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June — July 1965

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Cover photograph: "Dick" Johnson flying his Skylark 4 over Texas. *Photograph by Alex Aldott.*

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THE FREEDOM OF BRITISH GLIDING

By PHILIP WILLS

THE question above all others which our friends from other countries always ask us is: how have you retained your relative freedom from official control, which in nearly all other countries is the major difficulty preventing the development of our sport?

In spite of the fact that Britain is a small, highly populated country, which is popularly (if erroneously) believed to have a fairly dense air traffic, the British gliding movement is left almost entirely to control itself, with the minimum official intervention.

Firstly, let me list the main freedoms we have:

1. AIRCRAFT
   (a) No registration
   (b) No compulsory Certificates of Airworthiness
   (c) No compulsory licences for maintenance engineers
2. PILOTS
   (a) No state licences
   (b) No state instructors' qualifications or certificates
   (c) No state medical examinations
3. AIR TRAFFIC CONTROL
   (a) Exclusion only from two Traffic Control zones, London and Manchester; and half a dozen Special Rules Areas round specific busy airfields.
   (b) Cloud-flying permitted except in Airways and Controlled Zones and Areas.
   (c) Flying permitted in clear air in Airways and Control Areas.

This state of affairs produces amazement and incredulity in nearly every foreign country. Yet in any rational world, the same freedoms could be granted tomorrow, given the same background, for the complete proof of its wisdom is this:— *The British gliding movement has a safety record at least as high as any other country, and probably higher.* And it achieves this by imposing its own self-discipline, without the cost, delay and friction of state control.

How has this come about?

The Structure of The British Gliding Association

The older I become the more I am convinced that most of the troubles and inefficiencies of *Homo sapiens* are rooted in faulty and out-of-date political or administrative structures. On the macroscopic scale, good and decent men and women are born within obsolete national boundaries, and in spite of themselves find they are fighting and killing each other in wars.

Coming down with a rush to our somewhat smaller unit, the British gliding movement, through a mixture of luck and wisdom of its founders, at an early and vital stage of its development was given a structure which has attracted a continual flow of competent and responsible enthusiasts, prepared to give to its service a large proportion of their spare time. They come because the B.G.A. has a structure within which they *get things done*, and they can see the results of their work. This is the major satisfaction for the creative mind. Three absolutely vital foundation stones were laid at the beginning.

Firstly, on the creation of the British Gliding Association in 1929, the Royal Aero Club delegated full powers for all gliding matters to it, retaining only its inescapable function as the National body representing Britain in the main committee of the Fédération Aéronautique Internationale.

Secondly, after some distressing post-

birth pangs in 1934, the control of the B.G.A. was placed firmly in the hands of the British gliding *clubs* (not individuals), who appoint annually the majority of Council representatives.

Thirdly, it has been firmly maintained that a Council member, once appointed, must regard himself as, in the final resort, responsible to the gliding movement *as a whole*, and not to his own individual club.

The consequences flowing from these premises have been of fundamental importance. From the first one, there has never been any serious differences between our parent Aero Club and ourselves, over our entire history. Each party has had confidence in the competence of the other in their respective fields. In many countries, alas, this has not been the case, through no fault of the individuals concerned, but simply because of the fault in their basic structure.

The second premise ensures that at all times the B.G.A. is controlled by people who know what they are talking about, and who are in line with the basic philosophy of the movement.

The third ensures that we get on our Council the best possible people — for an intelligent man or woman must be free to decide for himself or herself how to vote after hearing the pros and cons of an argument, and will not be prepared to come to a meeting with hands tied by a decision of a club made before these have been heard.

Once it is ensured that the central body is in responsible and competent hands, time solves most major problems, and today we have the complete confidence and respect of all Ministerial and other bodies with whom we have dealings. If we have a case to put up to, say, the Ministry of Aviation or the Air Registration Board, they start with the assumption that it is a sensible one. If, after discussion, a regulation is imposed, they know we will see that it is obeyed, for we have built up a high standard of self-discipline. They know also that, to maintain this mutual respect, any restriction must be not only necessary, but be seen to be necessary. A mass of apparently unnecessary red-tape restrictions inevitably results in contempt of not only the bad, but also the good regulations. *Thus too many restrictions increase the dangers of flying*, by reducing the self-discipline of those indulging in it.

The Philosophy of British Gliding

And so we come to the basic philosophy which we have been able to persuade our Government to adopt in respect to the sport of gliding. It is this: *anyone is free, in the air as on the ground or in the water, to accept for himself any hazards he may wish, so long as he does not endanger anyone else.*

As soon as one looks at this, it is so blindingly obvious that it is incredible that it is not universally adopted. In all nations, anyone can go ski-ing, mountaineering, or underwater swimming, without the intervention of paternalistic Ministries. Yet in most countries, as soon as anything to do with flying crops up, this principle is abandoned. But its application means that Government control is strictly confined to *regulations necessary for the safety of third parties.*

That this philosophy works is shown by our record: people who glide are not such fools as to wish to take unnecessary risks with their lives, and can be relied on to take the necessary safety precautions. And if these are self-imposed, they will be more closely and universally observed.

In Britain, anyone is free to design and build a glider in his own back-yard, fly it from his own field, and break his own neck. It has happened, to my knowledge, once in the thirty-five years of our movement. Such a glider or pilot, however, would not be permitted to fly uncertificated from a B.G.A. club, where other people might be endangered, and the B.G.A. makes available highly competent technical advice and assistance to enable any such enthusiast to produce an aircraft capable of obtaining a Permit to Fly or Certificate of Airworthiness

Safety

Safety in the main relies on self-discipline. The air is too big for it to be possible for policemen to watch an aircraft all the time. Self-discipline requires a respect for laws and regulations, which in turn relies on confidence

and friendship between pilots and the authorities. This again requires good channels of communication.

A notable, and, so far as I know, a unique body which ensures this in the potentially disputatious field of Air Traffic Control is C.A.C.A.C. — The Civil Aircraft Control Advisory Council. Membership of this includes on the one hand the Ministerial A.T.C. officials, and on the other representatives of each civil user of the air: Air Corporations, commercial, sporting and club flying and gliding. Within this body all conflicting interests are discussed and the necessary compromises reached, after each party has been brought to realise the problems of the others.

Working with this body, the B.G.A. has been able to obtain official recognition of a new and revolutionary concept of Air Traffic Control: that *the degree of control should be kept as far as possible in line with the density of traffic in each particular volume of air;* this means the more traffic, the stricter the control; no traffic, no control.

Once again, as soon as one reads it, it seems incomprehensible that this should not be the universal philosophy, but indeed it is not: in some parts of the world cloud-flying is officially banned even in regions which do not see an aircraft in months. Of course the result is that no one obeys the restriction, and consequently the law as a whole falls into disrepute.

In previous issues of SAILPLANE AND GLIDING a number of papers written by Captain Goodhart and myself have been published outlining this philosophy and the basis of the calculations of collision risks between gliders and powered aircraft. Captain Goodhart's methods and figures have now been officially checked, and I have permission to publish the following paper presented at the March meeting of C.A.C.A.C. In how many countries would the responsible officials accept from a sporting body so apparently revolutionary a concept, and officially acknowledge its source?

* * *

Glider Cross'ng of Airways Collision Risk

1. Arising from previous discussions in C.A.C.A.C. on a statistical study of collision risk, a specific point emerged regarding the risk figure involving gliders, principally in airways. A separate study was therefore undertaken on this based on a method of estimating proposed by Captain Goodhart of the B.G.A.

2. Captain Goodhart provided estimates of the density and height distribution of cross-country gliders and figures for the relevant airways traffic were obtained by the Ministry.

3. In order to give a realistic picture of the airspace most concerned with the problem, the study was limited to the overland area south of 53°N. Allowance was made for correlation of seasonal, weekly and daily variations of traffic densities. No allowance was made for the possibility of collision avoidance by visual observation nor for the fact that gliders penetrate the airways in VMC only.

4. The result of the study gives the estimated risk of collision in airways involving gliders to be 1 in 250 years.

5. In considering the implications of this report the Ministry take the view that there is no reason to alter the present system whereby gliders can cross airways in VMC.

* * *

I have only space to record one further similar example of this unique relationship. After the war, the B.G.A. Technical Committee undertook to produce up-to-date Airworthiness Requirements for Gliders. When these were finished, they were submitted to the Air Registration Board, who approved them almost as they stood, and not only issued them officially, but *acknowledged their source.* The printed foreword in Section E, British Airworthiness Requirements for

Gliders, reads as follows:

Acknowledgment

The Air Registration Board has pleasure in acknowledging its indebtedness to the British Gliding Association for the closely co-ordinated effort which made possible the publication of this Section E of the British Civil Airworthiness Requirements.

The Association undertook the main work of preparation of the amendments which are included in this second issue of Section E through its Design Requirements Sub-Committee which represented the various interests which glider requirements might affect.

Our Freedoms

Let me now briefly discuss the list of individual freedoms I outlined at the beginning of this article.

1(a). NO AIRCRAFT REGISTRATION.—The first thing that strikes the eye of a foreign visitor to a British gliding meeting is the lack of registration letters or numbers painted all over our aircraft. Some have large numbers on their rudders, for competition purposes, but that is all, apart from a small B.G.A. C. of A. number on the rear of the fuselage.

What is the purpose of National registration? Presumably to ensure that an aircraft can, when necessary, be recognized in the air or on the ground. But in the air, the amount of cross-country flying is so small that there is never any difficulty in tracing a particular aircraft in the very small number of instances it has been necessary to do so, and on the ground — well, no one can land a glider in a field and steal away unnoticed! Until there are thousands, instead of dozens, of gliders flying cross-country, national registration numbers are unnecessary red-tape, which is, as I have pointed out above, undesirable from safety considerations.

1(b). NO COMPULSORY C'S OF A.—No C. of A. is necessary if you are on your own. The B.G.A. requires that all aircraft flying from the sites of affiliated clubs should possess either B.G.A. or A.R.B. C's. of A., or Permits to Fly or similar documents.

The A.R.B. C. of A. is only essential if gliders are exported to most foreign countries, though some accept B.G.A. Certificates.

1(c). THE B.G.A. LAYS DOWN STANDARDS FOR GROUND ENGINEERS AND INSPECTORS.—No one is fool enough not to employ them where necessary. Affiliated Clubs, of course, have to.

2(a). PILOTS' LICENSES.—The B.G.A. lays down the standards of A, B and C Certificates, and conforms with the International requirements for the Silver, Gold and Diamond badges.

2(b). INSTRUCTORS' QUALIFICATIONS.—The B.G.A. also handles these in the same way.

2(c). PILOTS' MEDICAL STANDARDS.—This is a matter of much frustration, expense and delay in many countries; indeed, in some, the procedure for obtaining the official medical certificate is so cumbrous as virtually to exclude would-be foreign visitors from taking courses at all. Yet no one will deny that an unfit driver of a motor car is a vastly greater public danger than an unfit glider pilot. So why require a greater degree of official medical control?

Over the last thirty-five years, experience has shown that no accidents from medical reasons have occurred which

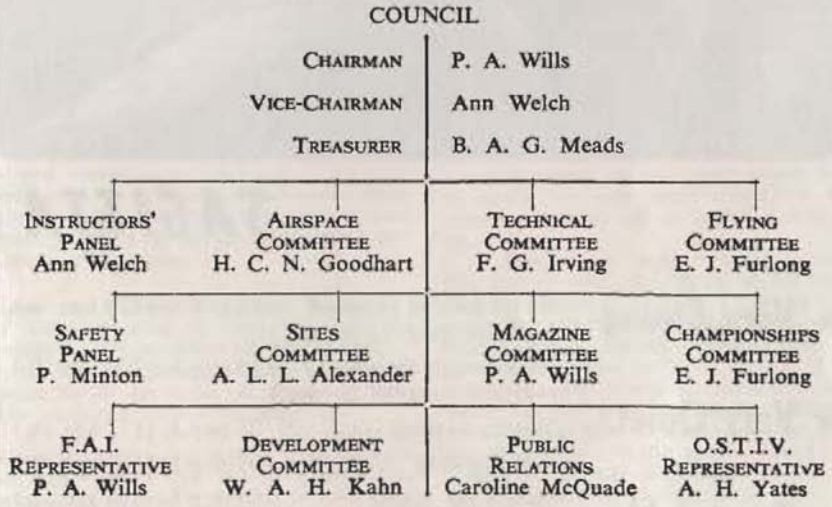
would have been prevented by official medical examinations. The B.G.A. requires a simple individual certificate to be signed by anyone before he may carry a passenger. It involves the minimum of time and expense, and has proved to be fully adequate.

3. AIR TRAFFIC CONTROL.—I have outlined above the way in which we have retained so far our relative freedom in the air. We *want* to be excluded from areas where we would be a danger to ourselves and to others, and willingly accept the necessary restrictions. On the other hand, we insist to the limit of our powers that we should be permitted to fly where the hazard is negligible.

Having agreed a method by which the risk can be rationally calculated, the stage is set for the continued development of British gliding over the years to come.

I outlined at the beginning of this article the foundations on which the B.G.A. is built, and append below the structure which has grown on these foundations. That we can find a continued flow of competent and responsible enthusiasts to man it in their spare time, and for the love of the game, is sufficient evidence of its soundness.

A pamphlet is available from the B.G.A. giving in full the Terms of Reference of each Committee and the B.G.A. Operational Regulations.



FLIGHT SAFETY CINESYMPOSIUM

THE General Aviation Safety Committee are holding a 2¼-hour flight safety "cinesymposium" in the Stafford Cripps building at the College of Aeronautics, Cranfield, near Bedford, on Friday, 21st May, 1965, commencing at 2 p.m. A repeat performance will be held at the same time and place on the following day, Saturday, 22nd May. There will be no charge for admission, and anyone interested in flight safety in General Aviation is invited to attend.

Visiting pilots must obtain prior permission to land, on Friday from Air Traffic Control (Cranfield 321, Ext. 308), and on Saturday from the C.F.I. (Cranfield 481, or Cranfield 321, Ext. 304). Landing fee 9s. per 1,000 a.u.w.

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FINAL GLIDES

By MIKE BIRD

Courtesy London Gliding Club Gazette

Calculators and All That

IF you are any good at sums you can pretty soon prove to yourself, by sums, that most of sums you are doing are a waste of time. Doing sums in gliding is mainly useful as a mental exercise; the direct practical value of in-flight calculations is tiny, mainly because they are usually wrong. We are left with a small residue of arithmetic that is worth doing — and that can all be done *on the ground.*

I wonder how many purchasers of the famous — calculator can honestly lay their hands on their hearts and say that they have flown even *one* final glide exactly by the calculator? When it comes to the crunch, if you will pardon the expression, to the knees-knocking, dry-mouthed, wet palms moment of final glide panic, only the most hardened competition pilot can bring himself even to understand, let alone obey, the circular slide-rule. However, I must put prejudice aside for a moment and describe the beast.

How the Circular Slide-rule Works

When a pilot is near the goal he wants to know either of two things:

(a) With the height he has, what speed must he fly to arrive at the goal (with the required safety margin)? or

(b) If he is to fly at the optimum cruising-speed, what height does he need in order to arrive at the goal? This question generally arises in the last thermal.

In the case of (a) the pilot lines up height scale "A" with distance scale "B". He then looks at the appropriate polar curve for the conditions, say 10 knots headwind. If it is at all possible to get in, the curve will intersect the speed-to-fly scale "C" at a particular figure, say 62 knots.

In the case of (b) he may say, "My best speed-to-fly (according to the MacCready ring or tables worked out from the polar) is 65 knots. With a 10-knot headwind and 22 miles to go, how high should I take this thermal?"

The whole object is to carry out the entire final glide at the cruising speed which is the optimum for the rate-of-climb achieved in the last thermal, leaving only the necessary safety height at the goal. To put yourself in a position where you do the final glide much above or below that speed loses time.

Usually what a pilot will do is this: some considerable distance from the goal he will do exercise (a) to see if he can get in. If he can't get in at any speed, he presses on with normal cross-country flying. Somewhat later he may do another check and finds he can get in at 50 knots. However, if his optimum speed for the conditions is 65 knots, he should continue normal speed flying until he arrives at a thermal, whereupon he does slide rule exercise (b) and finds that he needs 4,500 feet to get in. Having left at 4,500 feet, he reverts to exercise (a). If he runs through a patch of sink on the final glide, he re-sets the height and distance scales and reads off the new (lower) speed needed to reach the goal. If he runs along a cloud street and ends up with more height than is needed, he can again adjust the calculator to read off a higher speed to fly.

(I should say that a good coward like myself will start flying at 50 knots or even slower as soon as he gets within range, on the grounds that you never know: those cumuli ahead might all suddenly dissolve or turn rancid. They don't usually dissolve, however, and when shortly you get another thermal which brings you within easy range, you can then fly in at the proper speed.)

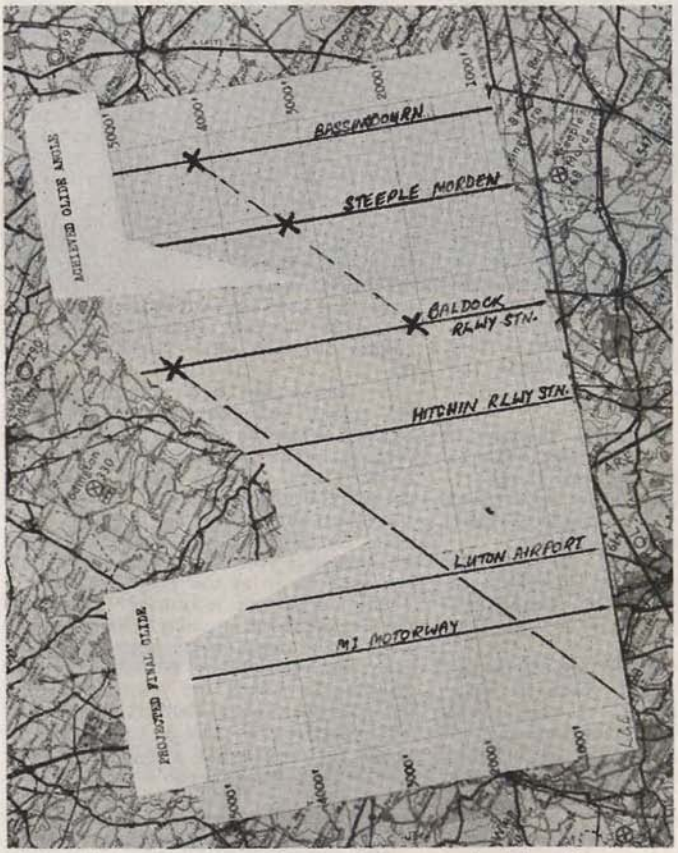
This all sounds reasonable: what are the snags about circular slide-rules? It is partly a question of visual presentation; the relationship between the real situation in which the pilot finds himself and the highly abstract figures and curves in front of him is too remote — except for experienced competition pilots who do not get nervous or flustered on the glide-in. I think the relatively inexperienced pilot needs a simple pictorial representation of what is going on.

The other and most ghastly drawback of the circular slide-rule is this: it gives no help in a crisis — when a cross-wind turns into a headwind or a light headwind strengthens or when large areas of

quite mild sink prevail. True, it tells you that you have not been making the distance you expected, but it works on the assumption that whatever difficulties of wind or sink you have just passed through, conditions *ahead* are going to be as forecast.

Aston Down in 1962 provided an example of this. On a closed-circuit day many pilots (I am thinking of those who returned early, not the ones who returned later and had no chance) fell short as a result of a marked strengthening of the headwind. These early non-arrivals were mainly pundits — and serve them right for using circular slide-rules.

What you must have is a way of seeing, clearly and pictorially, what glide angle you are achieving — and this should become clear as early as possible in the glide, so that a *major* correction can be made to the speed (not gradual little reductions of 5 knots at a time) or a new thermal found and used. It may be no use deciding at 1,500 feet



The map is covered in fablon so it is not ruined by the tape or by lines drawn on it. The chart is cut away to allow landmarks above the track to be seen. No mention of aircraft type or weather conditions is needed: the same basic chart works equally well for the Cadet or Sisu.

that a new thermal is urgently needed. You obviously have a much better chance of getting one if you make that decision at 3,000 feet.

The illustration (page 194) shows a typical pictorial final-glide chart which can be prepared shortly before take-off.

It is simply a piece of graph paper stuck on to a map along the final glide line. The height scale is 1,000 feet to an inch; it starts at 500 feet, the safety margin. No distance scale is really needed. Vertical lines are drawn up from the main landmarks.

When you arrive at the first landmark, Bassingbourn, you are not on finals. You are just pushing along flying either by a MacCready ring or by a rule-of-thumb estimate of best-speed-to-fly, say 60 knots. As you pass over — or level with — Bassingbourn at 4,200 feet, just mark a pencilled cross at that height on the chart. Press on. When you pass the next landmark or when you stop to take a climb, make another cross at the correct height. In the illustration we pass over Steeple Morden and then take a thermal at Baldock. (Of course the thermals don't necessarily situate themselves conveniently at major landmarks: you just have to get used to pinpointing smaller features.) We now have all the information we need to make a pretty reasonable final glide. As you can see, the performance of the glider at 60 knots in the prevailing conditions of wind and sink is summed up by the line through the first cross and the last.

Now just draw a line out from the goal which is reasonably parallel with the Achieved Glide Angle. That is the line down which you can fly. If thermals are going to 5,000 feet, you will be able to get in from Baldock.

All the way down the Projected Final Glide line you still check whether you are above or below. If you get noticeably below for any reason whatever, I think it is best to slow right down to max. range speed until you hit the line again. In a Skylark 3 the glide angle at 40-45 knots is 50% better than at 60-65 knots, so that slowing down as soon as trouble shows on the chart should prevent disaster. This is not the theoretically best way to do it, but the difference is a matter of seconds, a small price to pay for having a much clearer picture of what is happening.

This basic method uses no polar curves or weather forecasts; since both are pretty unreliable, I think this is a good thing.

Some Refinements

However, you can refine the system quite a bit to take some account of performance estimates and forecast wind conditions. Using "The Soaring Pilot" or Derek Piggott's book, you can learn how to calculate glide angles for different wind conditions for a particular glider; these angles can then be drawn radiating out from the goal, representing glides at 40, 50, 60, 70 and 80 knots. (This takes a bit of arithmetic but most of the sums can be done weeks before the contest.) If the achieved glide angle at, say, 60 knots in the period immediately prior to the last climb is reasonably parallel to the 60-knot line drawn from the goal, then it means you can rely fairly well on the glider's performance estimate in relation to the conditions. The advantage of this refinement is that if the last thermal is much weaker or much stronger than the average for the earlier part of the task, you can decide to do the final glide at a lower or higher speed than the 60 knots cruise which you have been doing previously. Where the glide-line for the new speed meets the place where you are on the map indicates the height to which you should take the last thermal.

If the indications are that you are going to get in at 70 knots or more with a fair margin, *don't stop* for any more thermals. Just haul back, then stick forward again as you pass the core. DON'T CIRCLE.

To sum up: The main object of paying so much attention to final glides is not just that one can clip a second here and there. The reasons for doing it as accurately as you can are that:

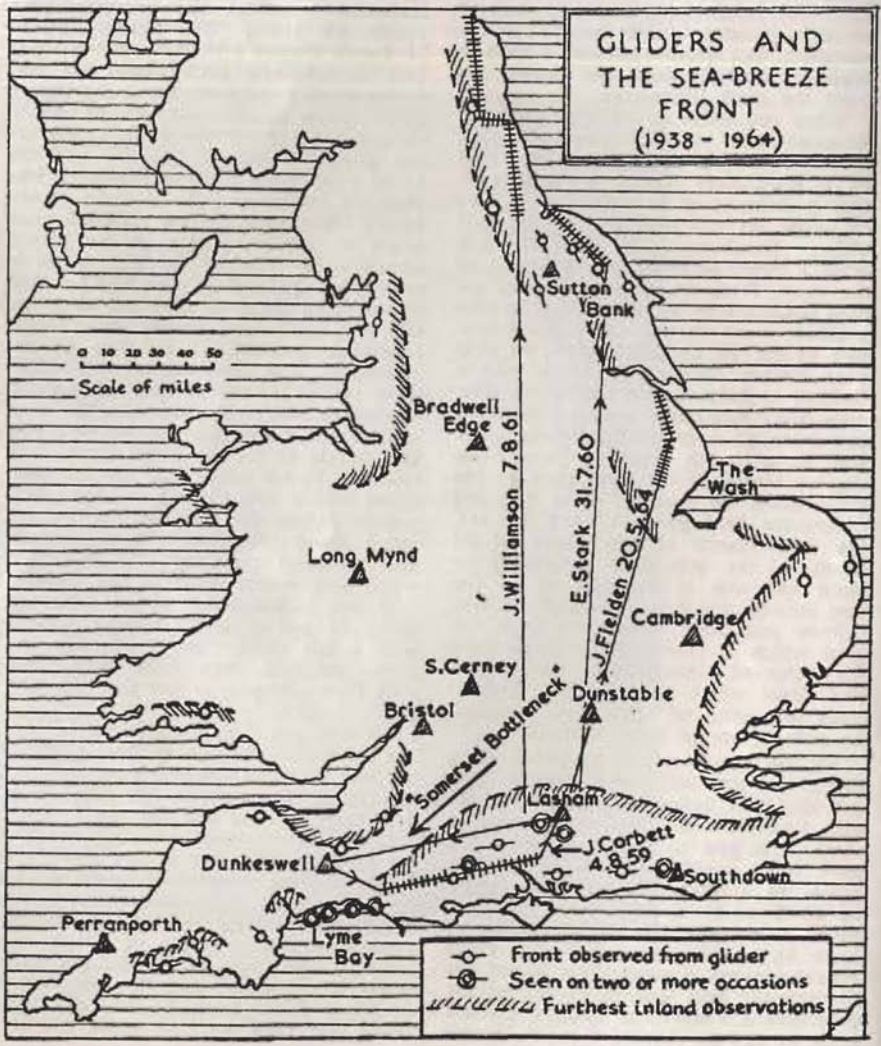
(a) It is terrifically exciting, possibly the most thrilling part of any flight, and

(b) Like the prospect of being hanged on the morrow, it concentrates a man's mind wonderfully. Your navigation, your attention to rates of climb and rates of sink, your whole soaring technique is sharpened over the last twenty or thirty miles. Gad, it's the only time I can ever keep the ball in the middle!

SEA-BREEZE SOARING IN BRITAIN

By JOHN SIMPSON

THE SEA-BREEZE FRONT HAS PRODUCED A FASCINATING STUDY TO ENLIVEN MY ADVANCING YEARS AND THERE IS STILL MUCH TO FIND OUT ABOUT ITS HABITS. ANY NOTES OF FLIGHTS WITH DIAGRAMS OR PHOTOGRAPHS WILL ALWAYS BE GRATEFULLY RECEIVED BY ME AT LASHAM.



THE SEA-BREEZE FRONT

I first met the sea-breeze as a stripling flying a Kirby Kite. It caused me to land downwind (unintentionally) after a glorious 80-mile dash to the coast in the 1937 Competitions. The next indiscretion I performed in the sea-breeze was to sink ignorantly and indignantly struggling to the ground in it in Dorset. This was in a London Club Olympia in the 1955 Nationals.

The sea-breeze, which "frequently happens in tropical climes", also occurs in a modestly restrained way around the coasts of Britain. On sunny, unstable, light-wind days in summer it may start blowing inland at the coast at about 11 a.m. and reach a strength of 10 knots by the early afternoon. If the wind is already blowing from the sea, then the sea-breeze may produce a slight increase in the general strength. In these conditions, soaring will not be good near the coast (except perhaps for hill-soaring on cliffs!) as cool moist air spreads inland.

Even if, however, there was originally a light wind blowing towards the sea, the sea breeze may be able to make progress inland against it. The boundary may be moving at only 5 knots, or may even remain stationary, while the sea-breeze behind it blows at 10 knots. As the land- and sea-winds are converging at this boundary, it is clear that air must be rising in the frontal zone between the land and sea air.

This *sea-breeze front* may typically move inland during the day perhaps 10 miles; even as far as 40 miles is possible if the offshore wind is very gentle. Knowledge of its behaviour is therefore very important to the Island Race.

Philip Wills was the first deliberately to use the rising air at a sea-breeze front when he made two pioneering flights along the coast of Devon and Cornwall in April, 1938.

On unstable days a sea-breeze front often forms even against a fresh offshore wind if this is almost parallel to the coast. The front then appears as a fat cloud-street roughly parellel to the coast, only a mile or two distant from it, either inland or out to sea. On the days of Wills's flights the 3,000-ft. wind recorded at mid-day at both Boscombe Down and Plymouth was N.E. about 20 knots. He found a line of clouds with strong lift stretching right across Lyme Bay, a few miles out to sea.

WHERE TO FIND THE FRONT

The map shows observations of the sea-breeze which have been reported in SAILPLANE AND GLIDING, with some additional ones described to me. Tracks of four notable flights are shown with the parts marked where pilots used the sea-breeze front.

(a) South coast

The front has been met most often in this area, chiefly in flights from Lasham and Dunkeswell. Both Southdown and Perranporth are so near the coast that they are often left in stable sea-air early in the day as the sea-breeze front passes inland. The cloud-forms at the front are often visible from Lasham to the south in the afternoon, and they were described by J. Mackenzie of the Meteorological Office in 1956.

With a light *westerly* wind the front usually moves inland sooner at Lasham and points further east than at Salisbury. The average time for arrival at Lasham is 17.00 GMT (6 p.m. British Summer Time). On some days in early May with a falling barometer the front has been swept inland very quickly, passing through Lasham as early as 14.30 GMT.

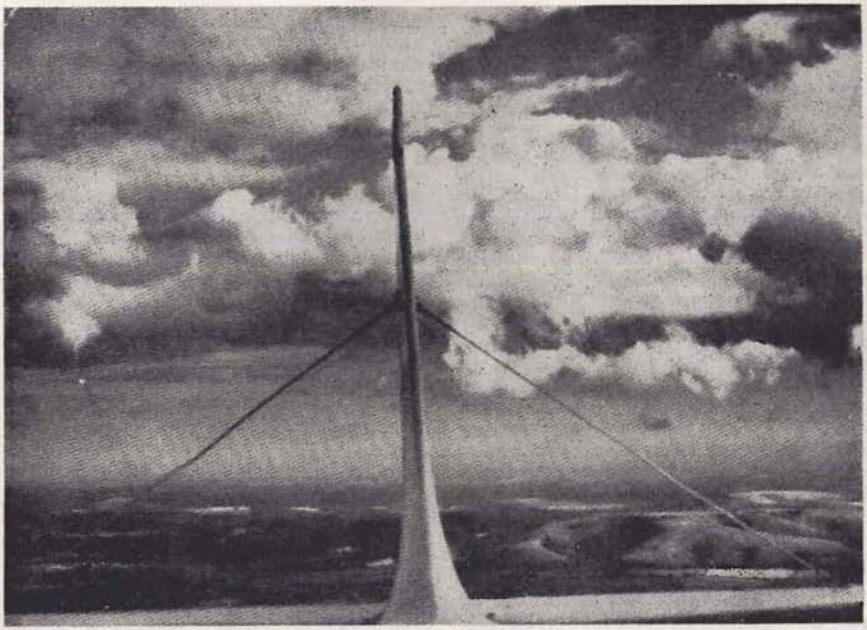
A special feature of these light westerly days is often the formation of a *"sea-breeze bottleneck"* in Somerset, between the sea air from the north and the south coasts. Two lines of ragged cloud may be seen converging somewhere to the west of Yeovil.

There are probably other places where two sea-breezes regularly meet; a case has been described by John Findlater (1964) in which thunderstorms formed at three such convergence points.

On light *easterly* days the front is likely to reach Salisbury as soon as Lasham. With stronger N.E. winds the most important feature is the line out across the Bay from Lyme Regis.

(b) East coast

The front has been met in the bulge of Norfolk and Suffolk and the opposing sea breeze has sometimes been a cause of anxiety near Norwich in long final glides towards the coast.



Cloud at sea-breeze front, south of Lasham at 1,800 ft., 17.25 GMT, 11th August, 1963. (Photo by J. E. Simpson.)

Some long flights made from the south have depended on the sea breeze from the N.E. coast for their success. It seems likely from weather maps that, on the day in 1960 when Ted Stark flew along a 30-mile section, the front lay 10 or 15 miles inland, extending over 80 miles from Manby to Middlesbrough. The sea breeze also reaches Cranwell, 20 miles inland from The Wash, and north of the Humber it may move inland to the edge of the plateau. John Fielden, with his wide experience and special flair for this type of soaring, won the 1964 Nationals with some remarkable soaring in this district. The front reaches Sutton Bank and has been observed there recently by members of the Yorkshire Club.

Further north, near the Tees Valley, the front comes inland past Middleton St. George; it is very likely to be marked here by industrial smoke haze. A remarkable flight was made in this area in 1961 by John Williamson. He picked up the front at 14.30 GMT near Darlington, and used it to complete a 500-km. flight across the Scottish border. On this day the winds inland were W.S.W. 5 to 10 knots, and the sea breeze was S.S.E. 10-15 knots. The sea breeze had started at 12.00 GMT and formed a front 40 miles long by 15.00 GMT.

FORECASTING THE SEA-BREEZE FRONT

At Thorney Island, which is south of Lasham, and only a few miles from the coast, sea-breeze forecasting charts have been drawn up. It has been found that sea breeze and non-sea breeze days can be separated on the basis of the forecasted 3,000-ft. wind and the expected excess of the land temperature over that of the sea.

As a very simplified guide, we may say:—

1. If the offshore wind is greater than 15 knots, a sea breeze is unlikely.

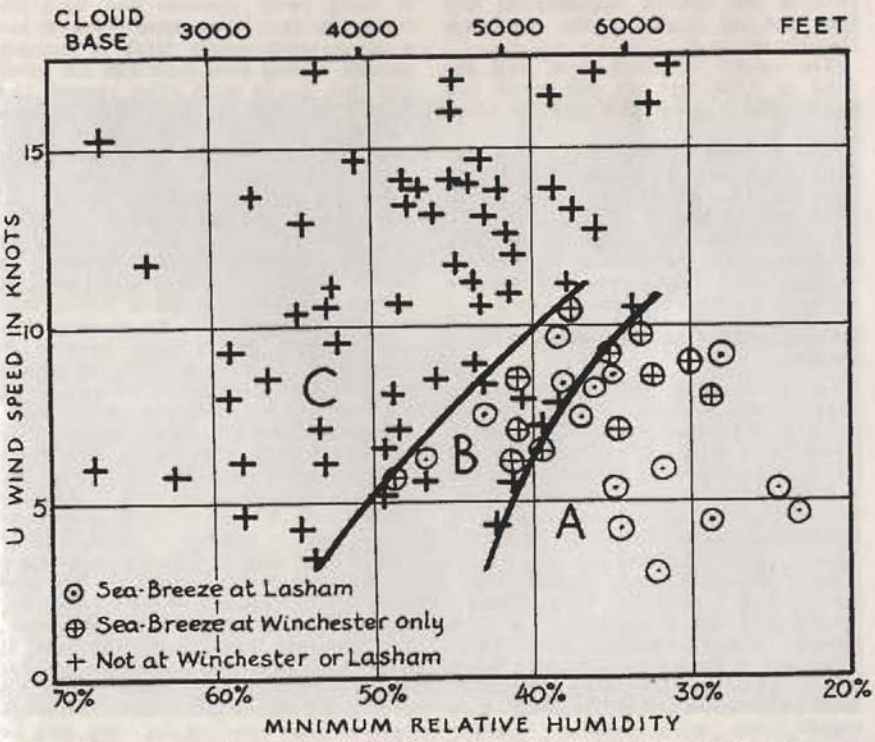
2. If the wind is 15 knots, a land-sea temperature excess of 15° F. is needed for a sea breeze.
3. If the wind is 10 knots, a temperature excess of 5° F. will do.

The *average* temperature excess reached in June is about 6° F., so on any reasonably sunny June day with a wind of less than 10 knots at 3,000 ft. a sea breeze is likely at Thorney Island. A sea breeze against a 10-knots wind is likely to start by 11.00 GMT, but against 15 knots at 15.00 GMT or later.

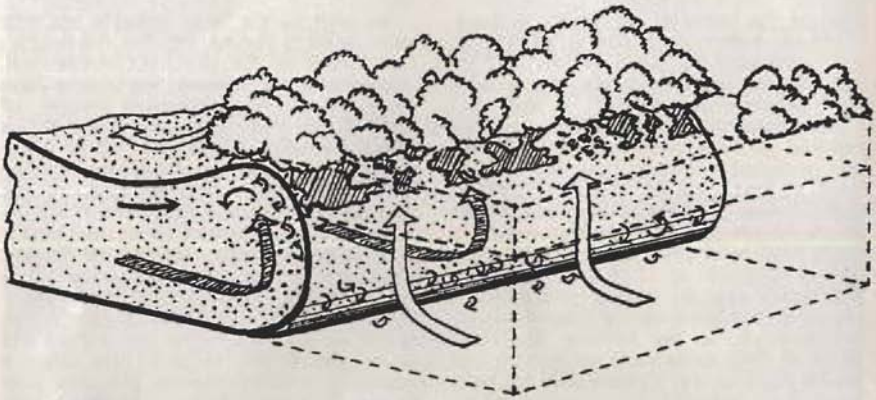
Whether this sea breeze will progress inland depends on many other factors. For example, in the Lasham sea-breeze study of 1962 there were at least 28 sea-breeze days on the south coast; on only 8 of these did the front move inland as far as Lasham.

As well as the wind-strength and the sun's heating during the day, an important factor is the depth of convection. Tephigrams for Lasham sea-breeze days show an average inversion height of 4,000 ft. on N.E. days and 6,000 ft. on W. days, and the depth of a well-developed inland sea breeze seems to be between a half and two-thirds of the inversion height, i.e. between 1,500 ft. and 4,000 ft. A greater depth of convection may certainly produce a deeper local sea breeze, even triggering off a line of cumulo-nimbus near the coast.

The most effective "index" for a sea breeze at Lasham so far has turned out to be the lowest value of the relative humidity reached during the day. See below. This index happens to be an easy one to work in practice, as on a good



Occurrence of sea breeze, 1962-3. A, always. B, Sometimes. C, Never.



Idealised sea-breeze front.

thermal day there is a simple relation between the relative humidity at any time and the height of the convective cloud-base.

The height of cloud base, and the wind at 3,000 feet are our bread and butter, and a good hint may be taken as:—

"On a good thermal day, when the wind is less than 10 knots, a sea breeze front at Lasham if cloud-base is at 5,000 feet or higher."

If you have a hair hygrometer, you can expect the sea breeze at Lasham on light-wind days when the relative humidity has fallen below 35%.

RECOGNIZING AND USING THE FRONT

On a cloudless day, finding lift is always more difficult. Fortunately the front is often made visible by haze or smoke, and when you are in the lift there may be enough birds flying there to help. In late May and early June, swifts may be found in very great numbers, collecting thousands of insects carried up in the rising air.

On a day with small cumulus, sometimes small ragged cu of a different texture may act as markers. The most obvious thing is usually some cloud with a base lower than normal by a thousand feet or more. This may be in quite a narrow strip forming very rapidly the now familiar "curtain clouds".

This cloud is formed in sea-air which is being swept upwards and back towards the sea; being more moist, it has a lower condensation level. It has not usually a clear level base like the other cumulus, but is more often ragged, and may even look at first sight like a decaying cumulus. You should, however, be able to spot sections of it rushing upwards.

Soaring along the front, as in all other cases, "the lift is where you find it!" However, you can start flying at an angle towards the line where you expect the front to be until you hit turbulence. When the lift is found, start working the best area by circling; this will at least ensure your keeping in touch with some of the lift, and should get you high enough to set out along the line. The lift is usually on the landward side of the curtain clouds, and may be very narrow. The cloud may form at any level down to 1,500 feet or so, and you may suddenly find it forming around you. It seldom forms in sections more than a quarter or half a mile long, but it may be possible to pick up the next bit of lift beyond the gap and to maintain height without circling for many miles. If, after finding turbulence, you suddenly find yourself in sink, it is probable that you have gone too far into the sea-air. You need to be on your guard against this because, although parts of the "nose" of the front may be almost vertical, two or three miles

nearer the sea the slope has been measured to be about 1 in 100, and your gliding angle won't get you out of this! If you have flown too far into the sea-air, smoke direction near the ground may give you a clue.

On a good cumulus day the absence of cloud over a large area may well be a sign that the sea-air has come inland and damped down the thermals.

On days with convection as deep as 8 or 10 thousand feet, the front may bend itself into more or less regular waves. These bulges may be 10 or 15 miles apart, and are sometimes outlined by bars of cloud, lying at right angles to the coast. These clouds have been called "bar-clouds" or "sausage-clouds"; they appeared on the day of John Corbett's out-and-return sea-breeze flight, and some examples are shown in my photograph.

RECOMMENDED READING

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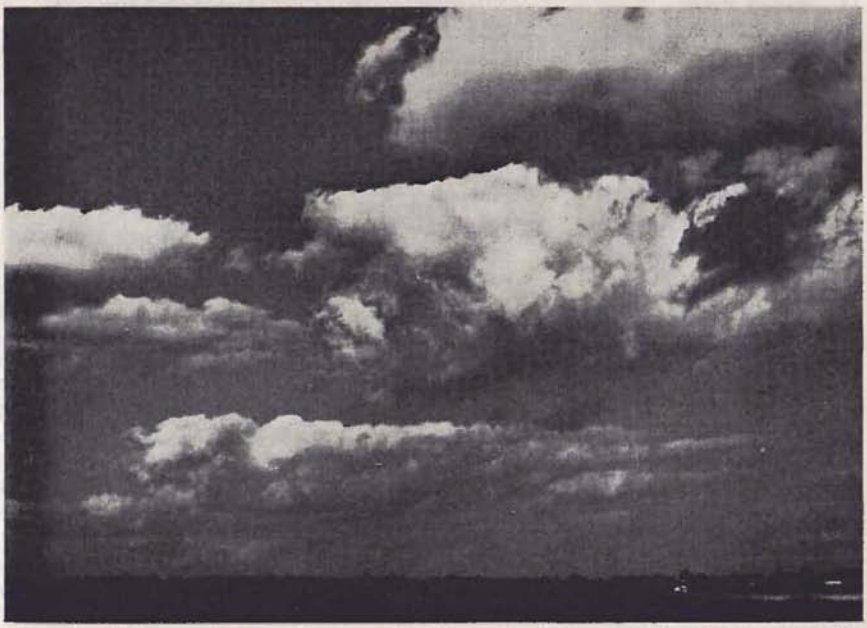


"Bar clouds" at sea-breeze front near Southampton. The sea is 8 miles to the right. 16.30 GMT, 9th August, 1963.

ENTRIES OPEN CLASS —1965 World

No.	*Pilot*	*Country*	*Sailplane*
1.	Edward Makula	Poland	Zefir 3
2.	Jan Wroblewski	Poland	Zefir 3
3.	Raymond Smith	Rhodesia	Skylark 3F
4.	Jim Harrold	Rhodesia	Skylark 4
5.	"Boet" Dommisse	South Africa	BJ-2
6.	Sture Rodling	Sweden	PIK-16c Vasama
7.	Hans Nietlispach	Switzerland	Skylark 4
8.	"Bomber" Jackson	South Africa	Olympia 419
10.	Richard Johnson	United States	Skylark 4
11.	Andrew Smith	United States	Ka-6CR
12.	Mikhail Veretennikov	U.S.S.R.	A-15
13.	Vladimir Chuvikov	U.S.S.R.	KAI-19
14.	Ciril Kriznar	Yugoslavia	Meteor
15.	Rudolf Hossinger	Argentina	Standard Austria SH
16.	Derek Reid	Australia	Skylark 4
17.	John Blackwell	Australia	Standard Austria
18.	Franz Ulbing	Austria	Ka-6
19.	Rafael Frene	Argentina	Standard Austria SH
20.	Henri Stouffs	Belgium	Ka-6CR
21.	Charles Yeates	Canada	Skylark 4
22.	David Webb	Canada	Dart 17
23.	Milan Svoboda	Czechoslovakia	L-21 Spartak
24.	Harald Jensen	Denmark	Hütter Libelle
25.	Ejvind Nielsen	Denmark	PIK-16c Vasama
26.	Seppo Hämälainen	Finland	Skylark 4
27.	Jean Pierre Cartry	France	Edelweiss
28.	Jean Paul Weiss	France	Edelweiss
29.	Rolf Spänig	Germany, West	D-36
30.	Rolf Kuntz	Germany, West	HKS-3
31.	John Williamson	Great Britain	Olympia 419
32.	Nicholas Goodhart	Great Britain	Dart 17
33.	Kornel Thuri	Hungary	A-15
34.	Györgi Petroczy	Hungary	A-15
35.	"Paddy" Kearon	Ireland	Olympia 419
36.	Michael Slazenger	Ireland	Olympia 419
38.	Daniel Arber	Israel	Skylark 4
39.	Walter Vergani	Italy	Skylark 4
40.	Fiorenzo Lamera	Italy	M-100S
41.	Gerrit Jan Ordelman	Netherlands	Sagitta 1
42.	"Dick" Georgeson	New Zealand	Skylark 4
43.	Gerald Westenra	New Zealand	Skylark 3G

Championships—ENTRIES STANDARD CLASS

No.	*Pilot*	*Country*	*Sailplane*
51.	Heinz Huth	Germany, West	Ka-6
52.	Rudolf Lindner	Germany, West	Phoebus
53.	George Burton	Great Britain	Dart 15
54.	Tony Deane-Drummond	Great Britain	Olympia 465
56.	Leifur Magnusson	Iceland	Ka-6CR
57.	Thorhallur Filuppusson	Iceland	PIK-16c Vasama
58.	Vishwa Gupta	India	Ka-6
59.	Tom Evans	Ireland	Ka-6CR
60.	Attilia Pronzati	Italy	M-100s
61.	Leonardo Brigliadori	Italy	Uribel C
62.	Rudolf Mestan	Czechoslovakia	Standart M-25
63.	Ed van Bree	Netherlands	Ka-6
64.	Eric Réparon	Netherlands	Ka-6
65.	Rex Handley	New Zealand	Ka-6
66.	Allan Cameron	New Zealand	Olympia 460
67.	Tor Johannessen	Norway	PIK-16c Vasama
68.	Harald Höimyr	Norway	Ka-6CR
69.	Jerzy Popiel	Poland	Foka 4
70.	Franciszek Kepka	Poland	Foka 4
71.	Robert Clifford	South Africa	Ka-6
72.	Per-Axel Persson	Sweden	PIK-16c Vasama
73.	Irve Silesmo	Sweden	Ka-6CR
74.	Markus Ritzi	Switzerland	Standard Elfe
75.	Urs Bloch	Switzerland	Standard Elfe or Ka-10
76.	Richard Schreder	United States	HP-12
77.	Wally Scott	United States	Ka-6CR
78.	Iozas Jarushevichus	U.S.S.R.	KAI-14
79.	Oleg Suslov	U.S.S.R.	KAI-14
80.	Karel Korpar	Yugoslavia	Libis-18
81.	Vasilij Stepanovic	Yugoslavia	Delfin
82.	Reinaldo Picchio	Argentina	Ka-6
83.	Bob Rowe	Australia	ES-60 Boomerang
84.	Malcolm Jinks	Australia	ES-60 Boomerang
85.	Harro Wödl	Austria	Ka-6
86.	Johann Fritz	Austria	Standard Austria SH
87.	Marcel Cartigny	Belgium	Foka 3
88.	Martin Baeke	Belgium	Ka-6BR
89.	Peder Mortensen	Canada	Olympia 460
91.	Václav Marecek	Czechoslovakia	Standart M-25
92.	Niels Sejstrup	Denmark	Ka-6CR
93.	Ib Braes	Denmark	Ka-6CR
94.	Juhani Horma	Finland	Havukka Standard
95.	Matias Wiitanen	Finland	KK-1B UTU
96.	Jacki Lacheny	France	Edelweiss
97.	François Henry	France	Edelweiss
98.	Manfred Blauert	Germany, East	Foka
99.	Bernd Nolte	Germany, East	Foka

PILOTS FLYING IN THE STANDARD CLASS

51. Heinz Huth, 57, Germany West, Ka-6.

1,500 gliding hours since 1928. 1st Standard 1964 nationals.

Huth is the only pilot to have the distinction of having won two World Championships in succession, and will defend his title again at South Cerney. He won the German nationals no fewer than six times running and must surely be rated as the world's greatest pilot. He was awarded the Lilienthal Medal in 1964. He still finds time to instruct at his own club in Hamburg. At 57 he will be the oldest pilot flying, and no doubt his performance will be closely watched by everybody. He is a flying safety officer.

52. Rudolf Lindner, 34, Germany West, Phoebus.

900 gliding hours since 1954. 3rd Standard 1964 nationals. First entry.

Rudolf is one of the three pilots who broke the world distance record in June 1963 with a flight of 875 km. and it is only the second time in gliding history that a world record was jointly held by three pilots; Alvin Parker, U.S.A., has since broken the record with a flight of over 1,000 km. Rudi is also a power pilot, and is a master mechanic.

53. George E. Burton, 33, Great Britain, Dart 15.

750 gliding hours since 1948, 22nd Open 4th Standard 1964 nationals. First entry.

George crewed for the British Team in 1960. He is an expert on gliding equipment and instrumentation. The Dart he is flying is the first one with a metal spar and is about 45 lbs. lighter than his own Dart; he has also been slimming himself and has lost over 20 lbs. in weight over the last six months. With the rest of the British Team he has been training at Bicester over Easter and finished 12th.
He has recently taken over the post of chief development engineer with Gas Chromatography Ltd., Maidenhead.

54. Tony Deane-Drummond, 48, Great Britain, Olympia 465.

1,100 gliding hours since 1937, 34th Open 6th Standard 1964 nationals.

Tony has been national champion once and has various national records to his credit; as an Army Brigadier he has not so much time available now, but he has a vast amount of competition experience. While training at Bicester he finished 15th.

56. Leifur Magnusson, 32, Iceland, Ka-6CR.

90 gliding hours since 1961, 4th 1963 nationals. First entry.

Leifur has the fewest number of hours and no doubt this championships will be a great experience for him. He has two national records to his credit. Works for the Icelandic Civil Aviation administration.

57. Thorhallur Filuppusson, 35, Iceland, PIK-16C Vasama.

490 gliding hours since 1944, 2nd 1964 nationals.

He has four national records to his credit; instructs in his spare time and runs a hobby shop.

58. Vishwa B. Gupta, 37, India, Ka-6.

350 gliding hours since 1956. First entry.

He is an instructor and power pilot and has various national records to his credit. His hobbies include table tennis, swimming and hockey.

59. Thomas W. Evans. 29, Ireland, Ka-6CR.

201 gliding hours since 1953. First entry.

Tom is an AER Lingus pilot and flies Boeing 707s and has 4,000 hours logged. He is Chairman of the Irish Gliding Association; his hobbies include Rugby and shooting.

60. Attilio Pronzati, 37, Italy, M-100S.

1,300 gliding hours since 1948, 4th 1964 nationals.

He has various national records to his credit. He likes fishing and hunting and is a sports goods manufacturer.

61. Leonardo Brigliadori, 37, Italy, Uribel-C.

1,150 gliding hours since 1953, 2nd 1964 nationals (Spänig, Germany, 1st).

Brigliadori also flew in England in 1954, and this will be his sixth appearance. He has a number of national records to his credit, and is also an instructor. Bank clerk.

63. Ed van Bree, 30, Netherlands, Ka-6.

900 gliding hours since 1949, 1st 1964 and 1963 nationals.

Ed was reserve in Germany in 1960 and took over from Seyffert on the last three days by special permission as Seyffert had been taken ill. He has various national records to his credit and is a jet pilot with the Dutch Air Force.

64. E. Réparon, 33, Netherlands, Ka-6.

660 gliding hours since 1950, 2nd 1964 nationals. First entry.

Has various national records to his credit. Enjoys photography and is a junior Director.

65. Rex Handley, 34, New Zealand, Ka-6.

175 gliding hours since 1952, 2nd 1964 nationals (team entry). First entry.

Rex is both an instructor and power pilot and enjoys aeromodelling. Airline pilot.

66. Allan R. Cameron, 35, New Zealand, Olympia 460.

350 gliding hours since 1960, 4th 1964 nationals. First entry.

Allan is an instructor, and enjoys motor racing, tennis and Rugby. Motor mechanic.

67. Tor Johannessen, 36, Norway, PIK-16C Vasama.

250 gliding hours since 1959.

He is a 1st Officer with Scandinavian Airways, and has various national records to his credit.

68. Harald Höimyr, 33, Norway, Ka-6CR.

1,000 gliding hours since 1948.

Harald is an instructor and power pilot; he is in charge of flying operations with the Norwegian Aero Club.

69. Jerzy Popiel, 33, Poland, Foka 4.

2,250 gliding hours since 1948, 11th 1964 nationals.

Jerzy like Makula is a most experienced competition pilot and they excel in pair flying. He has three national and one world record to his credit. He is an instructor and power pilot and also in charge of the technical committee for gliding. Aviation engineer.

70. Franciszek Kepka, 25, Poland, Foka 4.

1,300 hours since 1950, 1st 1964 nationals. First entry.

Kepka went solo at the age of 10 (by special permission) and had all three diamonds at the age of 19. He came 6th in 1962, and 5th in the 1963 nationals. He has one national and one world record to his credit. He is both an instructor and power pilot. He is a keen athlete.

71. Robert Clifford, 31, South Africa, Ka-6.

500 gliding hours since 1958, 2nd Standard 1964 nationals. First entry.

He has one national and one world record to his credit. Apart from being an instructor he is also a power and helicopter pilot. Aircraft engineer.

72. Per-Axel Persson, 43, Sweden, PIK-16C Vasama.

500 gliding hours since 1942, 6th Scandinavian Championships.

Persson will be the veteran of this championships as he will be flying for the seventh time; he only missed 1952 and 1963. He is also the first post-war World Champion, and has one world record to his credit. We hope that he will bring his accordion to enliven the proceedings at South Cerney.

73. Irve Silesmo, 34, Sweden, Ka-6CR.

1,100 gliding hours since 1948, 7th Scandinavian Championships.

He has one national record to his credit and has been entered for the fourth time.

74. Markus L. Ritzi, 34, Switzerland, Standard Elfe.

460 gliding hours since 1953, 1st 1964 nationals. First entry.

Has been national champion several times and holds a number of national records He flies for Swissair and has commanded Convairs since 1959.

75. Urs Bloch, 32, Switzerland, Standard Elfe or Ka-10.

503 gliding hours since 1955, 3rd 1964 nationals. First entry.

Bloch is both an instructor and power pilot and works as an airline pilot.

76. Richard E. Schreder, 50, U.S.A., HP-12.

2,000 gliding hours since 1955, 30th 1964 nationals.

Dick has various world records to his credit and has built and designed the HP series. The HP-12, his latest design, is for home assembly and can be fitted with a quick removable twin-engine, so that it can be flown without any groundcrew assistance. This is the first time Dick will be flying in the standard class.

77. Wallace A. Scott, 41, U.S.A., Ka-6CR.

700 gliding hours since 1961, 2nd Open 1st Standard 1964 nationals. First entry.

Wally, we are told, is one of the best Ka-6 pilots flying. He broke the world goal record on the 23rd July, 1964, with a flight of 520 miles. Cinema owner.

78. Iozas V. I. Jaruschevichus, 33, U.S.S.R., KAI-14.

1,500 gliding hours since 1956, 1st 1963 nationals. First entry.

Also flew in the Czechoslovakian nationals 1964 and finished 26th. He has one national record to his credit and is also a power pilot. His interest lies with all aviation sports. Full-time gliding instructor.

79. Oleg N. Suslov, 30, U.S.S.R., KAI-14.

1,200 gliding hours since 1957, 6th 1963 nationals. First entry.

Suslov has one national and one world record to his credit; is an instructor and enjoys motor cycle racing. Lathe operator.

80. Karel Korpar, 29, Yugoslavia, Libis-18.

400 gliding hours since 1956, 1st 1964 nationals. First entry.

Power pilot and full-time gliding instructor.

81. Vasa Stepanovic, 37, Yugoslavia, Delfin.

1,300 gliding hours since 1946, 2nd 1964 nationals.

Instructor and power pilot. Machine technician.

82. Reinaldo H. Picchio, 38, Argentina, Ka-6.

500 gliding hours since 1945, 1st Standard 1965 nationals. First entry.

He came third in a recently held selective contest, which we assume was held in order to choose the pilots for the Argentinian team. Mechanical engineer.

83. Bob Rowe, 39, Australia, ES-60 Boomerang.

2,000 gliding hours since 1944.

Bob has various national records to his credit and is an instructor. Orchardist.

84. Malcolm Jinks, 21, Australia, ES-60 Boomerang.

180 gliding hours since 1960, 1st 1964 nationals. First entry.

Malcolm is the youngest pilot to fly at South Cerney; he has two national records to his credit and has also won various Rallies.

85. Harro Wödl, 41, Austria, Ka-6CR.

2,500 gliding hours since 1942, 1st 1964 and 1963 nationals.

He flew in the Swiss nationals and finished 6th. He has various national records to his credit and is a full-time gliding instructor.

86. Johann Fritz, 40, Austria, Standard Austria SH.

650 gliding hours since 1943, 2nd 1964 nationals.

He has various national records to his credit, is a keen aeromodeller and also enjoys ski-ing. Constable.

87. Marcel Cartigny, 44, Belgium, Foka.

900 gliding hours since 1935, 4th 1964 nationals.

Marcel also flew in England in 1954. He has 15 national records to his credit, is also a power pilot. Car dealer.

88. Martin Baeke, 39, Belgium, Ka-6BR.

700 gliding hours since 1959, 2nd 1964 nationals (1st Nietlispach, Switzerland).

He also won the 1964 Victor Boin Contest, both an instructor and power pilot, and has various national records to his credit. Public relations officer in the Air Force.

89. Peder Mortensen, Canada, Olympia 460.

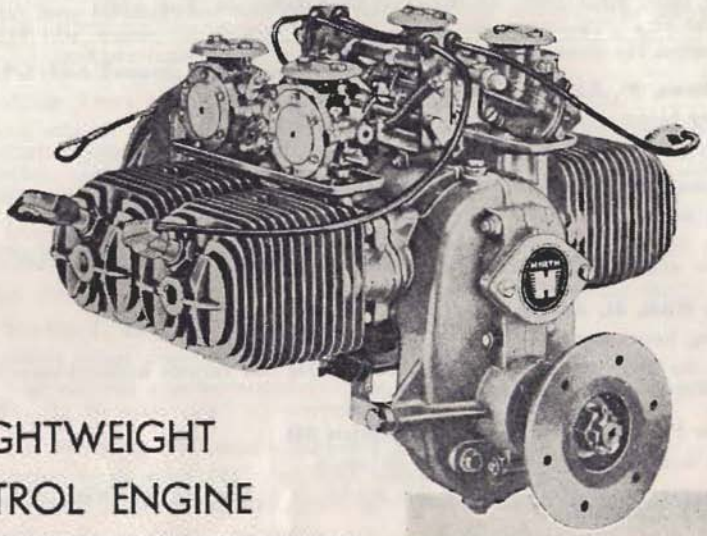
No further details available.

62. Rudolf Mestan, 29, Czechoslovakia, Standart M-25.

1,500 gliding hours since 1949, 4th 1964 nationals.

He was national champion in 1957, 1959 and 1961 and has flown in a number of Eastern European competitions. He is both an instructor and power pilot and has various national records to his credit.

ANNOUNCING
THE NEW HIRTH GLIDER ENGINE



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91. Václav Marecek, 34, Czechoslovakia, Standart M-25.

1,100 gliding hours since 1945, 3rd 1964 nationals.

He has flown in all five Czechoslovakian nationals and three times in Eastern European competitions. Both he and Mestan last flew in world championships in Poland, 1958. Instructor and power pilot, also has various national records to his credit.

92. Niels S. Sejstrup, 37, Denmark, Ka-6CR.

1,050 gliding hours since 1946, 2nd Scandinavian Championships.

Has various national records to his credit. Officer in the Danish Air Force.

93. Ib Braes, 37, Denmark, Ka-6CR.

500 gliding hours since 1955, 5th Scandinavian Championships.

Ib carried out a splendid flight in Argentina 1963 on a day which proved to be a no-contest. One national record to his credit. Dentist.

94. Juhani Horma, 35, Finland, Havukka Standard.

1,400 gliding hours since 1945, 1st 1964 nationals.

He also flew in the 1962 Nordic Championships which he won. Has two national records to his credit and is an instructor. Fire Brigade Sergeant.

95. P. Matias Wiitanen, 27, Finland, KK-1B UTU.

1,100 gliding hours since 1955, 3rd Scandinavian Championships.

Five national records to his credit; as a professional pilot he still finds time to instruct at his own club in his spare time.

96. Jacki Lacheny, 33, France, Edelweiss.

1,850 gliding hours since 1948, 2nd in his last nationals.

He has various national records to his credit and is both an instructor and power pilot. He came 2nd in the standard class in Argentina.

97. François Henry, 28, France, Edelweiss.

1,200 gliding hours since 1955, 1st in his last nationals.

Henry became well known in Argentina where he held the lead for five days, dropping finally to sixth place. Second Lieutenant Pilot.

98. Manfred Blauert, 41, Germany East, Foka.

630 gliding hours since 1952, 4th Eastern European Championships. First entry.

Has two national records to his credit. Economist.

99. Bernd Nolte, 26, Germany East, Foka.

680 gliding hours since 1958. First entry.

Has one national two-seater record to his credit.

Compiled by RIKA HARWOOD

We will be pleased to hear the experiences of the competing teams during the Championships. The editorial office of *Sailplane and Gliding* will be established on the ground floor of the Control Tower throughout the meeting. We wish all the pilots good soaring and happy landings.

ALAN E. SLATER RIKA HARWOOD

With the Beagle Husky, take-off acceleration is rapid. Trials in widely varying conditions have shown that even when fully loaded, the Husky is airborne after a run of only 175 yds. This abundant power together with full panoramic visibility makes the Husky ideal for towing either single or two-seat Sailplanes. In flight, the aircraft is easy to handle . . . for harmony of control and stabilities has been achieved to an exceptional degree. Going gliding? Then get going with a safe, fast Beagle Husky.

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THE Kronfeld Club has pleasure in announcing that it offers all overseas visitors and competing teams honorary membership for the period they are over here for the World Gliding Championships. A map of how to get to the club is on page 220. The club is open evenings only Monday to Friday 5.30-11 p.m. Should you want to contact someone during the day Mrs. Bonham, at FORest Hill 9390, will be pleased to hear from you.

There will be two lectures of particular interest to our visitors; the first on Wednesday, 19th May by Wally Wallington, who is the chief forecaster at South Cerney, and he will give a hint of the expected "met." during the championships period.

The club will have up-to-date news on the championships throughout, and on Wednesday evenings this will be a special feature to be followed by a film.

The second date to note is Wednesday, 16th June, when we hope as many of our visiting teams who are in London will come along and tell us their news. Please bring any slides or films you may have. This will be followed by a very special film entitled "Champion of Freedom", a fascinating tribute to Sir Winston Churchill.

We plan a more serious analysis of the championships on the 30th June, when the British team will be coming along to speak.

Y. C. B.

Diary of Lectures and Film Shows
Wednesdays at 8 p.m.

May 19. South Cerney Championships Forecasting by C. E. Wallington.
„ 26. Powered Flight Film.

June 2.-9. Stop Press News from South Cerney followed by a film.
„ 16. The World Gliding Championships by our visitors, followed by film "Champion of Freedom".
„ 23. Inter-Manx Air Display.
„ 30. First reflections on South Cerney by the British Team.

July 7. New thoughts on Variometers, by Brennig James.
„ 14. Film: Building the Forth Bridge.

THE NEW OLYMPIA 465

by Derek Piggott

FOLLOWING the success and popularity of the Eon Type 460 Series 1 (463) as both a competition and club machine, two special prototypes have been developed for this year's World Championships.

A number of refinements have been made to the basic "460" airframe which has resulted in great improvement in the all-round performance.

The most obvious alterations are the much slimmer fuselage with its smaller cross-section and the all-moving tailplane. The change in the fuselage shape has improved the rather angular lines of the 463 and the new machines have a very pleasing appearance while retaining the original basic structure and flat sides.

Accurate performance tests have been carried out at Bedford (Cranfield) on the first aircraft, which has an almost standard 463 wing. The second one has a thinner aerofoil and a slightly increased mean chord. Theoretically this should give an even better performance at both high and low speeds. However, the first aircraft has proved to be more suitable for our conditions and is superior to the standard Ka-6. At 45 knots the advantage is not very great but at 65 knots the difference appeared to be almost 20%. This improvement has not been made at the expense of the low-speed circling characteristics.

The controls of the 465 are well harmonised but heavier than the 463 Series, and this gives the general impression of flying a much larger and more stable glider.

The elevator forces are, perhaps, rather high, but with an all-moving tail this is probably desirable to encourage the more frequent use of the trimmer. This is an important point about all-moving tails which is sometimes overlooked. With a normal elevator and trim tab, it is more efficient (but less pleasant) to leave the trimmer in the middle position, holding the stick force needed at higher cruising speeds. However, with the all-moving arrangement, the tab is exactly aligned with the main surface, giving the minimum drag when the stick forces are trimmed out. Therefore with all-moving tails the glider should be accurately trimmed at all times.

The 465 can be trimmed to any useable flying speed regardless of the weight of the pilot, and the large trim wheel is conveniently mounted in the left-hand front edge of the seat like the earlier 419.

The wing efficiency has been improved

by changing from Frise to plain ailerons with the hinge at the top surface (similar to the Ka-6 and Skylark). The aileron gearing has also been increased so that a full stick movement is possible, without the stick banging against the pilot's leg. These changes have increased the aileron forces, but the rate of roll remains very good and there is ample rudder to prevent adverse yaw when full aileron is used.

The first two 465's were specifically designed to be just large enough for Tony Deane-Drummond, and the cockpit is comfortable for small and medium-sized pilots, but is rather too small for larger people. However, it should be a simple matter to extend the nose a little and move the pilot forward about six inches on future models. This would improve the all-round visibility for tall pilots and reduce the minimum permissible cockpit load, both of which are a little restrictive on the prototypes.

The inevitable increase in the empty weight resulting from the all-moving tail has been compensated by an increase in the maximum all-up weight of 680 lb. in order to leave a useful payload of about 240 lb.

In spite of the impressive improvement in performance, the stall is even more docile than the 463, and the handling of the 465 is suitable for the most inexperienced pilots.

My own impression, based on a few hours test flying, is that the 465 will prove to be a very potent competition machine. Let's hope that it proves a world-beater at South Cerney this year.

THE DART 17

By NICHOLAS GOODHART

ON 3rd April Slingsby Sailplanes produced the prototype of the 17-metre metal-sparred Dart for initial flights at Wombleton.

Immediately I had cast off the tow and slowed down, it was apparent that the low-speed performance felt right; this was no proof but just a feeling — the acid test would come later when scratching in weak thermals with other gliders of proved performance. The rest of the brief handling tests showed spin and stall satisfactory and the controls light and responsive. The rate of roll was about the same as a Skylark.

I got one more flight in the machine, thermal soaring at Lasham, before going to Bicester for the Inter-Services Championship, where the performance of the glider was proved by its comparative performance under full competitive conditions. During these Championships, we had both "scratchy" weather and good strong thermals of up to 10 knots in small cu-nims. Under the whole range of conditions, it seemed that if anything the 17-m. Dart always had a slight edge over any other glider competing.

But what really counts far more than the odd per cent of performance are the extremely comfortable cockpit, the superb view, the light controls, and the very great ease with which three people (ordinary, not superhuman) can rig and unrig under all conditions.

All the above is based on four competition days' flights at Bicester and may sound too enthusiastic, but the simple fact is that in this limited amount of flying I have as yet found no aspect on which I could ask for any significant improvement.

LINE VORTICES OVER THE JURA

By F. J. M FARLEY, F.Inst.P.
Aero Club de Suisse Group Vol de Geneve

PERHAPS there is something unique about the waves that form over the Jura when the wind blows strongly from the north-west. Or, perhaps it is just a more clear-cut, more extreme case of what happens usually when the wind blows over an escarpment with a sharp drop on the lee side. But whatever it is, it does not correspond to the classical picture of the lee wave, as pictured in the standard texts on Soaring: "the wind flows down the hill and bounces up again further downstream". The essential fact in the Jura wave is that over a fixed point on the map the air is going both up and down; down at low altitude, but up at high altitude with a rather sharp transition in between.

The Jura run for about 200 km. along a line roughly S.W.-N.E. at the left-hand top corner of Switzerland. If we were to approach from the N.W. at right angles to this line (blown in the wind so to speak), we should see a gently rising plateau, broken by a series of valleys and craters running S.W.-N.E. across our path. Eventually we reach the last and highest ridge from which the plateau drops down 700-1,000 metres in one steep sweep clear to the alluvial plain which runs up from Geneva through Yverdon, Neuchatel and Olten to Basel in the north. On the rare day, all too rare, when the air is stable and clear above and blows in at 20 knots or more from the sector west to north, it is over this steep lee slope that the Gold and the Diamonds can be found.

For us at Geneva, where the Jura are at their highest, 2nd August, 1964, was one of the good days and produced the effects illustrated in Fig. 1 (heights are given in metres above the plain). Seen from above, the Jura were covered by a thin sheet of stratus which flowed forward with the wind in a smooth un-

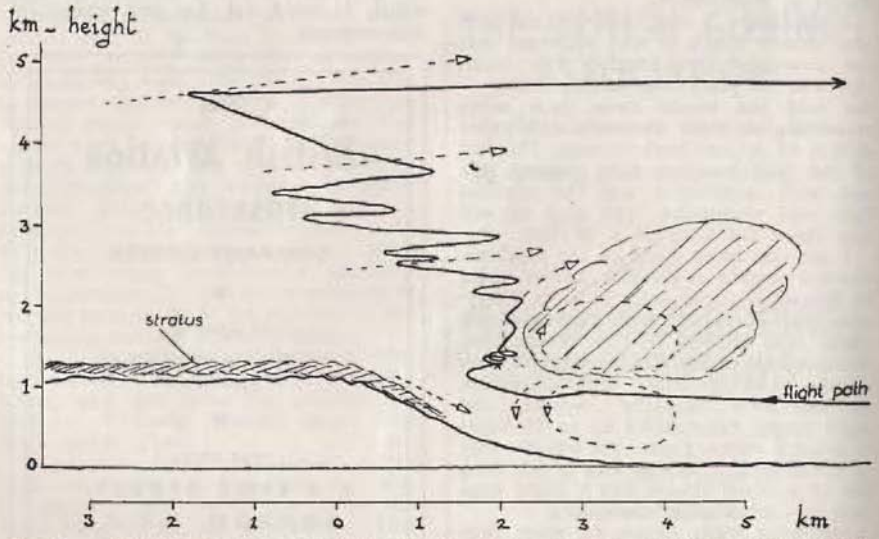


FIG. 1.—*Approximate scale drawing showing Jura plateau on left with stratus layer, vortex cloud, and flight path (solid line, X marks point of release); note that flight components perpendicular to the paper are not indicated.*

ruffled layer 1,200 metres above the plain; this shows that the flow was not perturbed by the undulations of the plateau underneath. But at the edge of the final ridge the stratus did not continue straight on, but flowed down sharply clinging close to the lee slope. (This is characteristic of the wave phenomenon here: the speed at which the clouds move down the slope looks very high and I am going to suggest that they are forced downwards and accelerated by the vortices that form downwind.) Half-way down the slope the layer was dissolving continuously, leaving an interval of clear air.

Beyond this, 1-2 km. from the drop, and stretching parallel to the ridge for hundreds of kilometers, lay an impressive rolling line of solid cloud, and parallel to this another about 10 km. downstream. Opinions are divided: some call this cloud a rotor, and some a wave. The truth seems to be that it is half-and-half, having rotor characteristics at the bottom, but looking smooth, lenticular and diffuse at the top. It is well-known that in the clear air between the cloud and the Jura there is lift, and with luck one can climb smoothly but surely, up and up to well above the cloud, where the view is spectacular and the altimeter incredible. Let me describe some observations made on such a flight, and go on to suggest speculatively an unorthodox picture of the phenomenon.

I took off at 10.30 hrs. in the group's 20-year-old Olympia (DFS-Meise), ably towed by Rolf Mossman in the Champion. The 10-km. tow from the aerodrome of La Côte on the shores of Lac Léman to the Jura went normally and we climbed well, although the air was rather turbulent. We passed under the main line of cloud perpendicularly at about 800 metres and then turned to fly along parallel to the system about half-way between the cloud and the ridge (see Fig. 1). Under the cloud I was surprised to find conditions rather smooth and steady. Then towards the far edge of the cloud, and in the clear beyond it, we encountered strong sink, the vario showing as much as −1 m/s even though we were still on tow (normal rate of climb +2 m/s).

Conditions were better nearer the ridge and we succeeded in climbing

gradually. South of the Col de la Faucille the ridge turns into a steep cliff and it is here that the best lift is often found. True to the book, as we approached this region at about 1,000 m. the vario showed that we were in lift, and after hanging on for about five seconds I pulled the release, not wishing to start too high. On my right the sea of cloud was streaming off the Jura to dissolve lower down; and two hundred metres to my left an ill-defined wall of turbulent-looking cloud with stray wisps in front towered up to the heights. I made one turn with the airbrakes out to mark the release, but felt it prudent to close them again when I saw the vario swinging into sink (in the end this hardly showed on the barograph trace).

After this, in these rather wild conditions, I was relieved to see that I was still in lift of about 0.5 m./s. To avoid losing it I circled twice just in front of the cloud, brushing against some thin wisps in the process. Then, with a little height to spare, I started to explore southwards and very gradually pulled up to a more comfortable level, 2,000 m. or so, above the plain, where I could relax and admire the view.

Up here all was smooth and calm and the Olympia flew without a tremor, trimmed to fly just above minimum sink at 65 k.p.h. Pointing only 30° off wind we remained practically stationary over the ground, and apart from the faint hissing of the air all sense of motion was lost. One floated, hands off, as if in a balloon. At this level the cloud was seen to be lenticular in form at the top, semi-transparent and very smooth and pure in outline.

Exploring both longitudinally and transversely for better lift, I found to my surprise that I had to move forward. In fact immediately above the cliff, where below me I could see the cloud streaming downwards, I was still in lift. I found this difficult to believe at first, with the result that I was often slipping back nearer to the cloud where I thought lift would be better, but it was definitely less strong. Finally, reaching a better position along the ridge where the lenticular behind me rose higher, I explored 1-2 km. upwind of the cliff edge and found no tendency for the lift to diminish. In fact here, 4,600 m. above the plain, I had my best vario reading of 1 m./s. It had taken me two hours to climb this far, and having no oxygen it seemed wise to break off the climb here at 5,000 m. a.s.l. and return to give the others a chance. (In retrospect this looks like a good opportunity missed to go higher: could it have been an effect of anoxia?)

Other machines penetrated even further upwind of the ridge at lower altitudes and still found lift. So it is clear that over the edge of the plateau the streamlines diverge: near the ridge the air is descending, but higher up it rises, and it starts to rise well ahead of the discontinuity when the cloud below is still completely flat. But, what tells the air to go up? Or if you like, how does it know that the plateau ends and the final escarpment is coming?

Searching around for an explanation, I came across this picture of a vortex pair (Fig. 2) taken from a standard text on hydrodynamics*. Here the air circulates in opposite directions around

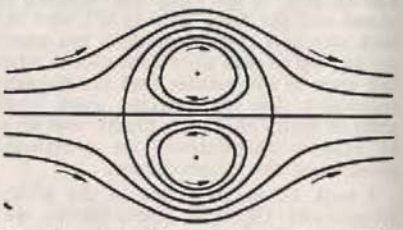


FIG. 2.—*Streamlines for a pair of line vortices (from Lamb, Hydrodynamics.)*

the two axes and the whole system is extended more or less indefinitely in length perpendicular to the paper. The two line vortices tend to attract each other, off-setting the natural tendency to dispersal, with the result that the system can persist. In still air the vortex pair advances horizontally at a speed proportional to the amount of circulation around each axis. Of course, if the airstream itself is moving in the opposite direction, the vortex pair will remain stationary in space: this is the typical situation, for example, when vortices are formed behind a stationary obstacle. The

*H. Lamb, Hydrodynamics, Dover, New York, 1954, p. 221.

oval line surrounding the two vortices is the boundary separating them from the main airstream, and the external air flows past as if it were a solid body. Thus in front of the pair is a region of almost stationary air.

The striking fact is that the streamlines in the lower part of Fig. 2 correspond very closely to the lee side of our mountains. If we add a firm boundary as shown shaded in Fig. 3, nothing in the flow will be changed (apart from an unimportant discrepancy at the lee side of the lower vortex). Adding the cloud, with lower boundary we get a picture not very different from Fig. 1. This suggests that a double line vortex is in fact formed in the lee of the Jura, and I have sketched in (dashed lines) some possible flow lines to show how this might look.

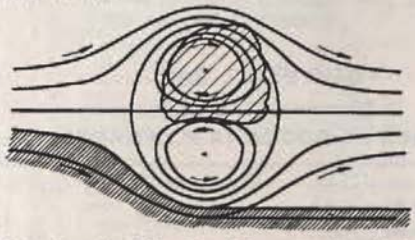


FIG. 3.—*As Fig. 2 with ground added, plus a tentative vortex cloud.*

In broad outline the correspondence between this picture and the observations is excellent, the main features being the following:

(i) lift at high altitude well forward of the plateau edge;
(ii) calm conditions under the cloud with strong sink at the upwind edge at low altitude;
(iii) sharp transition from sink to lift on passing an altitude roughly equal to the ridge height;
(iv) the pressing down of the stratus cloud layer against the descending slope, and its apparent acceleration;
(v) no horizontal wind at the point of release, possibility to circle without being drifted into the cloud.

It would be good to search in future flights for other features of this model which have not so far been confirmed: in particular for further evidence of the lower vortex. For example, the picture suggests lift at low altitudes below the lee edge of the cloud. Also, a reverse flow of air horizontally towards the hill should exist at cloud base. At ground level under the cloud the wind should be away from the ridge: compare the single vortex picture which requires a ground wind towards the ridge.

In summary, I suggest that the Jura "wave" phenomenon is typically not the classical oscillatory wave with lenticulars above and possibly a roll could below. Instead it consists of a pair of line vortices rotating in opposite directions. The secondary line of cloud, 10 km. or so downstream, may be a secondary vortex pair induced by the first, or it may be an oscillation of more classical type.

The rather clearly defined transition in the Jura from plateau to plain undoubtedly accentuates the features I have described. But it may be that the double vortex plays a rôle in other wave effects. I have heard that a steep lee slope is an important factor in triggering a wave, while the upwind contour is comparatively unimportant. This suggests that the Jura double vortex may in fact be more widespread than we have so far suspected.

Appendix

Meteorological data for 2.8.65

Altitude	*Wind*		*Temp.*
m. a.s.l.	*knots*	*dir'n.*	*°C*
500 (ground)	10-20	270	—
1500	25	280	+11
3000	30	290	+3
5500	40	310	−10
9000	60	320	−37

(The Jura ridge runs approximately at 40°.)

INTER-SERVICES AND R.A.F. COMPETITION
16—25 April

THIS, the largest contest ever organized by the R.A.F., served also as a rehearsal for the World Champs flying organization. After four days of too little lift or too much wind, contest flying began. League 1 tasks and winners: 21st, triangle via S. Cerney-Lasham (not completed), Delafield; 22nd, free distance, Spottiswood; 23rd, free distance, Delafield; 24th, race to Swinderby, Goodhart.

League 2 pilots all flew the Olympia 2B type. Their tasks and winners were: 21st, free distance, Payne; 23rd, free distance, Bailey; 24th, line through Swinderby, Payne.

Air Marshal Sir Patrick Dunn opened the meeting, and Air Vice-Marshal C. J. R. Salmon presented the prizes at the concluding ceremony.

Final results, League 1

Order	*Pilot*	*Sailplane*	*Contest Day and Date* 21st 1	22nd 2	23rd 3	24th 4	*Total Points*
1.	H. C. N. Goodhart	Dart 17	93	639	861	1000	2593
2.	I. P. Goldney	Skylark 3F	49	654	706	813	2222
3.	J. Delafield	Ka-6	214	607	1000	342	2163
4.=	N. W. Kearon	Olympia 419	72	297	836	788	1993
4.=	D. F. Holding	Skylark 4	0	473	824	696	1993
6.	J. S. Williamson	Olympia 419	100	33	959	869	1961
7.	I. W. Strachan	Skylark 4	87	431	616	818	1952
8.	D. Spottiswood	Skylark 4	30	728	496	674	1928
9.	C. M. Greaves	Olympia 463	13	16	807	806	1642
10.	E. Stark	Dart 17	0	0	797	828	1625
11.	J. G. Croshaw	Skylark 3B	49	633	32	839	1553
12.	R. A. E. Dunn	Skylark 4	49	633	409	424	1515
13.	D. C. Austin	Olympia 463	27	591	403	410	1431
14.	J. A. Evans	Olympia 419	49	0	702	659	1410
15.	A. J. Deane-Drummond	Olympia 465	0	0	507	836	1337
16.	M. Seth-Smith	Olympia 463	72	486	635	99	1292
17.	F. W. L. Shepard	Skylark 3F	22	522	700	0	1244
18.	J. Stanley	Skylark 4	0	0	836	368	1205
19.	A. Somerville and J. H. Wheeler	Olympia 463	0 —	0 —	— 560	— 601	1161
20.	A. W. Gough	Ka-6	15	222	0	758	995
21.	G. Barrell	Ka-6	0	21	472	443	936
22.	A. S. Loveland	Olympia 463	13	21	0	804	838
23.	C. Dorman	Skylark 3B	0	0	472	202	674
24.	P. Williams	Skylark 2	46	0	364	175	585
25.	D. J. Marpole	Skylark 2	0	0	0	284	284
26.	N. A. Wilkinson	Olympia 463	0	0	0	166	166
27.	A. Alty	Skylark 2	0	0	5	130	135
28.	D. H. Scarfe and J. H. Welsh	Olympia 463	0	0	0	0	0
29.	B. Gunter	Skylark 3B	0	retired			
Hors Concours							
8+	P. A. Wills	Skylark 4	31	911	0	887	1829
11+	G. E. Burton	Dart 15	49	534	0	933	1516
24+	T. Evans	Ka-6	0	19	275	—	294

Awards and Winners

Emmott Trophy to Inter-Service Individual Champion: N. Goodhart.

Roderick Salmon Trophy to Inter-Service Team Champions: R.A.F. team — J. Delafield, N. W. Kearon, J. Williamson. R. Navy 2nd, Army 3rd.

McEvoy Trophy to R.A.F. Individual Champion: J. Delafield.

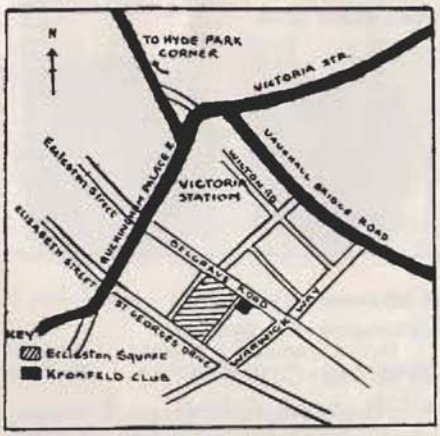
Inter-Command Winners: Bomber Cmd. team — I. H. Payne, I. W. Strachan.

Tinsley Trophy to League 2 Winner: I. H. Payne (daily av. 976 pts.); 2nd, Bailey; 3rd, Barratt.

THE KRONFELD CLUB—The first ten years

NOW that the Club is ten years old, it has been suggested that the reasons for its founding and some of the pains surrounding its birth should be committed to paper before the memories of the more elderly members deteriorate any further.

For some years, those members of the Surrey Club who lived in London had felt that it would be a nice idea to have a room in London where members could meet during the week to discuss gliding — though looking back, one would think one saw enough of one's fellow members at weekends to be thankful for a more peaceful non-gliding atmosphere during the week. However, in January, 1955, one of the Surrey members was walking through Eccleston Square on his way to view a residential flat, when he mentioned casually to the landlord's agent who was with him that it was a pity that the landlord did not have a single room to let which members of his gliding club could use. The member was slightly taken aback when the agent replied that there was a derelict basement flat belonging to the same owner at 74 Eccleston Square, which had been empty for 2½ years due to a closure order. This was inspected and, as it was obviously too large for any one club to run, the idea of it being a London centre for people interested in gliding and light aircraft flying was conceived.



HOW TO GET THERE

Members of other clubs around London were approached, all of whom appreciated the possibilities and felt that their club members would support such a venture, the various local and public health authorities were contacted to find out their requirements and planning permission for change of user was applied for and granted on the 31st March, 1955, so an inaugural meeting was called for the 3rd May, 1955.

This was attended by representatives from the British Gliding Association, Poplar Flying Association and the Biggin Hill, Imperial College, London, Scottish, Southdown and Surrey Gliding Clubs, and after discussion it was decided to go ahead. A Secretary was elected, and even more important, a representative to look after the bar. On behalf of the B.G.A. and the P.F.A. it was stated that although they could not commit their Associations officially they would give all the support they could.

Then started the hard work. What seemed like acres of plaster were hacked out and re-rendered in waterproof cement, the old plaster mostly disappearing below the floorboards in the same way that the housewife will sweep dust under a carpet. The premises were re-wired, redecorated, furniture bought and a contemporary bar built in one of the three rooms and in November, 1955, the Club held its first Wednesday talk.

From then on, although the activities of the Club centred round the regular Wednesday night talks or films, other events were considered, and in November, 1958, the Club held its first Annual Aviation Art Exhibition and Competition and its first Annual Dinner and Dance. Both these events have gone from strength to strength, particularly the former, which is the only competition of its kind in the world.

Similarly with most gliding clubs, security of tenure was not too certain and when, in March, 1962, the Club's lease came to an end, the possibility of moving to other premises or amalga-

mating with another aviation body was considered, but fortunately the new landlords, who had bought out the previous owners, were prepared to offer the Club a lease of over 80 years provided suitable alterations were made to the Club so that it could, if necessary, be used once more as a residential flat.

A Special General Meeting was called at which the whole position was put to members and in spite of one member who stated that, "He would prefer the Club to stay small. Everyone knows everyone else and 'we like the slight mess'," it was agreed that the long lease should be purchased, the alterations carried out and the Club completely redecorated. Thanks to the generosity of members and other friends of the Kronfeld Club, sufficient was raised for the alterations and redecorations and the Club's bank agreed to advance enough for the lease, so the Kronfeld is now in the fortunate position of having security of tenure, together with a smart modern decor.

It is probably true to say that as an organisation catering for anyone interested in sporting gliding and flying, it is unique in the world and in its tenth year the Kronfeld is extremely pleased to offer membership free to the pilots and teams from abroad visiting England for the 1965 World Gliding Championships.

HUGO TROTTER

AVIATION ART

By DAVID SHEPHERD

The author, a member of the Industrial Artists Group and a well-known landscape and animal painter, has often judged the Kronfeld Art Competition.

THAT this is a very specialized form of art is obvious to anyone who has tried to do it. But it is none the less stimulating and enjoyable for all that.

Most important of all, I think, is that the artist must have a feeling for his subject. This, of course, applies to any field of painting whether it be portraits, landscapes, or machinery. The business of bringing "life" into a painting of any "man-made" object is doubly hard unless the artist can feel that, to him, the machine "lives". If the person looking at the painting feels the same thing, then the artist can be justifiably pleased. If the artist does not have this feeling, it is better left to the photographer; the result, then, is a purely factual analysis, no more, no less.

It is therefore up to the artist to go further than the photographer. This may well be achieved, however, by knowing what to leave out rather than by putting in "the lot". This, to my mind, is half the secret. Leave something to the imagination — suggest, by implication, that all the windows are in the fuselage instead of laboriously painting each one of them, which will make it look like a coloured photograph.

The other problem in painting aircraft is, of course, that there is no easy, tangible way of showing that they are moving. One has no easy way as with locomotives making smoke, or ships' bow waves. In any case one is to assume that if one is looking at an aircraft, you, and the person looking at the painting, are in another one flying along with it. Therefore it won't look as though it's moving! Nevertheless some way must be found to avoid it looking dead. One cannot, one may well think, paint air.

Now obviously every self-respecting artist has his own idea on how it should be done. This is as it should be. For my part I believe that a feeling of the aircraft being in its element, moving from one bit of air to another, can be achieved, first by, as I said earlier, knowing what to leave out. Secondly, it is a question of subtlety. This can best be illustrated in the simple, unquestionable point of "3D". If an aeroplane is painted in the three-quarter view coming out of the canvas, so to speak, then the tail must obviously not be painted so strongly as the nose. It is surprising how many amateurs slip up on this point, and then wonder why their result looks flat. It is really a simple question of colour "tones", strength of colour, recession — call it what you will. But obviously if the darks in the tail are painted as dark as the darks in the nose, the nose will fail to look nearer to you and all sense of movement will be lost.

This last point can also be carried into the rest of the painting. The darks in the landscape, or clouds, below must not be painted as strongly as any of those in the aircraft.

Decide on the overall composition of the picture before starting, and bear in mind that everything, apart from the aeroplane, can still play a part. You, the artist, have it easy in many ways over the photographer. The artist can put his clouds, fields, coastlines just where he wishes so that they all play a vital part in leading your eye to the central interest, which must be decided beforehand. Decide what you are painting, keep it simple, and make everything else subservient to it. Do not try to paint everything, which will only confuse the onlooker.

Above everything else, enjoy what you are painting. Something seems to be going out of our lives these days, with everything around us getting more and more functional and scientific. It is up to us as artists to see in these things more than just a "hunk of metal": to try to convey in paint the spirit, atmosphere and feeling of these machines to those less fortunate among us who only see them as inanimate objects. In this sense one could say we have a duty. But most important is that it must be fun doing it. I only have to drive under a bridge when a begrimed, smoke-belching locomotive roars overhead to lose all thought of driving for a second or two. Similar thoughts are conjured up at the sound of merlins. I do hope you feel as I do.

EASTER AT LONG MYND

TWENTY-TWO competitors were off to a good start on Good Friday with a race to Lasham, which was reached by five. Mick Kaye in his Dart made it in 2 h. 30 m. and Ric Prestwich in Skylark 4 in 2 h. 31 m., but as the timing was not considered accurate to within a minute they were bracketed first. Brian Jefferson (Skylark 3G) took 2 h. 55 m., Ron Rutherford (Skylark 4) 2 h. 58 m. (encountering two waves), and Ivor Shattock (South Wales' Skylark 2) 3 h. 45 m. John Brenner (Olympia) missed the goal by 4 miles. Michael Armstrong (Olympia 460) saw a burning, glowing and smoking ammunition dump at Welford but all it gave him was 6 knots down; armed Americans sprang from the ground as he landed.

A westerly gale on Saturday was unsafe for field landings but safe for hovering flights over the Mynd.

Sunday's task was downwind to Long Marston, near Stratford-on-Avon, then distance S.W. along a line through Nympsfield. Only Mick Kaye and Tony Adams (Olympia 460) got beyond the turning-point, and Tony won by virtue of 10% handicap bonus. These two made their into-wind legs by hopping from slope to slope along the Cotswolds.

Monday's wind was nearly as strong from N.N.W., and by the time the weather allowed a task to be set, it would have taken too long to rig all the gliders one-at-a-time in the lee of the hangar — the only safe place. But Mike Randall, a non-competitor, borrowed Keith Mansell's Dart and flew to Nympsfield.

Distance along a line through Lasham was set for Tuesday, but lift under an overcast sky was too weak for anyone to try it.

Leading final results, being the sum of two days' placings according to C. E. Wallington's scoring system, were: M. Kaye, 3; R. Rutherford, 6; I. Shattock, 8; R. Prestwich and S. Wills, also 8; M. Armstrong, 10.

Entrants from the various clubs were: Midland, 8; Derbyshire and Lancashire, 5; Kent, 3; Scottish G.U., 2; Coventry, 2; South Wales, 1; Lasham, 1.

A. E. S.

THE EFFECT OF WIND ON A 100-Km. TRIANGLE

By NICHOLAS GOODHART

IN flying a 100-km. triangle, the wind direction has more effect than the wind strength on the speed achieved round the course.

In order to see the effect of wind direction, consider an equilateral triangle with sides of 18 nautical miles, which is being flown in thermals averaging 3 knots achieved rate of climb.

Assume the performance of the glider is such that it has a best inter-thermal speed of 60 knots for achieved rate of climb of 3 knots, giving an achieved cross-country speed of 33 knots. At 60 knots the glide ratio is 1:24.

NO WIND.—In no wind the task can be considered as a steady cross-country flight at start-line crossing height (3,281 ft.) followed by a final glide at 60 knots. The final glide will be:

$$\frac{24 \times 3281}{6080} = 13 \text{ miles long}$$

The total time for the flight will then be:—

$$\frac{54-13}{33} + \frac{13}{60} = 1.46 \text{ hours.}$$

FINAL LEG DOWNWIND.—When there is wind the direction must be specified. Consider first the case in which there is a 10 knot wind and the course is flown so that the final leg is directly downwind.

The first two legs can be considered together as each is flown with the wind at 60° to the track. The achieved average speed over the ground is 26.8 knots.

On the final leg the ground speed is 43 knots until final glide is started when it becomes 70 knots. Final glide ratio is now 1:28 over the ground. Thus distance on final glide is:

$$\frac{3281 \times 28}{6080} = 15.1 \text{ miles.}$$

Total time for the triangle is therefore:

$$\frac{36}{26.8} + \frac{2.9}{43} + \frac{15.1}{70} = 1.63 \text{ hours.}$$

FINAL LEG UPWIND.—The ground speeds in this case are as follows:

First two legs - - -	36.8 knots
Last leg before final glide	23 knots
Final glide - - - -	50 knots

Final glide ratio is 1:20 over the ground, thus final glide distance is:

$$\frac{3281 \times 20}{6080} = 10.8 \text{ miles}$$

Total time for the triangle is therefore:

$$\frac{36}{36.8} + \frac{7.2}{23} + \frac{10.8}{50} = 1.51 \text{ hours}$$

CONCLUSION.—From the three times for the triangle it can be seen that, provided the triangle is flown with the last leg into wind, the effect of 10 knots of wind is only to increase the time taken by 0.05 hours, i.e. 3 mins.; but if the triangle is flown with the last leg downwind the effect is to increase the time taken by 0.17 hours or just over 10 mins.

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TURN HEIGHT.—Anyone who has followed the argument this far will have observed that the whole thing is based on a nonsense. If one has choice of direction of the last leg relative to the wind, the implication is that the triangle is not a task in a competition but simply one that one has selected oneself in order to try and beat a record. Under these circumstances the rules do not require that turning points be passed at 3,281 ft. (or below). Any height will do provided one can convince the Flying Committee that a correct turn actually was made.

Now assume that it is a splendid day with thermals going up to any height required. Consider the 10-knot wind case with last leg upwind. The best height to turn is that height at which the last leg is all final glide. This height will be:

$$\frac{18 \times 6080}{20} = 5470 \text{ ft.}$$

Thus on the outward two legs we must gain an additional 2,189 ft. at 3 knots, this will take 7.2 mins., and during this time we are drifted 0.6 miles along track. We are also drifted 1.0 miles across track and this cuts down the over-the-ground speed for the "level cruise" to 36.6 knots.

Thus total time now becomes:

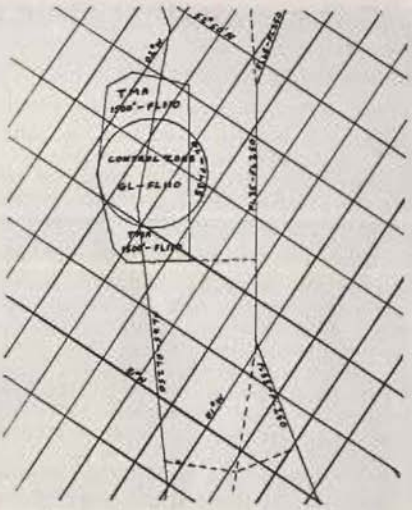
$$0.12 + \frac{35.4}{36.6} + \frac{18}{50} = 1.44 \text{ hours.}$$

In other words, by going the right way round a triangle and by turning high at the last turning-point it is possible to turn 10 knots of wind to a slight advantage. The optimum wind is around 7 knots, in which case the advantage is nearly 3% over the no-wind achieved speed.

CONTROLLED AIRSPACE CHANGES

THE following changes to controlled airspace have been made since the state of affairs shown on last year's maps:—

AMBER ONE has been extended in width as shown in the diagram. The point at which the base steps from



3,000 ft. to FL45 just south of Bicester has been moved 2 miles back towards the London TMA.

BIRMINGHAM CONTROL ZONE AND TERMINAL AREA. As from June 3rd it is intended to introduce a revised Birmingham Area as shown in the diagram. The cylindrical control zone will be a special rules zone which can only be entered with radio permission from Birmingham. It is in effect therefore totally prohibited to gliders at all times.

BLUE ONE east of the Manchester TMA. The section with a base level of FL50 is extended eastwards to a point 23 nautical miles from the TMA boundary. From this point onwards to the east the airway base is FL75.

HIGH INTENSITY RADAR AT MALVERN. This is not airspace information but is of interest. In position 52° 08′ 00″ N, 02° 20′ 05″ W, there is a high-powered research radar which can be a hazard to pilots. Below 6,500 ft. in the immediate area of the transmitter the intensity is such that it could be injurious to health to remain in the area for more than one minute.

The aerial is 140 ft. in diameter and clearly visible from the air; pilots are advised to keep at least 500 yards clear.

H. C. N. GOODHART,
Chairman, Airspace Committee

" Cut me another slice please, mother! "

By ANDREW THORBURN

WHILE soaring from time to time, peacefully, at heights above ten thousand feet, the aching emptiness of the sky above central Scotland brings home to one some of the emotions that must beset man while travelling in space.

Often, no task having been set, the aim of the flight is merely to enjoy Nature's abundant gift of aerial support, found over and in the lee of the Scottish mountains. Adjust the trim, choose a course to maintain track along the wave of rising air, and then the mind, relieved of thoughts technical, is free to ponder over the endless infinity of space.

Far below, planes with engines shuttle to and fro as weekend pilots and fare-paying passengers are violently thrust through the lower reaches of the sky. Down, and four miles east of Portmoak, a twin-engined speck of silver suddenly ejects a flowering rash of parachutes. The Skyjumpers' Club are practising over the new Glenrothes airstrip — but they too are down — and going further down — not up, as we are.

The mind is drawn from the creeping things beneath by the even song of the hovering sailplane as it gently rides the silk-smooth waves. In all directions the surrounding landscape is concealed by undulating clouds, leaving only the gap below through which to maintain contact with places known. Here and there some five thousand feet further up are a few soft lenticular cloud forms, awaiting the man with oxygen-breathing equipment to challenge them. Without this life-preserving substance we edge gently out of the lift, when the altimeter indicates about fourteen thousand feet. And so such flights in solitude pass, leaving us happy to have claimed as our own the few hundred cubic miles of space that few can attain, or even want.

Not so, however, on Sunday, 14th February. Casting loose from the Tiger at two-and-a-half thousand over Glenfarg, a quick search through the canopy of the 460 revealed Ian Dandie flying the Skylark 2B which had been towed up just before me. He could be seen poised in front of the wave cloud overhead. Settling down head-into-wind, showing air speed 45 kts., the vario confirmed the wave area by indicating a climb of 5 kts., and before long the

Westwards at 80 *knots along the Forth Valley; altitude* 10,000 *feet.*

Meeting another "460" at 12,000 feet, between the cloud layers.
(Photographs by Andrew Thorburn.)

cloud was sinking astern.

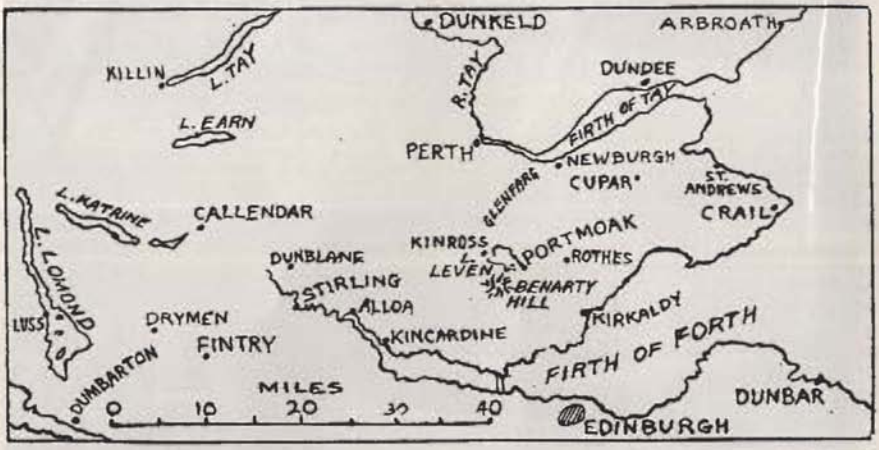
Soon we were flying in formation at the pre-arranged rendezvous eight thousand feet over Newburgh. Poised alongside each other, cameras busily clicking, there was time to reflect upon the pleasures of companionship in such an empty void. Moving eastwards in formation along the river Tay and at 12,000 feet above it one could at least claim half of the sky on this occasion — or could one? What was that speck high and ahead? A jet? No — the Skylark 4 — must be Roger Mann, cuddling his oxygen bottle and on what turned out to be a successful quest for a Diamond height at 19,000 feet. And now, down below, the front of the wave cloud began to erupt gliders with monotonous regularity as they cast off from aerotow and climbed up into the sunshine.

Number four on the scene was the Swallow flown by Gordon Downes, who later landed south of Dunbar, some fifty miles away. Then Bill Lawson in his 460 came up to join us and the Fife Schools' T-49 piloted by Jim O'Donnell moved rapidly across the clear space below at about ten thousand feet. The Ka-7, wingtips reaching forward, wafted upwards and moved off into the west. The club Olympia 2B with seventeen-year-old Douglas Mackay — one of the Fife School pupils — floated up among the others and he landed later at Crail for his Silver.

The Moonrakers, who had chosen the right time to visit us on a wave safari, bobbed their glider with the R.A.F. roundels up and down among the rest. A new touch of colour came into view as the Vasama, in tones of sky blue, streaked about at high speed, its pilot, Tom Paterson, eventually landing at Lanark for his Silver badge.

The Weihe and the Skylark 3B, both with several pilots taking turns, were employed in this yo-yo act and before long the sky north of Portmoak, between ten and fourteen thousand feet up, supported what looked like a swat of flies just after a spring hatching.

By now the formating 460 and Skylark 2B were at thirteen-and-a-half thousand, just entering a layer of haze in front of a higher lenticular. The canopy of my glider completely coated over with ice crystals, so that keeping the Skylark in view through the clear-vision window was quite a task. The sub-zero temperature soon turned pleasure into pain, and so with a wobble of the wings to the



other glider I dived away down wind to the ten thousand feet level, where things were a good deal more comfortable.

I reached this altitude and spotted the Forth road and rail bridges some twenty miles south of the overcrowded scene I had just left. From here it seemed that an out-and-return trip of about 150 km. would be an interesting thing to do, so, settling down with 80 kts. on the clock and ½ kt. up on the vario, I worked along the uplift side of a wave cloud below me, which as it turned out took me all the way across central Scotland to Loch Lomond and back.

En route various points of interest were photographed — Kincardine Bridge, Alloa breweries, the windings of the river Forth at Stirling, Charlie Ross's caravan site at Fintry, the south end of Loch Lomond, Dunblane, where we have a new winch under construction, and so on.

On the homeward flight over Charlie's caravans, I met that man himself in the Skylark 3B. We were both steaming along at 80 kts. and our closing speed must have been in the region of 200 m.p.h. He was doing the same out-and-return trip.

Fifteen miles from home the airbrakes and downdraughts were used to get down to a more civilised level just below cloud, and when I landed back at Portmoak — a human icicle — I had been airborne for about two-and-a-half hours. The trip to Loch Lomond and back, however, took only a little over half of that time — making a speed of around 75 m.p.h. for the 150-km. out-and-return.

I keep hearing about some French place called Fayence and another site in Italy that has flying conditions along a valley only fit for Hell's Angels — but what is wrong with spending a holiday high up among the Scottish "burds" — O ye men from south of the Border? This is the place to chase "polars" — we have the climate here!

As for me, next time I intend to snuggle an oxygen bottle with me and stack myself at an even higher level — the middle reaches between ten and fourteen thousand are becoming overcrowded.

OVER THE CLOUDS THE SKY IS BLUE

BY IB BRAES

Showing that even a no-contest day can produce exciting experiences. This flight was made during the 1963 World Gliding Championships in Argentina.

THOUGH not superstitious, it was not without a touch of excitement we went to briefing at eleven o'clock on the 13th February. At the time the weather was already developing for something big. Cumulus clouds shot briskly up, and a fresh wind was blowing from the north. What was the task to be?

The unveilment soon came: out-and-return flight to "9 de Julio", an aerodrome 82½ km. due south of Laguna de Gomez.

The meteorologist promised cumulo-nimbus rising up to 25,000 ft. during the afternoon. In addition he blessed us with a northerly wind of about 20 kt. at 4,000 ft. (cloudbase) *increasing* to about 40-50 kt. at 25,000 ft. as a jet-stream was hanging over the district. The start-line was open from 12.30. It all sounded very exciting, and — bet your life — it became so!

When we came out from the briefing room it was evident that the weather was developing quicker than anticipated, so most of the pilots got very busy in preparing for take-off.

At about 12.30 the clouds had laid themselves in long 15,000 ft. high cloud streets, or rather fronts, stretching almost parallel in the direction of the course. One front (I) was lying about 10-15 km. east of the course; the other visible front (II) was situated just west of the course; between the two fronts was a spreading of cumulus activity. Moreover it was clear that the fronts were rolling slowly eastward.

I got well over the start-line at 13.48, and with the strong tailwind it was not long before I reached Front II, which by now had rolled into the line of the course. The situation was now far from promising: in front of me it was raining and no sun was visible, neither forward nor to either side of the front diagonals — in other words, this big area of the Front II was apparently collapsing.

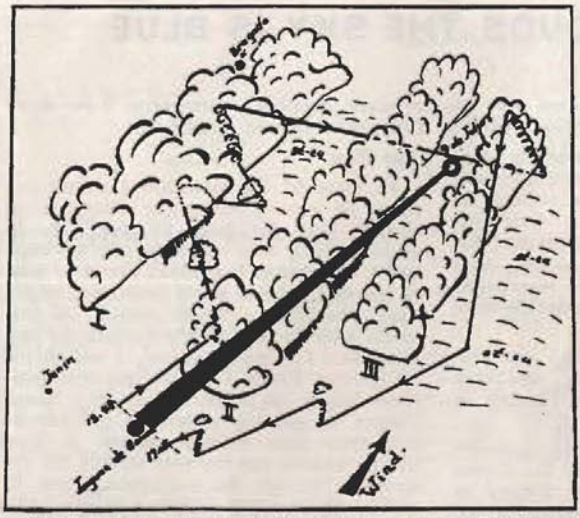
The Plan

In view of the situation I dared not carry on exactly along the course, even though with my good altitude I could glide a long way towards the turning-point. But Front I, situated about 15 km. to the east, looked much healthier; moreover, there were small cumuli on the direct way to it. Quickly I made up my mind and formed the plan: I would try to contact Front I at the greatest possible height in order to have a good chance of gaining access to the cloud-lift, then gain enough height in this lift to enable me in one stretch to fly straight through the collapsed Front II and so arrive at the turning-point at the prescribed maximum height of 1,000 metres.

It was a very exciting decision, because from the view of earning points it was very dangerous to divert from the course; on the other hand, I should not earn many points by gliding down and landing in the vicinity of the turning-point.

So, round with the "bus" — or more correctly, the Ka-6 (Rhönsegler) — and away to the nearest good-looking cumulus 5-6 km. to the east. Here was 1-2 m./sec. and I climbed as high as I could in order to have a good chance of attacking Front I. From this height I had — as I thought — a very good view of the situation, and consequently I dived into the side of the nearest cumulo-nimbus.

Never, never in my life have I experienced such a downfall. It simply rained "cats and dogs" — and how it hailed too! The water ran down the inner side of the cockpit as though a tap had been turned on. I began to feel seriously uneasy as to whether the Rhönsegler was going to "sink". But in fact the variometer was only showing ½m. sink, so I carried on, hoping to find some lift somewhere. But oh, how it rained — at the time I sent Noah and his Ark a sympathetic thought!



From the starting-point, left bottom corner, the direction of flight goes diagonally to the right. Front II barred the way, so Braes got enough height in Front III to pass the turning-point, and in Front III to cover most of the way homeward.

At length I got out of the bottom of the cloud, and as the variometer was still pessimistic, I — crestfallen — again had to go out to the west, where the sun was still shining.

Nervously my altitude disappeared to about 800 m. before my spirits once more rose in accordance with the altimeter after a call at a little cumulus.

At it again! — and the next cumulonimbus, a little farther south, got an unexpected visit — and this time I was much more lucky: with typical Argentine hospitality the "clock" showed 4 m/s. I found myself about 15 km. north-west of the town of Bragado, and before I reached the base, I worked out my course, speed, and height to reach the turning-point at an altitude of 1,000 m. At that time I was about 55 km. from the turning-point, so I had to climb to a height of about 4,000 m.

Blind to the Turning-point

With the lift averaging 8 to 10 m/s. it went quite nicely, and at 4,300 m. I corrected the course, 260°, and speed 135 km./h., and soon I came out into the loveliest sunshine. I had no ice formation as freezing level was about 4,500 m., but nevertheless it was necessary to fly on the compass, because I had no ground visibility on account of a fine white sheet of strato-cumulus originating from the collapsed Front II that stretched out like a high wall about 20 km. in front of me.

At a height of about 2,000 m. I met Front II. It was only a little turbulent, yet I got a single lift that sent me up 300 m. in straight flight (see barogram).

Well, I had now been flying on instruments for nearly 40 minutes. The last time I saw the ground, I was 55 km. from the turning-point, and the last 25 minutes I had been flying at a speed of 135 km./h. almost at right angles to a strong wind of perhaps 30 kt. average. Accordingly — and will anyone blame me for the thought — I was very anxious to get under cloud base and see where I was!

If everything was O.K., I ought to be near the turning-point in five minutes.

Suddenly, at a height of 1,300 m. I had passed Front II, and . . . came out to the most beautiful sight and the greatest gliding experience I ever had . . . In front of me — right on my course — and about 7-8 km. away, lay 9 de Julio's aerodrome, and under me the landscape resembled a veritable battlefield of fallen gliders — it demanded quite a lot of self-control not to become "silly" at that moment!

I rounded the turning-point at 15 hrs. at the required height of 1,000 m., but though the turning-point lay in the sun,

the air here was absolutely dead after the violent rainfall from Front II that had passed. On the other hand, another front (III) came rolling along about 10 km. to the west. The front was just about to hide the sun again; but under it, farther out to the west, I could see that the sun was shining again. Here was my real chance! I realised that the only possibility of getting home in the strong headwind was again to go out west seeking for contact with the coming Front III, and staying high. So once more at right angles to the course!

Soon I was beneath Front III heading west for a tiny little spot of sunshine; but — down and down I went, 400 m.-350 m., and under me, on the ground, lay "meine liebe kollega" Nietlispach — it was far from an inspiring sight.

Diamond Altitude reached

Then suddenly, at 330 m., there it was — 1 metre. In a moment I had got 3 m./s. out of the thermal, and Nietlispach was getting smaller and smaller — I must confess — in a very pleasant and delightful way! At 1,200 m. I reached the base at a rate of 4 m./sec., steadily rising in the cloud. Now the variometers got busy: 5, 6, 7, 8, 9, 10 — 15 m./sec. Soon they ran themselves off the top, and I heard the voice almost breaking in the Crossfell "squeak" variometer.

The thermal was fairly calm with no problems. I was climbing at a constant airspeed of 80 km./h. Only the altimeter's activity convinced me that I was going up in a so-called "howling Argentine storm" with a vertical speed of perhaps 60 km./h. or more.

At 5,000 m. I got anxious about the oxygen apparatus as I did not think it gave enough oxygen. I therefore examined the tubing to see if a knot had developed! It was not the case, so I decided, although I really felt in quite normal condition, to leave the cloud.

It is worth notice that while I had been examining the oxygen apparatus I had climbed 800 m. to a total height of 5,840 m. — the Diamond was — what I did not realise at that moment — home: hip, hip, hurrah!

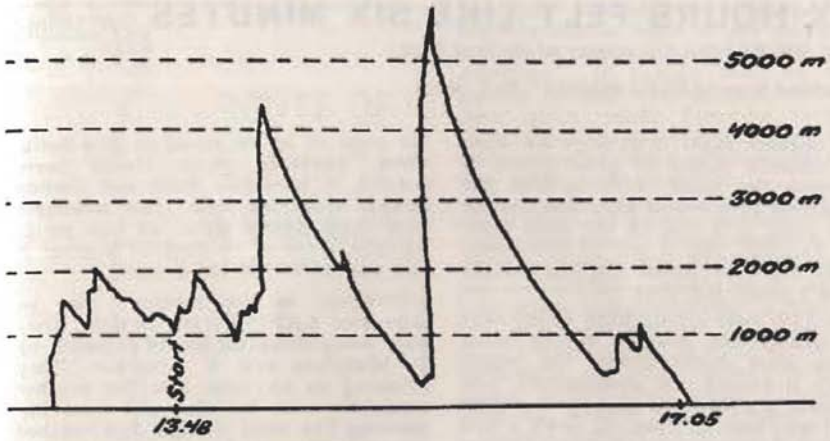
Where No Birds Fly

I straightened up on a course of 320° and was now on my way homeward on my absolutely best glide ratio, i.e., about 110 km./h.

Gradually I began to be a little impressed by the size of the cloud system in which I was flying, because, after 10 minutes' straight flight, I still had to fly on my instruments. Suddenly it struck me — over-icing of the hood! And indeed, when I opened the window, I was flying in the brightest sunshine and had evidently done so for some time.

Curious, I turned my glider a little to the right, and from my tiny world in the cockpit I looked out through the panel and was witness to a most fantastic view. Indeed, it was microcosmos against macrocosmos, a constellation whose proportion sometimes is unrealised by many of us so-called civilized human beings.

The cold front, which I had left, stood just in front of me like a big snow-covered mountain-massif — pure white, with an almost vertical wall going down, down — 4,000 m., I think — reaching the snowy carpet of a layer of stratocumulus, which totally covered the earth. Above me the wall was still ris-



Alt Min. 330 m

Alt. Max. 5840 m 5510 m

13 - Feb. - 63

Pilot J. Braes

ing about 2-3,000 m., demonstrating the great power of these giants of the clouds. It was easy to guess that the weather beneath the front was frightful, but it was not my problem — I had no problem at all. I flew in a smooth world of beauty, created by those wonderful clouds, and crowned by a sky as blue as you have ever seen. It was a marvellous adventure, and I began to understand the fascinating feeling the mountaineer has when, after troublesome efforts, he plants his ice-axe on the peak of the mountain.

In this environment I flew almost an hour on a steady course of 320°.

To the Hard Facts again . . .

At about 1,300 m. I came out of the strato-cumulus layer. Now I was able to orient myself a little, whereupon the hard troubles of reality again made their entry in my cockpit!

The dead-headwind had only given me a glide-ratio of 1:10 and there was still 30 km. left to reach Laguna de Gomez! Again the conditions seemed to be better to the west, where small cumulus about 10-15 km. away were forming in the sunshine, free of strato-cumulus. I reached the area at about 500 m. and after careful searching I found a good thermal of 2-3 m./sec. Here in the late afternoon the wind had weakened a little, so after a happy meeting with two thermals to near the base (1,300 m.) I could pass the finishing line at 17.05 with 160 km./h. on the clock.

My arrival was not very exceptional, because many of the pilots already had been retrieved by aero-tow. Most people thought I was joking at the finishing line! Later on, when they told me that I was the only one who had fulfilled the task, I thought that they in reverse were joking at me! But nevertheless, so it was, and the joy was naturally great in the Danish camp.

How things finally turned out, with cancellation of the contest, was the last hard fact of the day. Well, what do you think? Ought I really to be superstitious in future? Was the 13th February really an unlucky day?

No, it was the day of all time! Today there is only one thing I am annoyed at, and it is that we at the evening party in the restaurant did *not* get the third bottle of champagne uncorked, because, as Cowboy said: "What an infernal noise when the cork bangs on the six-metre high tin roof!"

SIX HOURS FELT LIKE SIX MINUTES

By V. BELYAKOV *(Sportsman of the First Rank)*

Translated from "KRILYA RODINY" by C. Wills

A distance flight is perhaps the most romantic dream of glider pilots. It combines the thrill of flying with the fascination of a tourist excursion. At the same time, it is one of the most complex exercises and a test of endurance. I will tell you about one such flight which I made last year.

On 13th June a cold front rolled over our airfield, and, because of this, some of us slept badly during the night. Firstly it excited our imaginations, and secondly, a cold front night is a plague to all who wish to sleep. At dawn it was freezing. I turned over and over below my blankets and I began to have nightmares. I dreamed of a night in a field and a glider, silvery with dew, which seemed to shiver likewise in the cold.

Putting it briefly: on the morning of 14th June I very nearly ignored the cold front. However, this mood disappeared in the twinkling of an eye when we rushed out from our tents. From horizon to horizon, the sky was so clean that it might have been wiped with a damp rag. A light wind was blowing, and before our eyes went the first, still ragged, cumuli. What glider pilot could remain indifferent to this sight? A feeling of joyful excitement developed among the waiting sportsmen, which became still greater when it was read on the briefing board that some of us would try for distance.

All through the morning we prepared for the flight. As some of us lacked experience (only two of us had fulfilled the norm for a first rank sportsman),* it was decided to play safe with the frontal conditions and to have a predetermined leader. The course decided upon was in the general direction of Tula, Veronezh and further to Shakhti.

We were all in the mood to give battle when, suddenly, high clouds were noticed. A secondary front was coming quickly from the west. This miserable little front nearly upset all our plans. Already, some of us doubted whether it was wise to set off for distance.

However, at this moment, over us came two KAI-19's from Drakiin. They were being flown on record attempts by O. Manafova and V. Chuvikov. They informed us by radio that the weather conditions were not bad and were improving. The wind strength had reached between 25 and 35 km./hr. and the clouds were building up. The pilots of our club betted that there were thermals of 3-4 metres to between 1,500 and 1,600 metres. These were almost ideal conditions for distance flights.

At last, at 1 o'clock, it was decided that conditions were good for a 600-km. flight or better, but that it would now be safer to aim at the 350-km. norm for Master of Sport.

I took off first and released at 700 m. in a 4-metre thermal under the edge of a cloud. I started off without prospecting, and in five minutes the whole group was in the air. The first 100 kms. went rather quickly — the regular 3-m. thermals allowing us to hold a steady 120-130 km./hr. As we had previously decided, we went to the edge of the front, one after the other, each of us watching the leader, whose task it was to find the lift.

After an hour of "not much" in the region of Volovo station, the secondary front caught up with us. Further to the south, on our course, the weather was cloudy. After a short discussion (by radio), it was decided to fly along the front 20 kms. to the east, where, it seemed, conditions were better. There we found a cloud street, under which we went about 100 kms. as far as Elyets. Good weather conditions prevailed over this part of the course and, as during the first hour, we were able to put up not a bad average speed (75 km./hr.).

*TRANSLATOR'S NOTE.—Master of Sport: one must pass proficiency tests in three sports. One such test may be the 350-km. distance flight in a glider, after which, presumably, one becomes "sportsman of the first rank".

Above Efremov, we unexpectedly heard a strange voice in our earphones — "Blaniks flying over the town — your intentions". It seemed that we were passing through the domain of some other glider pilots. Listening to their conversation, it appeared that they were flying round triangles, although the wind was rather strong for this.

Up to Elyets our journey had, as one might say, been covered with roses. Now began the thorns. Things began to die with the evening. The cloud wasted away and the thermals became weak. As the river Sosna was approached, a huge 30-km. gap (area without lift) appeared. Here I made a tactical error which, unfortunately, is made rather often by young pilots. There came a moment when the weather was "finished" when I plunged straight across this gap. Two hours earlier such a decision might have been right. Now I was punished. Twice I had to work half-metre thermals when at 500 m. and once I had to choose a landing field. My comrades said to me (over the wireless): "If you choose — land. We will also land with you." My protest was received in vain. Not wishing to ruin the group's achievement, I went on trying desperately to find some lift and — in the end, I found some.

From the start until my mistake, I had gone first. Now, on joining up with the others, who had gone round the gap, I was last.

Leader of the group, in these difficult conditions, was the expert pilot (now Master of Sport) L. Bekhov. Those 100 kms. during which we followed him under a cloudless sky were, without question, the most interesting and unforgettable of the whole flight. The group kept very much together, as directed, all the five gliders in two or three neighbouring thermals. Everyone felt that they must keep the little chain going and use every small remaining chance to go further.

The sun was already low on the horizon, when Bekhov noticed that, 20 kms. further on, there was an aerodrome. The prospect of a night in a field had never filled me with joy, and my comrades also felt the same about it. Therefore Bekhov's suggestion was received with general enthusiasm.

However, at this time, Y. Sevostyanov

lagged 2 kms. behind. He was unable to gain height and he decided to land on an agricultural airstrip. In order not to desert one of our comrades, V. Mastrykov decided to land with him. This was a risky decision, as we were not sure within 2 or 3 kms. whether we had gone far enough to qualify for the norm of Master. But the feeling of comradeship was far stronger than the danger of missing the norm. When, on landing, we measured the map, it was found that Mastrykov and Sevostyanov had flown 355 kms. The three remaining of us, Bekhov, Ylyanova and myself, landed 10 kms. further on.

The strange thing was that, on landing, we did not feel tired. It was as if it had been a six-minute circuit rather than a six-hour cross-country.

But after one-and-a-half hours of de-rigging and quartering the gliders, we felt literally as if we were falling off our feet. We were very happy when some sportsmen from Voronezh came to help us. All the participants in our cross-country wish to thank them from the bottom of their souls. Unfortunately, glider pilots do not meet with such a warm welcome every time they land near an aerodrome. But such a friendly attitude is normal among all the aviation sportsmen of DOSAAF.

HELP OTHERS TO HELP US

By WALTER KAHN

WHEN did you first hear about gliding? Were you taken to Whipsnade to the animals but spent your time watching gliders instead?

If only we could tell more young people about our sport! There is a very simple way of achieving this. In this year of the World Championships would you donate one year's subscription of the magazine SAILPLANE AND GLIDING to the library of your school or college or even your old Boy Scout Troop, A.T.C. unit or local Youth Club? If the glider pilots in this country and abroad did take part in this scheme, we could really "get Gliding across" to the younger generation. Think of the advantages—more friends for Gliding throughout the world, more public support when we need it most, future Ministers of Aviation and powerful officials being introduced to Gliding at an early age.

It is a simple inexpensive request, one which can have far-reaching benefits to us all and a chance of interesting youngsters in the sport which we all feel has no equal.

Just complete the enclosed form and send it together with your remittance to the SAILPLANE AND GLIDING Office and we will do the rest.

How pleased you would have been if someone had done this for you when you were young!

SHAW SLINGSBY TRUST

THE transfer of Slingsby Sailplanes from the Shaw Slingsby Trust has now been completed. Philip Wills has resigned as Chairman, and Mr. J. Bradley has been appointed in his stead. The new Board consists of Fred Slingsby, Peter Street, John Reussner, W. Slater and Philip Wills, who has agreed to remain on the Board for a further transitional period.

With this operation, and with the heartening support which has been given the Trust by the B.G.A., by Gliding Clubs and by various individual enthusiasts, the serious problems with which it and the gliding movement were faced by the decision of the Revenue last year to discontinue recognition of its charitable operation have been overcome, and by the best possible means: the internal loyalty and support of gliding folk themselves.

A few Clubs have found it impossible immediately to raise all the necessary sums, but are doing everything to do so as quickly as they possibly can.

The future of Slingsby Sailplanes as a major supplier of British gliders seems assured.

The Trustees of the S.S.T. want to take this opportunity publicly to thank all those clubs and individuals who have made possible this outcome.

PHILIP WILLS JOHN FURLONG
BASIL MEADS GODFREY HARWOOD

SOME FACTS ABOUT WINCHES

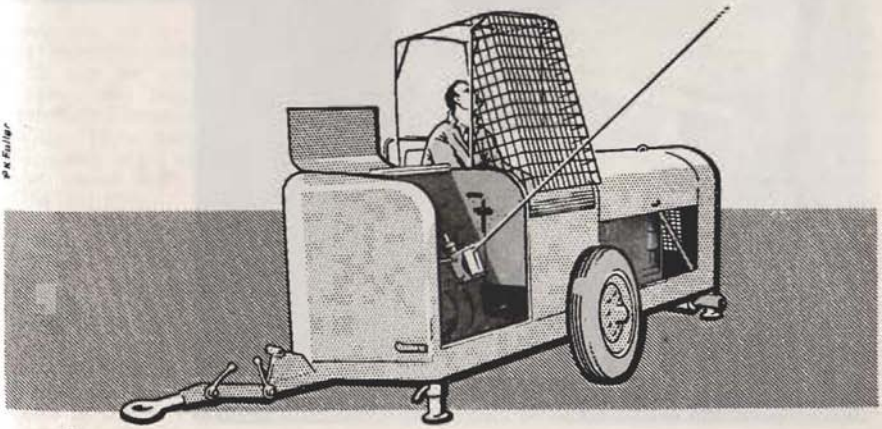
By PETER ROSS (BEA Gliding Club)

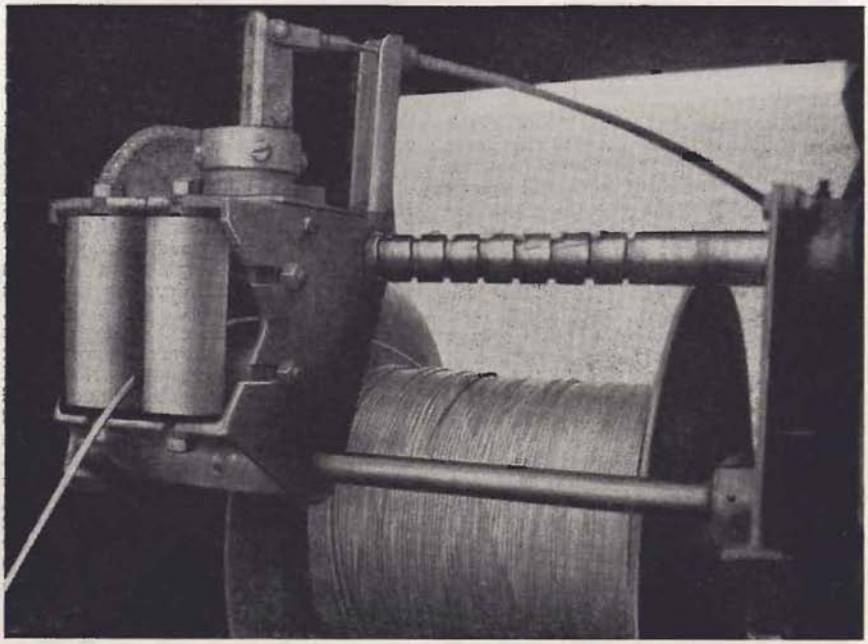
THERE must be many other clubs who, like us, have decided that their single drum Wild ex-balloon winches are due for retirement now that spares for the Ford V.8 are becoming increasingly difficult to obtain, the power is insufficient to launch modern two-seat gliders in light winds, winch spares are unobtainable, and petrol (now that the tax rebate has ended) costs about four times the price of diesel. The following is an account of our investigations into a replacement.

WINCHES IN SERIES PRODUCTION

M. B. WILD LTD., Argyle Street, Birmingham 7.—The two-drum winch as supplied to the A.T.C. in the last few years. Trailer mounted and powered by a Bedford petrol engine driving through a friction clutch and gearbox. From here onwards the right-angle transmission, peg clutches, drums and paying on gear are similar to those used on the old balloon winches, but the rollers which guide the cable from the glider on to the winch are of improved design and incorporate a swinging arm. The main roller is of 6 in. diameter. Price is £3,500 and examples may be seen at the Derbyshire and Lancashire Club or at any A.T.C. Gliding School. Messrs. Wild are not prepared to sell individual components.

K. and M. PFEIFER, Langebruckenstr. 36a, P.O. Box 107, Fulda, Germany. British Agents: Thermal Equipment Ltd., 158b Acre Road, Kingston-on-Thames, Surrey.—Single-drum winches with the axis of the drum in line with the engine crankshaft. See picture. Mounted on a trailer which can be lowered on to four corner supports. The paying on gear (See photos Nos. 1, 2 and 3) is driven by chain and scroll gear, but the whole system is mounted between a pair of counter-balanced arms and is free to pivot about the drum axis. As the glider is launched the cluster of guide rollers, paying on gear, etc. is lifted up by the cable so that it has a virtually direct passage from the glider to the drum without passing through any sharp angle. The swinging arm also operates an automatic over-run brake when the cable is being pulled out. Cable tension raises the arm and releases the brake, lack of tension allows it to fall and apply the brake. The guillotine is operated by a compression spring and is mounted immediately behind the guide roller cluster. To allow for the swinging and traversing move-





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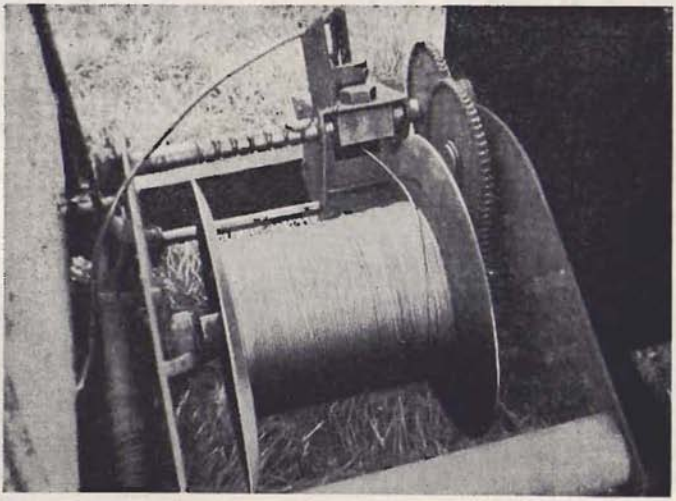

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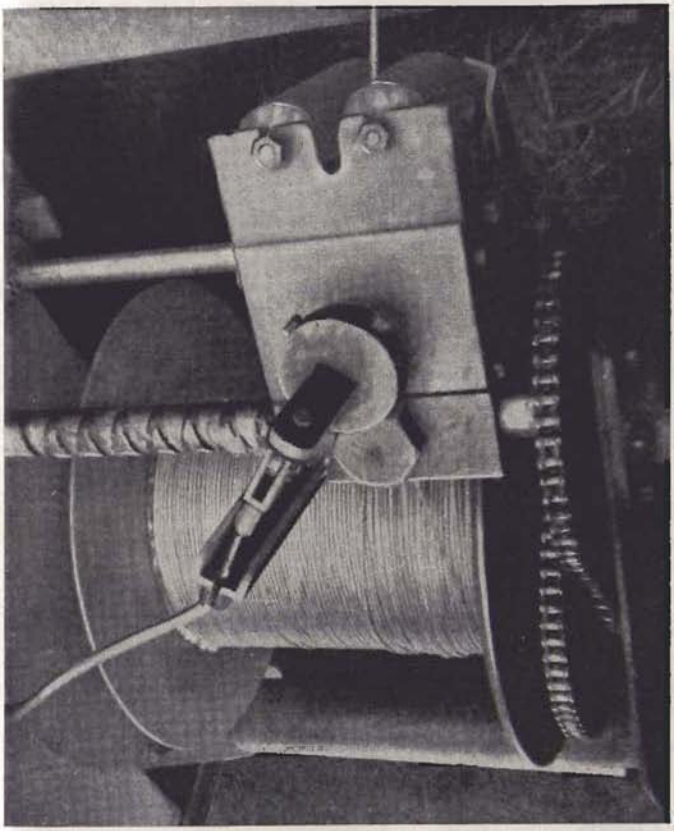
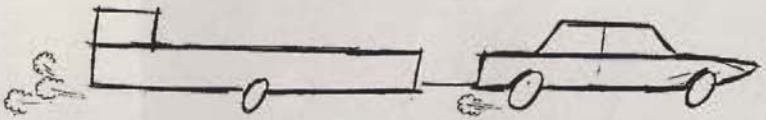


◀ 3

ment the release mechanism is operated by Bowden cable.

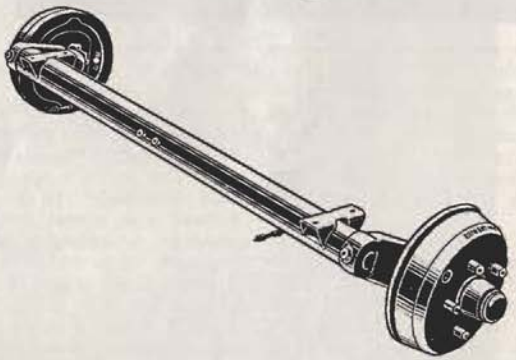
It can be supplied with or without engine, and two may be seen at the Southern Command Club at Netheravon, Wilts. They have been in production for many years and are thoroughly tried and tested units. Price is about 12,000 DM (£1,120).

RODER-PRAZISION, Burgomeister-Haas-Strasse 15, 632 Werk Alsfeld, Germany.—These single-drum winches may be either trailer or lorry mounted, the driver faces the winch engine as in a lorry and the drive passes under the cab to a right-angle drive and cable drum behind and to the right of the cab. The cable is led forward from the underside of the drum through a pair of rollers running along a horizontal track. These feed the cable on to the drum and are moved sideways by a completely enclosed scroll gear running in an oil bath and connected to the rollers by a push rod. The cable is guided under the cab and alongside the engine by concave rollers and comes out by the radiator through a swinging pulley guide. An example may be seen at the Midland Gliding Club, where it has given reliable service for over seven years. They have fitted a Humber Snipe petrol engine and automatic transmission which appears to work well despite all the theoretical shortcomings. Any size of drum can be fitted, and the one at the Mynd is of large diameter and narrow width. Any



Coming down to earth . . . you'll need Rubery Owen independent suspension

Towing is so smooth on a Rubery Owen independent suspension. The torsion bars give 4 inches of independent movement to each wheel and the whole unit allows a lower centre of gravity for exceptional roadholding and easier towing. Independent suspension makes a world of difference to towing. Fit a Rubery Owen axle to your trailer.



RUBERY OWEN & CO. LTD., Trailer Equipment Division,
P.O. Box 10, Darlaston, Wednesbury Staffs. Tel: James Bridge 3131.

engine up to 200 h.p. may be fitted and the winch is supplied with engine for 14,080 DM (about £1,310) or without engine for 8,300 DM (£773). (All prices quoted here and later are ex-works Germany and do not include carriage and import duty.)

They will supply a set of drawings and licence to build one winch for 200 DM (£18) on condition that you buy their right-angle drive, paying on gear, guide rollers, and guillotine for 3,004 DM (about £270).

RICHARD TOST, Thalkirchnerstr. 62, Munich 15, Germany.—A two-drum winch mounted on a lorry chassis. They claim to have sold 200 examples, and offer glowing testimonials in support. Power is a 154 h.p. Oldsmobile Rocket petrol engine driving through a fluid coupling and a modified automatic gearbox. The drive is taken through a right-angle reduction gearbox to one or other of the two drums. The driver sits between the drums facing the engine, and the cables pass through tubes which swing to lay on the cable. They emerge beside the radiator through perhaps the cleverest type of pulley/roller cluster that has yet been invented. Two pulleys are mounted so that a small gap is left between them, and two guide rollers prevent the cable jumping the pulleys. The whole assembly is free to rotate through 360° around the axis of the cable. The price, ready for mounting on a lorry or trailer, is 13,464 DM (about £1,255), or without engine 10,258 DM (£955).

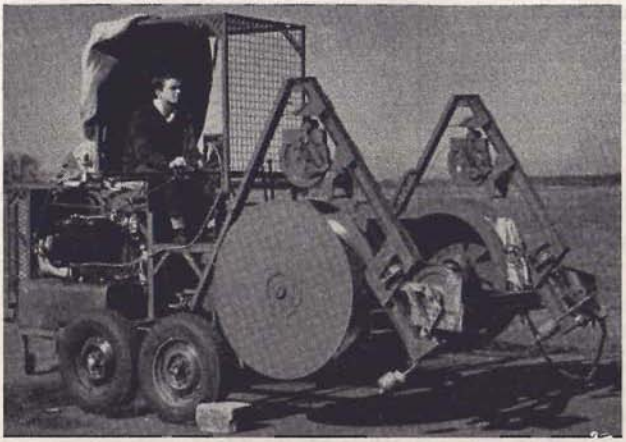
MOTOIMPORT, 26 Przomyslowa, Warsaw. British Agents: Norco Engineering Ltd., Burrel Road, Haywards Heath, Sussex.—Two single-drum winches:—

ZUBR 3.—A trailer winch similar in layout to the Pfeifer, fitted with 85 h.p. six cylinder petrol engine. At time of writing there is no price available.

SW-4 "TUR".—A self-propelled winch looking, from its photograph, rather like a sports car. Fitted with a 90 h.p. petrol engine with the drum at right-angles to the direction of travel. The price is £1,030 f.o.b. Gdynia.

NON-PRODUCTION WINCHES

DUNSTABLE.—Successive developments of the basic Wild winch have resulted



◀ 4

in a series of self-propelled two-drum winches which use only the right-angle bevel box from the original Wild winch. They have abandoned the use of paying-on gear in the interests of simplicity and reliability ("If it is not there it can't go wrong") but their maximum cable length is comparatively short (2,500 ft.).

Amongst the clever ideas incorporated are:

(a) Drive taken through a fluid coupling made by Crofts (Engineers) Ltd., Thornbury, Bradford, Yorks. (price about £150), which does away with the conventional clutch and gearbox.

(b) Selection of drive to either drum through industrial clutches made by the same company (price about £25) which can be operated from the cab without having to be lined up by eye.

(c) Disc brakes for each drum. These are not only better than drum brakes but permit wear to be seen immediately and linings can be replaced in minutes. Mechanical ones are made by Twiflex Couplings Ltd., The Green, Twickenham, Middlesex, and cost about £22 each. The Cambridge Club is successfully using hydraulic disc brakes from a car which may be cheaper.

(d) A very neat and effective cable guide using a counterbalanced swinging pulley. The pulley is recessed into the side plates to prevent the cable jamming. The Army Club at Odiham achieve the same result by mounting guide rollers at each side of the pulley.

CLAYTON WINCH.—The two Clayton winches are now at Dunkeswell (108 h.p. engine and piano wire) and Paignton (126 h.p. and cable). A full description was given in the December, 1960, issue. They are trailer mounted two-drum winches and the diesel engine drives through a Vulcan Sinclair fluid coupling (Fluidrive Ltd., Isleworth, Middlesex, price about £150) to a special right-angle drive gearbox containing the cam drive to the paying on gear, and the drum selector mechanism, all running in oil. Very large drums are used and the guide pulleys are 12 in. diameter, Photo No. 4. They are probably the most effective winches in the country and are capable of launching an Eagle in no wind. They cost about £2,500 and Mr. Clayton, of Northmoor, Dulverton, Somerset, is thinking of building some more.

IMPERIAL COLLEGE WINCH.—This winch is now at Lands End and is specially interesting because it is fitted with a torque converter (made by Self Changing Gears Ltd., Lythalls Lane, Coventry, and cost about £200 to suit an engine developing 275 lb.-ft. torque) as well as a diesel engine. A torque converter not only acts as a fluid coupling but also as a variable ratio gearbox.

It is a characteristic of all types of fluid drives that the power transmitted with the engine idling is sufficient to take up the slack (when the cable is released) and this winch, having only

one drum, is able to take advantage of this to provide sufficient cable tension to act as a drum over-ride brake when the cable is being pulled out.

DERBYSHIRE AND LANCASHIRE.—The pioneers of the unit type of multi-drum winch where the drums are on the same axis as the crankshaft of the engine and the drive passes through the centre of the drum to a clutch on the far side. Two of these may be seen, one built in to a brick building and the other on a self-propelled lorry chassis driving through a fluid coupling.

DONCASTER.—So much has already been written about the famous converted bus winches pioneered by the Doncaster Club that the briefest description will suffice. A Daimler or AEC single-decker bus with 70 h.p. diesel engine driving through a fluid flywheel to a pre-selector gearbox is provided with a quick release coupling for the prop. shaft to the back axle. After driving to the launch position the drive is disconnected and an alternative shaft to the drum is attached. The drum is basically a lorry wheel with flanges added, mounted on half a lorry axle as support. A cluster of rollers which pivot to allow the cable to rise with the glider guide the piano wire on to the drum. There is no paying on gear. The last 100 ft. is cable.

You buy a bus for £120, parts for the conversion for £30, and after ten days' hard work you can have a winch which will give you almost as good a launch as anything in the country. Doncaster is well worth a visit.

What we have learnt

From what we have seen and heard there appear to be certain essential features for a winch to be used in this country:

(a) Diesel engine for:—
  (i) Fuel economy: Diesel fuel costs only 1s. 4d. per gallon.
  (ii) Reliability: Maximum revs. are controlled by a governor so over-revving is impossible. No ignition system to give trouble in damp weather. Very rugged construction.
  (iii) Flat torque curve: Engine torque remains almost constant over a wide range of engine revolutions.
  (iv) Maximum power at low revs: No reduction gear required to drive fluid coupling.

(b) Fluid coupling to:—
  (i) Reduce strain on cable: permitting longer cable life, and making possible launches with weaker cable.
  (ii) To allow the engine r.p.m. to build up before any load comes on the engine: the engine cannot give adequate b.h.p. at lower r.p.m. and this build-up allows the engine to provide full power to the fluid coupling from the start of the launch to give the best possible acceleration to the glider.
  (iii) Simplify winch driving: eliminates need for driver to control clutch slip.

(c) Cable paying on gear: to reduce cable wear.

(d) More than one drum: the launch rate with one single drum winch cannot be as high as with two single drum winches. A two-drum winch is cheaper to make, run, and maintain than two single-drum winches.

(e) Large diameter glide rollers/pulleys: fatigue in flexible steel cable due to bending is avoided if it is wrapped around a diameter greater than 40

times the cable diameter. For cable up to 25 cwt. this means in practice at least 8 in.

(f) Automatic over-run brake when paying out: a brake which operates only when the retrieving vehicle slows down allows the drum to be unwound with the minimum power. An automatic brake prevents cable tangling.

CHOICE OF FLEXIBLE CABLE OR PIANO WIRE

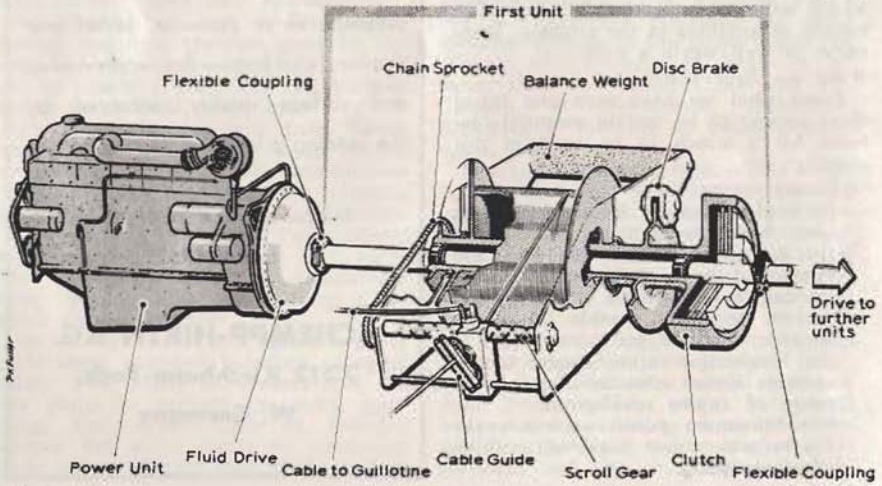
Piano wire is much cheaper to buy, and because it is lighter it will permit a higher launch than cable for the same length. Piano wire kinks very easily and will then break as soon as any tension is applied.

When two lengths of piano wire have been wrapped round a drum and are laid out side by side extreme care must be taken to avoid them touching. If they do then they wrap around one another over a considerable distance and it is a long and arduous task to separate them. We expect to lay out four parallel cables and feel that the potential hazards of piano wire rule it out for intensive fumble-free operation with multi-drum winches despite the other very real advantages.

NEED FOR A STANDARD WINCH

I doubt whether the winch experts would ever agree on the ideal winch, as each club has different requirements. The greatest need is for something which is at present unobtainable in this country — a standard cable drum and paying on gear incorporating all the features mentioned above. The diagram shows a possible layout.

Using this unit clubs could build single, twin or multiple drum winches as required, and could take the drive to a back axle for self-propulsion from the end of the last unit. Just imagine how many you could get along a bus chassis!



OBITUARY

DR. W. B. KLEMPERER

A leading pioneer in the development of soaring flight, Wolfgang Klemperer died in Los Angeles on 25th March from virus pneumonia.

Klemperer first came into the news during the German gliding competitions on the Wasserkuppe at which the art of soaring flight was first developed. He helped to design the Aachen low-wing monoplane glider and first came with it to the Wasserkuppe in 1920, but no soaring was done until the 1921 meeting, when Klemperer made a world record glide of over 13 minutes during which he maintained height for some time before descending into the valley. He was present again in 1922 when the world's record was raised by others on one, two and three hours. In that year he joined the Zeppelin Airship Works as head of the Research and Testing Department. In 1924 he emigrated to the United States and took a similar job at the Goodyear Zeppelin Corporation; then left that firm for Douglas in 1936. In recent years he moved on to space research, and I used to meet him at International Astronautical Congresses. But I first saw him at the World Championships in Sweden in 1950, when we were both concerned with others in working out a constitution for the O.S.T.I.V.

In America he naturally took a prominent part in the development of soaring, and only on 12th February this year he was presented with the Warren Eaton Memorial Award at a ceremony in California. In the course of his acceptance speech he said:—

"I remember when I began to build flying models in 1908, with rubber and then with compressed air motors, and to fly hang gliders, a wealthy aunt of mine vowed to disinherit me if I attempted to resort to such dangerous fuels as the gasoline of the devilish horseless carriage, but I assured her that the day would come when we would fly without any fuel."

Dr. Klemperer's son and daughter have also taken up gliding.

Some of his reminiscences of the early days were published in SAILPLANE AND GLIDING in 1962 (p. 259) and 1963 (p. 298). A. E. S.

BOOK REVIEW

The World's First Aeroplane Flights, by C. H. GIBBS-SMITH. A Science Museum Booklet, published 1965 by H.M. Stationery Office, London. Price 2s. 6d.

THIS booklet has a number of historic photographs, a table of "powered take-offs and flights" from 1903 to 1908, and a learned discussion by the author of what constitutes a flight ("there is happily no telling who was the first to deflect himself from the vertical sufficiently to earn the title of first 'flier' or 'glider' "), followed by short descriptions of "first piloted attempts to fly".

The Story of Gliding, by ANN and LORNE WELCH. Published May, 1965, by John Murray, London. Price 28s.

THE proof copy only arrived just before we went to press and there has not been time to read it right through; but several gliding people have been shown it

and without exception have been fascinated and declared their intention of buying the book the moment it is published. It is intended, not as a complete history, but as a story of "what appear to be the main stepping-stones" in the development of a "unique" activity. The 21 chapters are grouped in four sections: Early Days, The Rhön, England, and Up to Now. The pilots' accounts of many notable flights are included. There is a great number of illustrations: 58 photographs, 25 line drawings and 4 maps.

A. E. S.

CORRESPONDENCE

BIOGRAPHICAL CORRECTION

Gentlemen,

It is little wonder that SAILPLANE & GLIDING has enjoyed a substantial increase in subscriptions, for it is indeed well written, informative, and beautifully printed. I consider the April-May issue to be outstandingly well prepared in all respects.

I would like to make two small corrections to my biographical paragraph shown on page 110. The first is to admit that after checking my log books more carefully my gliding hours total only approximately 2,000 hours; so I am not the highest time pilot entered after all. I have not kept a very close account of my flying hours for many years, and I apparently let my Texas enthusiasm include some of my powered flight time with my gliding hours when I filled out the entry questionnaire.

The second is to clarify that the RJ glider designation in the case of the well-known RJ-5 sailplane stands for Ross-Johnson, and not my initials alone as, unfortunately, many believe. Harland Ross was the principal designer of that outstanding machine and, as such, should be given proper credit.

Dallas, Texas. RICHARD H. JOHNSON

THROW AWAY THE SLIDE RULE

Dear Sir,

As correspondents from foreign parts seem to have the ear of the editor on this subject, may I be allowed to comment from this detached viewpoint on the "Wallington special" scoring system, and in particular on the contribution from Robert B. Smith in your April edition.

Mr. Smith bases his argument on a comparison between gliding and other sports. If he had known as much about golf as he does about gliding, I am sure his conclusions would have been quite different.

In many sports, such as most ball games, a match consists of a contest between two individuals or teams. Thus, to find a winner from amongst several entrants, a series of matches must be arranged either in the form of a knock-out or league competition. In other sports, however, such as equestrian events, every competitor is trying to beat every other competitor simultaneously in each of several successive tasks. The results of this type of sport are decided by a points system. Gliding is surely the latter type of sport.

Golf, of course, has it both ways. If you want a series of contests between pairs you score by match-play rules. On the other hand, most championships are decided on stroke-play whereby every competitor plays (say) four rounds and the winner is he who takes least strokes for the 72 holes all added together. This is analogous to four contest days at a gliding championship, and one really bad round of golf will lose you that championship just as surely as one really bad day will lose you the other.

I quite agree with Wally that the present points scoring system can be improved and possibly even simplified, but I am convinced that the place scoring system is not the answer.

H.M.S. Anchorite, Singapore. NIGEL STEVENSON
(Lieutenant, Royal Navy)

It will, of course, be understood that the British Gliding Association cannot accept responsibility for the claims made by advertisers in "Sailplane and Gliding".

PUBLICATIONS

"AUSTRALIAN GLIDING"—monthly journal of the Gliding Federation of Australia. Editor, Gary Sunderland. Subscription 30 shillings Australian, 24 shillings Sterling or 4.25 dollars U.S. and Canada. Write for free sample copy, "Australian Gliding", Box 1650M, G.P.O., Adelaide.

"MODEL AIRCRAFT"—Official Journal of the Society of Model Aeronautical Engineers. Features, contest-winning model designs, constructional articles, photographs and reports of international and national contests. 2/- monthly from any newsagent. Send for specimen copy free from "Model Aircraft", 19-20 Noel Street, London, W.1.

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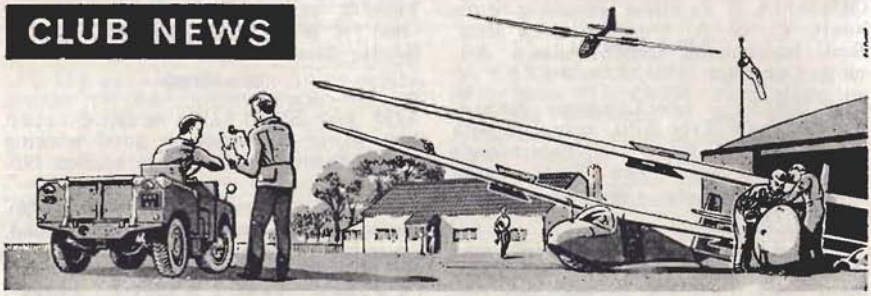
CLUB NEWS



WE wish all our visitors from overseas the very best of luck in the championships and hope they enjoy their stay and will be able to visit some of the clubs who report in each issue.

We shall be back next issue with all the news of the other gliding that went on during the championships.

Copy for inclusion in the August issue must reach me typed double spaced by 30th June at 14 Little Brownings, London, S.E.23.

12th April, 1965

YVONNE BONHAM (Mrs.)
Club News Editor

AVRO

WE now have permission from farmers and Air Traffic to do local field landings, quite a few pilots require checks prior to cross-country clearance; the fields are graded with the final one having most of the usual hazards.

At the moment Malcolm Brocklehurst is leading a "crash" programme on mods. to one of our trailers, once this is complete we will be moving around with our T-21, and doing dual field landings.

Our first social occasion of the year was a Hot Pot and film show, and was a most enjoyable evening, with a contingent of ex-members swelling our ranks.

Tim Brocklehurst, our 12-year-old pilot, became a T.V. star overnight, he was featured in "HEADLINERS" flying circuits in our T-31B. Tim's father, Ron, is now trying to steal the limelight back again, by completing his 5 hours, our first Silver leg this year. J. A. K.

BATH (Keevil)

AS we approach the end of our second year of existence we look back upon our progress with fair satisfaction.

Having started with literally nothing in the kitty, we have attained the desirable situation of having, this last twelve months, paid our way and shown a slight profit.

This has been mainly due to a hard-working nucleus of members who have slaved unselfishly for the benefit of the club.

We held our second Annual Dinner on 2nd April, the guests of honour being John Williamson and his charming wife. John, in his speech, paid tribute to our progress and pointed out that last year we achieved the second highest ratio of 1st solos to number of launches — a point that none of us had realised at the time.

We were able to wish John all the very best in the forthcoming world championships.

Flying-wise, we have now dieselised our winch, and we are in the process of dieselising a towing vehicle. We hope these two developments will cut our cost even further.

Add to these two methods of launching John Graves with his Auster and we

really hope to accomplish a record number of launches this season.

The latest syndicate aircraft is a 463, which joins the Olympia and Swallow already well established.

Footnote to long-suffering gliding wives — think yourselves lucky that not all husbands own and fly tug aircraft. I could take you to a house right now where you would find a certain Auster having a refit. You would find the mainplanes being re-covered in the lounge, the "prop." standing behind the door, etc. K. N. S.

BLACKPOOL & FYLDE

WE moved back to our home site at Blackpool Airport early in November and have had a satisfactory winter with very few unflyable days. There was some interesting soaring on north winds during February.

We have had an extraordinarily dry winter here in North-West Lancashire; practically no snow, very little fog, but an odd weekend or two of Force 8.

Arrangements are now complete to move to our summer site at Salmesbury Airfield, which lies between Preston and Blackburn, and it is opportune to record our thanks to our Technical Officer, John Gibson, and also to our Chief and Assistant Engineers Malcolm Eaves and Terry Hogben respectively for so thoroughly preparing the equipment in readiness for a busy summer.

At this time of the year we have always a feeling of deep gratitude to English Electric for the continued availability of Samlesbury Airfield. Blackpool Airport, where our popular clubhouse is situated, is an ideal winter site, but it cannot be compared with Samlesbury so far as soaring is concerned and also, of course, there is no air traffic at weekend to harass and frustrate us.

In conclusion, we should like to mention that there is always a warm welcome at our clubhouse for visiting flying types and their friends — so let "Breezy Blackpool" be your "Goal" — in more ways than one. J. S. A.

CORNISH

WE have been so busy doing things lately, that we haven't had time to write about them.

We have had a re-organisation of our Committee system and, acting on the principle that a change is as good as a rest, a number of people have exchanged hats. George Collins has taken over from Tony Lapham as C.F.I., Tony has become Technical Officer instead of George Tuson, who moves to the "Chair" in order to give Ernie Hayman a well-earned rest. Ernie becomes Deputy C.F.I. and Safety Officer.

Things have been going great guns on the flying side. We now have a Ford F.100 truck and a Blanik. The former has increased our average launch height by at least 25% and the latter has confirmed what we suspected, namely that there is quite a lot of thermal activity in Cornwall if you have the right aircraft to find it with. Within an hour of its arrival, the Blanik had been to 3,500 ft. in a clear blue sky. (Our thanks to Andy Gough for aero-towing it down from Oxford.)

Since the Blanik arrived, the Tiger has really begun to earn its keep: if the present rate continues we shall more than treble the number of aero-tows we did last year.

Our courses start on 3rd May and go on until mid-September. Bookings are well spread out over the period, but we still have some vacancies if anyone is looking for a nice gliding holiday in Cornwall. G. E. T.

DERBYSHIRE & LANCASHIRE

THIS year, by some miracle, the summer arrived in early spring. Our fleet of three training two-seaters, one T-49, four intermediate and two high-performance sailplanes, has not had its usual winter sleep as flying was impossible on only one weekend.

Many of the Club's new instructors have made visits to Lasham on instructor training weeks in the early months of this year. They have returned wiser men with more confidence in their own flying, and an enthusiasm to teach others.

At the time of writing it appears many pilots will be away from the home site at Easter, competing at or visiting other clubs. However, to increase our chances of soaring this year, from 21st April we shall commence flying on Wednesday and Thursday afternoons and evenings as well as at weekends. An advanced

soaring week is planned from 26th June to 4th July, and the return weekend competition with the Midland Club will decide the temporary ownership of the Beer Tray.

As always, Camphill welcomes visitors, but if you are bringing a glider and crew and wish to stay a week, please let us know in advance. D. M. K.

DORSET

THE Dorset Gliding Club (as the Blackmore Vale Gliding Club) was founded by a few enthusiasts in 1961 and flew at Henstridge disused airfield. Later it moved south nearer the coast and was joined by members of another new club, the Bovington Garrison Gliding Club.

At present we are negotiating for a more suitable site and have three club aircraft, six privately owned aircraft, a Tiger Moth, seventy full-flying members and seventeen associate members.

As we like to welcome visitors from overseas we have a special temporary full-flying membership fee of one guinea a month for experienced glider pilots from abroad. P. J. H.

DUMFRIES AND DISTRICT

THE fine weather at the end of March saw the beginning of our soaring for this year with Charlie Park doing a couple of hours in the Prefect. The T-31 and Tutor have also been in demand and the "460" syndicate are just completing their C. of A. at the time of writing. This spring we have been able to help the newly-formed Edinburgh University Gliding Club with some circuits on Saturdays in our T-31. We wish them every success and hope that we may be able to co-operate to our mutual advantage. We also have more new members to keep the two-seater going.

The housing development on part of the aerodrome is now very close to the end of the main runway and we may not be able to enjoy the use of the runways for very much longer. Active site investigation therefore is likely to be a prominent feature this summer as our hill site at Thornhill has been partly ploughed by the farmer.

We would be very pleased to welcome any visitors from other clubs during the summer, preferably airborne. G. J. K.

GLASGOW & WEST OF SCOTLAND

ALTHOUGH our Club has not featured in Club News for an issue or two, things have not been at a standstill, although, as usual, flying ceased for the months of January/March.

Our technical department has been hard at work carrying out modification work to our Tutor and giving the T-21 its C. of A. We are especially grateful to our Ground Engineer, Jack MacGregor, who has spent many hours during the "dark months" fettling the aircraft.

On the social side, our monthly meetings have been generally well attended, when lectures on various gliding subjects were given and an assorted selection of films shown. We have not yet decided whether the members came along for the instructional lectures or for the liquid refreshment which flowed freely throughout the meetings.

By the time this edition goes to print we hope to have sampled the Scottish thermals again back at our Fintry site. For the past nine months we have been based at Strathaven, Lanarkshire, but due to the airfield being closed for extensive alterations we have been forced to return to our home site.

Finally, may we welcome the foreign contingents to the World Championships and hope they have a pleasant stay in Britain.

T. J. G.

KENT

THE A.G.M., held at Kent County Fire H.Q. on 3rd April, was very well attended. Tug Burne was re-elected Chairman; Robin Wilson, secretary; Roger Neame, treasurer. After the formal meeting an informal discussion was held.

A number of members soloed in the autumn, among them Pauline Dunk, our first lady member to do so for some years; Mike Honey got his C also in the autumn. On 27th March Bill Gartland in the Skylark 4 was towed to the ridge at Wye, where he soared for three hours before landing. Thermals started in February this year, and we are hoping that with regular aero-tows from the Tiger Club, we shall have a first-class soaring season.

P. B.

LAKES

ADVERSE weather at weekends has cramped flying during the winter months but frustrated pilots have found employment as labourers extraordinary at the "pyramids" — in other words the new clubroom.

Thanks to willing helpers construction proceeds apace under the direction of a few experts whose experience and ability have proved invaluable. We feel confident that the premises will be comfortable by the time the first course meets in June.

Among our distinguished visitors we have had the privilege of entertaining Tony Lapham, former C.F.I. of the Cornish Club. Some of our pilots were able to fly with him and at least one had his first solo immediately afterwards.

David Millet has been appointed Senior Flying Instructor to the West Wales Club and Derek Sandford has been transferred to work in Derby. In their respective spheres they have made great contributions to the welfare of the Lakes. We congratulate them on their preferment and wish them well.

F. G. R.

LASHAM

UNFORTUNATELY club statistics published in the last issue of SAILPLANE AND GLIDING gave a distorted picture of Lasham operations in that they reported only the operations of the Society which provides the premises and launching facilities and the Training School, and omitted all the results of the clubs which operate the soaring aircraft.

The figures shown are therefore correct so far as launches are concerned, but are quite misleading as to hours flying, cross-country miles and certificates gained, since none of the club figures were included in the total. We really did get a few Silver C's during the year!

Similarly, the statistics as to courses, namely 42 courses and 140 pupils, were provided in response to a B.G.A. Questionnaire, "How many ab-initio courses did you hold in 1964?" Since it has been our policy at Lasham to provide a fair number of advanced courses, the statis-

tics for courses were correspondingly understated by about 60.

In future, we hope that the individual clubs' results will be shown separately in SAILPLANE AND GLIDING. We find that this arrangement of a consortium of clubs works very well; the Society can concentrate on the management of the Centre and the clubs can get on with the more serious business of soaring.

However, that is all past history; at the time of writing we are looking forward to the next soaring season and have already filched the "plate" back from Dunstable. We are also geared up for the training season with three T-49's and the Blanik. Turnround at the wire-launch point is much quicker now that we have abandoned the winch and are operating the 2-car system from the runways; we find that in normal conditions we can keep up an average rate of one launch to at least 1,000 feet every three minutes, which not only removes frustration, but gives us an effective increase in capacity. A. D. F.

LEICESTERSHIRE (Rearsby)

LEICESTERSHIRE Gliding Club has now been resurrected from its many years of inactivity by giving its name to the late East Midlands Club at Rearsby. Now there will be no chance of confusion with either the Midland or East Midlands (R.A.F.) clubs. We are still aero-tow launching only at Rearsby and finding this policy to be successful after our early teething troubles.

Our flying fleet now comprises: one Capstan and one Olympia (Club owned); one Skylark 4, one Ka-6, one Dart and one elderly Olympia (syndicate owned). A second syndicate owned Ka-6 will soon be arriving.

Our season started well on 20th March when Ivan Vesty and Dennis Hatton soared in wave, to 7,500 ft. and 6,500 ft. respectively, right over the airfield.

Then, on 4th April, came our first good thermal day. Long spells of no aircraft in sight and a solitary, waiting Tiger. Two triangle tasks were completed, thirty-two flying hours were logged by our six aircraft and John Willett was last seen heading in a north-easterly direction. Congratulations, John, on a Silver distance. D. H. A.

LINCOLNSHIRE

SINCE our first operational weekend of 29th November, 1964, we have continued to make steady and most satisfactory progress. The Club now has 70 fully paid up members, and the addition of a Grunau Baby brings our syndicate owned fleet to three. We hope to add a further T-31 to our present overworked and solitary club aircraft.

Four months' weekend flying have produced 1,200 launches — all by Champ auto-tow. Eight new members have done credit to our C.F.I. Siggy Romrig with first solos. Don Studholme goes on record for the Club's first solo and was closely followed by his equally bug bitten colleague Len Greatorex. These two soon converted to their Grunau Baby, when Len reversed the batting order to be our first new member to achieve his C. E. B.

MIDLAND

ON Sunday, 28th March we held our Annual General Meeting. Appointed to the Committee were John Anstey, Ron Hayes and Alan Parkinson, in succession to Norman Groucutt, Mike Randle and Bob Swift, who stood down. Our sincere thanks go to Norman, Mike and Bob for the work they have done whilst on the Committee. The other Committee Members and Officers continued in office.

This season we intend to organize a few small informal weekend competitions in an attempt to encourage more cross-country flying from the Mynd.

We are pleased to welcome back Peter Wulff, who used to be a regular visitor to the Mynd, and who has rejoined his old syndicate.

Radio is becoming increasingly popular amongst our private owners. Pilots have reported hearing messages being passed at Lasham and Rearsby.

A scheme to have telephone communication between the winch and the launching point is to be tried in the fond hope that the launching rate can be improved. K. R. M.

NEWCASTLE

LITTLE of general interest has happened at Carlton since the last Club Notes were written. Flying has continued

each weekend and although the number of launches increases rather slowly, the average duration of the flights is very satisfactory. In fact our average flight time this year is 18 minutes, and with the start of the thermal season we hope to maintain or improve on this figure.

One of our two tractors has recently returned from an overhaul and our sincere thanks in this connection are due to Dennis Snaith, the latest recruit to the M.T. Department.

Almost as the last of the winter snows melted from the site, steps were taken to encourage the growth of much needed grass. Parts of the site were once again covered in a white mantel, but this time it was lime not snow, and we are all hoping that our efforts this year will be successful. It's amazing how grass grows where you don't want it, but won't grow where you do.

Several members' courses have been arranged for the coming months, and it is anticipated that evening flying will be continued throughout the summer, provided that there is sufficient demand, on Wednesday and Friday evenings.

At long last, work is in hand on the erection of a permanent workshop to replace our old faithful, but very unsightly, "tin hut". This should be a most useful addition to our buildings.

B. W. B.

NORTHAMPTONSHIRE

IT is now twelve months since we moved from Podington to Cranfield and it is possible to review the Club's progress.

Operations began disastrously with a loss of about 15 members; a major accident to the T-21 and later a breakdown of the winch coupled with poor flying weather. However, after two months conditions improved and with the help of the College Club training became possible in their Bocian. Later a two-seater was hired and the Club began to find its feet again.

The year finished up with 2,494 launches and 250 hours in the bag, compared with 2,015 launches and 233 hours in 1963; a membership of 60 and even a bank balance.

The Club has been considering the possibility for some time of purchasing another Swallow, however a Sky and trailer came on the market and this has been purchased instead, making our fleet up to four sailplanes.

Club syndicates are operating a Skylark and an Olympia.

This year it is proposed to fly on Thursday evenings, and run a flying fortnight in the first two weeks in August. There will be an emphasis on cross-country flying and the acquisition of Silver C's.

R. N. W. K.

NORFOLK GLIDING CLUB — *In conjunction with Norfolk Education Committee, the club ran a youth course during the Easter holiday — believed to be the first of its kind in England. Instructor John Lawton is pointing. Keith Parton on left.*

NORTHUMBRIA

THE soaring season opened at Hedley Fell on 28th February but by 3 p.m. the thermals were replaced by snow clouds, which gave the heaviest fall of the year and prevented all but 14 members from attending the film show next night. Those who did come enjoyed a very entertaining show and a plentiful supply of sandwiches, to which our rather plump C.F.I. did more than justice.

The spell of anticyclonic weather, which until now has precluded thermal activity, broke on Sunday, 3rd April, and members were treated to the rare sight of the T-21, Ka-7 and Eagle airborne simultaneously.

Encouraged by the streets of cu. reaching far in the distance, Alen Brown set off for Silver C distance, but only reached Whalton, about 16 miles away.

After scratching round at a very low level for a long time, squealing in protest, the Eagle finally managed to get away and followed the Ka-7, only to run out of lift at R.A.F. Ouston, embarrassingly nearby for retrieve by road.

Behind the scenes, work has been going on to produce an airworthy Tutor and two-drum winch, neither is yet in service but this is expected very soon.

The grants from the County Education Committee and the Department of Education and Science towards the T-21 have helped to bring finances into the black again and negotiations for a long lease on the site are progressing well.

In May the Club is having a week's course at Portmoak and Dave Wilson has entered the Doncaster Regionals in July.

P. W. L.

OUSE

THE soaring season has now started with a bang — the first good day being 28th February, when Dave Roberts, from Swinderby, sportingly brought his Tiger Moth to give us our first taste of aero-towing. Our thanks also to tug pilot Con Greaves, who completed some 40 excellent tows. Conditions were so good we had to impose a time limit on the Swallow to give pilots the chance of an aero-tow.

March brought the Club its first C of the year by Les Smith. An early morning start brought its reward when John Taylor and Keith Massey did half-an-hour and one hour plus respectively in wave with the Swallow. Weak wave conditions persisted all day and both Norman Worthy and again John Taylor completed flights of over an hour. Our hard-working secretary, Ron Taylor, has the distinction of being the first member to achieve his C under wave conditions.

The following week-end, Mike Annison, "Andy" Anderson, Dennis Yeates and Peter Oglesby all achieved C flights. The way Andy whistled up to 3,500 ft. above our heads in 20 up was a sight for sore eyes. Ron Taylor and Les Smith have converted to the Swallow while Keith Massey and Norman Worthy are promoted to passenger pilots.

Tim Wray has broken Les Bellamy's height record with a climb to 5,200 ft. for the first Silver C leg of the year. This record didn't last long, however, for Jim Smith wound his way to 6,100 ft. By the way some of these Swallow pundits are performing, Les's duration and distance legs are also in danger of being cracked.

G. L. B.

OXFORD

THE fourteenth A.G.M. of the Club accepted the principle that the club's basic charges must be met by subscriptions and the annual fee is now £10 with a 20% reduction for the Private Owner.

There has, of course, been an "Oxford" club for more than fourteen years but the only direct link with the club founded by Robert Kronfeld in the early 30's is an item in the annual statement of accounts.

The winter months have produced little flying and it is but small consolation that this year so far, we have exactly doubled the figures for the same period in 1964.

On the ground, however, there has been much activity. The new winch continues to grow and the working party led by Bob Collisson and Trevor Moss has converted our building to provide a stores which is unbelievably tidy and a workshop both spacious and cosy.

With a somewhat spartan clubroom, it could be that next winter, instead of "hangar flying" around the stove, mem-

bers may find it more comfortable to direct their energies to more useful effect.

The Club will make its contribution to the World Championships on the ground, amongst the Observer Teams, and in the air, where Skylark 4 No. 169 will fly "incognito" as "No. 37" for Israel. A. S.

SCOTTISH

WINTER wave flying has been common at Portmoak for some years now, and conditions were at their best on 4th and 5th February. The flying which took place on Sunday, 4th is described in detail elsewhere, and congratulations are due to those who completed diamond, gold and silver legs that day. The wave persisted throughout Monday, although it was more difficult to reach and work it than on the previous day. The most notable flight was made by Valerie Wyles, who was aero-towed to 3,000 ft. above Newburgh, on the east coast, climbed to 9,000 ft. and flew across the breadth of the country to land at Wemyss Bay, on the Firth of Clyde (74 miles) thus completing her Silver C. The same day, Jimmy Rae made an out-and-return trip to Loch Lomond in the Skylark 3 and brought back photographs of his Crossfell vario at the top of the 3X scale.

With the approach of spring, several new projects are under way. A new bridge is to be built over the ditch at the gate, and a concrete floor is to be put in the hangar, which has recently had improved lighting installed. C. of A. inspections are well in hand, and an experimental section of nylon-sheathed launching cable is in use, the theory being that the nylon will protect the cable from abrasion by the ash which we use to fill up the holes in the field. On the training side, a card system has been set up to keep track of the progress of the growing numbers of pre-solo pupils.

The weather during late February and March was generally unexceptional, with little soaring possible. However, 28th March produced low-altitude wave in a southerly wind, probably triggered off by Benarty Hill, and this enabled John Goudie (Olympia) and Jack Melrose (Weihe) to gain their Silver heights. Thermals appeared in earnest for the first time on 3rd April. Several of the private owners hope to be competing in this year's regionals. B. M.

SOUTHDOWN

DURING the first three months of the year, although we fly only at weekends, there were no less than seven days on which we soared our ridge. On two weekends we were blessed with thermals and there were several local soaring flights, limited only by our pet Airway.

On 14th February we were very pleased to see members of the Kent club with their Skylark, and indeed any visitors will always be made most welcome.

We are at present running a Spot Landing Competition with the Tutor, which is proving most amusing, even embarrassing, for some participants.

E. M. K.

STAFFORDSHIRE

THE excellent weather of recent weekends has encouraged good attendances at Meir with a satisfactory increase in launches given. A further increase is anticipated when our diesel winch goes into regular service. It was successfully commissioned on 14th March and gave about a dozen experimental launches proving itself capable of launching any of the club fleet. It is now having minor modifications to its control system prior to entering service. We expect to obtain a big fuel economy with this winch.

Our aero-towing facility is now self-contained thanks to the assistance of the Coventry Club, who checked out our tug pilots over a period of several weeks. We hope to reciprocate by lending them our tug during the Regionals in July. Several private owner groups have visited Meir recently to sample our conditions and towing. Most of them have had good soaring flights during their stay.

Sunday, 4th April was an excellent soaring day with good thermals to 4-5,000 ft. These were extensively used and some good heights and durations recorded by pilots warming up for Silver C attempts later in the season.

A. W. H. L. W.

SURREY

IN the earliest Spring days we at Lasham have been enjoying all types of soaring except hill lift. Sea breeze fronts appeared at the end of February, and again a classic one the last weekend in March. On the day of the B.G.A. Ball wave soaring was possible, and the thermal season began early. In suitable conditions we soar a section of the South Downs, which are only ten minutes aero-tow from the airfield, but the winds have not obliged recently.

The Club was very pleased to be awarded the B.G.A.'s Douglas Trophy for 1964 for three flights in Club Skylarks by Dr. Brennig James, Alan Purnell and Harry Howitt which totalled 655 cross-country miles.

Last season three Gold and sixteen Silver C badges were completed by Surrey pilots, and the total cross-country mileage by the Club fleet (consisting entirely of Skylarks) was 7,460 miles. 2,056 hours were flown from 2,784 launches, giving an average flight length, summer and winter, of 44 minutes. We give these figures because they were entirely omitted from Lasham's statistics as published in the last issue of SAILPLANE AND GLIDING.

P. G.

SWINDON

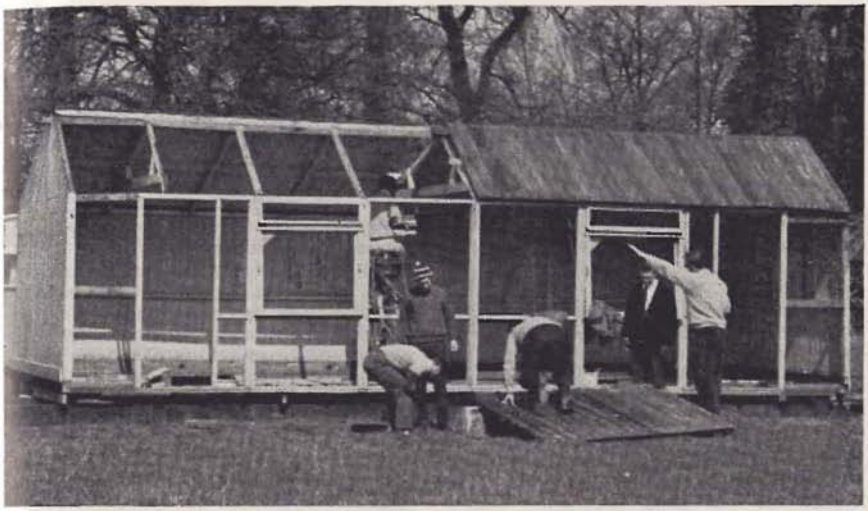
SWINDON Gliding Club, being the nearest Club to South Cerney, is, of course, very much looking forward to the World Gliding Championships. The Club and members are anxious to help and assist in any way they can any visitors who care to visit our South Marston home drome during this period.

We shall be organizing passenger glider flights during the World Championships and we also expect to be flying every day at South Marston as well as acting as the host field for aeroplanes coming in from everywhere.

Club achievements since last communication — Geoff. Turner attained a Silver C height in the new syndicate Skylark 4, Margaret Young got her C and we expect our Olympia back any day now after C. of A.

P. C.

SOUTH WALES GLIDING CLUB — *Members of the Club with their T-31 and members of the Eglwysilan, Mynydd Mayo and Graigevan Llyshan Pony Club.*



Worcestershire Club's partially completed clubhouse.

WORCESTERSHIRE

SUNDAY, 4th April brought near perfect conditions to Bickmarsh. Unfortunately we were caught, as it were, with our winches down, and could only look longingly at the sky and reflect sadly on what might have been.

Nevertheless a hard core of stalwarts have put in a lot of work. This has resulted in the T-31 being complete with C. of A. and spoilers and the club having a clubhouse. Before the winter's activities are forgotten due credit must be given to Ron Freeman for the excellent job of organizing the Annual Dinner and Dance.

Some new additions have been made to our stable, these include a Tutor with spoilers and canopy, a diesel operated generator and a tractor for cable retrieving. An extension to the front of our hangar which is proceeding will enable us to leave the aircraft fully rigged, a great saving in time and temper.

Perhaps the most pleasing news for us has been the instructor's category gained by Bob Baker. This, of course, opens the door to full B.G.A. membership with its attendant benefits.

Holiday courses, which proved so popular last year with members, are being run again, and are in fact being extended over a longer period so that the maximum number of people can take advantage of them. We have every hope of an active and successful season.

R. C. S.

YORKSHIRE

THE Yorkshire Club have taken the winter opportunity to have their annual overhaul of equipment and to do our sums to check against our steadily rising costs. Our financial year was changed to coincide with the calendar year and the result has been a very small surplus which is encouraging after a difficult year financially.

The Annual General Meeting was held in November, when John Reussner, who has been the Club Committee Chairman for some ten years, retired and Chris Riddell was elected in his place. Chris retired as C.F.I. and his place has been taken by Henry Doktor, our resident instructor for some years.

In December Jack Martin, our steward, left us to take up another post, and Mrs. Susan Doktor assumed responsibility for winter catering. Susan's efforts have been first-class and have provided

us with weekend refreshment until Mr. and Mrs. Parkinson took up the position of stewards on the first of April. Susan Doktor remains as Clubhouse Chairman and, with Henry, is responsible for the overall running of the clubhouse and courses.

The Tiger Moth was sold at the beginning of the year and in its place a Beagle Terrier is available. This aircraft is a good deal more comfortable and pulls them up quicker than the Tiger. A heater and three seats widens its scope quite considerably.

The arrival of this aircraft and the very warm late March weather has given us some very good flying. On the 27th of March Cliff Banks and Ralph Hindle got up to 10,800 ft. in a wave flying their Blanik, and the following weekend, Barry Goldsborough flew a 74-mile triangle on Saturday, 3rd April, followed by a 70-mile out-and-return to Barnard Castle the following day. Both flights were in his Sky, now refurbished and looking very well.

We were pleased to welcome a party of members from the East Midlands Gliding Club with their Tiger Moth during February, and although the weather was not sympathetic, plenty of flying was done. We plan a number of courses this year and look forward to many visitors from other Clubs, and if you arrive by air, call us up on the radio before you come in. J. C. R.

SERVICE NEWS

BANNERDOWN (Colerne)

ONCE again the February-March period has been relatively "flat" and aerial activity largely confined to ups and downs with an average of four minutes between them, although we did have two days when the green ball hovered bravely in the top half of the tube.

For several weeks the T-21 trailer stood at readiness for the inaugural beat on our new ridge near Bath racecourse; the great day dawned, 27th March, when an early start saw us rigging on the top in the "quiet" behind the ridge while 20 knots flowed steadily overhead. C.F.I. "Tug" Willson took the first flight with your scribe, and such was the lift that five hour plans were hastily conceived and the T-21 regained the deck with the G meter reading +2! During the day, however, conditions slowly changed; nevertheless it is obvious we have a first-class site and every credit is due to Tug for this splendid addition to our local facilities and to our potential.

Bannerdown, as usual, will contribute in various ways to the total R.A.F. effort to the World Gliding Championships, which includes the provision at South Cerney for a month of 30 Chipmunks and pilots, static and flying displays and marshalling, launching and controlling staffs. P. H.

EAST ANGLIAN (Waterbeach)

ON 1st April the East Anglian Gliding Club merged with the Fenland Club, which is situated at Feltwell. Although losing our identity of East Anglian we make a flourishing club even stronger, and face the prospect of a successful summer season.

The weekend of the 27th-28th March saw the last of our activities at Waterbeach, and the occasion was marked by a party in the clubroom.

This party also served as the club's farewell to Dave Paton, our aircraft member, to whom so much is owed for the way he "kept 'em flying". Dave has now left the R.A.F. and is continuing to service sailplanes at Dunstable.

Our C.F.I., Jack Alcock, leaves for Germany in June on posting, with our best wishes and most sincere thanks for his keen interest in club activities.

East Anglian sailplanes and equipment are now redistributed among RAFGSA Clubs. However, we have taken the Sedbergh and Grunau with us to Feltwell, together with a diesel winch.

Ex-members of East Anglian may regret the demise of this happy club, but the name will be perpetuated on the John Hall trophy, a link with the past which is now held by Fenland for annual award. E. E.

EAST MIDLANDS (Swinderby)

SINCE our last appearance in these columns, the tempo has slackened somewhat due to bad weather. During

this period, however, a ridge which looked marginal at first near Caistor turned out to be quite soarable as Don Austin proved in the SF-26. Plans are being made for much greater use of this, although it is a fair distance from Swinderby.

A new Olympia 463 has been added to the fleet, also a second canopied T-21 in exchange for the Kranich.

A group of club members visited Sutton Bank for some wave soaring but the weather was against them and little flying was done.

Dave Burton soloed in the T-21 for his A and B cert., Tom Lawson, Derek Burton and Tex Horton soared the Grunau for their C and Mrs. Burton flew the Grunau to North Coates for Silver distance and height.

Con Greaves had a very interesting wave flight over Swinderby from an aero-tow. He reached 10,000 feet when he had to leave lift because of failing light. J. G. W.

FENLAND (R.A.F. Feltwell)

THIS season promises to be the best ever for "Fenland", as all our equipment is on top line, and we now look forward to enjoying the fruits of our winter labours.

A and B Certificates have been gained by two of our U.S.A.F. members, Jim Rears, and "Chuck" Lennors. Flight-Lieutenant Laurie Rowe also made the grade.

A warm welcome is extended to members of the East Anglian Club (late of R.A.F. Waterbeach) whose amalgamation with us is now complete. We hope they enjoy their gliding with us as much as they did at their own site.

Colin Elliott has returned from a re-categorisation course at the R.A.F.G.S.A. Centre, and now sports his B category instructor's ticket.

A "Soaring Fortnight" will be run from R.A.F. Feltwell, with operations each and every day from Saturday, 29th May to Sunday, 13th June inclusive. A warm welcome is extended to any R.A.F.G.S.A. members in our area during this time, and there will be plenty of flying each and every day.

To bring the records straight, after our amalgamation with East Anglian, our aircraft fleet now consists of two T-21's, two Grunau's, an Olympia 2B, Gull 1 and a Ka-6. We also have two diesel winches, with a third one being converted.

We would finally like to wish all competitors in the World Championships every success, and we further hope our foreign visitors enjoy their stay in this beautiful country of ours. C. R. E.

HERON (R.N.A.S. Yeovilton)

AFTER the Christmas leave period flying stopped for a spell to allow major inspections to be carried out and the ground equipment to be overhauled in readiness for the 1965 season.

The Heron Club came second to Portsmouth in the Home Air Command Trophy for 1964, having doubled its 1963 points score. We are making strenuous efforts to improve in similar manner this year, in the hope that we can unseat Portsmouth.

Our first flying day in February produced thermal conditions and a longest local flight of 1 hr. 35 min. by Ray Foot in his Skylark 3F. This promising start was completely reversed the following weekend when the airfield was snowbound!

Colin Hart obtained his A and B certificates on our second flying day. Since then conditions have in the main been stable, instruction of our new members has progressed favourably and we hope to see more new pilots solo very soon. Experiments in running winch and auto launches together have worked well and boosted our launch rate. In all, prospects for the coming season look most promising.

Robbie Robinson will be taking the Club Olympia to Bicester for the Inter-Services Competition and our Secretary, Mike Livesay, is crewing for Nicholas Goodhart in the World Championships at South Cerney. M. L.

PORTSMOUTH NAVAL

THE Annual General Meeting of the Club held recently was attended by thirty-four members. In his opening address, Humphry Dimock thanked John Stanley for his efforts in organising the Dunkeswell R.N.G.S.A. Competition, and also Peter Davies, C.F.I.; John Limb,

Treasurer; Eddie Warburton, Ground Engineer, and Leslie Vine, Secretary, for all the hard work they had put in to make last season a successful one. He also informed the meeting that the Club proposed to purchase a Swallow for the coming season.

A ballot for the Committee resulted in the election of Lionel Bowles, Ian Hammond, Keith Morton, Pat Ring and Peter Wilson.

The C.F.I., in his report, thanked Ian Hammond for his efforts to form the Tiger Moth Syndicate and also Keith Morton for taking on the task of Records Secretary. He announced that it was proposed to train a further five Club Instructors to alleviate the current shortage. Those chosen were Mike Berridge, Des Biggs, John Limb, Leslie Vine and Alan Williams.

The Goodhart Trophy for the member who has shown improvement in his flying and has been, generally, a good club member was awarded to Mike Berridge.

L. D. V.

CRUSADERS (Cyprus)

OUR club fleet now consists of two T-21B's, one modified for solo ballast, and a Swallow. We operate from an unmade track alongside a 3,000-yard runway. Launching is by winch, a Pfeifer and a Wild, and we also have a tractor for cable retrieving. We have a steel hangar which has been built by self-help. We glide summer and winter on Saturday afternoons and Sundays. During the winter thermal conditions are good, with tops generally around 5,000 ft. Our record altitude is 9,000 ft. Lee waves are frequently observed over the centre of the island, formed by the Troodos mountain range (height 6,000 ft.). Unfortunately cross-country flying is not allowed. During the summer months temperatures are around 100°F. and there is a persistent inversion at about 100 ft., these conditions last from May to September. We have a total membership of approximately seventy service personnel and families and an active

Some members of the Crusaders Gliding Club with the Club's entire fleet.

membership of about thirty.

In the last month we have had four A and B certificates, by Alan Madge, Tom Beck, Mick Reynolds and Neville Ward. Bob Miller and Peter Latham have converted to the Swallow. Despite much interference by powered aircraft we have done a fair bit of soaring, with many flights of one hour duration. Normally landings have been caused by powered aircraft movements rather than lack of lift. Soaring is now becoming commonplace and most members have indulged.

It is hoped to hold a camp over the Easter period at the Dhekelia airstrip, where there is a ridge as well as good thermal country. J. D. B.

We would be pleased to receive news for this section from every country in the world where soaring is done. — A. E. SLATER, *Overseas News Editor.*

ARGENTINA

IN the National Contest 37 gliders took part, 17 in the Open Class, with a handicap system for marks, and 18 Ka-6's in the one-type class. Both classes were classified as one to determine the 12 pilots who had to participate in the Selection Contest, which started two days after the Nationals had finished.

During the Nationals only four tasks were flown in 10 days owing to weather conditions, and in the Selection Contest 5 tasks in 6 days.

Hossinger won in the Open Class with a Standard Austria SH, and Picchio won in the Standard Class in a Ka-6.

JORGE BERTONI

Mr. Bertoni has kindly enclosed all the daily score sheets for both meetings, and a table showing the handicap factor for all sailplane types in Argentina (except the Standard Austria SH with 0.51 and an unidentified machine with 0.71). This table, given below, helps to identify the types flown which are not mentioned in the score sheets.

Handicap Factors

Type	*Factor*	*Type*	*Factor*
Grunau Baby	1.000	Sky 34	0.68
Hütter	1.000	Condor 4	0.67
Schw. 2-22	1.000	Blanik	0.65
Tutor	1.000	Skylark 2	0.65
Rhönbussard	0.88	Ka-6	0.62
Specht	0.88	M-100	0.62
Olympia	0.82	Foka	0.60
Kranich 2	0.82	Skylark 3	0.59
Spalinger	0.82	Skylark 4	0.56
Fauvel AV36	0.76	Zefir 2	0.56
Ka-8	0.69	St. Austria	0.52

Daily Results

JAN. 7TH.—Distance along a fixed course: won in the Open Class by Oddone in a Skylark 3 with 115.7 km. (adjusted to 68.26 km. by 0.59 handicap). Rizzi, in Sky, had second highest score with 87.5 km. (adjusted, 59.5); but Hossinger made second best distance, 108 km. (adjusted, 55.1).

The One-class contestants, all flying the Ka-6 type, had the same task (as on all days); Berreta won with 134.2 km., and two others exceeded all the Open Class pilots.

JAN 8TH.—In a goal-and-return race of 195 km., Hossinger won both on points and on absolute speed, 83.88 km./h. Rizzi was second on points with a Sky at 57.1 km./h., but Minuzzi in a Standard Austria, though placed 7th, averaged 79.4 km./h. Urbancic won in the One-Class with 73.42 km./h.

JAN 9TH.—Hossinger again won the task, a dog-leg race of 168 km., by being the only pilot to get there. Sara, in a Ka-8, came second on points with a distance of 146 km., but Benudez nearly finished the course with 165 km. in a Sky. In the One-Class contest only Craz got there.

JAN. 11TH.—Hossinger won a 100-km. triangle race at 98.02 km./h. Rizzi with his Sky came 2nd on points, with 64.47 km./h., but Fleiderman and Stanley, each in a Standard Austria, went faster at 78.22 and 77.47 km./h. Fittipaldi won at 75.06 km./h. in the One-Class.

Leading Final Results

Pilot	*Glider*	*Points*
Hossinger	St. Austria SH	3759.0
Sara	Ka-8	2768.0
Rizzi	Sky 34	2706.3
Oddone	Skylark 3	2392.7
Caro	?	2143.4
Vega	St. Austria	1815.4
Fleiderman	St. Austria	1533.7
Penna	Skylark 3	1529.4

In the One-Class contest Picchio won with 3366.7 points.

Selection Contest

Twelve pilots took part in this, and no handicap factors were applied.

JAN. 19TH.—A 203-km. triangle was completed by only three pilots: Hossinger at 71.54 km./h., Frene (Ka-6) at 54.68, and Aracil (Ka-6) at 46.89.

JAN. 20TH.—A 102-km. goal race was completed by Sara at 71.30 km./h. and Picchio at 54.88. Four other scored, but Hossinger did not. All scorers flew Ka-6's except Rizzi (Sky).

JAN. 22ND.—Dog-leg goal race, 122.5 km., completed by nine pilots. Best speeds: Frene (Ka-6) 61.23 km./h., Rizzi (Sky) 58.59, Cruz (Ka-6) 57.30, Hossinger (St. Austria SH) 57.12.

JAN. 23RD.—Distance along a line; best performances, Berreta 205 km., O. Sara 204.45, Cruz 203.5, Bueno 203.4, Hossinger 202.75, all with Ka-6 except Hossinger.

JAN. 24TH.—Goal-and-return race, 219 km., completed only by Hossinger at 71.4 km./h. and Bueno at 56 0.

Leading total points for the contest: Hossinger 3,885.3, Frene 3552.7, Picchio 3452.0, Aracil 3303.7, P. Sara 3149.1.

AUSTRALIA

FORTY sailplanes were lined up for the opening ceremony of the National Championships at Benalla, Victoria, performed on 27th December by the Australian gliding pioneer, the Hon. W. R. Garrett. To provide a spectacle, a 100-km. triangle was set, League 1 to go twice round and League 2 once round. As the lift was only to 4,000 ft. and scratchy, the public were well entertained. Winners: League 1, J. Blackwell in Ka-6 at 37.4 m.p.h. (6 got round twice); League 2, A. Thompson in Nymph at 25.7 m.p.h. (5 got round).

On 29th Dec., in a 20-25 kt. wind, with good lift to 4,000 ft. and an occasional 6,000, Malcolm Jinks won a 114-mile out-and-return to Tocumwal in a Ka-6 at 42.2 m.p.h. "by using only the best lift available and pressing on down to 1,000 ft. to find it." Second: A. Johnson in Arrow at 37.4 m.p.h. In League 2, D. Curry in ES-57 won a 132-mile downwind goal race at 36.7 m.p.h.

Only two League 1 pilots completed a 300-km. triangle on 30th Dec., J. Blackwell at 30.9 and R. Deane at 27.8 m.p.h., each in a Ka-6; the 2nd leg was into a 10-25 kt. wind and the 3rd leg crossed irrigation areas around Shepparton. Jack Iggulden's Boomerang caught its tail skid on power wires and he retired from the contest with a cracked vertebra. A. Thompson, in a Nymph, won an out-and-return to Tocumwal at 24.5 m.p.h. in League 2.

Short tasks were set on 31st Dec. to get everyone back to see the New Year in, and nearly everyone completed them. Winner in League 1, R. Martin in ES-60, out-and-return Tocumwal at 41.5 m.p.h.; next best speeds, two Arrows at 37.5 and 36.9, Foka at 36.7, two Ka-6's at 36.1 and 35.9, Mucha at 35.2. In League 2, R. Barrington won a 100-km. triangle race at 43.0 m.p.h. in a Cherokee.

The Australian 300-km. triangle record was beaten three times in quick succes-

sion on 1st Jan., by Dick Deane at 39.2 m.p.h., G. Sutherland at 40.2, and M. Jinks at 42.3, each in a Ka-6. Bob Rowe, in a Boomerang, would also have beaten the record but for striking heavy sink on his final glide. League 2 had the same task but none completed it. Winds were light.

A visitor from New Zealand, Peter Heginbotham, with a Ka-6, won on 2nd Jan. by going 111 miles on an uncompleted 150-mile out-and-return. Only Col Churches in a Ka-6 kept airborne when high cloud brought everyone else down during the morning; then a brisk wind sprang up after lunch and cumulus began. League 2's best distance was 44 miles by G. Horwood in a Cherokee along a 64-mile out-and-return.

On 4th Jan. the best lift was over League 1's turning point, Deniliquin, giving pilots the false impression that difficult conditions had improved. Only two completed the 188-mile course, J. Blackwell and J. Northover at 33.1 and 28.5 m.p.h., each in a Ka-6. Bob Rowe flew the Boomerang that didn't — he overshot the turning-point into New South Wales and landed there. League 2 failed to complete a 114-mile out-and-return; M. Page went 74 miles in an Olympia, and two home-built Cherokees each made 54 miles.

Four completed a 124-mile out-and-return for League 1 on 5th Jan.: M. Jinks in a Ka-6 at 31.4 m.p.h., A. Johnson in an Arrow at 30.6, Derek Reid in a Skylark at 30.0, and W. Simpson in a Ka-6 at 27.4. League 2 had a 44-mile goal race, won by R. Connelan in an ES-52 with the help of handicap points.

League 1 had a dog-leg race, into wind (17 kt.) and then downwind, on 6th Jan., won by Blackwell in a Ka-6 at 50.7 m.p.h. League 2 had yesterday's task, won by P. Greatwood in a Nymph at 50.8 m.p.h.

Peter Heginbotham had two tries at a 110-km. triangle on 7th Jan. and went faster the second time, at 45.9 m.p.h.; so did Cox, at 46.4, but Churches won with 46.6 the first time round. In League 2, R. Urbonas went fastest on a 72-mile out-and-return at 43.2 m.p.h. in an Olympia, but J. Crawley won at 23.4 m.p.h. in an ES-52 with handicap help.

By this time the leaders in League 1, with their average daily scores, were: M. Jinks 1,000 (he shared his machine but won every time he flew), J. Blackwell 968.8, A. Johnson 917, D. Reid 851. But Reid lost this place on 8th Jan., coming 10th in a 300-km. triangle, which R. Deane won in a Ka-6 at 35 m.p.h. League 2 had a 215-km. triangle.

On the final day, 9th Jan., League 1 had a 215-km. triangle, won by J. Coolhass in a Foka at 43.8 m.p.h., and League 2 a 110-km. triangle. After next day's closing ceremony, Max Howland in a Ka-6, Ian Aspland in a Mucha, and Maurice Bradney in an Arrow all flew homewards 330 miles north to Narromine, obtaining their Distance Diamonds.

Final Scores League 1

	Pilot	*Glider*	*Av. daily points*
1.	M. Jinks	Ka-6	992
2.	J. Blackwell	Ka-6	960
3.	A. Johnson	Arrow	921
4.	C. Churches	Ka-6	841
5.	R. Martin	ES-60	835
6.	D. Reid	Skylark	829
7.	J. Northover	Ka-6	822
8.	S. Cox	Ka-6	791
9.	P. Heginbotham	Ka-6	789
10.	R. Deane	Ka-6	772
11.	L. Harrison	Arrow	769
12.	J. Rowe	ES-60	756
13.	A. Patching	Ka-6	740
14.	W. Simpson	Ka-6	736
15.	C. Deland	Ka-7	724

64 pilots competed

League 2

	Pilot	*Glider*	*Av. daily points*
1.	R. Curry	ES-57	901
2.	J. Crawley	ES-52	885
3.	M. Page	Olympia	862
4.	F. Smith	Cherokee	816
5.	G. Horwood	Cherokee	764

33 competitors scored.

BRAZIL

THE 8th National Championships were held at Sao José dos Campos in mid-December. In poor weather, five contest days were possible. Owing to the variety of sailplane types a handicap system was used. Georg Münch became Brazilian Champion for the fourth time in a BN-1. *Aero Revue*

FINLAND

THERE were 169 sailplanes registered in Finland on 1st February, including two unairworthy school gliders. The most numerous types were PIK-15 (28), Ka-6 (17), Rhönlerche II (15), Ka-8B (13), Vasama (11) and Grunau Baby (8). *Flyv*

GERMANY WEST

MANY regional contests are announced. That for Schleswig-Holstein, Bremen and Hamburg is at Itzehoe, 15th-25th May. For Lower Saxony and Berlin, at Wunstorf, 27th May-7th June. Hessen, Rheinland-Pfalz and Saar, at Eilertchen, 3rd-13th June. Bavaria at Roth, 4th-13th June. Baden-Württemberg at Klippeneck, 18th-27th June. Nordrhein-Westfalen at Oerlinghausen, 21st June-4th July.

ACCIDENT ANALYSIS.—During 1964 there were 74 severe accidents with 14 fatalities; it was the worst year since 1958. Of these, 42 occurred while landing; 14 during winch launch (most due to cable break below 100 m. and pilot's attempt to turn back); 2 on aero-tow (both due to unconventional attitudes causing structural failure); 6 while slope-soaring (two spun in, one hit a transport cable, the rest flew into tree-tops); one collision between a Ka-7 and Ka-6, from which the Ka-6 pilot saved himself by parachute, but the two in the Ka-7 had none.

Structural faults accounted for 6: While a glider was upside-down a bolt fell from the aileron control, then a wing broke. A rudder was wrongly coupled but the pilot got down safely from a winch launch. A new machine on test flight had no elevator control, and in another new machine on test the tail broke; both pilots were saved by parachute. A rudder cable broke but the pilot landed without injury. A 10-year-old machine proved almost uncontrollable but was landed from 100 ft.; it had spent several years in a cellar, and was passed for flying without being weighed; damp had got into the end of the fuselage. Another 10-year-old machine broke on landing. A two-seater spun in with fatal result to instructor and pupil, and a single-seater spun into a river from 800 ft. *Aerokurier*

GHANA

THE gliding school at Afienya, about 25 miles from Accra, is to be developed into a youth centre for training youths from other parts of Africa. The principal of the school is Hanna Reitsch.

IRELAND

WE believe we are now on the verge of receiving official sanction to aero-tow out of Baldonnel Aerodrome, now re-named "Aerodrome Vic Easmuinn", or Casement Aerodrome. We have been informed that "the licence is being drafted", so perhaps the end of the red tape is in sight. Meanwhile, all members have been circularised re aero-tow operation and procedure, and our tug has been doing plenty of flying elsewhere, mostly at Collistown Airport.

Our new two-way radios are in a somewhat gloomier position. Though now in our possession, permission for their use is still bogged in red tape. However, a comprehensive circular on radio procedures, and the new phonetic alphabet, is being carefully prepared.

The search for a new soaring site continues sporadically, like the thermals at Baldonnel. Scarce though they are, some lucky pilot manages to use a few for an hour or two now and then. Recently, Raymond Treacy went solo on the Ka-7 two-seater, the first pupil to do so under our new training scheme. Congratulations Ray!

In recent months, Tom Evans' new Ka-6, which arrived by sea last Decem-

ber, made its maiden flight at Baldonnel. It was followed shortly after by Michael Slazenger's new Olympia 419, which had been aero-towed from England not long previously and both are entered for the World Championships. A four-man syndicate amongst our Members had bought Michael's old prototype Olympia 1. Also, the Bergfalke is flying at last, and we have just heard our new Ka-8 is on its way. This will make a total of 10 aircraft, including our tug, all rushing our field at once, which will give rise to some headaches. To help alleviate this difficulty, a system of Marshals has been devised, with Dave Hooper as Chief Marshal, and General Factotum. (Poor Dave!)

As we go to Press, our World Championship Fund has already reached two-thirds of the target. Mrs. Slazenger graciously gave the I.G.A. the use of Powerscourt Gardens for St. Patrick's Day, which realised approximately £48, in spite of being almost washed out by the weather. However, to swell our coffers further, Count de la Poer has kindly organised a Gliding Field-Day in his grounds at Clonmel. C. G.

ITALY

FOREIGN pilots who wish to do some gliding in Italy for a short period no longer encounter the difficulties which existed in the past. They only have to show their licence and logbook. Only pilots who intend to stay in Italy for a long period require an official validation of their licence.

The Gliding Centre of Varese (Centro Studi del Volo a Vela Alpino), on the north shore of the Lake of Varese, 31 miles from Milan, sends this welcome news together with information about the Centre. There are ample hangars, a workshop, about 15 different types of sailplane and two types of tug (Stinson 15 and Dornier 27), and a pleasant clubhouse; also a meteorological office. In spring and summer there are good thermals along the Alps and Alpine foothills, and in autumn and winter N.W. winds produce waves. Visiting pilots with no experience of mountain soaring are first trained by instructors in two-seaters.

The following flying charges are made (€1 = about 1,000 lira):—

Single-seaters, 3,100 l. per hour; two-seaters 4,000 l. per hour; tow to 600 m., 2,000 l.; to 1,000 m., 3,000 l. Fees can be compounded at 18,000 l. for 10 hours, or 31,000 l. for 20 hours, excluding tows. Pilots bringing their own sailplanes are charged 700 l. per day for use of hangar and airport services, and 220 l. per minute for tows.

Reservations for lodging should be made 20 days in advance. Prices vary according to requirements; the minimum for full board is 2,000 l. per day. "On request the gourmets can order rich and delicious meals, although glider pilots do not indulge in these luxuries . . ."

The O.S.T.I.V. holds study and research courses during the first 20 days of September each year at the neighbouring village of Calcinate del Pesce; pilots should apply through their national governing bodies.

UNITED STATES

WAVE activity in the Sierras the winter of 1964-65 has been characterized by ground winds of unusual intensity and very turbulent air. For some reason, there have been no very remarkable flights, despite the strong conditions, or perhaps because of them. As an example, on 22nd February, three ships took off from Tehachapi but were unable to get above 15,000 ft. a.s.l. in part because winds were so strong they could not stay in the lift area. One of the pilots, Earl Seagars, reported a solid wall of dust 40 miles in length reaching from the ground (3,000 a.s.l.) to 15,000 a.s.l. Being unable to get back to the take-off point, they flew along the wave to an airport beyond the end of the wall of dust, where they landed in surface winds of 60 m.p.h. Fortunately helpers were on hand and they got the ships in hangars. A short time later the control tower measured wind gusts of 90 m.p h.

The strong surface winds seem to come in pulses along tongues perhaps a mile or two wide and ten miles long, with a direction parallel to the direction of wind aloft. The effect is to create areas of severe turbulence well up-wind and down-wind of the roll cloud along and above these tongues. This may have

been the undoing of another pilot one week later in this same area.

Flying the Rebel, a one-of-a-kind high performance ship with a three-piece wing, 3-Diamond pilot Bob Brown was letting down for a landing apparently well downwind of the roll cloud when the outer wing on one side separated at the attach point in severe turbulence. Brown survived his jump from about 3,000 ft. above the ground, but it is reported that he suffered painful injuries from being struck twice by the wreckage after jumping and being dragged a long way across the desert after landing. The surface winds were estimated to be in excess of 60 m.p.h. at the time, and the same pulsing tongues were again in evidence. HARNER SELVIDGE.

U.S.S.R.

REGIONAL Contests will be held in 34 different regions, each lasting 5 to 7 days. Tasks will include 100-km. triangles, 300-km. goal flight, and return to start after being towed 75-125 km. away from it. Winners of the "Regionals" will take part in the "Final" contest of the two-year Spartakiad, in which a 500-km. triangle may be set. Winners of this contest will go to the 17th Russian national meeting.

MASTERS OF SPORT.—New regulations for Masters of Sport of various grades came into force on 1st January. To be a Master in the International Class one must finish 1st to 5th in a World Championship or 1st to 3rd in a major international contest, or in either case win a daily task; or one must set up a regional speed or height record of world standard and then, in the course of a year, make a triangular or out-and-return flight of 500 km. or free distance of 550 km.; or one must set up two world's records in the course of two years.

To qualify as Master of Sport one must either win 1st to 5th place in a Russian national contest or win a task and accumulate 80% of the winner's points; or fulfil required standards for speed and distance on condition that 10 other First Grade Sportsmen are doing them at the same time; or set up a national record of regional standard.

To qualify as First Grade Sportsman one must fulfil the norms for speed and distance; for Second Grade, norms for distance; for Third Grade complete one's ab-initio training and be passed out as "good".

Speed norms for Master of Sport are 50 km./h. for 200-km. triangle (or twice 100 km.), and 60 km./h. (50 for First Grade) for 100-km. triangle. Speed norms for Master of Sport (1st and 2nd Grade in brackets) are: free distance 350 km. (250, 100); or out-and-return 300 km. (200, 70); or triangle 300 km. (200, 100). (*Translated by* C. WILLS).

Krilya Rodiny

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