Photo: Geoff Mitchell

weather, our cross-country mileage is higher than ever—with more than half of them being flown by Peter Ramsden, who won the club ladder competition for the third successive year. As Peter is buying a Cobra for the next season, we shall ensure that his launches are cut at 300ft in order to give the peasantry a chance!

The annual dinner passed off merrily in the Merchants Taylor's Hall, York. The guest of honour was Group Captain Abel of RAF Church Fenton.

Now that we have a tug, the wave seems to have either gone or is late this year. We know it does appear over the site, for last winter a number of machines started to go up in it after a winch launch—but they had to come down at a faster rate, because they were the hangar flights! We can only hope it will re-appear and give us something more than circuits in the 'brass monkey' season.

E.R.

OXFORD—club art competition

CLUB activities in the past few weeks have had a distinctly social emphasis. Anita Cox and Tessa Stevens organised a club Art Competition; this was well attended and the standard was amazing. Who was to know such talent lurked? The clubhouse was transformed both in warmth and decoration. Flying models hung from the ceiling, parachute canopies were draped to soften the corners and there were large aerial photographs of Oxfordshire which had members local soaring in no time.

The classes were judged by Professor Malcolm Laurie, Flt Lt P. Burgess and Mrs Taylor. Winners were: Painting, Arthur Speechley; Models, Peter Brooks; Photographs, Martin Harris; Tile, Geoff Beeston. The competition was so successful that it was decided to hold it annually.

The AGM was held on November 25. There was a committee change with Malcolm Roberts replacing Andrew Henderson. Yet another example of the poor weather was given in the treasurer's report: It was July before £50 of soaring money had been earned. However, the year was not as disastrous as was originally feared because of better weather in August, September and October. Club trophies were awarded as follows: The Simpson Cup to Peter Curtis for his Gold C triangle flight and the Club Ladder trophy to David Lidbury. Professor Laurie most generously donated this trophy, a magnificent recording barograph.

J.R.

SHROPSHIRE—territorial exploration

OCTOBER 28 must surely have been the last thermal soaring day of 1972. The day looked good in the early morning and by noon good cloud streets were in evidence with all gliders being launched straight into lift. The proceeding terminated at 16.45 with 7,000ft being the best height recorded.

Once into November the weather changed and the waves have duly appeared, being very visible and impressive mid-week but giving way to low cloud and rain at weekends.

We have inspected the Vale of Llangollen from both air and ground level with a view to hill soaring and have identified possible emergency landing sites. Without penetrating too far up the valley it should be possible to hill soar in S to SW and in N to NE winds.

The airfield D/F facility is now working on 130.4mHz and seems to be very accurate; it has yet to be tried in earnest.

By the time this note appears, a dinner will have been held in Chester on December 14 to celebrate our existence.

I.P.

SURREY & HANTS—plough-shares, anyone?

THE next horse ploughing competition ought to be held at Lasham. The airfield has a distinctly agricultural appearance at the moment with levelling going on at the western end. Many years of landings in the same places with the same bounces had produced a regular series of bumps, enough to destroy anybody's confidence in good touchdowns.

New buildings for accommodation and office space are springing up and our fleet is being modernised. The trusty Skylark 4s are with us no more; we had a stampede of enquiries at our asking price. The Pilatus B4 gliders are coming this winter to go into the fleet where the Skylarks were—at the 30-hour stage. With much lighter trailers and easier rigging there should be less sighing before retrieves! The Kestrel trailer is all but complete—at a total cost of about £200, incidentally—and awaits its occupant.

C.L.

USK—wave week

A SUCCESSFUL week was held which started with some local soaring on Saturday, November 17, and Sunday, November 18. Sunday ended with floods over the roads to the site in the evening. Monday and Tuesday were only just flyable with unstable NW winds and huge cunims.

Wednesday was the first wave day, but the tug was unserviceable. Tony Gaze kindly saved the day by arriving with full tanks to drag all three two-seaters and six single-seaters into the wave. The best climbs were by Andrew David in a K-6E and K. Mitchell in the Compton Abbas K-6CR to 11,000ft. I was deposited at 3,000ft, sinking to 2,500ft before climbing in company with the three two-seaters to 5,500ft. Peter Cotterell made 7,000ft in the Blanik, while Ray Stafford-Allen, with his son Peter, could be heard talking to LGC extolling the virtues of the view from 'Treble Threes'.

By the time I got to the site on Thursday, our Cirrus had been up and down from 14,300ft in the hands of Bob Cunningham and the best of the wave had gone, but not before P. France had taken the K-13 to 9,300ft in company with Treble Threes again. There was great activity as both the Capstan and Blanik had landed out to avoid storms which crossed the site. Tony Hunt managed to take the Compton Abbas K-6CR to 12,500ft, while Brian Edwards had the glazed look of someone who had been in wave for the first time—on his second aero-tow too! He wisely abandoned his climb in the club Swallow to avoid the same storm and landed safely at the site.

For determination, the prize must go to K. Mitchell, who tried for 4½ hours to ward off the cold for his 5 hours. His heels were still sore the next day.

We did not know it then, but that was the last of the wave.

It did re-appear on Saturday, but by this time the tug had departed, because of impending snow warnings, for Compton Abbas.

We welcome any weekend expedition to our site (phone Raglan 536), especially if they are accompanied by a tug. The club height record is still 20,000ft.

I.H.S.



The best side of a lenticular; near Usk
Photo: I W Shattock

YORKSHIRE—Sportex exhibition

THE last cross-countries of the season took place on a sparkling Friday in late September when four club members flew a total of 600kms on out-and-return flights to Barnard Castle and Newcastle.

Bar profit soared during the month of October, when members of the Four Counties gliding club visited us; they also had some pleasant flying and managed two Gold heights in wave.

Public courses again proved popular and enjoyed a high proportion of soaring. Midweek activity continued unabated into the month of November, with visitors from Trent Valley, Lincoln and RAF Benson taking advantage of the hill-lift and wave. During one week no less than 11 five-hours were flown, three by our own club members.

Our stand at the Sportex Exhibition in Harrogate aroused considerable interest and we appreciate the efforts of Barry and Hilda Gregson in arranging and manning the exhibit.

Airfield improvements are continuing under the supervision of Mike Benson, whose hard work throughout the summer and autumn deserves our thanks. The autumn draw, which took place at a party on October 21, raised £250 for club funds.

S.V.G.

SERVICE NEWS

618 GLIDING SCHOOL (ATC, West Malling)—15,000th launch of 1972 celebrated

ON December 3, 1972, 618 Gliding School, which operates at RAF West Malling, achieved its 15,000th training launch of 1972.

The aircraft, a Sedburgh T-21, was flown by two staff cadets of the school. Sgt Gary Brunning at 17 years of age was the first pilot, and the second pilot was Sgt Raymond J. Crawley, also 17 years of age. The first pilot is a 'C' category instructor and the second pilot is a Grade 1.



To mark the occasion, illuminated scrolls were presented to both pilots by the officer commanding 618 Gliding School, Squadron Leader G. F. Fuller, RAFVR(T).

The school has operated at West Malling since 1965 and is tasked to train cadets of the Air Training Corps and Combined Cadet Force to pre-pilot, proficiency (solo) and advanced standards.

The pre-pilot standard sets out to train cadets of 15 years of age to a standard acceptable for solo training (proficiency) when they attain the age of 16 years. This qualifies them for the BGA 'A' and 'B' certificate; and if recommended for further training they return to the school at 17 years of age to undertake training to the advanced level.

Squadron Leader Fuller, who has commanded the school for the past four years, is assisted by six staff officers, all of whom are qualified instructors, and, together with the other enthusiastic instructors, contribute their time to this interesting task.

The school is the largest of some 28 similar schools throughout the country and has a fleet of eight aircraft and a staff of approximately 50 instructors.

D.S.

CRANWELL—now RAFGSA club

IT must be a few years since Cranwell last appeared in these columns, but now that we are a full member of the RAFGSA, I hope matters will change. A lot of changes have taken place, and we are lucky in having the husband and wife team of Andy and Janine Price as

CFI and treasurer respectively. The club fleet comprises a K-7, Olympia 2B, Grunau Baby and two T-21s, plus a syndicate Cobra 15 and, of course, John Delafield's Kestrel 19.

The club is active every weekend from Cranwell's North Airfield. However, operations are not confined to Cranwell; on a recent visit to Sutton Bank, Ian Macfadyen completed his Silver C with a 5-hour duration flight. Ernie Taylor has also completed his Silver C this summer.

Norman Irvine and John MacCaulay are doing tremendous work rebuilding our caravan, while Dave Hassall is making great improvements to the clubhouse and bar. For the future, club vice-chairman John Delafield is taking his Kestrel 19 to compete in the South African Nationals, whilst other members are heading on a reciprocal bearing to Aboyne in search of stratospheric wave!

THE POACHER

EAGLE (Detmold)—review of year

HAVING just completed a very successful year at Detmold we feel we ought to remind readers that the club still exists despite these our first notes in two years.

Like many others, we suffered from a poor soaring season, but nevertheless completed a record number of launches with a slight increase in hours. Membership numbers were almost doubled so, not surprisingly, a loss at the end of 1971 was turned into a hearty profit, in spite of the expense incurred in replacing the winch engine and gearbox.

Despite good attempts at 300km triangles by Malcolm Hook and John Mitchell, and Gold distances by Martin Hardy and Brian Backhouse, success eluded all but Tony Clarke and Geoff Lenton, who completed the Silver badge with cross-countries.

At the services championships run this year by Eagle we could not produce the champion (congratulations to Nick Nichols of Laarbruch) but we held second, third, joint fourth, fifth, sixth and eighth positions, and Bryan Bowler won the special prize for the best overall performance in a Swallow.

Autumn saw a rush of Bronze legs by prospective 1973 pundits and the season ended on a 'high' note with Gold climbs by Martin Hardy, Tony Clarke and Brian Backhouse.

Now that the winter has stopped gliding at 'Wetmold' airfield, members are busily repairing gliders and equipment in time for a recruiting drive to be held at RAF Gütersloh in January and February.

During the year we said goodbye to Chris Watson, Vic Davenport, Malcolm Hook, Gordon Berry, Geoff Lenton and John Berryman.

CFI Alan Somerville has been posted. We wish him well in his new unit—10 miles from Detmold!

B.B.

KESTREL (RAF Odiham)—CFI Ed North retires

AFTER many years as CFI, Ed North has relinquished his position, and his place has been taken by John Baker, who recently joined the club. Gordon Barry has also joined us from the Detmold club and taken over as semi-permanent winch driver and deputy MT member. Leigh Hood is still waiting for the army to tell him where he is posted and at the moment commutes 300 miles each weekend to fly with us. Until further notice he is retaining the post of deputy CFI.

The club has at last obtained its own clubroom and bar. The official opening took place on November 18. The first qualification drinks were bought by Pam Davis on completion of her Bronze C and who graciously bought a barrel of beer. This and a barrel of beer laid on by the instructors meant that the majority had free drinks for the duration of the evening. We were also delighted to entertain a few of the Abingdon club, who joined us for the evening, but warn them that a party will soon be dispatched to recapture our club sign which disappeared that evening!

Our club statistics are down on last year but we are still knocking on the 5,000 launch mark, which we intend to beat next year. This should be quite easy with the help of our third winch and improved weather.

As ever, we extend an invitation to all who may be passing. If you can't fly in then come by car and swap tales with us over an ale.

H.R.J.

SOUTH WEST DISTRICT—ridge adventuring

UNDETERRED by the weather, club pilots have made use of the wind by adventuring to the nearby ridge site, Inkpen, and have had prolonged flights of up to three hours on the Pewsey Bowl. We are hoping to find other 'reliable' ridge sites as they seem to be an ideal solution to pilot frustration caused by waterlogged airfields.

One keen pilot braved the elements and soloed in the T-21; we managed to get a completed aero-tow clearance on the only stable weekend on November 25.

The club's domestic face has improved after a spate of trailer painting, hangar sweeping and general maintenance. The Olympia 419 has been packed away ready for its shipping to South Africa and our former CFI, John Evans.

Entertainment this month was highlighted by the marriage of CFI John Dabill and gave rise to a successful party on November 18, allowing one week's recovery time.

J.R.D.

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INDEX TO ADVERTISERS

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Bristol & Gloucestershire Gliding Club	70
British Gliding Association	11
Chiltern Sailplanes Ltd	26
Classifieds	57-59
Peter Clifford Aviation Co Ltd	Inside front cover
Cobb-Slater Instrument Co Ltd	25
Cornish Gliding & Flying Club	70
Crossfell Variometers	26
Crystal Engineering Ltd	8
Daltrade Ltd	42
Deeside Gliding Club (Aberdeenshire) Ltd	70
Derbyshire & Lancashire Gliding Club	70
Electechniques	26
Elek Books Ltd	18
Gliderwork	11
J A Harrison (Brokers) Ltd	63
J Hulme	26
Irvin Great Britain Ltd	65
Kent Gliding Club	72
Lasham Gliding Society Ltd	71
London Gliding Club	59, 72
London Sailplanes Ltd	25
Marlowe, Gardner & Cooke	58
Midland Gliding Club	72
MIT Soaring Association Inc	52
Mowbray Vale Insurance Brokers	11
The New Inn Hotel	50
Pilatus Aircraft Ltd	19
Radio Communications Co	11
Sailplane & Engineering Services Ltd	10
Sailplane & Gliding	24
Scotlandwell Caravan Site	48
Scottish Gliding Union	Inside back cover
Slingsby Sailplanes	4
Southdown Aero Services Ltd	65
Southern Sailplanes	12
Southern Soaring Centre	71
Southward Garage (Retford) Ltd	26
Speedwell Sailplanes	52
Sportair Flying Club	11
Three Counties Aero Club Ltd	35
Thermal Equipment Ltd	40
Torva Sailplanes Ltd	62
J Thorne	35
Brian Weare	26
West Wales Gliding Club	Inside back cover
Worcestershire Gliding Club	Inside back cover
Wycombe Gliding School	Inside back cover
Yorkshire Gliding Club	Inside back cover
Yorkshire Sailplanes Ltd	12, 52

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