JUNE, 1947

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Sailplane and Glider

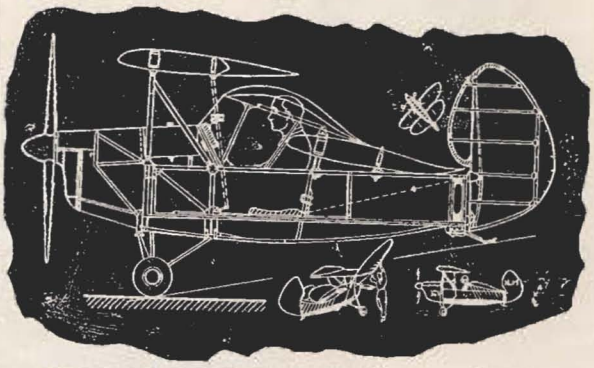
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Sailplane and Glider

and ULTRA LIGHT AIRCRAFT

THE FIRST JOURNAL DEVOTED TO SOARING AND GLIDING

JUNE 1947 ★ Vol XV No 6

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and
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The *Sailplane and Glider* is published on the fifth day of every month. Price One Shilling and Sixpence per copy; 19/- per year posted. Advertising Rates on application.

Published for the proprietors, Glider Press Ltd., by the Rolls House Publishing Co., Ltd., Breams Buildings, Fetter Lane, E.C.4, and Printed by the Mendip Press Ltd., London and Bath.

CONTENTS

	Page
Editorial	1
Convection and the Soaring Pilot	2
Best Flying Speeds	3
Beginners' Page	5
Soaring the Short "Nimbus"	7
Formation and Operation of a Gliding Club	9
Gliding in Spain	11
News in Brief	14
Swedish International Soaring Contest	15
Powered Sailplanes	16
B.G.A. Announcements	17
News from the Clubs	19
Letters to the Editor	20

Front Cover: *"'Weihe' over the Monflorite School of Gliding at Huesca, Spain."*

EDITORIAL

FOR the first time in eight years Britain is holding National Gliding Contests, and the event will be a landmark in British Soaring History. To Bramcote Airfield, by the kind permission of their Lordships of the Admiralty, will be coming, we hope, not only a host of British Soaring pilots, but also teams from Sweden, Denmark, Holland, Belgium, France, Switzerland and Spain, all of whom have been invited, thus illustrating what has always been a great point in favour of this sport—its natural and therefore wide International appeal. Visitors from foreign parts are very welcome and we shall try to make this evident at Bramcote. It is in many ways perhaps a great pity that they cannot be allowed to enter the competitions except perhaps as "also rans" unless the Committee organises "off-events" for non-British pilots only, which is an idea.

We are glad to note that the B.G.A. have modified the proposed qualifications for entry somewhat, and reduced number of aero-tows is going to open the gate wider to more possible entries, especially as there will be facilities for qualifying in this particular on the spot. The provision of messing and accommodation on the Royal Naval Air Station at a moderate fee will also be a great boon to those whose business it is to be there.

The contests have been organised both to serve as a rehearsal for the F.A.I. Gliding Contests, which are to take the place of the Olympic Games event next year, and also to provide a data to guide the selectors of the British team for this contest. No doubt also a good deal of other valuable experience will be acquired which will enrich the movement in general.

There has been the usual "flap" about getting C's of A for new machines in time, but no doubt everything will be in order "on the night." In this respect the co-operation of the Air Registration Board has been much appreciated.

The B.G.A. are having some headaches which might well be passed on to all devotees of Gliding, and they have mainly to do with finance. The cost of all this is going to be considerable, and this goes for the organisation alone, without the provision of prizes. An appeal has been made to all those interested to support the funds of the B.G.A., so that it has not to carry the burden of this event entirely on its own slender resources. No doubt there will be some public support but only if this is very great indeed, is it likely to be able to provide entirely the necessary finance. Anything that our readers can do, therefore, either by way of direct donation, or by way of going to the Contest and taking their family and friends and paying the necessary admission and car-parking fees, will help to swell the funds.

There remains an important point on which our readers may also help which is the provision of personal and team prizes for the winners. Such things as barographs, variometers, A.S.I.'s, barometers, fountain pens, silver pencils, etc., would be gratefully received.

Sailplane regrets that owing to the shortage of paper production it is unable to do such justice to the Contest such as it would have liked to have done; we can only hope that next year these shortages will have been overcome.

For the rest let us hope we have good weather and large crowds.

AN AIRMAN'S ECSTASY

OH, I have slipped the surly bonds of earth
And danced the skies on laughter-silvered wings;
Sunward I've climbed, and joined the tumbling mirth
Of sun-split clouds—and done a hundred things
You have not dreamed of: wheeled and soared and swung
High in the sunlit silence. Hovering there
I've chased the shouting wind along, and flung
My eager craft through footless halls of air;
Up, up the long delirious, burning blue
I've topped the wind-swept heights with easy grace,
Where never lark nor even eagle flew;
And while, with silent lifting mind I've trod
The high, untrespassed sanctity of space,
Put out my hand, and touched the face of God.

This poem was written by Flying Officer I. Gillespie Megee, a 19-year-old airman who was killed shortly after leaving Rugby. It was brought to the attention of Lord Tedder, who sent it on to Air Cmdre. Howard-Williams, late Chairman of the Executive Committee of the R.A.F.A.

CONVECTION AND THE SOARING PILOT

By F/Lt. H. NEUBROCH

Continued from May issue.

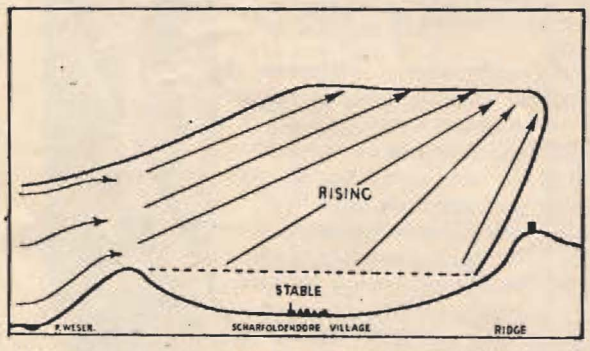
III

(*d*) Evening Thermals.

UNDER "Vertical currents as a result of local overheating" we have already mentioned one effect of lift found in the late afternoon and even after dusk over surfaces of relatively great absorption and slow re-radiation of solar heat. Professor Georgii, however, uses the expression "evening thermal" to describe a different type of vertical movement associated with *orographic* lifting (forced ascent of air caused by a physical obstacle in the path of its movement) which is usually only found, if at all, at heights above 3,000 feet. Its comparative rarity and inaccessibility without aero-tow have left it almost unknown and unused, but it would seem to offer a valuable and interesting field of investigation to the practical glider pilot.

I have myself experienced an example of this type of lift, though at the time I put it down to a standing wave effect. On September 10, 1946, I was launched at 1045 hours in a "Minimoa" from the ridge at Scharfoldendorf. After five extremely harassing hours of ridge soaring in a gusty north-easterly, with fracto-stratus hanging down to a mere 200 feet over the ridge, during which time I never reached 600 feet above launch, the valley west of our hill cleared, and just before 4 p.m. I watched F./Lt. MacIntosh being launched in a "Grunau." The wind seemed to have veered slightly and I was finding it more difficult to maintain a safe height. My surprise was therefore considerable when next I saw MacIntosh, way above me at perhaps 2,000 feet, flying with more freedom than might have been warranted by anything I had then experienced on the ridge. After some time spent in searching for more lift, I found very smooth air rising at about 5 ft./sec.

As I was by that time rather fatigued by the past five hours' effort, I was immensely pleased with these new conditions which allowed me to put the "Minimoa" into a gentle turn, after which she rose, hands off, perfectly smoothly, while I sat back to enjoy the scenery.



(*Fig. 4.—East-West cross section from River Weser to launching point on Scharfoldendorf ridge, with probable air currents at* 16.00 *hours on September* 10*th*, 1946.)

Having reached the upper limit of lift at approximately 2,500 feet, I cruised about in an area of some 20 square miles without losing any height. After more than an hour of this sort of thing flying became for me, for reasons other than meteorological, distasteful in the extreme, and I landed just before half-past five. By this time the sun was quite low above the western hills, but in the layers between 1,000 and 3,000 feet above the valley a large parcel of air continued to rise smoothly. My own descent had only been accomplished after a steep dive with spoilers fully extended, and another sailplane remained airborne easily for another half-hour.

After reading Professor Georgii's notes on evening thermals, it seems to me that the weather behaved somewhat like this: till about 4 p.m. Scharfoldendorf had been in a warm sector, but at that time cold, unstable air broke into the valley west of our ridge. Due to the hour of day and the cloud earlier on, radiation at the bottom of the valley had ceased and the surface air was cooled to form a *stable* lower layer in which no lift of any form would have been found. Matters were different at the height at which I saw F./Lt. MacIntosh in his "Grunau." Here the air, belonging to a cold, *unstable* mass, had been lifted orographically by the hills to the west of our own ridge (between the river Weser and Scharfoldendorf village), and, since its equilibrium in relation to the air around it had been disturbed by being lifted, it simply continued to rise until that equilibrium had been restored, *i.e.* when its adiabatic loss of heat gave it the same temperature as the surrounding air.

Such an effect will be found when any airmass is lifted orographically into a layer where it becomes unstable in spite of its adiabatic loss of heat. During the day instability may be present at the surface, but due to surface cooling in the evening, the airmass in question will become stable, and unless it is lifted by a physical surface obstacle in its path to a height where it becomes unstable in relation to the air around it, no evening thermal will result. The presence of a range of hills or mountains extending into an unstable layer is therefore essential for the occurrence of this phenomenon.

(*e*) Convection at Height.

Professor Georgii's distinction between height and evening thermals seems to be based somewhat arbitrarily on whether orographic lift is present to set off instability at height, or whether that instability is simply due to the properties of the atmosphere, as when advection of very cold air at great height keeps convection going. He discusses the latter case under the heading of "Heights Thermals," meaning convection above 6,000 feet when there is a stable layer below that which pre-

cludes the possibility of vertical currents. Such conditions, he says, are most frequent when surface heating is least, *i.e.* in the winter and at night.

On June 21st, 1934, the German woman pilot, Hanna Reitsch, was towed to 8,500 feet after a launch in the late afternoon. Just below 8,000 feet she noticed slight lift, and after releasing from the towing aircraft she remained at the same height for some time. Between 7,800 and 8,200 feet she found lift of 4 ft./sec. This was entirely due to an instability layer at that height which was situated above a perfectly stable layer.

I am certain that many such flights must have been undertaken since those days, but insufficient means have restricted British pilots to make use of convection at height. Given, however, the possibility of launching by aero-tow, and close co-operation with the meteorologists, another field of soaring possibilities should yield worth-while results.

(*f*) Sea Convection.

This is probably the least explored yet at the same time perhaps the most intriguing form of convection. In discussing it we have hardly any practical experience to go on, and as regards theory, opinions are sharply divided between those who think soaring in sea convection feasible and those who don't.

True, G. H. Stephenson flew the Channel just before the war, but the height, 6,000 feet, to enable him to do this was gained, mainly, under and in a cloud which was formed by convection due to the temperature difference between the land and sea surfaces along the English coast. Mr. Stephenson himself stresses that this temperature difference should be as great as possible, but it is obvious that no such temperature differences are likely to be present in the open sea around the British Isles.

In fact, experienced power pilots have not found any sufficient amounts of convection in our home waters, and this would seem to limit the range of flights over the sea to less than fifty miles from our shores, provided that sufficient height were first gained over land.

Frontal thunderstorms advancing over the coast and out to sea might also be utilized much in the same manner as those—one would use to soar along a cold front over land, but they are liable to decrease in intensity over the sea if the sea temperature is low, and the pilot would not only have to cope with the usual difficulties of front soaring but also with the strong possibility of lift giving out altogether. As this form of soaring is probably the one which leaves the pilot the least control over his navigation it would not seem advisable to continue such a flight out of sight of land.

We would seem, then, to have arrived at a dead end in our endeavour to soar anywhere except over land. But once again Professor Georgii comes to the rescue by pointing out that in theory, at least, conditions in the tropics should be quite favourable for distance soaring flights over the sea. " Thermal upcurrents," he wrote in 1934, " can occur anywhere on the ocean where the water temperature is higher than the air temperature." It would seem that even

(*Continued on page 8*)

BEST FLYING SPEEDS

" A Criticism of a Criticism "

By GEORGE W. PIRIE

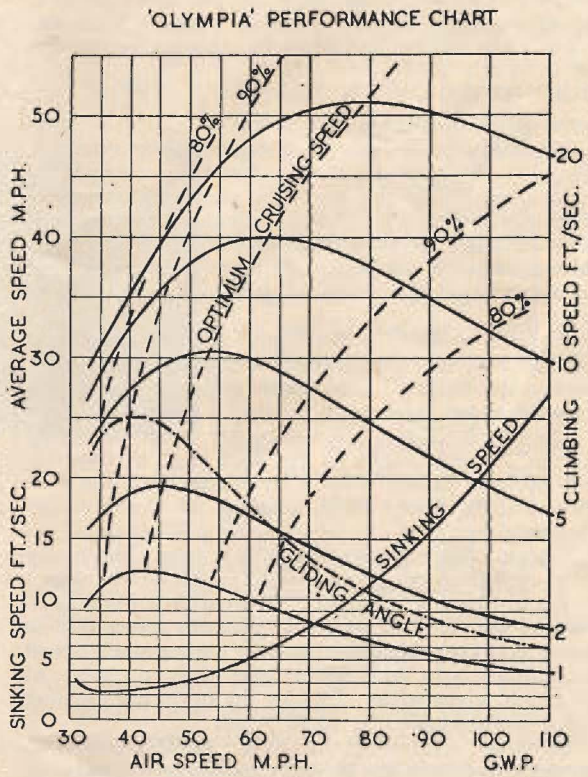
IT must surely have been heartbreaking to your earlier contributors to see, in your March issue, an unreasonable refutation of their excellent articles on " Best Flying Speeds." In plugging gliding angles, Mr. Smith has failed to appreciate the basic aim of his predecessors, and has, moreover, lost his case by default, through quoting a triply-false example in support of his retrograde ideas.

Firstly, he has portrayed a downdraught, of such a size and strength as should only be met on a day when thermals would be anticipated by his "opponent" of at least 10 ft./sec. This would cause the latter to fly at 60—65 m.p.h. on that score alone.

Secondly, he has credited his opponent with a knowledge of best flying speeds, yet denied him any common sense.

Thirdly, he has failed to appreciate that his problem is complementary, rather than contrary, to that of his antagonists. He will find, indeed, that the cruising speed graphs already indicate the speed at which to fly through downdraughts.

Let us consider the expression for air cruising



speed (that is, the average air speed from the top of one thermal to the top of the next one).

$$\text{Cruising speed} = \frac{V \times VC}{VS + VC}$$

Where V = mean flying speed between thermals.
VS = ,, sinking ,, ,, ,,
VC = ,, climbing ,, in the new thermal.

Notice how these factors are known to the pilot through his A.S.I. and variometer, except that he may not know what proportion of VS is due to the natural characteristics of his sailplane, and what is due to downdraughts.

Now visualise how the still air characteristics are evaluated. We take one climbing speed at a time (say, 1, 2, 5, 10 and 20 ft./sec.), multiply it on the top line by the flying speed, and add to it on the bottom line by the corresponding sinking speed.

My own graph for the "Olympia" includes efficiency loci for 100%, 90% and 80% efficiency. The important features of the evaluation are that

(i) VC appears on both the top and bottom lines.

(ii) The top line is a product whereas the bottom line is a sum.

That explains why the maxima at higher values of climb (VC) occur at greater flying speeds (V).

A new set of calculations might be thought necessary, if the downdraught, rather than still air, characteristics are required, but this is patently unnecessary. Each value of downdraught would have to be added to the sum on the bottom line, but suppose, instead, that we simply add it to VC. The top line will now read V x (VC + D), and the bottom line VS + VC + D, where D is the downdraught. In other words, for each value of V and VS chosen, the top line will remain too great throughout by the factor $\frac{VC + D.}{VC}$ which is constant, whereas the bottom line is correct throughout.

The shape of the curves obtained, their maxima, etc., will, therefore, be correct, but the scales will be augmented. This can easily be checked, because it obviously means, that flying through a downdraught of 10 ft./sec. to a thermal of minimum strength, should demand the same optimum flying speed as flying through still air to an anticipated thermal of 10 ft./sec.

A glance at Mr. Smith's figures and my graph will confirm that this is so, remembering that the former quotes the total sinking speed and not the downdraught alone.

The whole basis of the case for optimum flying speeds, however, rests on the fact that, in thermal soaring, one should always fly faster than the best gliding angle, except when running out of altitude or thermals.

I hope I have shewn that the amount faster can be gauged from the graph by adding the downdraught to the anticipated thermal. Thereafter it remains to balance the odds of potential gains or losses due to under or over estimation, and to choose one's speed accordingly. It will be noticed that a choice of 55 m.p.h. gives within 10% of the optimum cruising speed for thermals of 1 to 20 ft./sec.

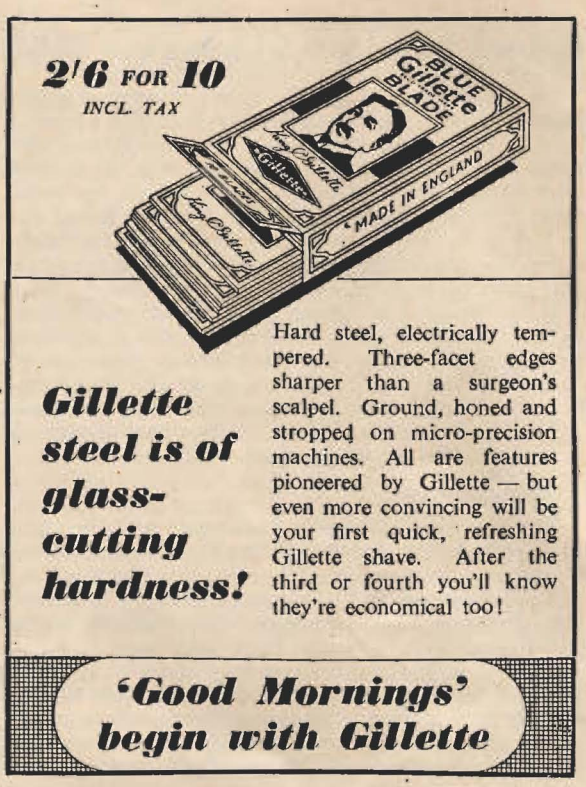
Moreover, rigid adherence to Mr. Smith's principles would cause one to be varying speed constantly, though not quite as much as a dynamic-soaring bird. This would occupy the attention, and would require mental gymnastics to interpret the variometer, at a time when navigation and the study of ground (or cloud) conditions would pay better dividends.

In the "Olympia," I contend that one should use the speed range and the stability. The elevator trim should be set between thermals to give the desired speed (at least 55 m.p.h. except on poor days) and attention should then be focussed on clouds, ground, maps, and flight planning generally, whilst seeking a new thermal. This should be discarded if it is not up to standard, and if height and conditions permit.

The aspect of the individual performance of particular sailplanes has been adequately covered by now. However, comparative sailplane cruising speeds were badly skimped in your recent articles. The author indeed neglected the difference in rates of climb in the same thermal of different sailplanes. Admittedly, this is relatively slight at high values of climb, but it is vital under critical conditions (*i.e.* of small or gentle thermals).

Anyone who has seen the "Adler" averaging 10 m.p.h. across country, on a day when the standard pre-war British sailplane was relegated to delayed descents, will realise how important this should be, both to the designer and to the discriminating private owner. It would, unfortunately, demand much research work thus to calculate absolute performances.

In the meantime, I, for one, shall be busy, and happy, in the more restricted field of private enterprise.



Beginners' Page
by
VERONICA PLATT

3. From the 'A' to the 'B'

LAST month I took you as far as the "A" Certificate, and up till now it has been immaterial whether you are learning on a level aerodrome or a hill site. I have also assumed you will be learning, not in a two-seater with an Instructor, but alone in a primary. There is some divergence of opinion here and you will find the experts arguing fiercely. On the whole people prefer the method they use themselves. You will find I have a bias in favour of flat country and primary training, simply because I learnt that way myself. But I will try to give you both sides of the picture.

One reason for the primary is that it is very cheap. Its construction is so simple that any Club can make one, and in case of minor crashery it is easy to repair. Then, too, you have none of the awful sensation of being left alone on your first solo. You are alone from the very first moment you sit in the machine, and you will find, surprisingly enough, that a flight in a two-seater with an Instructor makes you less confident rather than more so. But I do think that two-seater instruction later on is a great help. When you come to thermal flying there are so many short cuts to knowledge that can be better explained at the time than after you come down, and the Instructor has a chance to correct any small faults that may have crept into your handling of the machine. This can equally well be done by wireless—the only snag about that being that it sometimes fails to work and leaves you literally hanging in mid-sentence. . . . But it is again a much cheaper method than the two-seater, which unfortunately becomes increasingly expensive.



Relax !

My bias in favour of flat country comes from there being much more of it. There are so very few slopes that face in the right direction for our prevailing wind, whereas the war has left us with a great number of good airfields not too far from towns. I would like to see every reasonably sized community with its own Gliding Club, and there is no chance of that if we have to depend on hills and their owners. With a rope and an old car a glider can be got into the air; with a winch it is even easier. And from there to aerotow is but a step. Once you get on to aerotow you can continue to have fun perfecting your aerobatics even when the conditions are hopeless for either time or distance. But we are going ahead too fast—back to the "B."

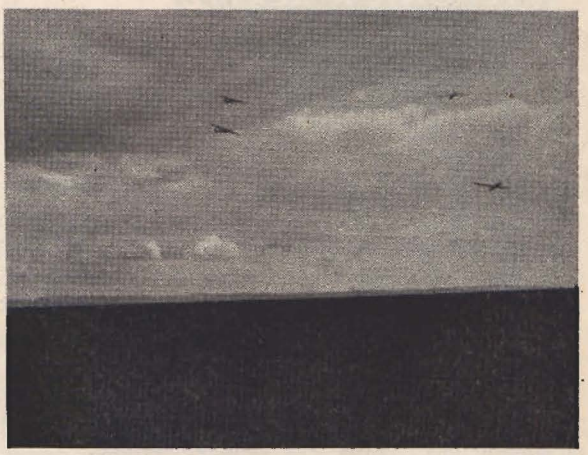
There is so little difference between the conditions required for the "A" and the "B" that it has been possible in England to get them both on the same day. I think this is wrong, as it may depend entirely on luck and nothing at all on your capacity to fly correctly. I prefer the method of giving the "B" at the end of a specified course in which you have covered certain ground. In the Argentine, where soaring flight has reached a very high standard, the period of training includes about fifty launches during which you learn tail wind landings (in case of emergency—or forgetfulness !), 360° turns, the difference between the reactions of stick and rudder in shallow and steep turns, spot landings, and the S-approach to an aerodrome. That to me makes the "B" certificate very much more worth the winning than if it merely means you have stayed up fifteen seconds more than the next man. But again, that is a personal bias. The fact remains that these things have to be learnt if you are ever to

fly properly and safely, and it is quite immaterial whether you learn them now or later. That must depend on your Instructor.

If you are flying from a hill site you will now be able to be launched from the hill. Later a small cabin will be fitted over the nose of your primary to give you a little more streamlining, or perhaps you will miss out this step and go straight on to a slightly more advanced type of trainer known as a secondary. If flying from flat ground you will be promoted to a longer cable. In any case your launches will now be considerably higher above the ground and you will have more time to think before you land. Now is the moment to try a slight turn—first a deviation from the straight by pressing the foot only, then a return to the original line with the aid of the stick as well. You will see that if you only press your right foot forward the machine's nose will turn rather heavily and clumsily towards the right, whereas if at the same time you push your stick a little over to the right the machine will incline slightly and the turning movement will be much easier and smoother. Look at any bird turning and you will see that they bank quite steeply towards the inside of the turn. If they did not they would skid outwards. And the tighter the turn they wish to make, the steeper the inclination.

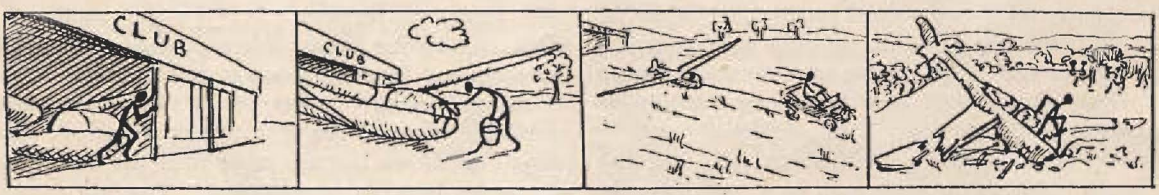
So it is with aeroplanes and gliders. A shallow inclination will give you a wide slow turn, a steep inclination a tight fast turn. But in these turns different forces begin to act on the wing surfaces. The air becomes a brake and you must fly with a little more speed. Get in the way of dropping your nose slightly before you start a turn. More accidents have been caused by failure to keep up speed in a turn than from any other reason. That is why the power pilot who stalls his engine after taking off should never in any circumstances attempt to turn back into the aerodrome; he cannot get up speed fast enough to counteract the braking effect of the turn and so loses all the buoyancy that speed would give him. So you can see that it is important to master turns till you can make them perfectly, accurately, and instinctively. You will need them all the time. In slope soaring you will be making 180° turns along the side of the hill over and over again; in thermal soaring you may want to make as many as two or three hundred consecutive perfect 360° turns without ever coming out into the straight. Practise them in both directions assiduously. Most people prefer a left turn to a right one, but you need both and both should be equally good.

It is easier to keep a steady bank in an aeroplane than in a glider because there are usually struts or the engine frame or cowling in front of you. Keeping this at an unchanging angle with the horizon is simple. In a primary you have to judge the angle of bank by your own inclination from the vertical. Keep your eyes on the horizon. If you look along the downward wing you will think the turn is much steeper than it really is. And let your body go with the turn. If you try to hold back, your upper



Beating up and down the slope.

shoulder will begin to ache and you will have a sensation of falling that is quite unpleasant. As in your beginning days, relax. Let yourself lean into the turn, make the movements of stick and rudder as lightly and gently as possible, and you will feel as if the wings really grow on your own body and you are making the turn with a lift of the eyebrow. When hands and feet are perfectly co-ordinated there will be no sensation of either slipping in or sliding out. The wind will blow steadily from directly in front of you. Should it press on the upper side of your face you are sliding out and need a trifle more bank. Should it blow on the lower side you are slipping in and should take the bank off a little. It is not because either way is particularly dangerous—it isn't. But it is sloppy flying and should be corrected till your instinct will not allow you to make any but perfect turns every time. And when you can do that you are well on the way to being a pilot!



Anticipation . . . . *Preparation . . . .* *Realisation . . . .* *Frustration . . . .*

SOARING THE SHORT "NIMBUS" TWO-SEATER

ONE of the great handicaps suffered by British Gliding Clubs operating on soaring sites since the war, has been the absence of high efficiency two-seater instructional machines, both to pass out new members and old returning ones as safe for solo flight, and for giving advanced instruction in thermal and cloud work to existing pilots. In most cases it is quite impracticable under the present set up with machines at present fantastic prices, to risk solo soaring until the instructor is reasonably sure of his pupil. In the old days one could take a chance on a £90 machine, which cannot be contemplated now on a £325 machine, if continued existence as a Club is considered; this has meant that three-quarters of the entire new membership applications have had to be turned down, to everyone's detriment and disappointment.

It was, therefore, with pleasure and pride that the Midland Gliding Club accepted the offer of Messrs. Short Bros. to give "Nimbus," their new high efficiency low wing tandem two-seater, its first hill soaring tests. The Club is conscious of the honour afforded it, not only because this is the first sailplane to be made by this grand old firm who pioneered the flying boat, made commercially the first aeroplane ever built, and since then have never turned out a poor aircraft; but also because it supplied the missing link which was undoubtedly holding back British Gliding Clubs who operate on big hill sites such as ours, where two-seaters are of key importance for the economic training of new blood. "Nimbus" also happens to be the first high efficiency two-seater sailplane to be produced by a well-known power constructor; and what a job they have made of the whole shining 62 feet of her, in design, workmanship, finish and detail!

As far as we were concerned the great day arrived on a Monday, and a foul day it was, with low cloud and a light S.S.-West wind and rain until 6 o'clock in the evening.

"Nimbus" had arrived at Church Stretton on the previous Saturday and had been conveyed to the top in the Club trailer and rigged on Sunday morning; but, alas, there was practically no wind, and what there was was from the South; this coupled with the fact that our winch is an ancient one, made it impracticable to carry out the comparative soaring tests which we had in mind for "Nimbus," until a slope soaring breeze arrived.

It should be added here, that prior to "Nimbus'" arrival at the Mynd, Testar, Heeley and myself had visited Rochester on the 1st January last, and Testar and I had one circuit each with Tom Weekes, who had done the lions' share of the initial tests; what is more it would appear to be largely to his keenness and initiative and to the spade work he did in building a B.A.C. two-seater for the Short Club that probably inspired Shorts' designing staff to get down to this intricate job, the happy result of which is "Nimbus."

It was clear to both Testar and I from the flying side, and to Heeley from the building and technical side, that Shorts had "got something" and as a result of that visit we ordered the first production model, which we hope will be delivered in June or July.

But to get back to the soaring tests; we were just finishing tea in the Club House at about 6 o'clock preparatory to departing home when to everyone's surprise the wind veered from S.S.-West to due West, at the same time increasing to 10 to 15 m.p.h.; the mist cleared and the cloud base went up to 1,500 feet and the great moment had arrived. "Nimbus" was wheeled out of the hangar to the edge of the portway, 300 yards behind the edge, and in no time she was hitched up to our old winch on the edge, and Tom Weekes and Chas. Wingfield were given a low launch of about 100 feet. At this time the wind was straight on the hill about 10 to 12 m.p.h.; a very light wind in which to test the heaviest sailplane yet built (1,200 lbs. all up). From the moment of release the issue was never in doubt, the steady turn to port down the ridge, and "Nimbus" began to climb with rock steadiness, and at the end of the first beat was a good 300 to 400 feet above the launch; Wingfield was flying her from the front seat at about 40 to 42 m.p.h., which appears her best speed for slope soaring; she seemed to have the normal climb of a high efficiency craft, and within 10 minutes she was 900 feet above the launch in relatively stable air with few or no thermal currents about. It soon became obvious from the ground that "Nimbus" had penetration right above the average, and Wingfield was soon cruising well out over the Wentnor valley a mile in front of the Mynd like a power craft. From the ground, the machine appeared to handle in the manner which we all looked for, and after 20 minutes' cruising about at varying speeds, she came in to an accurate landing with the use of the spoilers, to within 50 yards of the launching point.

As soon as the machine came to rest, the hood opened and a cheery voice shouted out, "Come on young fellow and try a bucket full of this." Charles was wearing his inimitable green hat, a green not its original colour, but through age, as it has always been since he used it for gliding pre-war. He wore his broadest smile which appears on his face when most pleased, and when there is "something about"; in less than no time Tom Weekes had jumped out and I was doing up the safety harness in the rear instructor's seat; after the cramped quarters in most sailplanes the room and comfort of this seat was gratifying; there is plenty of leg, elbow, shoulder and head room; a comfortable green upholstery absorbs the bumps of an angular chassis; the 100% vision perspex hood closes down comfortably but unobstrusively, with its small front window which can be controlled by the front pilot; on later models there should be two windows, as this does not admit sufficient air and the temperature rises within a few minutes. By this time the winch cable had been re-attached and all was ready for flight. "Nimbus" climbs on the winch rather differently to an ordinary machine, in fact she is the sweetest and easiest handling craft for winch launching I have yet flown; the launching technique is to ease the stick back to bring her weight off the skid and on to the wheel, and as soon as the requisite speed is reached, to ease

the stick forward again to the normal flying position; on this she " takes off " herself and climbs steadily until one is ready to release. On this flight we climbed to just under 100 feet, and went out over the edge on the normal soaring beat to the South.

Considering the lightness of the wind and the fact that we were flying at 40 to 42 m.p.h., she climbed steadily at from 2 to 4 feet per second for two miles down the ridge in the good lift spots; this is the normal rate of climb under similar conditions for a high efficiency machine flying at 30 to 35 m.p.h. We soon worked our way up to 900 feet, and speed was then increased to 45 to 50 m.p.h. This height was the approximate top of the " hill lift " for that evening, in fact the " Tutor ", which was flying at the same time with Tom Weekes up, was little over 500 feet. At 45-50 m.p.h. " Nimbus " was losing height at 2 to 3 feet per second, and when speed was put up to 55 to 60 at 4 to 4½ feet per second. Some slow circling was then tried. Some soaring pilots, of which I regret to say I am one, indulge in bad habits to get the utmost out of thermal currents; as soon as one detects a thermal we rudder into it at the same time, easing the stick slightly back to fly at the lowest possible speed in it; now when " Nimbus " is put into a slow turn she does not like it; on my first slow turn I got away with it and everything was alright, but on the second a buffeting set up on the tail which caused oscillation through the whole fuselage; I was relieved at once, however, by Wingfield's comment, " Oh, she does that on slow turns, don't worry "; he, incidentally, had lit a cigarette and was sitting back enjoying himself comparing our instrument readings; but this matter had to be further looked into, so more slow turns were done and in about one time in three the tail judder developed. I do not for a minute think there is anything dangerous about this, but it is unpleasant and Shorts' designers will soon make " short " work of it; after further cruising for 15 minutes or so comparing notes on performance the while, we came in to land with the normal " S " approach and no sign of tail judder at speed; she handles particularly well on the approach.

Chas. Wingfield climbed out and the Club's new Ground Engineer, Donald Campbell, got in and we had a further 20 minutes carrying out similar tests with similar results. One can talk to one's co-pilot in the same voice as at the same desk, so quiet is " Nimbus " in flight. Even at 70 m.p.h. with the window shut, she is as silent as a nightjar and as steady as a rock. Charles Wingfield had two more flights, one of which he put the speed up to over 70 m.p.h., and recorded a sink of only 5 feet per second. Conditions, however, were not really favourable for a flattering test; she would be her best in a good stiff wind of say 25 to 30 knots. I feel then she will out-fly anything, but as the jiggs are being prepared for the production models, time is an essential factor and Tom Weekes decided it was better to go back straight away to Rochester for immediate modifications which our tests had suggested. We are, however, looking forward to her return for the Whit. camp. For the courtesy and co-operation which Messrs. Short Bros. have shown us every member of the Club who has contacted the firm would like to express their deep appreciation; it is such co-operation between customer and manufacturer that leads to results and mutual goodwill. We thank them.

With 100 of these machines flying and giving instruction each week-end on the soaring sites of Britain access to the air for the ordinary man and lad which has been to all intents and purposes denied them since the war, will once again become available, not only to the benefit of the Gliding Club members but to the whole air experience of the country. Knowledge of air structure would appear to be as important in air navigation, as an intimate knowledge of the sea is imperative to safe nautical navigation. And the high efficiency two-seater sailplane is the way to teach and learn it.

C. E. H.

CONVECTION AND THE SOARING PILOT

(*Contiued from page* 3)

small temperature differences would suffice to cause thermals, as the lower layer of the atmosphere would become unstable by contact with and heating by the warmer sea. The higher water vapour content would be an additional source of instability and, moreover, the uniform surface of the sea would ensure a more regular distribution than unevenly heated land surfaces.

In practice, such conditions are given whenever a warm sea current from the tropics is found under relatively colder air or surrounded by relatively colder water or, also in the tropics, early in the morning when the sea has still retained a certain amount of heat while the air in contact with it has cooled off.

These theoretical considerations were confirmed in practice by the observations of the German gliding expedition to South America in 1934. The Germans found not only isolated instability over the sea, but even cloud streets, of which they brought back some photographs, stretching as far as the eye could see.

Meteorological conditions would therefore appear to exist in tropical waters to make ocean soaring a thoroughly feasible proposition. As the swell in those latitudes is normally not excessive, launches and landings should present no undue difficulties, provided sailplanes were designed to operate at sea. This may not be as crazy a proposition as it sounds—an Australian amphibian " water glider," a photo of which appeared in the February issue of the SAILPLANE, shows that somebody has given the design problem some thought. A floatplane could act as towing and retrieving aircraft.

If some of the above should indicate developments seemingly altogether too fanciful, considering our present economic difficulties, both national and as a gliding movement, it should be remembered that many of the schemes hatched by the pioneers of flight—that early " Peyret," the first glider to soar in this country, for instance—must have seemed equally phantastic in their day. With the exception of endurance soaring flights which will probably always be associated with ridge soaring and the standing wave, new advances in the art of soaring will mainly be confined to meteorological conditions embodying some form of convection, some of which were dealt with in this article, and all of which the practical soaring pilot should not neglect to study.

FORMATION AND OPERATION OF A GLIDING CLUB

A Lecture read before Aerotech F.C. No 1 on Dec. 19th by Ann Douglas.

Continued from May issue.

Maintenance.

This is invariably a problem in a small Club, as maintenance so often falls entirely on one able enthusiast. The ideal, of course, is to have the services of a paid and qualified engineer, either whole or part time. And as soon as any Club contemplates the question of paid staff, I would suggest that someone who will cope with maintenance and repairs is even more important than a paid instructor.

It is a good plan to carry as large a selection of spares as possible, so that repairs need not be hurried unduly, and the actual gliders can be put serviceable again with the minimum delay.

The Club should see that whoever is responsible for repairs has the proper tools and equipment, and adequate and pleasant working space and conditions.

Buildings.

These constitute a difficult problem for the prospective Club operator, especially at the present time. Lucky indeed is the Club which either has its pre-war buildings, or the use of those on a disused airfield.

The first essential is a hangar. About 6 trainers and sailplanes could be squeezed into the pre-war Ellis hangar of approx. 50 by 20 feet, although the process was reminiscent of a holiday suitcase. The doors on this hangar were its only real drawback, as anyone who has tried to extract frozen mud out of the many bolt holes with their fingers in the dark will agree.

If possible the doors should be of the sliding variety and along the side of the building so that there is less chance of the required glider being absolutely out of reach.

The door height need not be greater than 8 feet, or the inside ceiling higher than 10 feet, unless gliders of very large spans are to be accommodated.

Two troubles which occur in many glider hangars are sweating and floor wear. Metal-roofed hangars are bad in this respect, and if flat-roofed should be painted and then smothered in sawdust while the paint is still wet.

Wooden floors get very frayed by metal skid sheaths, and cement floors soon produce a fine enveloping dust for the same reason. I do not know what the best answer to this trouble is.

Workshop.

This should be separate from the hangar if possible and should be light, warm and airy, and possess an adjoining dope shop.

Club House.

Gliding Club members are not usually keen on the marble hall type of club house: the reason they require one being to keep dry and warm in, to eat and drink in, and, to talk in. A small wooden building containing a good sized main room with a large open fireplace—old trainers make good fuel—with a small bar, or snack bar adjoining. An office, a kitchenette or galley, a bunkhouse, and somewhere to wash are all that the average member desires. The above, however, is almost impossible at present.

Army huts can be converted quite suitably into Club buildings.

Shelters.

If the site is very exposed, a couple of small shelters in distant but useful corners of the landing area will make things more pleasant in winter. Members' cars can fulfil this function equally well provided they can get there without either becoming bogged or breaking their springs.

A word or two on club house facilities. At the entrance good boot scrapers and brushes are essential, and plenty of widely spaced hooks on which to hang dripping coats. These may seem small points, but they are important especially if there are no paid staff to keep on cleaning up the club house.

Bunkhouse.

As with gliders in the hangar, there is usually a tendency towards overcrowding in the bunkhouse, and although this is not very important, it should be avoided if at all possible. What is important, however, is that blankets and bedding must be kept aired somehow. It is easy to neglect this point, and it is, I regret to say, often overlooked.

Food.

If the Club is to attempt to provide full meals for its members, these should be of the feeding and filling variety, and there should be plenty for second helpings. To my mind, the two meals which should be concentrated on are breakfast and tea.

Lunch is often rather a failure as a main meal. It occurs just at the best thermal time of the day, and those who are taking advantage of the weather miss it; and those who want to fly often find the ground crew have vanished.

If members have had a really good breakfast, they will not expire if they do not have more than sandwiches or beans on toast for lunch. Tea, on the other hand, occurs at the end of the flying day in winter, and by four or five o'clock everyone is really ready for lashings of tea and toast. In the summer, the best of the thermals are over, and those who have missed lunch time by flying will be more than ready for a meal.

Bar.

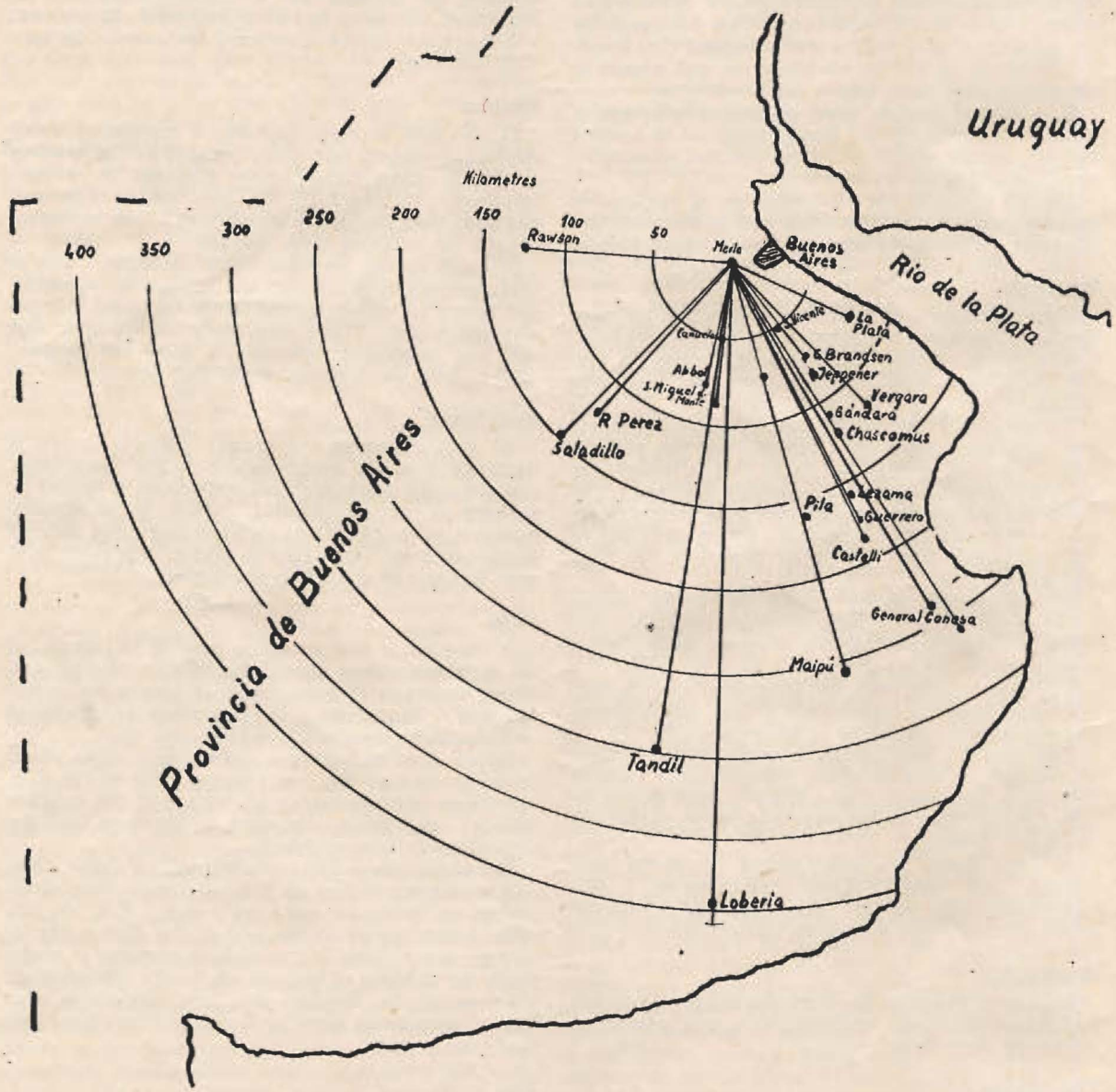
This is a good thing as it attracts members to the Club in bad weather as well as good. It also attracts a certain number of associate or non-flying members who are a financial asset to a Club.

To be continued.

2nd ARGENTINE SOARING CONTESTS

MERLO, February 2—16, 1947

DISTANCE FLIGHTS



A full report of the Contests appeared in the May Issue

GLIDING IN SPAIN

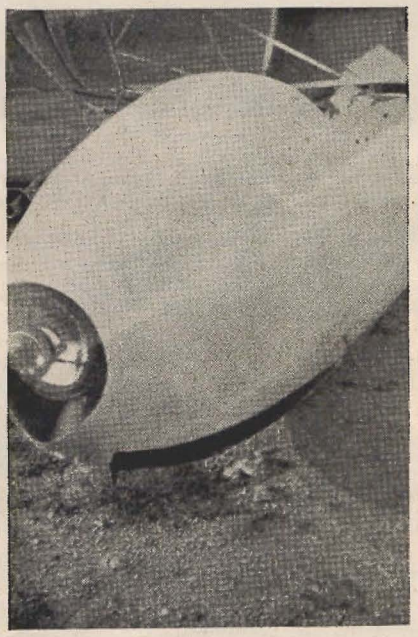
TAKE three times the area of Sutton Bank, frost it with a compact group of white stone buildings, strip the grass from the field and replace it with thyme and lavender, decorate with a fringe of snow-capped Pyrenees, and let the plain in front become dry and brown—there you have Monflorite, the National Gliding School of Spain. The situation is ideal. The air is clear and sparkling and there is a " Helm wind " second to none. Lenticular clouds begin to form when the wind comes from the North and there seems to be no limit to the heights that can be reached there. In 1945, Juez, one of the instructors, got to 6,000 metres (almost twenty thousand feet) in a " Weihe " ; and since then, on the 25th October of the same year, Juez and another instructor named Ara, each with a passenger, took off from the slope in two " Kraniches " and soared to 5,600 metres—or 7,500 feet above the existing world record.

Add to that a duration flight by this same Juez of 52 hours 36 minutes and you can see that Spain is something to be reckoned with in the gliding world ! They are blessed with perfect conditions, a far-seeing and most efficient Commandant, and full Government support. These things they are willing to share with us, who are not so lucky. Already they have invited a group of instructor, designer, and ten pupils from the Argentine for a stay of six months, and the Commandant tells me that he hopes to be able to extend those invitations till Monflorite comes to be regarded as the logical superseder to the Wasserkuppe wherever soaring pilots gather together. Certainly they have made a wonderful beginning.

The site was discovered by the present Commandant, Señor Peñafiel, as far back as 1931, but he was not able to get the school started till 1940. Pupils are drawn from any district or class and should be between fifteen and twenty-one. The course lasts about two months and is a necessary prerequisite to entry to the Flying Academy, though all pupils are at liberty to return to civil life instead if they wish. Once having completed the course they have the right to return for a month each year—till they are seventy or more if they choose ! Training and all flying is free. The pupil pays his fare, his food, and some of his clothes, though the school provides special boots as the ground is so stony.

During the ten months in which flying is possible about 200 pilots are trained. The school has a capacity for from eighty to ninety at a time. There are seven permanent instructors, a meteorologist, and a doctor. The school buildings are exceedingly light and airy and most beautifully clean and tidy. (This applies also to the workshops, which are models of what we should all like to have if only we could. . .) There is a big dining hall and the food is good and plentiful. There is compulsory chapel every day and on the whole the discipline is rather more military than public school, though exercised with tact and humour. In the four days I spent there I found that the atmosphere between Commandant and instructors, as between instructors and pupils, was excellent.

The training is interesting. The site is flyable in everything but an East wind. The slope faces West by South and here the first stages are taught. Pupils wear crash helmets from the beginning, but the school's reputation for crashery is exceptionally good and their few serious smashes have almost all been power pilots. . . They use the " S.G.38 " for primary work and speak most highly of it ; it is safe, strong, and very flexible. Later training is done in the " Grunau Baby IIb " and the " Kranich " two-seater, and the instructors alone are allowed to fly the " Weihes," of which they have several. In fact,



" Weihe " fitted with landing light for night flying.

they are very well off for machines, most of them being made in the country after the first few models were brought from Germany.

The system employed there seems to turn out an incredible number of skilled pilots in a remarkably short time, and the Commandant assures me it has proved very economical, in time, money, and material. Starting with twenty slides at the foot of the hill the pupil gets his " A," having learnt nothing more than how to keep himself aloft and fly straight and level. Then he goes to the top of the hill where he is bungy-launched, still in the primary, for another twenty flights. This time he learns deviations and fixed-point landings, and gets his " B." From here he passes to a phase of two-seater instruction in the " Kranich," aero-towed. Here he is taken in hand by the instructor and really taught to fly. Bad piloting is ironed out and he has at least twelve flights before he is passed to the " Grunau Baby "



Luis Vicente Juez, an instructor at the Monflorite School of Gliding, Huesca, Spain. He hopes to better his two previous records (Duration—52 hours 36 minutes, and height above release 17,600 feet).

He also, with Ara, is the present holder of the world height record for two-seaters. Each flying a "Kranich" with passenger they climbed to 21,325 feet above sea level—a gain in altitude of 17,880 feet.

unheralded—I left after four wonderful days, having made a host of friends. Gracias, Monflorite!

VERONICA PLATT.

OUTSTANDING FLIGHTS

Date.	Pilot.	Sailplane.	Time.
		DURATION.	
7.3.41	Tauler	"Spenlaub"	6 h. 13 min.
29.10.41	Sevillano	"Kranich"	11 h. 24 min.
30.2.42	Salinas	"Baby"	13 h. 4 min.
14.5.42	Ramos and Salinas	"Baby"	15 h. 37 min.
8.2.44	Sevillano and Juez	"Kranich"	20 h. 1 min.
4.7.44	Jnez	"Weihe"	17 h. 20 min.
26.3.45	Juez	"Weihe"	31 h. 2 min.
27.4.45	Juez	"Weihe"	52 h. 36 min.
		HEIGHT.	
10.6.42	Sevillano	"Kranich"	2.275 m. approx. 7,380 ft.
20.5.43	Ara	"Weihe"	3.480 m. 11,480 ,,
3.6.43	Juez and passenger	"Kranich"	4.200 m. 13,750 ,,
27.11.43	Juez and passenger	"Kranich"	4.625 m. 15,200 ,,
21.11.44	Ara	"Weihe"	5.450 m. 17,900 ,,
28.4.45	Juez	"Weihe"	6.000 m. 19,685 ,,
25.9.45	Juez and passenger	"Kranich"	5.600 m. } Superada la marca mundial en 2.295 m.
25.9.45	Ara and passenger	"Kranich"	5.600 m. } 18,400—that is 7,500 ft. above the world record.
		DISTANCE.	
28.10.41	Gutierrez	"Weihe"	Huesca-Fraga (Huesca) 55 miles
25.5.42	Ara	"Baby"	Huesca-Piera (Barcelona) 124 miles
20.5.43	Sevillano	"Weihe"	Huesca-Calig (Castellon) 130 miles
27.5.43	Sevillano	"Weihe"	Huesca-Castellon) 152 miles
21.7.43	Sevillano, Ara } flying in formation	"Weihe"	Huesca-Zaragoza & back

and gets his "C," by which time he has learnt to make full turns (though not steep) and to keep soaring. He now returns to the "Kranich" where he learns something about slope soaring, and is passed back to the "Baby" so well trained that he can often do his five hours after only three or four launches from the hill. When he has flown ten hours he receives his "Permiso de Navegacion," which theoretically entitles him to try for distance. In actual fact he has to have special permission for this, and the school is badly situated for distance, being in the very North of Spain and far too near the Pyrenees and the sea for anything spectacular.



Juez on his duration flight.

Using this method the score is approximately one "A," one "B," and one "C" per day, with the loss of a few skids in the primaries, repairs to about seven cabins and about three or four bigger jobs, with perhaps two machines written off a year. This seems a very cheap way to train about two hundred pilots, besides being extremely safe.

I append a list of the most outstanding flights made, and also a graph for the first four years, which gives an interesting picture of the growth of the school. I only wish there were some graphical method of showing what kindness I received there, with what courtesy they received me and how willing they were to devote hours and hours to showing and explaining everything. I arrived unknown and

RECORD OF PROGRESS

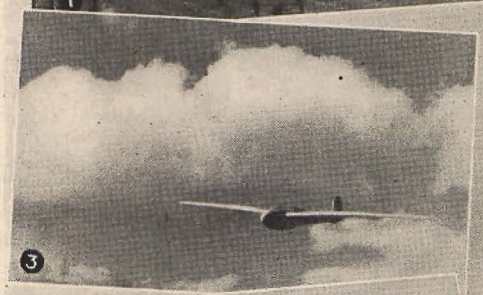
	1940-41	1942	1943	1944
Pupils	447	549	257	328
Flights	17700	20332	10552	9683
Hours flown	200	1600	3322	7917
Accidents (serious)	2	—	4	—
Accidents (light)	8	1	2	1

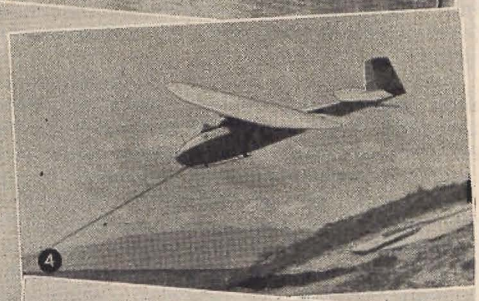
1 *and* 2. *Instructors' dining-room and lounge in traditional Aragon style.*
3. "*Kranich.*"
4. "*Grunau*" *Baby II b, slope launching.*
5. "*Weihe.*"
6. *Local vulture soaring.*
7. *Taking-off from hill top.*
8. *Repair shop.*

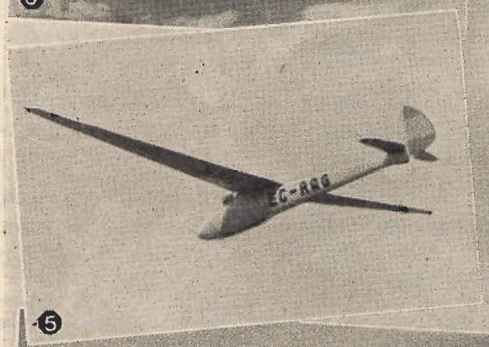
MONFLORITE GLIDING SCHOOL, HUESCA


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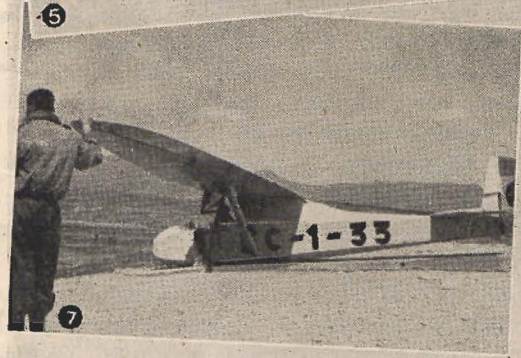

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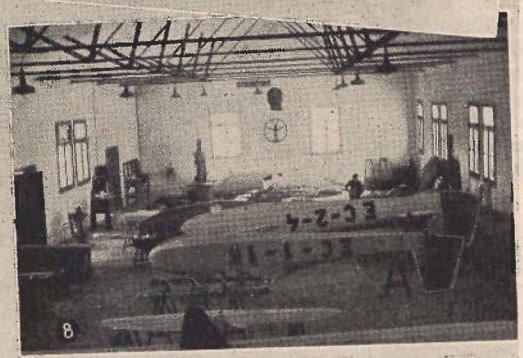


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ROYAL ARTILLERY AERO CLUB RALLY—JUNE 1947

Powered Flying and Gliding.

THE Royal Artillery Aero Club is holding a week-end rally on the 14th and 15th June at Thruxton Aerodrome (near Andover), to which all members of the Association of British Aero Clubs, The British Gliding Association and private owners are invited.

Saturday, 14th June, will be taken up with powered Flying and Gliding Competitions, Demonstrations, Aerobatics and a show of new light aircraft and gliders. Thruxton Aerodrome will be open free to the public and cars will be allowed to use car parks around the perimeter track on the payment of £1. Buffet Tents will be available and the Band of the Royal Artillery, Salisbury Plain Branch, will play during the afternoon.

Sunday, 15th June. The R.A. Aero Club will have much pleasure in acting as hosts to members of the other clubs who wish to use the Salisbury Plain area and the neighbouring hill soaring sites for gliding and Thruxton Aerodrome for powered flying.

A brochure giving details of the rally is being distributed to all aero and gliding clubs. There are to be five powered flying competitions and five gliding competitions, and anyone interested in receiving particulars of these or any other information should write to the Hon. Secretary, The R.A. Aero Club Rally, Air Wing, School of Artillery, Larkhill, near Salisbury, Wilts. Telephone Bulford 3171, Extension 547.

LETTER TO THE EDITOR

I am still trying to swallow the story put forth in the Cambridge Club notes on page 27 of the May issue. I feel that I shall be unsuccessful. Apparently the fortunate Mr. Hookings, who is so miraculously alive after investigating the spinning properties of the " Kite Mk.11 " at three hundred feet, not only blames the aircraft for the crash, but is supported in his views by the Club scribe (we hope, incidentally, that the said scribe is not the person who authorized the flight—or *is* he ?).

It will be interesting to know what kind of an " accident " caused him to spin at 300 feet, other than bad pilotage or inexperience. It is amazing that there are still at large those so naive that they expect mankind in general to believe them when they blame the aircraft concerned for pilot trouble, or misjudgment in flight authorisation.

To Mr. Hookings, my congratulations and, perhaps a little more air-speed next time : failing that, a set of " Sky-Hook "-ings, for Heaven help him if he tries the same tricks with a really vicious aircraft. I think the more thoughtful members of the Cambridge Club will assure Mr. Hookings that people do not walk away after spinning-in " vicious " jobs.

GEORGE HINCHLIFFE.
Yorkshire Gliding Club.

NEWS IN BRIEF

DURING a recent week-end the Midland Gliding Club put up 19¾ hours in 23 flights, flying with two Club and two privately-owned machines. The Chairman, Charles Wingfield, is satisfied with the behaviour of his new " Olympia."

WE understand from U.S.A. that the Ministry of Supply is interested in purchasing a two-seater training glider that possibly may result in a manufacturing licence for production in England. The machine will be used for experimental and trial purposes and will probably be the Schweizer " 2-22."

IT is reported that Flt.-Lt. C. F. Counter, R.A.F. Station, Leconfield, made a 39-mile glider flight from Sutton Bank, Thirsk, Yorks, to Filey. If confirmed, this flight qualifies him for the Silver " C."

VIRGINIA BENNIS established a National Single-place Record for women flying a " Kirby Kite," at Elmira, New York, August 4, 1946. Distance : 47 miles.

GLIDERS are to form part of a world-wide system for rescuing airplanes that have crashed or made forced landings. Thirty-nine nations have, so far, subscribed to the plan.

NO. 13 O.T.U. Gliding Club is being transferred to R.A.F., Leeming, Yorks, and will in future be known as the 12 Group Gliding Club.

NINE " B " and 49 " C " certificates were issued during 1946 by the Soaring Society of America. Raymond Parker was the only Golden " C " pilot. There were 11 Silver " C."

IN the May issue we reported that 13-year-old John Michael Hinton, of the Bristol Gliding Club, had obtained his " B." R. F. Tayler, press secretary of the Club, now informs us that John's father, Mr. H. J. Hinton recently got his " C."

A. D. HARDINGE reports that progress on the Hardinge-Davies Chilton " Olympia " continues to be satisfactory. Anticipated test flight in from nine to twelve months.

THERE are 42 Gliding Clubs in Finland, with a total membership of 1,500. Direction and supervision is by the Finnish Aeronautical Association (formerly the Finnish Aero Club), the central organisation of sports aviation in Finland.

CHAIRMAN of the Leicestershire Gliding Club, J. C. Rice, is to be host to eight Czech gliding pilots visiting this country for the International Rally in return for the hospitality shown to British pilots in Czecho-Slovakia last year.

Swedish International Soaring Contest

OREBRO. 3rd–12th JULY

REVISED REGULATIONS

THE competition comprises flights to pre-determined landing places in combination with altitude flights.

For the Swedish participators the contest will also be valid as Swedish Championship in 1947.

Those in charge of the competition (the management) fix certain places as pre-determined landing places (flight-goals) before the beginning of the contest. During the entire competition the competitor is free to take his choice amongst these places.

The contest includes 6 competition-days during a period of 10 days (the 3rd-12th of July). The contest is, however, considered as concluded, if owing to the weather (or other force majeure) less than 6 days have been fit for flying during that period of 10 days.

Competitor must possess a soaring-pilot's or an equivalent certificate and present a FAI sport-licence, issued by the national club of his country. He must also be trained to be launched into the air by power-towing.

The number of assistants must not exceed four (4).

A sailplane of optional type, parachute, barograph, life-preserver and a transport vehicle.

Sailplanes must possess and present C. of A.

All participating aeroplanes will have a certain "contest-number," painted in red figures at both sides of the fore part of the fuselage, which will be provided for after the arrival at Orebro.

Fidelity insurance "against the third party" is compulsory.

Exchange of sailplanes is not permitted during the contest.

The following parts of the soaring-aeroplanes are considered as spare material; they are permitted to be changed :—

(*a*) Skis.
(*b*) Instruments, including venturi—and pitot—tubes.
(*c*) Cockpit Covers.

Repairs can be done in accordance with the competitor's own wish. Repairs must, however, be done in a place indicated by the management.

While flying, all sailplanes are to be provided with barograph, parachute and life-preserver.

Barographs for the contest are to be delivered at the KSAK on the 14th of June at the latest in order to be calibrated.

During the contest power-aeroplanes are not permitted for return-transports of sailplanes.

Competition-days are decided upon by the management, which consequently informs the participators every morning whether the day is to be a competition-day or not.

Competition-time is between 0900—1700 (9 a.m.—5 p.m.). The management reserves the right to make necessary changes.

Each entrant will have at his disposal 3 towing-launches a day. The competitor decides himself when he wants to start. A start must be announced in writing on a start-card, which is to be delivered to the "starter" 5 minutes before the start at the latest.

On the start-card the competitor also states his flight-goal. If several competitors wish to start simultaneously, the one who has delivered his card first has the right of precedence. If a start has not been effected 3 minutes after the time, as stated on the card (hindrances in the air-traffic not considered), the right to start is not valid and a new card must be presented to the "starter."

In case of a failure in the start, owing to defective start-material, this start does not count and the competitor has the right to a new start as soon as circumstances permit.

The maximum-height by towing is decided upon daily by the management. When this stipulated height has been reached, the competitor has 2 minutes at his disposal before he has to uncouple. The towing must be carried out in such a fashion that after the release the soaring-aeroplane passes the line through the flying-field, right-angled to the intended flying-direction.

(*a*) Flights to pre-determined landing places.

A competitor, who does *not* land at the place, chosen by himself before the start (the flight-goal), receives points for the distance flown, projected at right angles on the straight line, connecting the start-flying-field and the in advance by the competitor assigned landing place, or on the prolongation of this line, according to the following :—

Points for distance = F (P-20)

where P = projection in km. (kilometres)
20 = inner limit in km. and F = the "days factor."

The "days factor" is calculated according to the formula :—

$$F = \frac{10}{Pm}$$

where Pm = the average of the day's three (3) longest projections.

The "days factor" is calculated to two decimals.

A competitor, who lands at the place, chosen by himself before the start, receives in addition 20% of his points for distance.

(*b*) Altitude flights.

A competitor, *who receives points for distance*, receives also points for altitude according to the following :—

Gain in altitude	0-1500	= 0·02 points/m
,, ,, ,,	1501-3000	= 0·025 ,,
,, ,, ,,	3001-unlimited height	= 0·03 ,,

The gain in altitude, which is calculated in metres, is the difference between the height of release or a

lower point reached during free flight and the highest point reached after this.

(*c*) **Ultimate result.**

Competitor has the right to credit himself with the points from only one flight per day during the contest.

Ultimate winner is the competitor, whose sum of points in total is the greatest after the whole contest is ended.

The Swedish Champion is the Swedish competitor with the greatest sum of points.

If a competitor is found guilty of having broken the regulations, he will be disqualified.

A protest can be taken into consideration only when it has been forwarded to the management 24 hours after the time, when the incident occurred. To the protest must be attached 25 Sw. Crowns, which is repaid if the protest is accepted.

ACTIVE CLUBS

In response to readers' requests we give a list of Clubs at which Gliding and/or Soaring is in progress.
P. primary. S. soaring.

Club.	Site.
Bristol. P/S.	Lulsgate Bottom, S.W. of Bristol.
Cambridge University. P/S.	Bourne, near Cambridge.
Derby and Lancs. P/S.	Camphill, Tideswell.
Leicester. P/S.	Ratcliffe.
London. P/S.	Dunstable.
Midland. P/S.	Long Mynd. Church Stretton.
Newcastle. P/S.	?
Northern. P*	Crown Point, Burnley.
Oxford University. P*	Chalgrove Aerodrome.
Southdown. P/S*	Friston, near Eastbourne.
Surrey. P/S.	Redhill.
Yorkshire. S.	Sutton Bank.
Croydon. P.	Beech Farm, Nore Hill, Surrey.
Imperial College. P.	Redhill.
N. Somerset Aero Club. P/S* (Gliding Section).	Western Zoyland Aerodrome.
N. Wales Cross-Country Soaring Club. S.	Clwyd Hills, 14 miles from Chester.
Scottish Gliding Union. P/S.	Balado and Bishop Hill.
Soaring Club of Great Britain. S.	
Ulster Gliding Club. S.	Down Hill, Londonderry.

* In the near future.

POWERED SAILPLANES

A PILOT'S POINT OF VIEW

WHEN something in popular demand is found to be too expensive for those who want to partake of it, one of two things usually happens; either ways and means are found to make the expensive " something " less expensive, or the people who want to partake of it shift their attention elsewhere.

With an extra shilling tax on our packets of twenty cigarettes, we can either give up smoking entirely and, perhaps, take to chewing gum, or we can continue to buy twenty cigarettes at the old price and accept an era of " ultra light " cigarettes and " low-powered " pipes. These may not have quite the same " performance " as the ones we have been accustomed to, but once we have got used to the new type, they will give just as much pleasure as the old ones.

As with cigarettes, so with flying. Powered flying is in great demand to-day, but it is much too expensive for the average person. As a result, the less enthusiastic types have already transferred their attention elsewhere (which is all to the good), while the ones who are determined to fly, come what may, have cast around for less expensive ways of getting airborne. Many of these have turned to gliding as offering a means of getting into the air cheaply but—and I know I shall bring a hornet's nest round my head by saying this—most of them are not fully satisfied. Ground slides, low hops, high hops and slope soaring can be very attractive, but only the true-blue gliding man can retain his enthusiasm indefinitely. And cross-country work in a high-performance sailplane, entailing as it usually does the employment of a retrieving car, trailer and crew (or well-trained wife), can be just as expensive as present-day powered flying.

Now we poor muts who are not happy unless we have a stinking engine roaring in front of, or behind us, never seriously thought of taking to gliding. Instead, we decided to work on the lines suggested by cigarette manufacturers, to see if we couldn't evolve something which, while being able to do everything the larger version could do, would not strain our purses too much. We decided, in fact, to attempt to produce an ultra light type of aircraft which would be much cheaper to operate than existing club machines.

The first step was the formation of the Ultra Light Aircraft Association which would serve for the purpose of co-ordinating the activities of these unrepentant powered fliers and to act as a negotiating body in the very necessary approaches to the Ministry of Civil Aviation. In effect, we started to re-plough ground which had lain fallow since the middle 1920's—and in consequence we have been condemned by some people for taking such a retrograde step. Progress, these people say, must be forever forward ; to resurrect the low-powered ultra-light types of those days can do nobody any good. What they forget is that every good scientist or engineer is constantly looking back, ready to make use of some idea which might have been impracticable when conceived but which, in the light of later knowledge, is just what the doctor ordered. A perfect example of this is before us to-day in the field of radio where the centimeter wavelengths first used by Hertz in 1888—and discarded by him as being of no practical use—are now employed in modern Radar sets. The reason ? Evolution of a type of valve which makes possible high-power generation of these waves.

Now what has all this to do with ultra-light aircraft ? Nothing except to give point to the fact that whereas in the 1920's aerodynamic knowledge was so comparatively slight that engines developing 90 B.H.P. or more were necessary to drag the two-seater " light " aircraft of the day into their natural element. To-day, with 20 years' accumulated knowledge behind us, we can design perfectly efficient two-seaters which will fly much better than their ancestors on much less power. Sqn.-Ldr. Kronfeld, for instance, is firmly convinced that not more than 40 B.H.P. is necessary for a really efficient two-seater, while a very good general-purpose single-seater can fly on quite a bit less.

That, then, is our answer to the critics who say that, in encouraging development of ultra lights (which term we use as synonymous with low power), we are moving backwards. On the contrary, we maintain that by developing means of flying with the minimum of power, we shall be advancing the science of aeronautics.

However, unlike gliding, which is now firmly established as a sport, ultra-light flying has yet to prove itself. We have already had many battles to fight and considerable prejudice to overcome in official circles. Not the least of our difficulties has been the allaying of fears aroused by unfortunate developments in our particular field some years before the war. The field had lain fallow for so long and the ground was so fertile that weeds were bound to appear sooner or later. The weed in this case was the " Flying Flea " which, growing quickly and strongly, was taken by many as being a useful new species. Unfortunately, this weed, taken in large doses, proved fatal to quite a few people and the Government was forced to ban its use. Ever since, succeeding Governments have regarded with grave suspicion anything springing out of the same ground.

Now many beautiful flowers and useful plants have been cultivated from what were once regarded as weeds and the same may be true of the " Flying Flea." But there are so many useful types ready to flourish if given a little encouragement and attention that it would be folly to waste time on the cultivation of an almost unknown species. We have, therefore, decided to concentrate on the things we know, the ultra-light aircraft of authodox design, as offering the quickest and best means of getting powered-flying enthusiasts into the air as safely and as cheaply as possible. What is more, we have managed to convince the Ministry of Civil Aviation of our good intentions and a favourable decision on the question of issue of Permits to Fly for ultra-light aircraft is expected any time now. It may, in fact, have been given by the time this appears in print, and with that hurdle taken, we may hope to see the first of our ultra lights in the air this summer.

R. W. CLEGG, *Hon. Sec.*,
Ultra Light Aircraft Association.

N.B. It is pointed out that powered Sailplanes are only one of the categories of light aircraft covered by the U.L.A.A.

BRITISH GLIDING ASSOCIATION

NATIONAL CONTESTS, 1947

National Contests, 1947.

AS already announced, the date will be between the 21st and 29th June. The locality will be Bramcote Aerodrome, near Nuneaton, which has been kindly placed at the disposal of the Association by the Admiralty.

Extract from Regulations.

1. The period of the Contests will be from 09.00 hours B.D.S.T. on June 22nd to 16.00 hours B.D.S.T. on June 29th. Flying will be permitted on Saturday, June 21st, but no marks may be gained on that day.

All Pilots must attend a Competitor's Meeting at Bramcote Airfield at 20.00 hours B.D.S.T. on Saturday, June 2nd, for briefing on flying regulations, local rules, etc., and to produce the documentary evidence required under Section A paras. 5 and 7, and Section B para. 4. A Pilot unable to attend must appoint a responsible deputy.

2. *Entries.*—The glider/s must be the bona fide property of the entrant. The acceptance of entries is at the absolute discretion of the Organisers, who reserve the right to refuse or exclude any entry without assigning a reason.

Special Note.—In view of the possibility of overcrowding, the Organisers will in particular accept or refuse entries with special reference to the performance and suitability of the gliders and the experience and capabilities of their pilots.

3. *Contest Number.*—All gliders accepted will be allotted a Contest Number. The Organisers will provide each glider with a set of number printed on paper, and these must be affixed on each side of the rudder and on the lower surface of the main planes.

4. *Certificate of Airworthiness and Insurance.*—No glider may be entered for the Contests unless :

(a) It possesses a current Certificate of Airworthiness (or the equivalent Service document) endorsed for winch-launching and aero-towing.

(b) It is covered by a current Third Party Insurance Policy, to the limits required by the Air Navigation Acts and covering Competition flying.

5. *Qualifications of Pilots.*—No pilot may be nominated unless he or she :

(a) Holds a " C " Gliding Certificate.

(b) Holds a Silver Badge, or has had at least 25 hours' soaring flight experience, or has at least 10 hours' soaring flight experience plus at least 250 hours' solo flying experience on powered aircraft.

(c) Has done at least 10 winch-launches or auto-tows.

(d) Has done at least 5 aero-tows.

6. *Number of Pilots.*—Not more than three pilots may be nominated for each glider. Not less than two or more than four persons (including the pilot or pilots) must be nominated as the team for each glider. One pilot must be nominated as Team Captain, and as such will be responsible to the Organisers for the proper observance by his team of all rules and regulations in accordance with Section E para. 6 (b).

7. *Nomination of Pilots.*—All pilots must be nominated before 20.00 hours on June 21st. The Organisers reserve the right, in special circumstances, of permitting during the Contests the transfer of a nominated pilot to a glider other than that to which he was originally nominated.

8. *Entry Fees.*—The entry fee for each glider is £3. 3s. 0d., plus 10/- if more than two pilots are nominated per glider.

9. *Entry Forms.*—Entry forms, complete with all particulars and fees, must reach the Secretary

of the British Gliding Association, Londonderry House, 19, Park Lane, W.1, before 12.00 hours B.D.S.T. on June 7th, 1947. Late entries, at double fees, may, at the discretion of the Organisers, be accepted up to 12.00 hours B.D.S.T. on June 14th, 1947.

Section B. Flying.

1. *General.*—The Contests are open to all types of gliders. Gliders with a wing span of less than 15 metres will be credited with a bonus of 10 per cent. of all marks gained. In the case of two-seater gliders, if necessary, the weight of the crew complete with flying clothes and parachute will be made up by the addition of fixed ballast to an average weight of 170 lbs. per crew member.

2. *Nature of Contests.*—The Contests will consist of a series of attempted goal flights. Each Competitot must declare his goal in writing before take-off. Only the best flight of the day made by each pilot may score marks. Each such flight may gain marks for both height and distance in accordance with the scales laid down in Section C.

3. *Parachutes.*—On every flight each crew member must wear a serviceable parachute.

4. *Barographs.*—On every flight a barograph, sealed by an official observer immediately before take-off, must be carried. Each barograph must have been calibrated to the I.C.A.N. scale within two months of the opening date of the Contests, and the calibration chart must be lodged with the Organisers before Contest flying commences. In cases of doubt the Organisers may demand re-calibration immediately after the Contests.

5. *Aero-tow Launches.*—On aero-towed launches the towing aircraft will carry a calibrated barograph. Immediately the glider releases the towing aircraft will dive and the height of release will be checked by examination of the towing aircraft's barograph.

6. *Height of Release.*—The Organisers will declare each day the maximum permissible height of release for aero-towed launches.

7. *Releases.*—On aero-towed launches, the point of release must be behind a line drawn through the starting site, at right-angles to the line joining the starting site to the declared landing point. All distances will be computed from the starting site, not the point of release.

8. *Landing Points.*—In the case of distance flights, the landing point must be confirmed by witnesses' signatures. If possible the landing point should also be marked on the pilot's map and initialled by the witnesses.

9. *Retrieving.*—Competitors are responsible for arranging their own retrieving.

10. *Control at Start.*—(a) No glider may be entered at the starting point until the pilot has reported to the Timekeeper in attendance that his glider is rigged and ready at the starting point. The pilot may then have his Contest Number placed on the starting board in his proper place, directly after other pilots previously entered thereon. At any time before the start he may withdraw and have his name re-entered at the foot of the list as it then stands.

(b) Before taking off a pilot must announce to the Starter the type of flight in which he is competing, *e.g.*, Goal, or Out-and-return, and must initial the Starter's sheet accordingly.

Section C. Marking.

1. *Distance Flights.*—The distance which will count for marks will be the distance along the line joining the starting site and the declared goal where that line is cut by a projection from the point of actual landing cutting that line at right angles.

Marking: Bad Normal and Good Soaring Days.

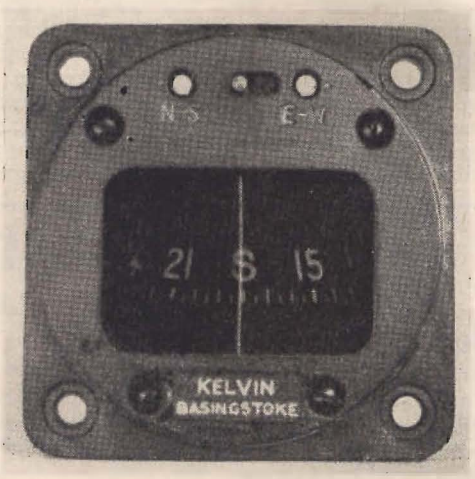
The average of the three longest flights on any given day will decide the scale by which marks will be awarded for distance flights on that day.

(a) When the " average distance " is less than 50 miles no marks will be awarded for the first 20 miles of any flight. Thereafter marks will be awarded at the rate of 3 per mile. *Continued on page 23*

SENSITIVE ALTIMETER

THE range of the Sensitive Altimeter by Kelvin, Bottomley and Baird, which has been advertised in SAILPLANE, is being extended from 80 to 150 m.p.h. in response to numerous requests from Sailplane pilots. It is pointed out that once over the stalling speed, Glider pilots only need airspeed indicators at the other end of the scale, *i.e.* when they are approaching the dangerous speed for air towing or diving in cloud.

This firm has also developed a very small compass which will fit into a case 2¼ ins. square for use in sailplanes and light aircraft, which is bound to be very popular because of its small size and efficiency.



We also hear that they are developing an Altimeter sensitive up to 30,000 feet for sailplane use.

Very few people realise that an A.S.I. may have a series of three diaphragms coupled, which give a horizontal travel of ¼ in., but which through a gearing of 1,500 or so, may be the equivalent of five times round the dial.

This is only one of the many refinements now available to sailplane pilots as a direct result of wartime development.

NEWS FROM THE CLUBS

BRISTOL GLIDING CLUB.

On the two or three occasions in the last month when sunshine has coincided with our presence at Lulsgate we have been gratified to find definite thermal activity from the aerodrome itself, making soaring possible for the first time. As might be expected, Rex Young's new " Olympia " has taken greatest advantage of the as yet weakish lift, with the present best height of 2,400 feet. Our " Grunau " is a close second, and the Club's first post-war " C's " have been gained by Hinton and Chantrill over the aerodrome.

This indicates considerable potentialities under more suitable conditions, especially as we now have 4,000 feet of cable on the winch and really useful heights can be reached with a moderate wind speed. Both sailplanes have been launched to 1,500 feet without difficulty, the highest launch yet being to 1,600 feet with a twelve-stone pilot in the " Grunau."

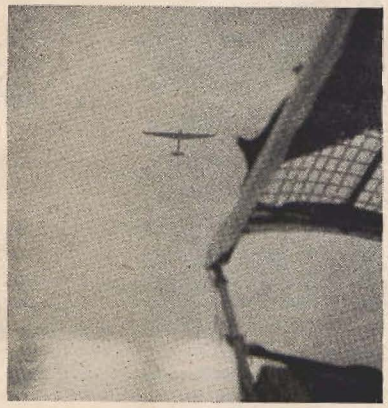
Ab initio work has been hampered by high winds but is rapidly regaining its former momentum. Up to the high-hop stage training is now done by auto-towing the " Cadet " on a sisal line, leaving the winch free for the sailplanes. Four " B's " have now been gained by pupils since our start last September.

Equipment and ground organisation is improving steadily, with a marked gain in operating efficiency. Field-telephones are now in use between launching-point and winch and are a tremendous asset from every point of view; it is well worth laying out the cable even for an evening's flying. The James three-wheeler milk-float, presented to the Club in the early days of its renascence and rebuilt by members, is now in service and has proved to be a fast, loud and well-ventilated vehicle. It has been fitted with an overload release hook for its appointed task of winch-cable retrieving, and is also equipped for laying and reeling-up the telephone line at beginning and end of the day.

To encourage members to turn up regardless of the weather and press on with the many maintenance and improvement jobs, an incentive scheme is now in operation whereby two and a-half hours' work under the eye of our Ground Engineer is rewarded by a priority chit. This entitles the holder to one extra launch on any flying day regardless of his place in the " order of arrival " list. It is as yet too early to measure the effectiveness of the device.

CAMBRIDGE UNIVERSITY GLIDING CLUB.

With the beginning of term, flying began at Cransden Lodge Aerodrome. It had been hoped that by now a return to Bourn Aerodrome (which is considerably nearer Cambridge) would have been possible, but the M.T. dump, though slowly dissolving, has not yet cleared itself of the main runways.



" Olympia " at top of launch at Camphill

The most interesting development since the beginning of term has been the successful solution of the excessive wastage of ropes with auto-towing. Piano wire has been substituted for sisal rope with results that speak for themselves.

Cost per launch (wire depreciation), less than 8d.; reliability, 95 launches to date without a break; height obtained (on 1,400 ft. length), regular 1,000 ft. records, " Tutor " 1,060 ft., " Olympia " 1,200 ft.

The technique of handling this wire, however, is not easy, and it is hoped to have a full article on auto-towing available for the SAILPLANE very shortly.

On May 3, from a wire launch, John Pingle, in " Olympia," contacted thermal and climbed to 4,600 ft.

YORKSHIRE GLIDING CLUB.

The first " flying " weekend was Easter, and a gale blew over the whole period. Hopeful ones hung around, and the hangar doors got a well-deserved coat of paint. Windless, overcast conditions on the week ending 12th/13th made an opportunity for rigging and flight testing.

Saturday the 19th proved to be the opening of the season—in fact the lid flew off with a bang, for George Counter, launched in the " Kite " at 1550 (D.B.S.T.), after 40 minutes' hill soaring, found thermal lift to 5,000 feet, hung on to it, and arrived at the coast near Scarborough, still 3,000 feet above starting height. He flew down the coast as far as Filey—49 miles—where he landed on the golf course. Earlier the same day W. Sharpe had reached 3,500 in the same machine. Seven hours' soaring for the day. Many members who didn't turn up are now regretting it !

The following day was unsuitable for all flying. Saturday, the 26th, brought patchy hill soaring with a sudden burst of thermal activity, in which W. Sharpe climbed rapidly to 3,600 feet; one day, he's going to take a barograph along with him—if he remembers ! Three new members had some two-seater experience, and certificates should be the order for them in the near future. Flying time, 5 hours and 20 minutes. Sunday, 27th, was a good rough hill soaring morning, but a gale sprang up after lunch and the afternoon was too rough for further flying. Flying time 3 hours and 15 minutes.

Future Activity.

The course, which begins July 26th, was mentioned in these notes last month. Already there are almost enough applicants to fill it, as we have decided to keep it to fairly modest numbers. The Hambleton Hotel is offering special terms for " bunkhouse " sleeping with meals in the hotel for intending visitors to the Club—the Hon. Secretary, Mr. Alderson, has full details for anyone interested. The dates of the A.T.C. courses are not yet settled, but the week-end " courses " for instructors of schools detailed, take place every week. The A.T.C. hangar will be erected in the near future, and the pros-

pects of our getting a club house are much brighter than they were, in the shape of our building from the Huddersfield training site of pre-war days. There are also possibilities that primary training may be tried later in the year, but it will be costlier and rather more subject to stern discipline than in the past, due of course to the cost and scarcity of equipment.

The club fleet has been increased by two new "Tutors" in very pleasant colour schemes if you're interested in such things, and there is ample scope for some new flying members.

General.

Last April we did rather more on fewer aircraft, the reason being that there were six "fit for flying" days then, compared with four this year.

A "Miles Messenger" landed on the top of the Bank during the month, and whilst we do not recommend the place for powered aircraft, there was nothing very difficult about it so far as could be seen. R. F. Stedman landed an "Auster" there on two occasions last year.

In short, we have some decent modern aircraft, decent ground equipment and a good site, so all we need now for a good season is the right kind of weather to separate members from their hard earned pocket money!

G.A.H.

ROYAL AERO CLUB GLIDING CERTIFICATES

(ISSUED UNDER DELEGATION BY THE B.G.A.)

GLIDING CERTIFICATES, "A"—72 (6279-6350)
"B" 31

No.	*Name*	*A.T.C. School or Gliding Club*	*Date taken*
2943	George Albert Bradshaw	141 G.S.	11.11.46
3666	Ralph Liddiard	N.W. 192 G.S.	22. 2.47
4825	Ian Gordon Peter Kingsellah Fletcher	124 G.S.	2. 3.47
5257	Patrick Stanely Wybrow	162 G.S., A.T.C.	15. 9.46
6283	Norman Clifford Everett	104 G.S., A.T.C.	9. 3.47
6284	Peter Norman Vines	192 G.S.	25 1.47.
6286	John Anthony Mawson Reid	Cambridge G.C.	17. 3.47
6289	Henry Cecil Lowcock	Ditto	17. 3.47
6303	Denis Joseph Letch	122 G.S.	5. 1.47
6308	George Lynn	82 G.S.	19. 5.47
6309	Horace Frederick Fulford	24 G.S., A.T.C.	17. 9.46
6311	Derek John Roe	130 G.S.	15.12.47
6314	Percy Williams	144 G.S.	9. 3.47
6317	John Michael Hinton	Bristol G.C.	3. 3.47
6320	Albert Henry Young	104 G.S.	27.10.46
6322	Peter Fassett	84 Group G.C.	21. 8.46
6323	Gerald Arthur Winter	Ditto	24. 8.46
6324	James S. McCallum	Ditto	5. 8.46
6325	Mark Manfred Luxton	Ditto	21.10.46
6326	Arthur Christopher Rolls Newbery	Ditto	23. 8.46
6327	Allan Morrison	Ditto	26. 7.46
6328	Reginald Joseph Gatt	Ditto	16. 8.46
6329	Eugeniusz Wyroba	R.A.F. Station, Quakenbruck	24. 8.46
6330	Tayeusz Josef Lukaszkiewicz	Ditto	27. 9.47
6331	Zdzislaw Kuczynski	Ditto	1. 6.46
6332	Josef Burandt	Ditto	15. 5.46
6333	Czeslaw Spaczynski	Ditto	1. 9.46
6334	Jerzy Marderwald	Ditto	8. 9.46
6343	George William Walker	151 R.U. (A.)	4.12.46
6346	Patricia Annette Blackwell	Surrey G.C.	7. 4.47
6347	Richard Hopkins Purvis	R.A. Aero Club	6.10.46

"C" CERTIFICATES—12

4439	Harry Usher Midwood	Derby and Lancs. G.C.	10. 4.47
5616	Michael Slater Whitham	2 Group G.C.	5. 4.47
6265	Reginald Hugh Grice	2 Group G.C.	9. 3.47
6286	John Anthony Mawson Reid	Cambridge G.C.	14. 4.47
6289	Henry Cecil Lowcock	Ditto	14. 4.47
6322	Peter Fassett	84 Group	23. 8.46
6323	Gerald Arthur Winter	Ditto	7. 9.46
6324	James S. McCallum	Ditto	26.10.46
6328	Reginald Joseph Gatt	Ditto	17. 8.46
6329	Eugeniusz Wyroba	R.A.F. Station, Quakenbruck	10.10.46
6330	Tayeusz Josef Lukaszkiewicz	Ditto	12.10.46
6343	George William Walker	151 R.U. (A.)	5. 5.47

SILVER BADGES.—2

83	R. E. Claudi	(4920)
84	W. M. D. Morrison	(1193)

Owing to lack of space several of the following letters have been held over from last month.

LETTERS TO THE EDITOR

I am a reader of your magazine and so I read a lot about gliding in Great Britain. I think perhaps you may be interested in a few particulars about our gliding club:

In Groningen we have one aero club, the "Noord-Nederlandsche Aero Club" (North-Dutch Aero Club), whuch contains three sections: one section for sport-flying, one section for gliding and one for aeromodelling. The Club was founded in 1932.

Before war the gliding section owned one "E.S.G.," one Zögling" a "Grunau Baby IIa," and a "Rhönbussard," which was built by two members of the Club.

When the Germans attacked the Netherlands on 10th of May, 1940, the "E.S.G." and the "Zögling" were blown up in the hangar at Eelde (Groningen Airport), on which airport the Club is now flying. The "Baby" and the Rhönbussard" were hidden in a warehouse, and happily the Germans didn't find them; but after the war the "Rhönbussard," which was hidden under bad conditions, could not get a C. of A., so the Club could only use the "Baby."

The Netherlands Royal Aero Club, however, instructed the Fokker works to manufacture 36 "E.S.G." gliders, which were leased out to the clubs that needed them. Our Club got two of them and so we could start flying in May 1946. The gliding section has sixty members now, which is too many for only three planes, but we hope to repair the "Rhönbussard" next summer, and then we shall have a high-performance sailplane again.

For launching we have two jeeps (war-surplus) and one winch after the design of Dr. Keuning, one of the three voluntary instructors of the Club. During 1946 we had a lot of trouble with the jeeps, which are not quite suitable for car-launching (not powerful enough). With winch-launching we can reach a height of about 1,500 feet in the "Grunau Baby," and under good

thermal conditions we can get lift from that height.

Two " E.S.G.'s " were crashed at the landing last year, and it took a long time to get them replaced. Gliding with " E.S.G.'s " was forbidden during the month of August, because there were a few faults in it. About 15 members, however, got an " A " certificate, and one member got a " C " certificate in the " Grunau Baby " last year.

Since November 1946 flying has been stopped by the bad condition of the airfield—too much frost and snow—but we hope to start again within a few weeks, when I will send more particulars to you.

W. J. KOPPIUS.
Member North Dutch Aero Club (Gliding Section), Groningen, Netherlands.

Many, many months ago F./L. Weekes, O./C. No. 168 A.T.C. Gliding School, and some of his instructors, most of whom are employed by Short Bros., had an idea that they would like to design a two-seater glider. They had a basic idea in mind, and in order to make the best job possible they consulted numerous experienced sailplane pilots to confirm, or otherwise, the details they were working on.

Having fixed their general arrangements and produced the necessary drawings, they set to work to build this glider in their spare time. In the autumn of last year their employers decided to complete the job with a view to making a commercial proposition of it. The result is the " Nimbus " which I had the pleasure of flying recently.

The wind was about 5/10 m.p.h., and the length of cable was not much over 1,000 feet, but a height of 700 feet was obtained with very light pressure on the stick. The position of the release is apparently suitable for aero-tow or winch launching, an unusual feature due to the low wing lay-out. On casting off the gliding angle was found to be a little more nose down than was anticipated, but was quite comfortable and added to the already superlative view for which this glider is noted.

As far as it was possible to tell in three circuits, this glider appeared to have excellent handling qualities and was " circled " in weak patchy lift at 300 feet with a complete sense of security and stability. There is quite a noticeable " Judder" on the tail just before the stall, but it behaves in quite a lady-like fashion when stalled. The rate of sink compares quite favourably with the " Falcon III," but it was difficult to judge the penetrating qualities under the circumstances.

There is ample room in both seats and a magnificent view from either, and the one-piece Perspex hood makes it very simple to carry on a conversation, and perhaps the best recommendation one can give on so short a trial is to say that one felt at home and comfortable immediately, and on climbing out my chief reaction was that I would look forward with great interest to an opportunity to try this glider under soaring conditions.

As this is apparently the only high-performance two-seater in production in this country, I see for it a very interesting future.

E. J. FURLONG.

Up to now, the story of our post-war activity presents a picture of enthusiasm, materialised through the many working hours put in by the keen members of the different clubs, who are only too anxious to get airborne again. Five years of bad storage had rendered some of the kites beyond repair in some cases even this most valuable material had been ruthlessly destroyed by the enemy. Adding to those misfortunes the shortage of material, the abnormal high post-war prices, and last but not least, the proverbial difficulty of a gliding club to get the necessary funds, it is easily understood that the problem of building our gliding movement up again was hard to be solved. Also, except for a few disconnected attempts there was no real soaring activity last year, and only about 500 launches were made, the majority of which by the " old sweats " who were getting the feel of air and stick again.

On the other hand, this situation was somewhat considered as an opportunity to start this time with modern equipment and new methods, backed by the experience of a few fortunate ones who were lucky enough to visit R.A.F., Swiss and French gliding schools.

As our pre-war experience had learnt us that the single seater training method by amateur and benevolent instructors had not only failed to give the expected results but had also been one of the many setbacks to the prosperity of the private club owing to the rather high crashery rate, the Royal Aero Club who has been promised a Government subsidy for gliding decided to take over all training up to C standard by the double-seater method under the supervision of full-time professional instructors.

To meet the most urgent needs two " Govier " two-seaters and two " Grunau Babies " were ordered in Switzerland for training purposes. The first of a series of training camps is to be held during the Easter period in the beautiful surroundings of the holiday resort of Spa, where about 40 pupils, who will be lodged in a nearby youth hostel, will be given instruction over a ten days' period. Our air force is largely contributing to this first effort by putting a " Tiger Moth " tugplane with pilot at our disposal, so that besides the usual short winch launches for practising take-offs and landings, the pupil will get plenty of airtime to get used to the co-ordination of the controls under the supervision of his instructor.

Very soon a furniture factory will start the production of a first series of 10 " Grunau Babies " for our account. These machines, which remain the property of the Royal Aero Club, will be put at the disposal of the private clubs at a rate of one glider for every 10 members up to C standard, in return the club has to bear the insurance expenses and subject themselves to a severe control of the Royal Aero Club especially with regard to their safety measures and the care taken in handling the machines.

We have great faith in this new formula, and believe it the right one for a small country with a small population.

We hope this information will interest you and are very anxious to receive some particulars about the prospects of this sport in your country.

A. MARECHAL,
The Secretary-General,
Aéro Club Royal de Belgique

I note that you have been compelled to raise the subscription from 13/- to 19/- per annum. It doesn't seem reasonable that you should have to bear the extra expense on subscriptions already in being, and I accordingly enclose P.O. for 6/- to cover the extra amount on my current subscription.

F. W. A. TAYLOR.
Sherwood Estate, S. Rhodesia.

Regarding Mr. Leache's statement and general comments about his being the first pilot to bale out of a glider, I wish to point out that on July 8th, 1942, both Mr. J. C. Neilan and my husband, Mr. R. F. Stedman, baled out successfully from a glider and both are members of the Caterpillar Club from that date.

C. K. STEDMAN.
Sherburn-in-Elmet, Leeds.

For the past few months I have dedicated my spare time almost entirely to the workshop and have eliminated 243 hours from the "Olympia" and with only seven more ribs to finish the complete set of wing ribs for the port and starboard wings, are well on the way with the machine, and can safely say it is more than half finished.

My partner has been doing sterling work on his side of the project, and only welding is required to complete the quota. We have decided to accept a very generous offer from Chilton Aircraft for the spar root fittings which, according to the manufacturers, have certain idiosyncrasies in the heat treatment process and distortion is the difficulty encountered. As the Germans used the Chrome-Molybdenum, this difficulty was eliminated, but as DTD 124 A is the only available equivalent in the United Kingdom, Chilton have had to use it as a last resort. However, we are prepared to accept the experience of the heat treatment experts of Chilton and do not want to bungle our first attempt, especially when we have had to import the DTD 124A, as there is nothing available in Australia that amateurs can lay their hands upon.

X4130, the desirable American metal, is here in Australia, but is tied up with *red* tape. Waghorn, of the Sydney Club, who was in England recently, commented on the superb craftsmanship in Hiscox's Chilton "Olympia," and was very impressed with the performances of this particular type.

I can see myself having very little flying this year in order to finish our job here, but will be well worth the effort.

A scheme to acquire a "Gull" two-seater is my next venture after the "Olympia" is built and flown for a time, but a great deal will depend on the flying qualities of the "Olympia," but if I could find a buyer here and invest in the higher-priced "Gull," the possibility of record flights with the higher performance machine with practically limitless range of country to fly over is very sound.

However, a great deal will also depend on the price of the "Gull," transport here, also duty.

I believe an "Olympia" sent out here would be landed at a cost of £1,000, rather high for the average sailplane pilot.

ARTHUR D. HARDINGE.
Melbourne, Victoria.

Enthusiasts who are eager to learn the elementary principles of flight may be misled by the February article by A. York Bramble, A.R.Ae.S., F.R.Met S. Considerable space is given to a criticism of an earlier article by another writer and York Bramble summarises one point with the statement: "But the truth is that a 'dangerous stall' condition can be reached at different times for almost all angles of attack, depending upon the different conditions obtaining at the time." Read alone or in its context this is incorrect.

Kermode, Ware and other authorities on the subject may be quoted to substantiate the fact that stalling occurs at a definite angle of attack which, for any given aerofoil, is constant. The stalling speed undoubtedly varies with the weight of the aircraft, the load factor in manoeuvres and the density of the air, but all who are interested in flying need to grasp the basic principle that these different stalling speeds occurs at the same angle of attack.

Angle of attack is a technical expression for the angle between the chord and the relative airflow, and the relative airflow is a parallel to, but opposite in direction to, the path of the centre of gravity of the aerofoil. York Bramble's definition of angle of attack is fairly similar to this, and if he means the same thing by "indicated angle of attack" it becomes impossible to agree with his example that "in a thermal a sailplane flown in the attitude of a diving turn, at an indicated angle of attack of, say, 20°, may be flying within safe limits, depending upon the rate of turn, *i.e.* upon the airspeed, in effect: whereas in straight and near-level flight it may have already passed the danger-line of the stalled condition at an indicated angle of, say, 15°, depending always upon the airspeed." What must be the definition of "indicated angle of attack" to make this situation feasible is an amusing topic for rainy afternoons at the club.

ARTHUR M. DENNIS.
Nailsea, Bristol.

With reference to the letter from our Chairman in the April issue of the SAILPLANE regarding a scheme for training *ab-initios*, I regret to inform you that, through matters beyond our control, it has not been found possible to continue with this scheme.

F. G. BATTY,
Secretary, Midland Gliding Club.

In an attempt to combine the views of F./Lt. Neubroch and G. O. Smith on the subject of best flying conditions I have treated the problem mathematically, and have arrived at a result which shows that they are both right, surprisingly enough, to an exactly equal extent.

Suppose a glider is going to fly from a given height through a downdraught of velocity U and width a, and then climb at a rate c in a thermal until it has regained its original height. Let V be the velocity of the aircraft, V^1 its ground speed and S its rate of sink in still air at speed V.

Then

Time taken to cross downdraught $= \frac{a}{V}$

Height lost $= \frac{a}{V}(u + S)$

Time taken to regain height $= \frac{a}{V}\frac{(u + S)}{c}$

Total time $= \frac{a}{V}\left[1 + \frac{u + S}{c}\right]$

$= \frac{a}{V}\left[\frac{c + u + S}{c}\right]$

Average speed $= V^1 = \frac{cV}{c + u + S}$

For V^1 to be a maximum its derivative with respect to V must be zero.

$$\therefore \quad \frac{(c+u+S).\ c-cV\ \frac{dS}{dV}}{(c+u+S)^2} = 0.$$

$\therefore$ Either $c = o$ or $c+u+S = \infty$ (which solutions do not concern us).

$$\text{or} \quad c+u+S = V\frac{dS}{dV}$$

$$\therefore \quad c+u = V\frac{dS}{dV} - S$$

The right-hand side of this equation is a function only of V, and for a given value of (c + u) has a unique value of V in the range of V which we are considering. This means that the speed at which to fly to attain the greatest ground speed is governed by your rate of climb in the thermal plus the rate of sink of the downdraught itself (not your rate of sink in the downdraught; this is greater by your sinking speed in still air).

If C = o (*i.e.* the upcurrents are only just strong enough to give you zero sink) then the problem reduces to that considered by Mr. Smith of flying at the best gliding angle in the downdraught; if, however, c is positive you can fly faster than this speed for the reasons given by F./Lt. Neubroch.

Having selected your value of V, then your groundspeed may be found. This depends not only on (c + u), which was used to determine V, but on the actual value of c itself. The stronger the thermals, the more nearly does your groundspeed approach your airspeed.

Having obtained your groundspeed, then the wind velocity may be added to it by the usual vector triangle.

The complete procedure, then, to fly from one point to another is:—

(1) Estimate the probable values of u and c which will be encountered, and calculate V.
(2) Calculate V^1.
(3) From the wind velocity and V^1 construct the vector triangle which will give you the course to follow between thermals to reach your goal.

It is realised that the whole business is getting too complicated, and this is only an ideal to be aimed at; but it should give a reasonable indication of the speed and direction most likely to give the best results.

E. DEWING,
Emmanuel College, Cambridge.

Dear Sir,

THERMAL LORE

As you know I have been for a long while very interested in aeronautical matters, and more especially in everything relating to gliding and soaring. I would like to open up a discussion on certain observations that I have made personally while flying here in the Argentine. There are still some mysteries to be cleared up in gliding, as also some erroneous theories to be destroyed, and these can best be ventilated by world-wide observations and the resulting discussions wherever glider pilots are gathered together.

Flying recently in an old "Condor I" I noticed that on calm days in the early hours of the morning or late evening, at certain heights and with stratified air, ascending currents would produce themselves as a direct consequence of my making several rapid and very steep turns. I noticed, too, that while rising in certain thermals the rate of climb eased off at certain heights, but with several quick turns I could start them up again in the same place and often with renewed intensity.

I also observed that if there were several sailplanes circling in the same thermal it would intensify; and that if I were circling alone it was enough for another sailplane to enter the same thermal below me for it to strengthen immediately.

These observations give me the impression that under certain conditions the sailplane itself might generate sufficient upcurrent for it to be maintained in the air, and even to gain altitude when the air around is sufficiently "stirred up." I have also been studying the behaviour of flocks of birds when they begin soaring at low altitudes. One can see them flying in small circles, rapidly and apparently in disorder, sometimes beating their wings. Later they widen their turns and continue to rise rapidly in a slow glide and in perfect circles.

In the hope that these observations may be of interest to you and perhaps of assistance to soaring in general, I remain

Yours sincerely,
J. B. CHOURROUT
(Albatros Club, Buenos Aires).

BRITISH GLIDING ASSOCIATION

continued from page 18.

(b) When the "average distance" is more than 50 miles but less than a 100 miles no marks will be awarded for the first 25 miles of any flight. Thereafter marks will be awarded at the rate of 2 per mile.

(c) When the "average distance" is more than 100 miles no marks will be awarded for the first 30 miles of any flight. Thereafter marks will be awarded at the rate of 1½ per mile.

2. *Height Flights.*

(a) No marks will be awarded for the first 1,500 feet of climb above the point of release.

(b) For climbs of between 1,500 feet and 3,000 feet above the point of release marks will be awarded at the rate of 1 per 100 feet.

(c) For climbs of between 3,000 feet and 7,500 feet above the point of release, marks will be awarded at the rate of 2 per 100 feet.

(d) For climbs from 7,500 feet above the point of release and upwards marks will be awarded at the rate of 4 per 100 feet.

3. *Bonus Marks.*

(a) For a distance flight ending with a landing within 1,000 yards of the declared landing point, a bonus of 33⅓ per cent. of distance marks will be awarded.

(b) For an out and return flight, declared as such, a bonus of 100 per cent. of distance marks gained will be awarded.

(c) For a flight declared as an out and return flight, but terminated at the declared turning point, a bonus of 33⅓ per cent. of distance marks will be awarded.

(d) For a flight declared as an out and return flight, but terminated at a point between the turning point and the starting site *after rounding the turning point*, a bonus of 33⅓ per cent. of distance marks gained on the outward leg will be awarded, but normal distance marks only will be awarded for the remainder of the distance (computed as in Section C para 1 (a).

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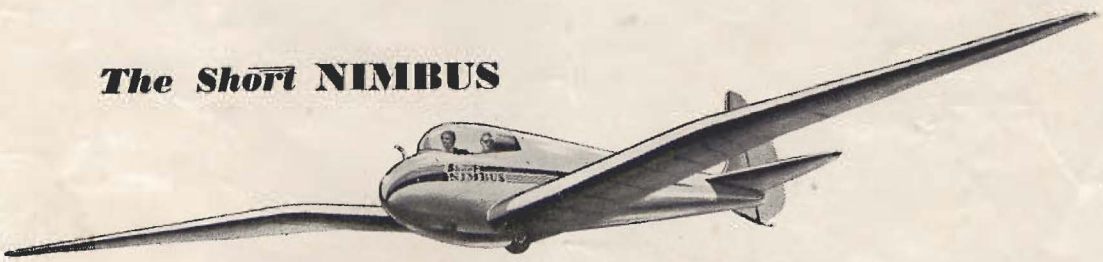
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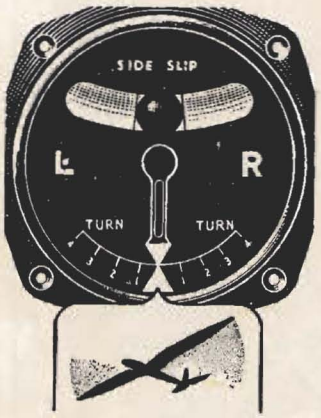
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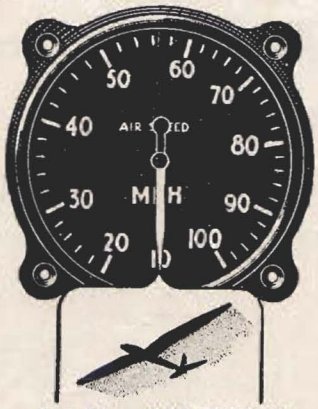
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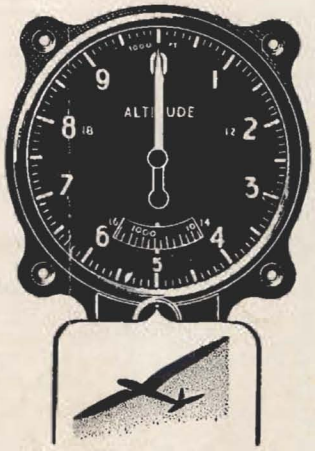
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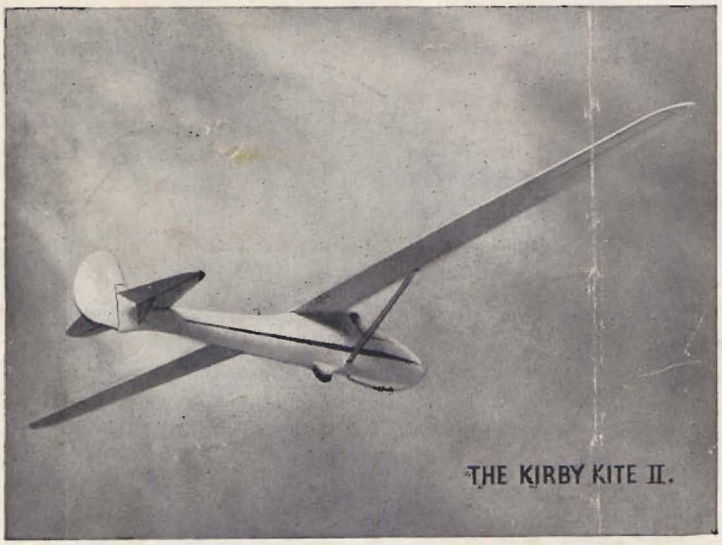


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