MAY, 1946

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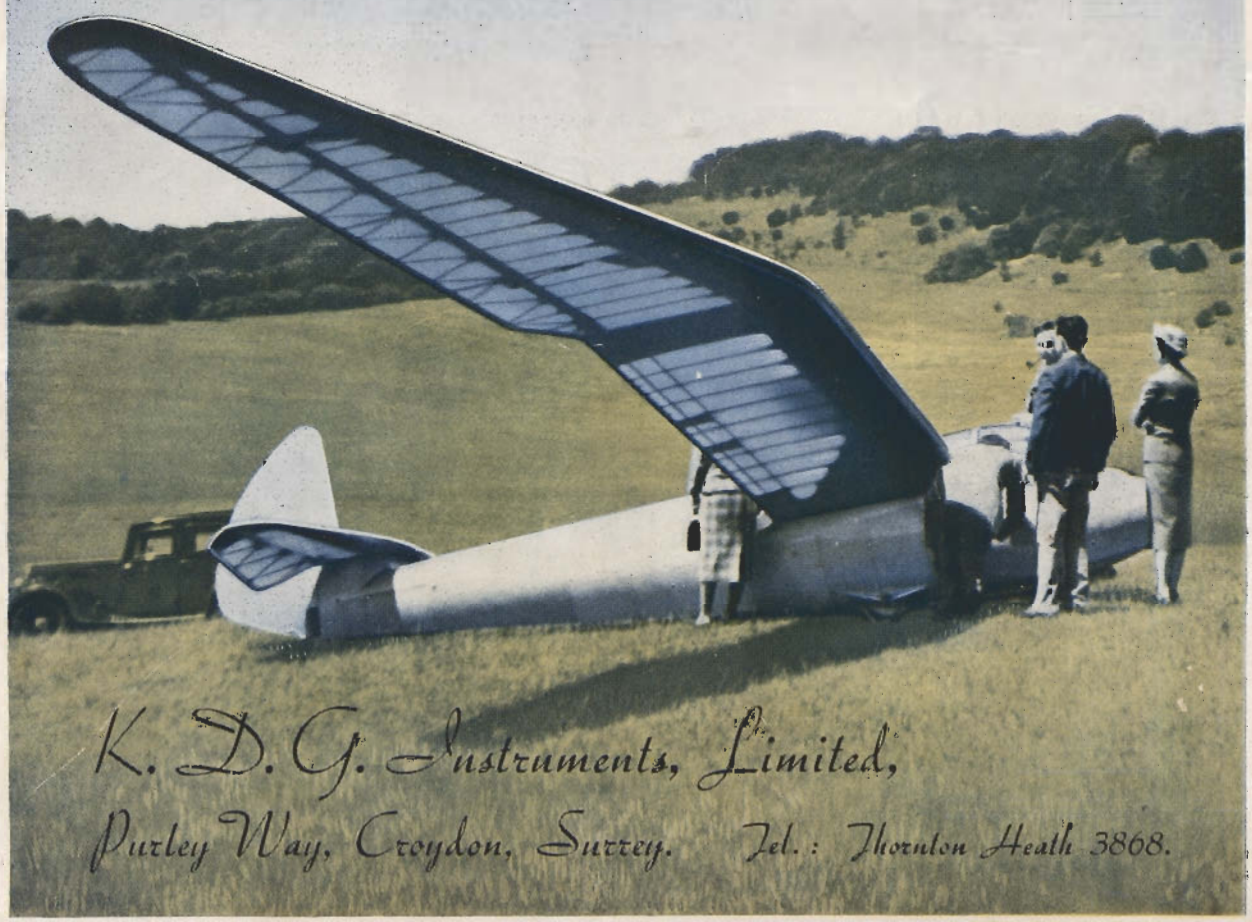
Sailplane and Glider

The First Journal devoted to Soaring and Gliding



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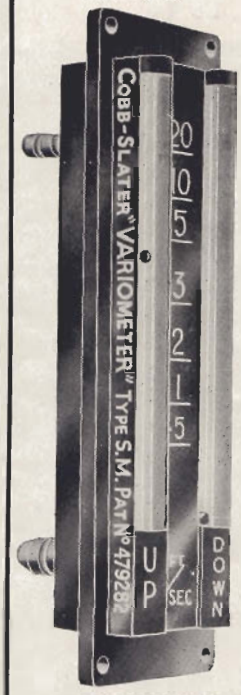

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Sailplane and Glider

THE FIRST JOURNAL DEVOTED TO SOARING AND GLIDING

MAY 1946 ★ Vol XIV No 5

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CONTENTS

OUR GUEST EDITOR—

Norman Sharpe writes—

IT is natural and proper that at the present time successive editorials on this page should be devoted to problems confronting Club Committees throughout the country in their efforts to get going again.

Apart from those restrictions on revival which, though annoying, should be only temporary, such as shortage of machines and petrol to get to them, the one great difficulty is to prevent Soaring from becoming exclusively a Rich Man's Sport. Aircraft and equipment costs are about 2½ times pre-war, and the cessation of the subsidy really means that Clubs will pay a further three times as much for their aircraft and spares, so that the cost of operating a sailplane at pre-war standards of efficiency will be about 7½ times what they were in 1939. This quite disconcerting multiplication factor can be reduced only by a certain ruthlessness in cutting out first the expensive hangover of wartime controls that are keeping up manufacturers' overheads, and secondly by likewise cutting out the more expensive kinds of flying, thus reducing crashery and enabling Clubs to get more use out of their fleet of aircraft. Very regrettably, this may mean ceasing to offer *ab-initio* solo instruction, the successive stages of which (unsubsidised either from without or by other Club activity) may be such as to prevent an economical number of applicants coming forward.

By reforms of this grim kind we may get the cost of operating a Club sailplane down to 5 times pre-war level. Well, though the Government has still made soaring what the man in the street will call a Rich Man's Sport, the enthusiast who cannot really afford it—to whom the fine record of the Clubs from 1930 onwards owes so much—will still make sacrifices he shouldn't and will come along and work, fly and pay. Make no mistake about it, we shall succeed and shall still have our fun—and in fact less work for it; there is no despondency in the Clubs on that score. But let it be quite clear that that is not our only aim, and that the Clubs cannot at present, without outside assistance, hope to fulfil their highest aspirations and follow up their tradition of service to the State.

The fact that there is such a tradition is perhaps not often enough remembered, but the £5,000 a year subsidy for the last few years before the war was one of the best investments this country ever made in aviation. The pre-war clubs, and those enthusiasts, flying and non-flying, gathered round them, were the sole repository and source of all practical gliding and soaring knowledge in Britain. Let that sink properly in—the Club movement is the parent of all Army and R.A.F. gliding, of Cadet glider training, and of the harassed manufacturers who supply their aircraft and who provided other valuable construction capacity during the war. Some indication that these things were understood in official quarters would be an encouragement. The cessation of the direct Government grant is a strange sequel to this record and to the possibilities of future service by a vigorous Club movement which the B.G.A. has recently put to Whitehall. Particularly in a Government which seems to act in other financial matters like an Utopian fruit machine in which every pull of the handle releases a jackpot of millions without the insertion of a coin, it is really very odd indeed.

There is, however, a ray of hope. It has been stated in the House of Commons as recently as March 20th that the Ministry's wish is to encourage gliding clubs, and that "*when gliders are available*" the nature of this encouragement will be considered.

(*Continued on page* 15).

BEST AIR SPEEDS

(Continued from March.)

THE EFFECT OF HEIGHT ON AIR SPEED

IN the last article we assumed on the graph that the true air speed was equal to the indicated; an assumption which in its practical application would only be warranted if the speed measurements were made at a low hight, *i.e.* near S.L., and on a day on which the air temperature and pressure were fairly near to standard. But glider aces have exceeded 25,000 feet already, while ordinary mortals may climb to 15,000 and over without a ghost of a chance of inducing an experienced soaring pilot to raise his hat an inch in recognition of such a feat.

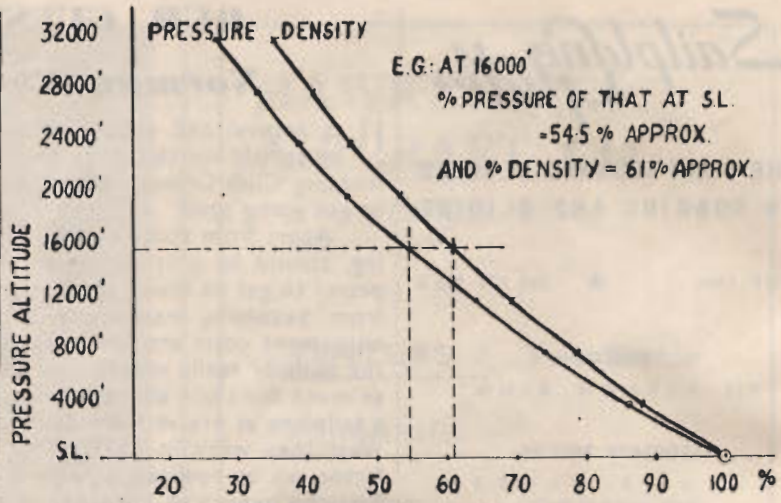
Thus there is good reason to enquire into the relationship between true and indicated airspeeds when we fly in regions in which the atmospheric pressure and temperature vary appreciably from standard conditions at sea level.

STANDARD CONDITIONS

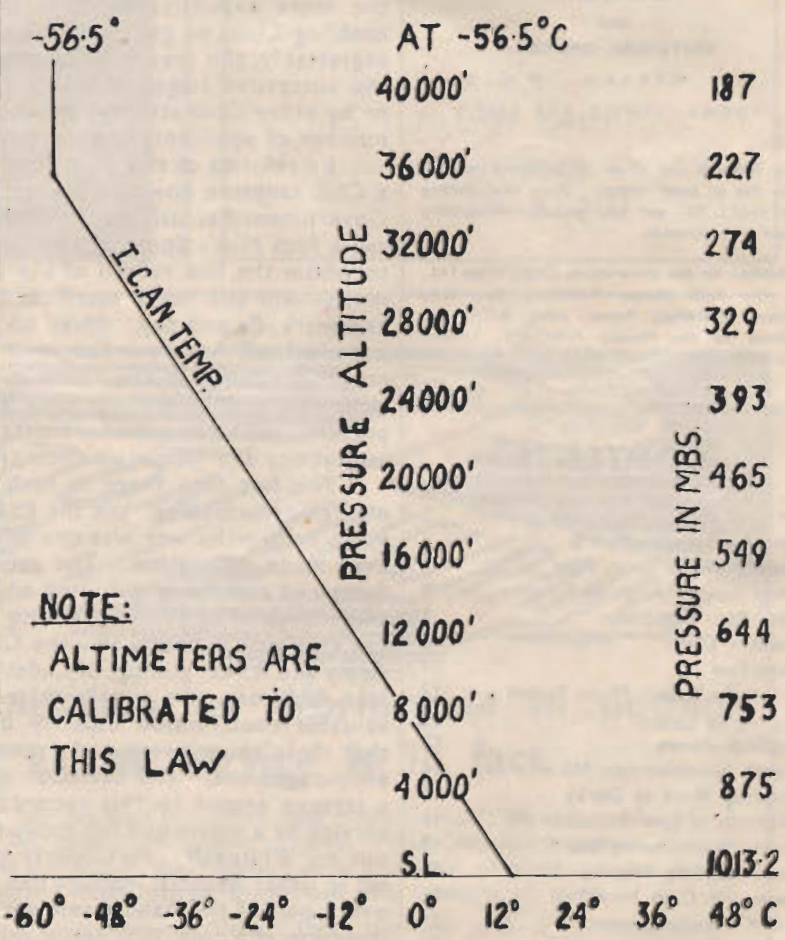
First let us establish what is meant by standard conditions, and what the main properties of the medium, in which we wish to move, are, before we commence the discussion proper on air speeds.

It should need little emphasis that some standard atmosphere is necessary for a variety of reasons; one very important one is to enable us to make accurate comparisions of aircraft performances in spite of atmospheric variations and changes of altitude. A standard atmosphere in fact is analogous to a reference line from which certain measurements can be made. The standard atmosphere which is almost universally adopted now is the I C A N calibration, which defines the atmosphere as normal when the following conditions prevail:—

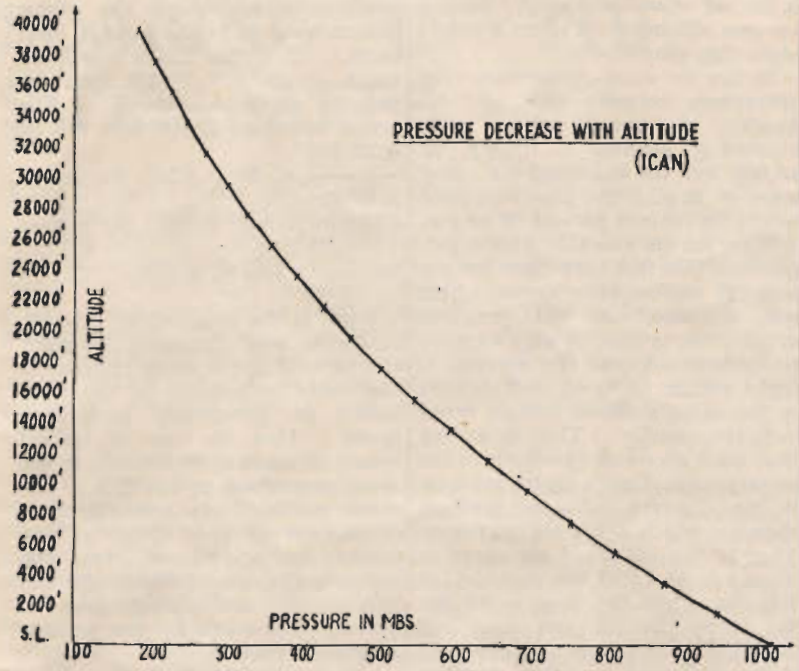
(1) Sea level pressure, 1,013.2 mbs.
(2) Sea level temperature +15°C.
(3) Temperature lapse rate, nearly 2° C per 1,000 feet (1.98 to be exact), up to roughly 36,000 feet, above which the temperature remains constant at about – 56° C.

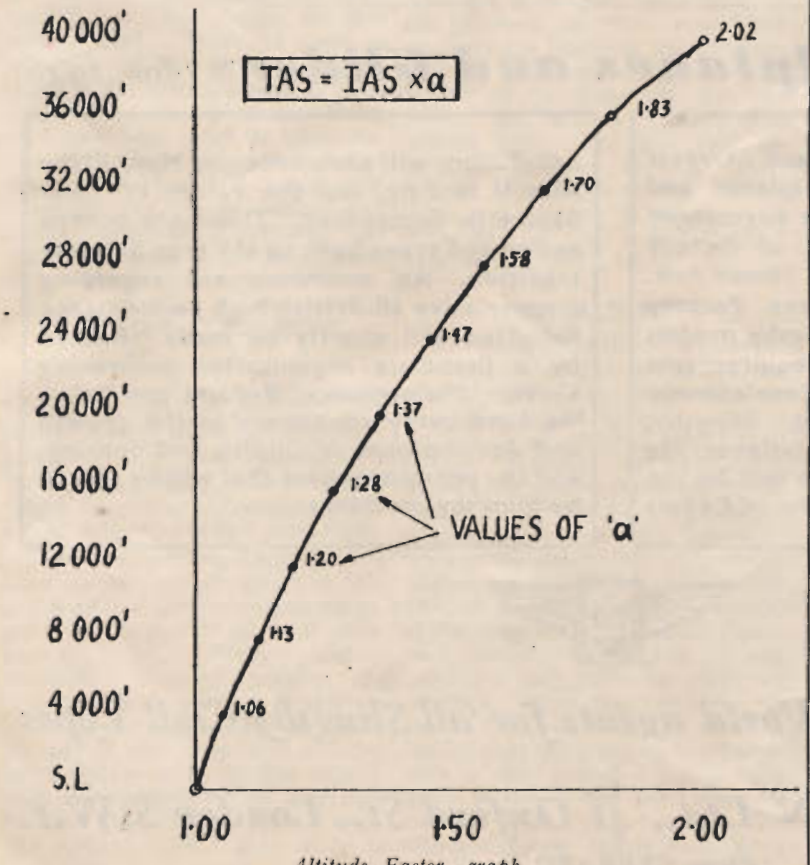


Curves showing % Pressure and % Density decrease with altitude.



I.C.A.N. Atmosphere Calibration.
Sea level temp.—15° C.
Sea level pressure—1013.2 *MBS.*
Temp. lapse rate—1.98° C. *per* 1,000 *ft.*
Above 36,500 *ft. temperature remains constant.*





Altitude Factor—graph.

INTER-RELATIONSHIP

Now the main characteristics of air are: *pressure*, *temperature* and *density*. If any two of those are known, the third can be calculated. This is as much as saying that a definite relationship exists between those three variables.

Density is really the one that is of most immediate concern to us in the field of aerodynamics, but a rather complicated gadget would be required to measure it. So we measure the other two with a thermometer and an aneroid barometer respectively (altimeter) and deduce the density from it, either by calculation or from tables.

The way in which the pressure and the temperature fall off with increasing altitude is shown in Figure 1 and 2 respectively. Figure 3 shows a comparison of the percentage decrease of pressure and density respectively as we climb. Of interest here is the discrepancy between % pressure and % density variations; it is due to the fact that as we climb, both pressure and temperature decrease; and that a decreasing temperature has the opposite effect on density as a decreasing pressure. Thus while the decreasing temperature tends to increase the density a decreasing pressure tends to decrease it. However, the effect of pressure drop on density is greater than the effect of temperature decrease, so that while with increasing height the density decreases, the *rate of decrease of density* will always lay behind the *rate of decrease of pressure*. (If, *e.g.* the temperature remained constant throughout the height scale, the graphs of % decreases of pressure and density would coincide.)

INDICATED AIR SPEEDS

Now to indicated air speeds: The degree of deflection of the air speed indicator needle depends on both the actual speed relative to the air and the density. This means that for a given air speed the I.A.S. will vary according to the density of the air at the level at which you fly. It should be easy to see that if you fly maintaining constant true air speed from a region of low density to a region of higher density maintaining the same true air speed—(*i.e.* if you descend)—your indicated air speed will be greater at the lower height,

because the air pressure on the diaphragm of the A.S.I. will be greater due to the higher density. Leaving aside for the moment the finer points of A.S.I. calibration and error correction, the actual relationship between I.A.S. and T.A.S. may be expressed thus: I.A.S. is proportional to the T.A.S. multiplied by the root of the ratio of the densities of that at the level at which you fly and that at sea level under N.T.P. conditions. Or, more concisely:

$$\text{I.A.S.} \propto \text{T.A.S.} \sqrt{\frac{\text{density at altitude}}{\text{density at sea level}}}$$

You need not despair. The root in this expression can be worked out quite easily for standard conditions and various altitudes and tabulated or plotted for the sake of convenience. If we call the root 'A' (altitude factor) and re-write the expression a little, the whole business of estimating your true air speed when you read your A.S.I. in flight at some altitude becomes much less frightening.

Thus we may write T.A.S. = I.A.S. x A, and all we need now is the set of values for 'A' for the various altitudes. Figure 4 represents this graphically.

Notice to what proportions the differences between true and indicated air speeds grow with increasing heights. If, *e.g.* at 16,000 feet the indicated air speed were 40 m.p.h., the true air speed would be 40 x 1.28 = 51.2 m.p.h.

Now let us consider the repercussions this fact may have on our original performance curve which was discussed in the previous article. It is first of all necessary to understand that the aerofoil in flight reacts to speed and density in the same sense as the air speed indicator needle. That is to say that for a given air speed (true) the aerodynamic forces on it increase if the density of the medium through which it moves increases. Thus if the indicated air speed is 35 m.p.h. at 1,000 feet and the lift 400 lbs. while the drag is 50 lbs. say, then the lift and drag will have the same values at 20,000 feet if the indicated air speed remains the same—at 35 m.p.h. Also the gradient along which the glider descends would be the same in both cases. But the T.A.S.'s will be much greater at 20,000 feet, for reasons explained above. The actual speed at 20,000 feet will be $\frac{A\ 20{,}000'}{A\ 1{,}000'}$ of 35 m.p.h. From the altitude factor, graph, the values are $\frac{1.37}{1.02} \times 35 = 47$ m.p.h.

Now, if the gradient of descent, or gliding angle, remains the same the vertical speed must increase in the same proportion as the horizontal (or practically horizontal) speed. Thus the rate of descent would increase at 20,000 feet in the same proportion as the T.A.S. In other words, if you know the rate of descent of your glider at any height for any speed, you can estimate the rate of descent for any height by multiplying, just as above, your value by the ratio of altitude factors.

F./Lt. A. MIRSKY.

(To be continued.)

SOARING IN THE SWISS ALPS

THERE is a district in the high Alps of Switzerland known as the Ober Engadin. The inhabited part is a flat-bottomed valley, running in a S.W./N.E. direction, which is not much more than a kilometre wide. The branch valley which leads out of the main valley, in a South-Easterly direction, gradually rises to become the Bernin Pass.

Here, at the junction of the two valleys, where the land broadens and widens, and the mountains rise, steeply on either side to some 10,000 feet, is Europe's highest aerodrome, 6,000 feet above sea level, adjoining the village of Samedan, and taking its name from this village. The mountain Muottas Muragl, alongside the aerodrome and at the junction of the valleys, has two or three kilometres of its sloping side nicely facing the prevailing wind. There, in front, is to be found lift such as soaring pilots dream of. A couple of beats after the launch and you are soaring at 10,000 feet, which is 4,000 feet above the launching point. Updraught in front of other promontories can then be reached and under favourable conditions and with experience, pilots make tours of 100 kilometres.

SAMEDAN AERODROME

The aerodrome itself is owned by a Company, but has been maintained during the war, and this winter, for the use of Swiss military planes. The Superintendent is Herr August Risch, who is also an active director of the Company and a keen supporter of motorless flight.

The local Gliding Club has its base on the aerodrome, but like many of its British counterparts, it is not very well off, and owns just a "Grunau Baby" and a nacelled "Primary," which are usually, when not in use, kept slung in the roof of the hangar. A certain number of club members, who are lucky enough to be private owners, keep their sailplanes near their own homes. One of them, Herr Wessel, the Instructor, or C.F.I., as he is officially called, who is a Silver "C," owns an S18 sailplane which at the time of the writer's visit was in an hotel dining room having just had a complete check over by its owner. (The hotel, which is temporarily closed, is owned by Herr Wessel and his parents, which explains why he was allowed to lodge it in the dining room.)

THE S 18

The S 18 looks like a cantilever "Gull III," but is aerodynamically similar to the "Petrel," having the same Gottingen wing section. Herr Wessel's machine is varnished with a high finish. He shares the enthusiasm of the writer for such a finish, claiming that then no defects can be hidden as with a painted exterior! The leading edge of this machine is covered with pine or fur plywood, not the usual birch ply, and the joints on the wing are capped. The monocoque fuselage is also of the same ply, but the joints are of the conventional scarfed type. Another very interesting feature is that Herr Wessel has increased the rudder, some eight inches, making it still more like a "Gull" or "Petrel." So much for the S.18.

LAUNCHING

Reverting back to the aerodrome —launches are charged for at the rate of 3/- to 4/-, and are by an electric winch of 32 h.p., which is worked by an operator, and owned by the Company. The system is to use pulleys with the winch at the side of the aerodrome. A guillotine is arranged at the box rollers in front of the final pulley, and usually launches are able to be made to 900 feet or over. Before the arrival of the electric winch, the sailplanes were taken to the top of the mountain and there launched by catapult. This was not done by the "Walk-run-release" method, but by stretching the rubber bungy with a rope round a pulley to a hand winch of the sort used for hauling boats up a beach. The sailplanes were taken back to a stable anchorage and freed by the pilots themselves, each machine being fitted with a quick release at the rear ends of the landing skids.

THERMAL CONDITIONS

The wind, in the summer, in this particular part starts to blow at 11 o'clock each morning, as regularly as an airline service. Then, of course, thermal activity develops in which pilots can circle up. But most interesting of all is the almost regular evening thermal. As the sun goes down the cold air comes trickling down into the valley and from the centre rises the warm air with wonderful smoothness. The phenomenon is one that develops occasionally in England, especially at the Bradwell Edge Hill in Derbyshire.

PLANNED FOR THE FUTURE

Soaring conditions are widely known to be reliable and interesting, and visits are made to the site by other clubs and by private owners, usually on the fortnightly camp basis. When the camps were in full blast last summer the graph record in the aerodrome control room showed 800 hours soaring in a month, with flights averaging 1¼ hours per launch. Herr Risch informed the writer that it was the intention of his Company to procure sailplanes for the aerodrome which could be hired out to certified pilots. Such a provision would increase the soaring activity at the site, as trailing one's own sailplane to such a formidable height, up expensive mountain railway systems is no light matter. Incidentally there is a funicular operating on the Muottas Muragl mountain and a good sized hotel, of the same name, at the summit.

One last point which will be of considerable interest to those contemplating a visit to this Swiss soaring camp—Risch hopes that later the club machines will be available "for the use of approved foreign visitors."

DUDLEY HISCOX.

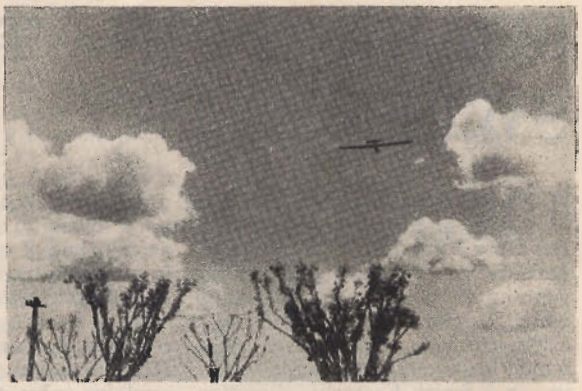
FROM

BUENOS AIRES

TO

ROSARIO

By Juan B. Chourrout



" Chiesa " on the way to Rosario.

ON the 11th November a few minutes after midday I cast loose after a rather long launch of 7 minutes to 700 metres—fine weather, ten mile an hour wind from the south-east. I began to climb at three feet a second till I was at 1,500 metres directly over the field. There I hung about waiting for Laplace in the " Spahlinger " because I had arranged to fly with him. He released low, climbed very rapidly and we got together at cloud base. There we set off towards the north, but Laplace appeared to be undecided and after staying for an hour quite near Merlo I eventually set out alone. I had an idea I could get to Rosario in about six hours.

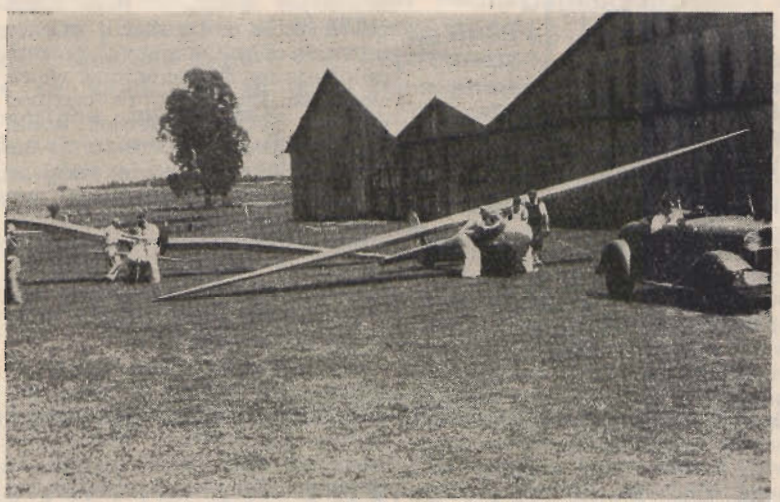
RECORD IN SIGHT

The weather was better than ever, the thermals stronger and the ceiling higher. I decided to fly comfortably without hurrying, so I stayed high, between 1,500 and 2,000 metres, and proceeded in short glides and rather in zigzags, because the wind was displacing me towards the Delta of the River Parana. There were good cumulus clouds pleasantly near eath other. I did not always go on up to cloud base because the cold was intense—in my covered cabin the temperature fell to 40 deg. Flying serenely along in this way I reached Rosario in five and a-half hours with 2,000 metres height in hand. This meant I could easily beat the Argentine long distance record even in a straight glide with no wind—and I had still a good wind and strong thermals, although the clouds had cleared away. But I absolutely had to get back to work in Buenos Aires the next day, so I determined to land in Rosario and return immediately.

SURPRISE VISIT

I flew for a while over the City and also over the river. There I found great wide thermals of three feet a second and perfect calm, as one can see by the barograph recording. A six o'clock I set out for the aerodrome at 75 miles per hour. There was a lot of activity so I decided to enter very low so as not to be in the way. I came in ten feet above the wire, dived her to grass level and so covered the thousand yards towards the front of the hangar. There I brought my glorious " Juan A. Chiesa " up all standing in front of the spectators. After the usual greetings began the equally usual questions poured out as well. " How did you get here ? " " In flight," I answered. " And where is the aeroplane that towed you ? " " Nowhere—I came in the glider, without an engine." " Where from ? " " From Buenos Aires, a hundred and seventy-two miles away." They looked at each other and nobody knew whether to laugh, to believe me, or what. But I asked them to verify my time of arrival, we found a functionary of the Aeronautica Civil, noted everything down, advised Buenos Aires, the newspapers, the radio, the United Press, etc., and in the end there was a great welcome from the " Rosarinos."

(*Continued on lower page opposite*).



" Spahlinger " and " Chiesa." Chourrout getting ready for Rosario trip.

First Post-War Silver "C"

The first Silver "C" to be obtained for seven years, the last being gained by Phillip Brown in 1939, has been awarded to S./L. M. A. Ramsay, D.F.C., at the Gitter Gliding Club, Germany. We obtained the following information concerning the flight, which is written by Ramsay himself.

Squadron-Leader M. A. Ramsey.

"The endurance part of the requirement was accomplished on September 19th last year with a flight of 6 hours 13 minutes on the hill wind at the Gitter slope. Part of the time was spent in an effort to get away on a cross-country flight, but thermal activity was not enough and so I had to be satisfied with the endurance.

"Suitable weather wasn't encountered until 24th March this year, a bright sunny day with about 4/10ths Cumulus at 3,000 ft. At 1100 hours, F./Lt. Haines, flying the 'Storch,' gave me an aero tow to 1,500 ft. in the blue 'Weihe,' and after releasing 2 to 3 mls. upwind of Gitter site I found almost at once a fairish thermal which took me from 1,350 to 1,800 ft. Others were found nearby and soon 2,250 ft. was reached, but then nothing more was found and I made my way back to the site (where a 'Grunau' seemed to be having some success), arriving there at 960 ft. Here several moderate to good thermals were encountered, and I was soon at 3,000 ft., at the downward end of the ridge. I flew across to a rather ragged cloud street, losing 450 ft. in the downdraught on the outskirts, but being compensated by a lift of 6 ft. per sec. under the cloud, which took me into a cloud at 3,300 ft. After circling for 8 minutes in the cloud I came out of the side at 4,200 ft., thus fulfilling the 3,000 ft. soaring requirement.

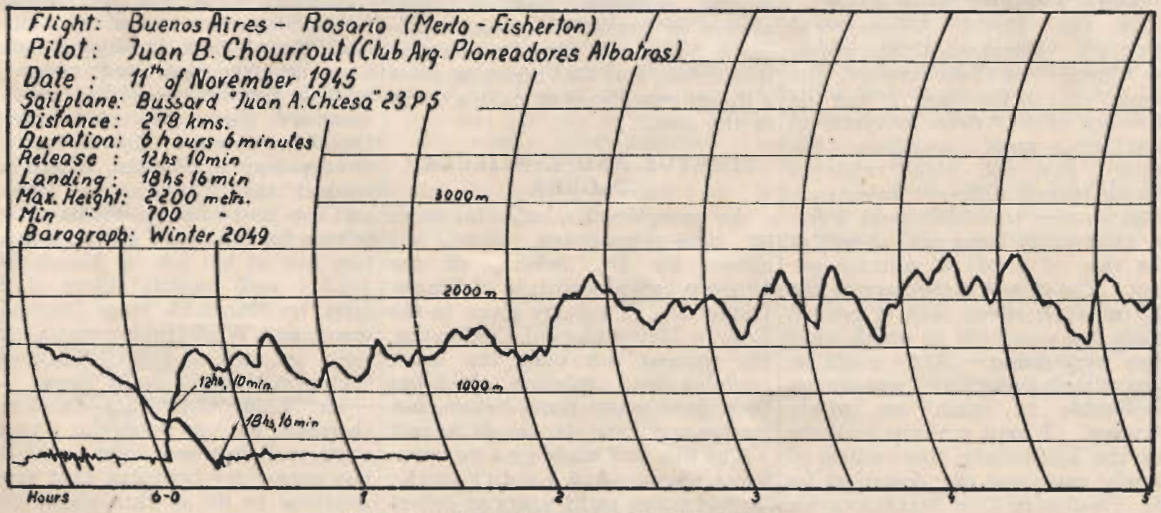
"In endeavouring to get back into this cloud I got into a terrific downdraught, and even under the cloud could find no more lift and so gave up. I was then 8 miles East of the site, and decided to press on to Helmstedt Aerodrome—just over 25 miles and just before the Russian border, and so headed North across wind to make good my track.

"I found the small cumulus clouds, and the cloud streets very disappointing, there being much downdraught at the outskirts and little lift underneath, and concluded that most clouds were evidence only of long-spent thermals. Numerous thermals of about 3 ft. per sec. in clear sky enabled me to maintain height between 2,250 ft. and 3,300 ft. until 3 miles West of Schoppenstedt (19 miles North-East of the site). For the next 12 miles the sky was cloudless, and I flew downwind of Schoppenstedt, a fair-sized town, hoping without success for a thermal. I decided I had enough height to cross Konigslutter Forest (3 miles) before giving up, and had nearly done so, being down to 1,650 ft. when the Schoppenstedt thermal was struck, giving a 6 to 9 ft. per sec. ascent, straight up to 3,150 ft. This height was enough for a straight glide to my goal about 8 miles distant, which was reached without finding any more lift, until almost over the airfield when a steady 3 ft. per sec. thermal was found which took me up several hundred feet and enabled me to finish the flight with a few loops prior to landing 2 hours 40 minutes after release. Further flight downwind could not be made, as the Russian demarcation line is only 5 furlongs East of the airfield. After a phone call, S./Ldr. Ward duly arrived in the 'Storch' to tow me back to Gitter."

FROM BUENOS AIRES TO ROSARIO

(Continued from adjoining page).

They swept me off to the local press, made me speak over the wireless, and it was one long party till I was able to catch the 9.30 bus for Buenos Aires. I had to stand all the way, but what did that matter? I had been sitting for six hours, after all!



Barograph of Chourrout's flight to Rosario.

RANDOM DIARY

WHEN British gliding had started up in early 1930, it was four months before the first *ab initio* "A" certificate could be attempted First to succeed was Graham Humby, who involuntarily soared an open "Primary" to 30 feet above Ivinghoe Beacon before making the prescribed descent through half a gale. There was a much less terrifying wind when on February 21st, 1931, he took the first *ab initio* " C " certificate in Britain.

After a year or so of good work as Club Instructor, Humby passed out of the ken of his fellow members, but his subsequent career has now been disclosed by a gossip paragraph in the *Evening Standard*, which omits the gliding, but tells us that he once built a boat in a Baker Street flat and had to lower it by crane from a window five floors up. He then became in turn an actor, dentist, garage proprietor, plastic surgeon, and finally, during the war, an aeroplane pilot as well as Surgeon Lieut.-Commander, R.N.V.R. His latest venture is a novel scheme of door-to-door transport by car and aeroplane. He picks you up off your doorstep, flies you in an " Auster " from Elstree towards your destination, and finally delivers you by car again at the terminal doorstep.

TIME COMPRESSION FILM

At the Royal Astronomical Society's " Geophysical Discussion on Clouds " on February 22, the great event of the meeting was the showing of a " time compression film " made up of colour films of the whole sky—the cloud changes during several different days, each from sunrise to sunset (and a few by moonlight), being run through at the rate of about 3 minutes per day. The clouds rushed across the sky at such speed that it needed much concentration to watch what they were doing. Many could be seen to melt away, but it was almost impossible to catch one newly forming. I kept a sharp look-out for the half-hourly alternations of cloudy and clear sky described by Mr. Poulter in THE SAILPLANE for June, 1939, but only once or twice could just a single alternation be detected.

On one particular day there was a striking series of cold fronts, probably at intervals of an hour or two, as they appeared on the film several times in a minute. With cumulus rushing across from W. N.W., an irruption of " false cirrus " would suddenly appear from the north, followed by a dark overcast going the same way, and then replaced once more by westerly cumulus as soon as the rain or snow had evaporated from the hemispherical mirror to which the camera was directed *via* an intervening plane reflector.

Graham Humby, first British ab-initio " C " pilot, in a " Prufling " cockpit.

This film has now been shown to several scientific societies, but always at breakneck pace. Sailplane pilots will want to examine it in detail, and that means at least a dozen repetitions at only a tenth of the speed.

STRATUS AND LENTICULAR CLOUDS

An exceptionally beautiful series of time-compression films was shown by Dr. Sekera, of the Meterorological Institute of Prague University, at a party given to the Empire Meteorological Conference. He showed not only the usual cumulus cloud evolution, which has been done many times before, but stratus and lenticular clouds. as well

The film was made by a meteorologist whose name I didn't catch ; he had taken eight years to collect the various items at an observatory in the High Tatra Mountains, 5,000 feet up. From this height one looks down upon the billowy surface of stratus clouds filling the valleys below. They shift so slowly that an exposure must be made only twice a minute in order to show reasonable motion when the film is projected at the usual rate. The cloud surface then shows as a swiftly flowing river, fastest in " mid-stream," with a striking reversal of flow in a sort of backwash near the " shore." Another example showed a series of wavelets coming slowly in to " break " on the " beach."

The lenticular clouds had been photographed at the same slow rate, but it was surprisingly difficult to detect the windflow through them, as they were rarely broken up into separate cloudlets. Their outstanding feature was the behaviour of the rear (or windward) edge, which would repeatedly creep slowly down-wind and then suddenly jump back again up-wind to its original position.

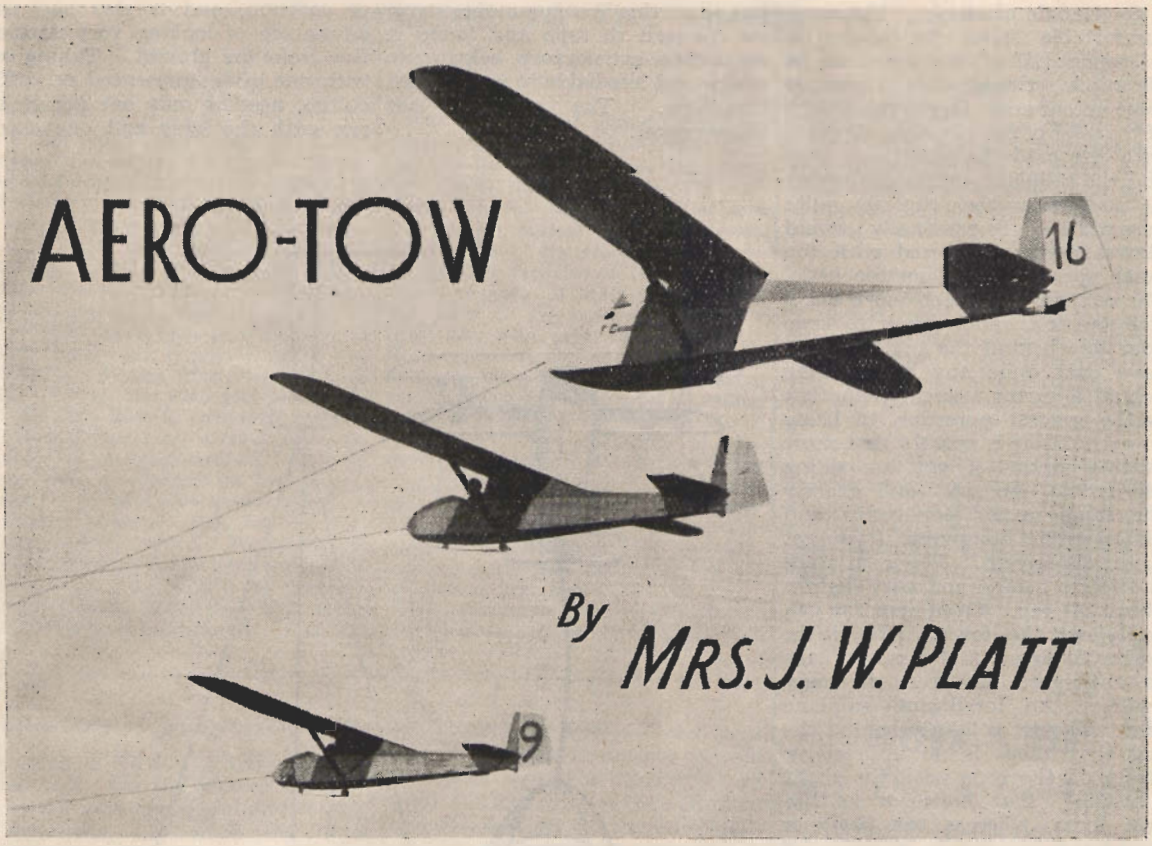
Dr. Sekera said he only had one copy of this 16-mm. film, but intends to make further copies of it when photographic materials become obtainable in Prague. He told me, incidentally, that in his country all the Air Force pilots have to begin their flying on gliders.

RUDOLF FEIGE

Another guest was Mr. Rudolf Feige, Superintendent of the Palestine Meteorological Service, who lives at Jerusalem and takes a leading part in the gliding movement over there. He was formerly Director of the Meteorological Observatory at Breslau, where he studied the " Moazagotl " cloud and was first to point out its possibilities for soaring. Hitler turned him out of his job on March 14, 1933 ; and exactly three days later, on March 17, Hans Deutschmann and Wolf Hirth proved him right by making the first soaring flights in the Moazagotl wave.

Mr. Feige says that excellent thermals go up from the domed roofs of Palestinian towns, and he has reason for believing that they continue to do so throughout the night.

A.E.S.



AERO-TOW

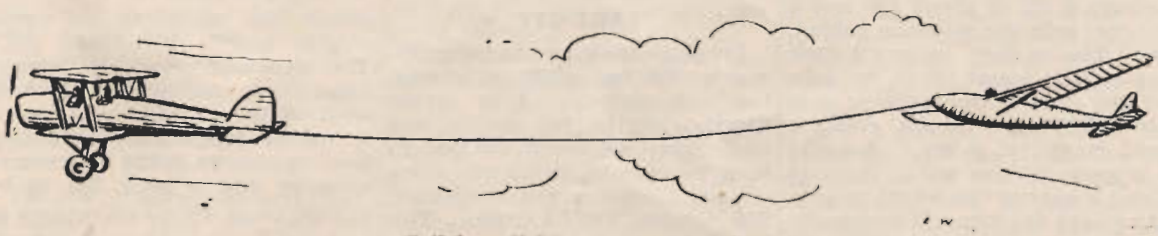
By MRS. J. W. PLATT

IT seems a pity that so many people should hesitate to start a new gliding club because they are convinced that it really needs a hill site. Actually almost any of the aerodromes scattered over Great Britain would be entirely satisfactory for both elementary tuition and advanced soaring. All primary work could be dealt with either by means of winch or car towing ; and there is no easier method of making sure you are casting loose in a thermal than by seeing the aeroplane in front of you rising so fast that you can hardly catch up with it, even with the stick well back against your body. Not all thermals make themselves felt so strongly, of course, but even a mild one will cause the aeroplane to rise. You can either cast off then and there, count about ten and circle, or—if you feel rich enough !—pass through that area in search of something better. A first-class towing pilot with experience of soaring will help all he can, returning again and again to the areas of best lift, but sometimes you are in the sad position of being behind a pilot who wanders aimlessly round the countryside while you watch the taximeter ticking up the pennies. . . . .

On the whole, though, aero-towing does not come so expensive as it sounds, for you need never waste a flight. If you are on the tow for as long as you can afford without finding anything interesting, you are at least high enough to try out some aerobatics, do a few tight circles, practise sideslips, and come in to a spot landing. And there is always the chance that you may pick up a thermal on the way down and turn the flight into something worth recording.

HINTS ON TOWING

The best kind of aircraft for a tug is something fairly foolproof, with a very low stalling speed and

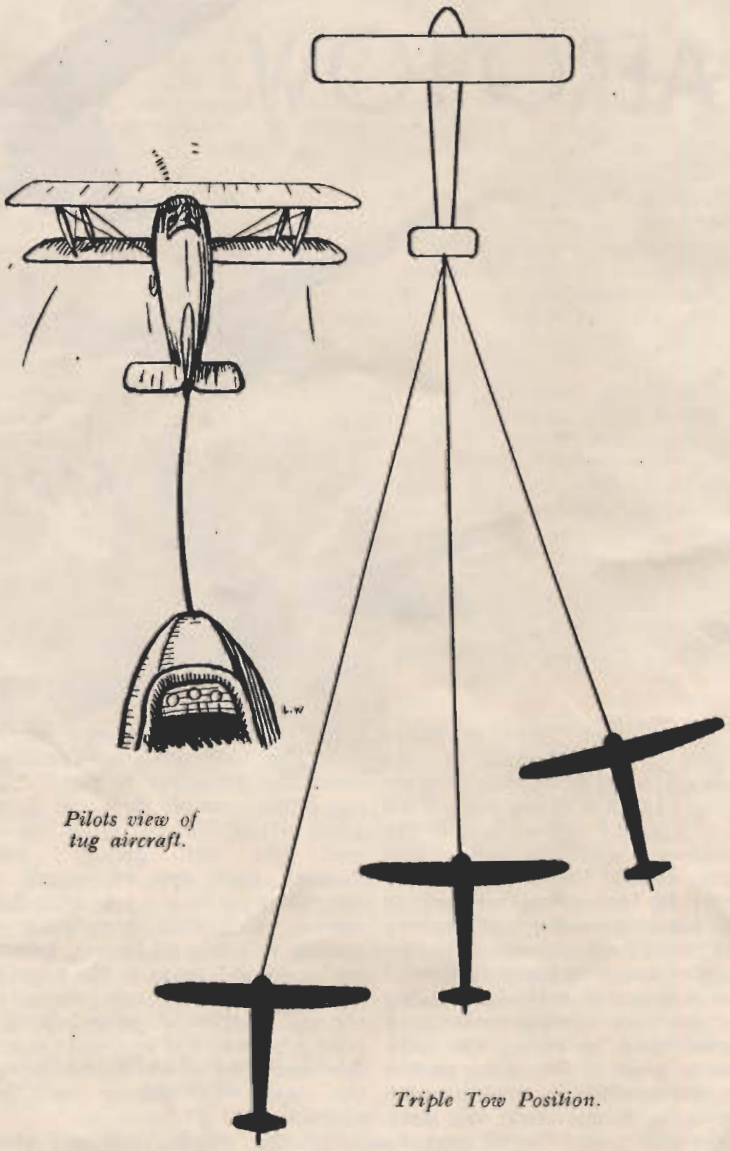


Sailplane slightly above tug aircraft.

a good angle of climb. The most comfortable speed for towing a "Grunau Baby" we found to be 50 m.p.h., though this varies to some extent according to the weight of the pilot of the sailplane. Towing with the cable hanging in a loop and the sailplane constantly trying to overtake the tug is quite miserable. I personally would always rather be towed with too much speed rather than too little. The controls are much more sensitive and it is much easier to keep your line behind the tug. If you have ever done any aquaplaning behind a motor launch, than that is the nearest sensation to being towed. There is exactly that same skating motion if you are riding too far to one side—and exactly the same rather unpleasant and disconcerting bumpiness if you get in the slipstream. The ideal place is directly behind and very slightly above the tug. From here you can easily see the towing pilot if he wishes to signal, and it is also easy to anticipate any turn he may make. An intelligent sailplane pilot will ride so lightly behind the tug that there is no appreciable strain on the rope until the slight "hiccup" that indicates he has cast loose, whereas the beginner sometimes travels in a series of snatches that may even cause the towrope to break. In a turn the tug pilot must be careful not to turn too steeply unless the soaring pilot behind is very experienced. A tendency to cut corners will cause first a slack cable and then an over-running of the tug, while insufficient bank in the sailplane, causing slipping out, will act as a very definite brake on the tug sufficient to stall it if it is underpowered.

TUG AND CABLE

In the Argentine we used some very old Pelicans with (I think) a Wright motor of some 200 h.p. These would tow comfortably at 50 m.p.h. and climb sufficiently to average a lift of about 300 feet a minute, with one sailplane behind. With two or three trailers it took appreciably longer, both to take off and climb. Our runways were about 3,000 feet overall, giving a good margin of safety. Actually I suppose the tow was airborne in about a quarter this length in anything but a flat calm. We originally used steel woven cable, quite thin; but when this became unobtainable we changed to rope and found it much more satisfactory, being more elastic and less liable to unexpected breakages. The cost came out about equal.



Pilots view of tug aircraft.

Triple Tow Position.

TAKE-OFF

For single towing we had approximately 300 feet distance between tug and glider. After trying varying lengths for double and triple tows we finally decided to keep to echelon formation, using 250 and 280 feet on the doubles and 220, 250, and 280 for triples. This way there was the minimum danger of collision, and it also had the advantage of looking very decorative from the ground. Taking off with one glider presented no difficulties, needing only one person to run with the wing and one extra beside the aeroplane to signal "cable taut" and "take off." The sailplane gets off almost immediately and needs to be held level till its aeroplane is airborne. A double sometimes needs help from spectators before it becomes airborne, and a triple has to be pushed by at least two persons to each sailplane—and even so, refused

LETTERS TO THE EDITOR

10, Courtfield Gardens,
Earls Court, S.W.6.

DEAR SIR,

I am glad that Captain Pears answered Charles Wingfield's letter, because I agree in principle with much of what he says, although I am in fact a staunch protagonist of solo training.

The whole affair, however, requires looking into from a new angle economically, mainly because the figures quoted in the SAILPLANE in November have been proved far out, being based on (I guess) 1937 experience. At this time I myself took my "A" on the 12th and my "B" on the 24th launch, the latter being a 90-second figure of 8 from 600 feet launch on an open dagling. I have never been so thrilled (or precocious) since! It was this great speed in training, however, that caused the high crashery rate. To-day, with improved methods and greater caution, the life of a secondary on training duties is nearer 30,000 launches, which figure can be substantiated. This will reduce the cost per launch of the primary or secondary very considerably.

The majority of gliding clubs are situated at soaring sites miles from the member's home towns, and therefore operate mainly at week-ends only. The members' travelling time and expense per launch are consequently considerable. To reduce this, and to provide the facilities of training for a larger number of members, training will have to be undertaken from a large flat field near the home city. Here operations can also take place on week-day evenings, thereby increasing machine utilisation, reducing travelling time, and relieving the soaring site of congestion. The economics of two-seater operation from such a site are considered to be so different from the figures quoted, that the ideal combination would appear to be solo training on utilities at the flat site, together with dual soaring at the hill site (where possible).

The two-seater on winch circuits offers less real useful flying experience to the pupil than Captain Pears suggests, and the main value of two-seater training in my opinion is to eliminate the two-way flights (*i.e.* slides). Half-an-hour's dual soaring, when available, will be much more useful than 30 slides, and much more economical. Thereafter the finest training is undoubtedly solo.

Two more points are of interest. During the sliding period, the pupil is learning much more than the use of aileron, and checking of rudder. By constant practice he is becoming adept at lifting, rigging, towing and even maintaining and inspecting. In this way he is learning to be of real use to the club when he finds himself at the soaring site.

Finally, Germany went in for glider training on a huge scale. She chose solo-primary training after an unparalleled experience of gliding, and must have had sound economic as well as practical reasons for this choice.

Yours faithfully,

GEORGE W. PIRIE.

AERO-TOW—(*Continued from p.17*)

to come unstuck the only time I tried it! On the whole, though, we were very successful and it was a red-letter day when one was adjudged sufficiently experienced to go on to the double.

MULTIPLE TOWING

A double is great fun. It is very pleasant to see a fellow member away there at your side, near enough to smile to and even shout at. Staying well away from him is not difficult, either—it only means a permanent slight pressure on the rudder to keep station. The rear pilot casts off first, the other following almost immediately. The tug pilot dives steeply to get the cables out of the way and return to the field, and the two sailplanes begin to circle together. When we were using the radio we used to practise synchronised acrobatics, very pretty to watch. And in the great display we had seventeen sailplanes flying in formation—five triples and a double.

ARGENTINE AERO TOW DISPLAY

The towing aeroplanes were lined up across the field, and took off one after the other. As the gliders were towed in echelon the tugs took up echelon formation as well and came over the spectators at about 400 feet. Then they climbed to 3,000 feet where the sailplanes cast off and formed into line ahead. They had been practising simultaneous 90° turns, but it was too difficult to keep so many different machines tidily in formation so that had been abandoned. Finally we adoped something quite spectacular. The first machine spun down three turns, straightened up and continued; the second followed and so on, right along the line. When they were all in line again they executed a circular follow-my-leader movement, straightened out and came round the field. As the leader reached the further boundary all turned simultaneously through 90° and came in to land along parallel lines. Very effective. They had also practised concentric circles, flying in opposite directions, but I forget if this was used at the actual Display.

That same year we also had eighteen sailplanes in the fly-past on the Argentine National Day, towing in six triples. Most of the machines were "Grunau Babys," but we also used the "Rhonbussards" and our "Viking," resplendent in a new coat of scarlet paint.

HOLLAND

Our Dutch Correspondent reports . .

RECENT INFORMATION from our Dutch liaison, H. Schwing, is that the National Laboratory for Aeronautics are to conduct several tests in the "Grunau Baby II" in regard to back placed hook launching. We hope to publish more details of this when we receive a full report.

News in Brief

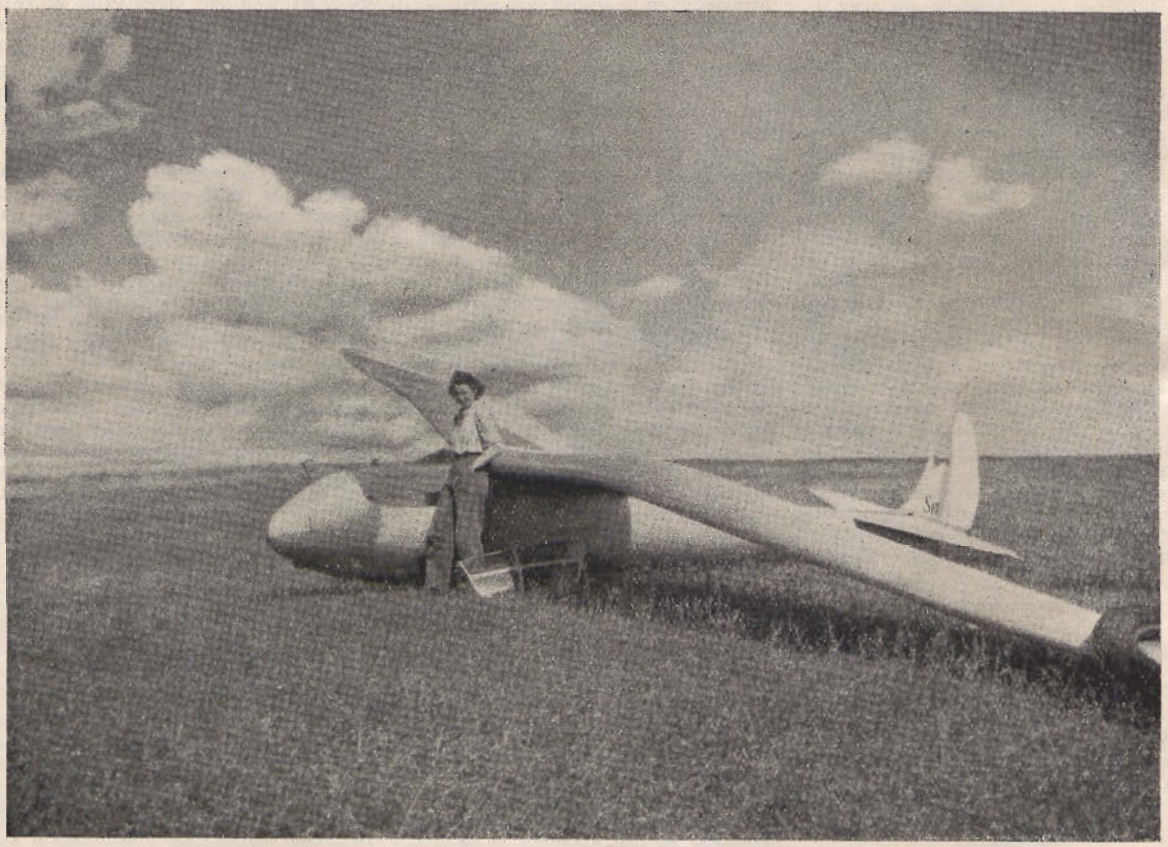
EASTER camps are being arranged, but as usual there is lack of material. Chief trouble seems to be lack of winches—but gliders are fairly easy to either hire or buy.

A DUTCH gliding expert visited Sweden and gained much useful information. Consequence—Dutch gliding party are going to Sweden in the near future at the invitation of the Swedish Royal Aero Club.

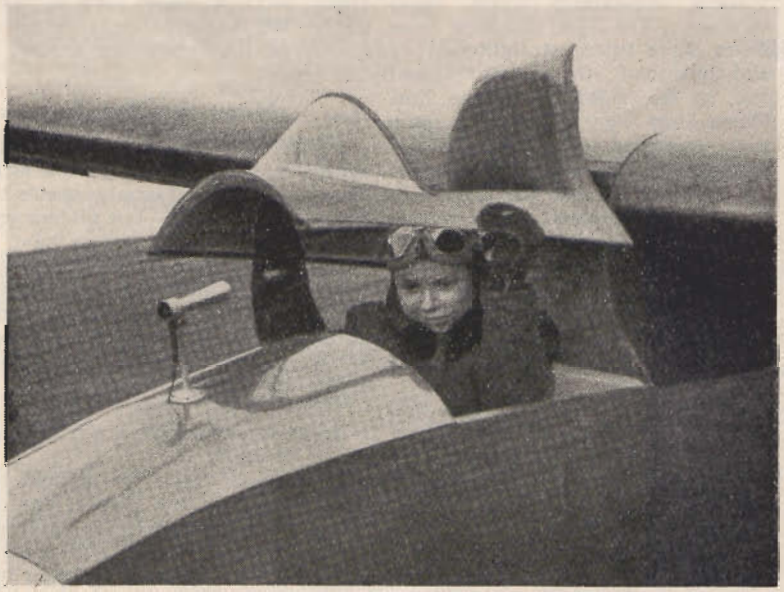
THE first gliders built by Fokkers since the war are ready for hiring to clubs.

It is hoped that the airfield of Ypenburg, near the Hague, one of the most active centres of gliding in Holland, will be sufficiently repaired to recommence gliding by AUGUST.

FRENCH SPORTSWOMAN No. 1



— *In the "Spahlinger."*



— *In the "40P."*

AFTER six months' training Marcelle Choisnet, a dress-maker, has beaten four French records and two world records, showing us most decidedly that soaring is within the reach of all.

"Marcelle Choisnet has beaten a world sailplane record." Twice this year this news has been briefly acclaimed in the Press, which twelve times has announced new French records. In any other sport this cascade of records would have called forth enthusiastic comments. Our record-breakers have to be content with a measly few lines. Why this indifference? Especially as we have here a popular sport at which anybody at all—possessed of the necessary will-power—can

achieve good results. To prove this we need do no more than quote the career of Marcelle Choisnet, double world record holder.

A DRESSMAKER

Nothing foretold her aeronautical successes. She came of a family to whom the air made no appeal. She herself was a dressmaker. Quite by chance her vocation was decided by a trial flight at Alencon ; and from then on her only desire was to be a pilot.

She began by taking her ticket as a power pilot, but at that time private flying was beyond the financial reach of most persons and she had to give it up. She wanted to be of use to her country, so she worked first as an assistant to North African prisoners and later with the Red Cross.

After the Liberation she put herself at the disposal of the Aeronautical Sport Service, which had just been created by the Air Ministry. Thus she became a part of the first Instructor's Course which took place at Beynes in September 1944. We find her again at Castelnaudary in January 1945, and at the Black Mountain National Centre in February. There the chief pilot, Gourbeyre, who was to have a great influence over her, took her in hand. She followed an intensive training and passed her tests with flying colours.

RECORDS

Then she began to think about records. She wanted to do better and still better. After various attempts, she took off on the 22nd April, 1945, with the idea of beating the French feminine duration record. She succeeded in this attempt and stayed up for 8 hours 52 minutes 54 seconds. But this result did not satisfy her, and a week later, the 29th April, she raised her time to 12 hours 20 minutes 50 seconds.

Returning to Beynes she decided to attack the distance records. On the 9th June she flew from Beynes to Champaubert-la-Bataille, raising the French feminine distance record to 139 kilometres. This she bettered four days later, the 13th June, covering the 347 kms. which separate Beynes and Saint Merd la Breuil in Corréze.

Then follows the period of International records. On the 20th July she set out from Beynes on a goal flight to Soignies in Belgium, 253 kms. away. She landed at her goal, thus beating the previous International feminine record of 195 kms. set up by the Russian Zelenkowa.

TWO SEATERS

On the 6th August, in a two-seater, " Castel 242," with Mlle. Gomichon as passenger, she landed at Lescheres-sur-le-Blaiseron (Haut Marne), 237 kms. from Beynes, beating the feminine International two-seater distance record previously held by the Russians, E.Velikosseltzeva and A.Voroskova, with 223 kms. The Air Minister, M. Tillon, rewarded her with the Aeronautical Medal.

Here we have a prize list such as no other sportswoman has achieved since the Liberation. And yet many people still do not know the name of this little champion, born of the people and endowed with naught save brains, courage, and the desire to succeed. Anyone present at the enthusiastic receptions in Belgium after her flight to Soignies or, more recently, in North Africa during Algiers Week, must realise how she has served the prestige of her country both in the Empire and abroad. With such an example soaring flight should take the place it deserves in the public eye. It is a sport for the people, well within the reach of all of us.

JEAN HOPPENOT.

(Acknowledgments to " Aviation Francaise.")

EDITORIAL—(*Continued from page* 3).

Let us hope that steps will quickly be taken to *make* gliders available, to cut down their cost to the clubs, to enable them to resume their pre-war training, and to encourage research and development by our manufacturers. And at the very least, to enable the clubs to make a start, surely the Government will replace to each club without added cost those machines taken over during the war, which were so well used to lay the very foundations of Military gliding and Cadet training.

NORMAN H. SHARPE.

STANDING WAVE AT DERBY

(A fully illustrated account of this phenomena will appear in the next issue).

SUNDAY, 7th April, provided us with some splendid and exciting soaring. Full advantage could not be taken of the phenomenon, as duration is limited by mutual consent in order number that the maximum of pilots may have an opportunity of flying.

" HELM WAVE "

The day started off with a good soaring wind from the W.N.W. about 20/25 m.p.h. Clear sky and good visibility. No signs of the conditions which later prevailed were visible, but it was soon apparent, after the first launch, that something was working as the first man off was soon in the 4,000 feet region. All our machines were launched as quickly as possible, and it was a grand sight to see four machines high above Camphill at the same time.

Cloud now began to form chiefly to the N. of the site, and eventually a distinct wave formation was noticeable from the ground. Lenticular bars also formed upwind, vertically over and downwind of Camphill—the downwind bars being very pronounced and showing four distinct layers in what appeared to be close proximity. By mid-afternoon the surface wind decreased considerably and it became difficult to break through a turbulent layer between hill soaring ceiling and the lower bands of the wave which was still in evidence.

EVENING THERMAL

Later still our famous evening thermal got to work and was taken full advantage of by Armstrong to make his Silver " C " height (with Barograph).

It was thought that " Kinder Scout," some 8 miles upwind, was the cause of our " Wave," but later information from our colleagues at Woodford (about 30 miles upwind) confirms that there were signs of wave formation directly over them.

The rather astonishing thing about this " Wave " is its limited width. Every pilot confirmed that it was only about four miles wide and directly downwind of " Kinder," so that it would appear that this magnificent soaring ridge had something to do with it. It is regrettable that an opportunity to study the next wave downwind could not be taken, but the demand on our small fleet of machines is so great that we are compelled to limit both duration and cross-country flights at week-ends.

A. L. SLATER.

THERMALS
AT LOW ALTITUDES II

The Sources of Thermals.

It has been established by the above quoted measurements that more than 50% of all thermals have upward velocities of 3-6 feet per sec. and average " diameters " of almost one-half mile at 1,000′ above ground. It would seem that they could be utilized for regular soaring if they could only be located with some certainty. Stacey's investigation of the origin of thermals remained somewhat inconclusive, due to the fact that no special wind measurements were made in connection with the test flights. Readings of the anemographs of Blue Hill Observatory were used and only thermals of 5 feet per sec. or more were utilized in computing the results shown in Table III.

These results are quite unexpected and most interesting.

Sources of Strong Thermals

TABLE III

Source	Number of Thermals
Swamps	10
Swamp border regions	8
Fields	7
Woods	2
Town	2
Total	29

18 out of 29 thermals originated over or near swamps. The high percentage of cases should leave no doubt about the truth of the fact, in spite of the possibility of certain errors in the calculation. The only other instance of similar observations are the author's notes on the Soaring Society's expedition to Wichita Falls, Texas, in 1938, when it was found that the riverbeds furnished regularly reliable thermals. Somehow it seemd hard to believe that such a high percentage of thermals rises from swamps. And, all in all the data of Table III do not seem to agree very well with general experience. The matter of the origin of thermals, then, calls for a great deal more investigation.

UP TO US

It is unlikely that systematic meteorological research will be spent on the origin of thermals in the near future. Thus it is up to the glider pilots themselves to find the answer. So far pilots have not contributed greatly to the solution of this problem for the simple reason that observations are carried out with disregard of some fundamental considerations on the drift of thermals. It is common practice for a pilot, upon encountering a strong thermal, to look straight down in order to discover the source. Thus, all sorts of peculiarities in the terrain are credited with being responsible for the updraft, while the real source is miles away (unless there exists an absolutely dead calm). In the following an attempt is made to acquaint more pilots with some of the characteristics of thermals in the atmosphere. When due considerations is given the drift of thermals, there should be a much better chance of either locating thermal sources from a glider, or locating the thermal aloft when the source is known.

We assume that a thermal rises due to the effect of a slight amount of heating of the air of the thermal over the ambient air, and we think the heating takes place on account of contact with a particularly hot spot on the earth's surface. There is room for argument about the correctness of these assumptions. But, it would go beyond the scope of this presentation to deal at length with the role of the lapse rates, air humidity and condensation phenomena in the mechanics of thermals. The simple case is assumed that the temperature of the thermal is somewhat higher than that of the surroundings at the ground, and that this difference is maintained as the thermal rises. The temperature difference necessary to produce a certain vertical velocity at a certain elevation can be computed. For example, in order to produce 10 feet per sec. at 1,000′—an exceptionally strong thermal—a temperature difference of 8/10° F. is needed. Or, *in order to produce the most commonly found thermals of 3-4 feet per sec. at* 1,000′, *a temperature difference of only* 1/10° *F. is required.**

Under the effect of the buoyancy of the " warmer " air, the thermal rises. The rise is a simple accelerated motion, as long as certain speeds are not exceeded, the same as the motion of free fall, but of cource in the opposite direction and much slower. The formulas of the free fall apply with the acceleration $g \frac{\Delta t}{T}$ (Δ t temperatur difference in ° C, T. = air temperature in °A) taking the place of the gravity constant g. Thus, it is easy to compute the vertical velocity at any height, also the time required to attain any certain vertical velocity, or the time required for the thermal to rise to various heights.

It is instructive to look at the figures of Table IV—computed for two examples, namely a 1/10° F. thermal, which produces 3-4 feet

* If the temperature of a common thermal of 2,000′ diameter is only 1/10° F. higher than the outside air, while simultaneously the temperature gradient in the vertical dimension is 5.5° F. per 1,000′, it will be next to impossible to obtain valuable indications from the Thermal Sniffer. But that need not prevent the Sniffer from detecting exceptionally strong thermals

per sec. at 1,000′ and a 8/10° F. thermal, which furnishes about 10 feet per sec. at 1,000′. Actual measurements on thermals, made by the author, show remarkable coincidence with the data obtained by these simplified computations.

It should be noted that the vertical velocity increases steadily with height. That means that a pilot who connects with a thermal at low altitude will find the going progressively easier as he gains height. It also shows that the higher the initial tow, the better the chances of encountering a thermal of sufficient strength for soaring.

The table has not been carried beyond 6,000′ as in the vicinity of that altitude there will be found either an inversion, which stops the thermal, or else the thermal is likely to develop into a cumulus head with further energies released for even stronger upcurrents. The data given for the 8/10° F. thermal above 3,000′ are unreliable, because the high velocities attained cause drag and frictional effects that are not entered into the simple computations, and which tend to hold down the thermal.

Attention is called to the time required for the thermal to rise from its source to the various heights. Even as strong a thermal as the second one quoted needs 97 seconds to reach 1,000′. The more common 1/10° F. thermal requires almost 10 minutes to rise to 1,000′. That then means that it has drifted with the wind for that length of time. Even if there is only a 6 m.p.h. wind—practically calm—that thermal is a mile away from its source.

Vertical Velocities at Various Altitudes and Times Required for the Thermal to Rise to Those Altitudes

TABLE IV

1/10° F. THERMAL

Altitude	Approx. Vertical Velocity	Time Required
250 feet	2 ft. per sec.	4½ min.
500 feet	2.5 ft. per sec.	6½ min.
1,000 feet	3.5 ft. per sec.	9 min.
2,000 feet	5.– ft. per sec.	13 min.
3,000 feet	6 ft. per sec.	16 min.
4,000 feet	7 ft. per sec.	18½ min.
5,000 feet	8 ft. per sec.	20½ min.
6,000 feet	9 ft. per sec.	22 min.

8/10° F. THERMAL

Altitude	Vertical Velocity	Time Required
250 feet	4.8 ft. per sec.	45 sec.
500 feet	7.2 ft. per sec.	69 sec.
1,000 feet	10.– ft. per sec.	97 sec.
2,000 feet	14.5 ft. per sec.	137 sec.
3,000 feet	17.7 ft. per sec.	169 sec.
4,000 feet	(21.–) ft. per sec.	(200) sec.
5,000 feet	(23) ft. per sec.	(220) sec.

MORE INVESTIGATION

In order to facilitate observations on sources of thermals, a handy means should be provided that enables a pilot to determine quickly the drift of any thermal he encounters. A chart could be developed that could be fastened to a convenient place on the dashboard and will give the pilot the distance of the thermal's source from available data, namely his altitude above ground, the rate of climb of the air (that is, the rate of climb of the ship plus the sinking speed of the ship) and the wind velocity, which should be determined before take off, or ascertained from the drift of the glider. The source of the thermal is of course always up wind; thus the wind direction must also be known to arrive at the proper spot.

CHART BASIS

The following designations are used to form the basis of such a chart:—

D	drift
H	altitude
v	vertical velocity
w	wind velocity
wo	wind velocity on the ground
t	time

The thermal drifts with the wind velocity which is wo on the ground but increases somewhat with altitude. The function w = f (H) is known to science but does not apply on days with thermal weather because whenever there are pronounced vertical air currents there is pronounced interlocking of the wind velocities of the turbulent zone. Therefore, the assumption that w is constant at all altitudes on days with thermals probably comes as close to actual conditions as any other assumption. The drift D then is the wind velocity wo times the time t required by the thermal to reach the altitude H.

$$D = w \cdot t$$

On the other hand, the time required for the thermal to rise to the altitude H is this distance H divided by the average vertical velocity. The vertical velocity of the thermal at the ground is zero and at the altitude H it is v, the average vertical speed therefore 1/2 v. Thus: $t = \frac{2}{v} \cdot H$. By substitution it is found that: $D = 2 \cdot \frac{w}{v} \cdot H$. A thermal vertical velocity v at a height H when there is a wind w originates at a point upwind at a distance $D = 2 \frac{w}{v} H$ irrespective of the acceration experienced by the thermal. The relationship states that the drift is larger, the stronger the wind, or higher the thermal. The drift is smaller the stronger the vertical velocity, which is easy to understand because a strong thermal rises in a shorter time than a weak one.

From this formula the data of Table V are computed. They give for the various wind velocities the distance (on the ground) of the origin of the most frequent thermal, namely the 1/10° F. thermal, when encountered 1,000′ above the ground.

From the same relationship $D = \frac{2 w H}{v}$ a chart for universal use at all altitudes, vertical velocities and windspeeds can be prepared. However, in order to be practicable, it should contain the sinking speed of the ship to be used and take into account the sea level elevation of the field over which it is to be used.

Since the rate of climb indicator and altimeter are now quite universal equipment of gliders, and since wind measurements can be obtained on many fields, there is every reason to believe that observations during regular operation of any particular field should soon reveal the principal thermal sources in that vicinity. Once a clue to those is established, the procedure can be reversed and it can be determined where the thermal should be found on any particular day and tows be adjusted correspondingly.

The location of a thermal from a particular source changes with the wind direction, the wind velocity, the height at which it is approached and—unfortunately—also with the intensity of the upcurrent. These factors move the thermal around constantly. Systematic use of the information presented here should enable a pilot to look for a thermal where it is likely to be found instead of searching blindly for it. Such a procedure cannot help but increase the number of soaring flights made from tow.

(Acknowledgments to "Soaring.")

Drift from its Source of a 1/10° F. Thermal Encountered at 1,000'

TABLE V

Wind Velocity m.p.h.	Distance feet	Distance miles
3	2,300	½
6	4,700	.9
9	7,000	1.3
12	9,400	1.8
15	11,700	2.2

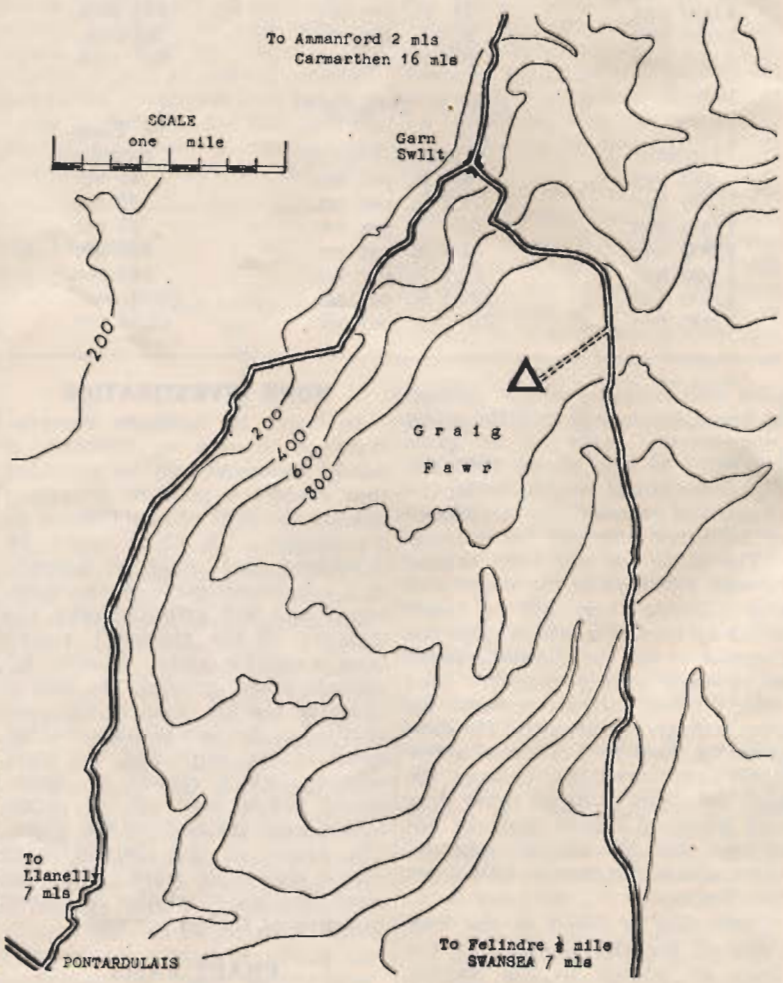
The Fforest Fawr Soaring Site

THE announcement in last month's SAILPLANE that Capt Pears is proposing to begin a Gliding and Soaring School at Ammanford, near Swansea, has aroused a good deal of interest in Gliding Circles and not only in Britain. Enquiries have been received from abroad already.

This new private enterprise venture owes much to former members of the old Swansea Gliding Club, foremost among whom is Mr. John Hayman. The site, as the map shows, is within reasonable reach of several sizeable towns, and is yet far enough away to enable devoters to enjoy the beauties of nature in peace.

The landing area at the top of the slope is about a mile long and half a mile wide. The hangar is situated in a fold in the 900 feet contour (not shown on the map) and will enable machines to be rolled out and launched N.S. and West with the minimum of ground handling.

With Capt Pears is Len Myerscough, who has had much experience of instructing in military gliders and holds the R.A.F. Instructors' qualification, and who should be well qualified for introducing ex-Service pilots to the sport. The technique to be adopted is "" Dual Instruction and Solo Practice."" By restricting the numbers under instruction at any one time it is hoped that on favourable days no-one shall have less than 2 hours in the air. The whole cost of a fortnight's flying with 14 hours in the air would then be about £12. 12s., which is very good value and should be sufficient for a "C" and for some people a possible Silver "C."



Aero-Modelling Section.
Edited by R. H. Warring.

FLIGHT CONTROL

VERY few accurate observations have been made as to the sinking speed of model gliders in still air, but the best value is in the region of 1 ft. per second. This can be achieved by the ultra-lightweight types and has also been claimed for very large models with a high degree of streamlining and loadings exceeding 8 ounces per square foot.

In general, the sinking speed of the average model glider lies between 2 and 4 feet per second. Most orthodox types are *capable* of the lower figure, but very few are trimmed to fly at their optimum attitude.

FOR LIGHTWEIGHT MODELS

Especially with the very light model gliders it is possible, with the running launch, to get an altitude on tow almost equal to the length of the tow line. That is to say the model can be brought almost dead overhead of the operator with the line absolutely taut.

Using a 300 feet towline length the highly-developed lightweight glider can thus turn in a flight of four to five minutes' duration in still air. An excellent practical demonstration of this was given by the Bushey Park Model Flying Club at the recent Surbiton Glider Gala held on Epsom Downs. Bushey Park have produced a specialised lightweight design, several variants of which are used by club members, almost unbeatable in calm weather or when little thermal lift is present. Due to their very low sinking speed they will take advantage of the slightest " riser."

Basically these models feature large, high aspect ratio wings; relatively small " stick-type " fuselage; simple tail unit with fin mounted in front of the tailplane. Also each model is fitted with a fuze-type dethermaliser, which brings us to the subject of this month's feature.

MODELS AND THERMALS

Modern high-efficiency contest models (whether glider or rubber driven) are readily capable of making thermal flights. On a fine, warm summer day a good model should, and on average will, contact a " riser " on at least one out of every three flights. More often than not the model flies out of sight and is probably not recovered the same day. A fair percentage are eventually located and recovered, but some hundreds of models are lost each year.

This is even more true of America. Summer weather here is such that it is almost impossible to fly a well-trimmed model on a hot day without losing it.

THE DETHERMALISER

The dethermaliser is the logical outcome of the development of high-efficiency models and was, in fact, originated in America around 1939. A dethermaliser is a means of spoiling the flight of a model after a predetermined time and bringing it down to earth. Its use is as follows :—

Suppose conditions are such that any flight of more than five minutes' duration would result in the model flying out of sight, with risk of loss. The dethermaliser unit is timed to operate after, say, four and a-half minutes. If the model makes a normal flight of around two to three minutes the spoiler is not brought into use, but should it contact a thermal and still be flying after the set time the spoiler is brought into action and the model descends rapidly whilst still in sight.

In spite of the obvious advantages of the scheme, on paper, it has not been widely accepted until comparatively recently — mainly because of lack of knowledge of the actual timing method to use.

One of the first British modellers to use a dethermaliser was Norman Lees, of Halifax, who worked on the original American method of giving a considerable amount of rudder offset after a set time to force the model down in a spin. Shortly after R. Copland and R. H. Warring were working on the drag-parachute method which was also developed independently by the Bushey Park and Croydon Clubs. Other methods—such as dropping ballast attached to some part of the airframe by a length of line to upset the trim—have also been used.

THE DRAG-PARACHUTE

The drag-parachute appears the best to date, being relatively simple

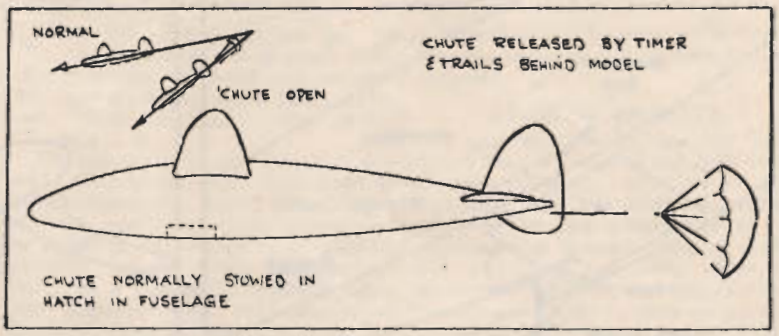


Fig. 1. Parachute air-brake.

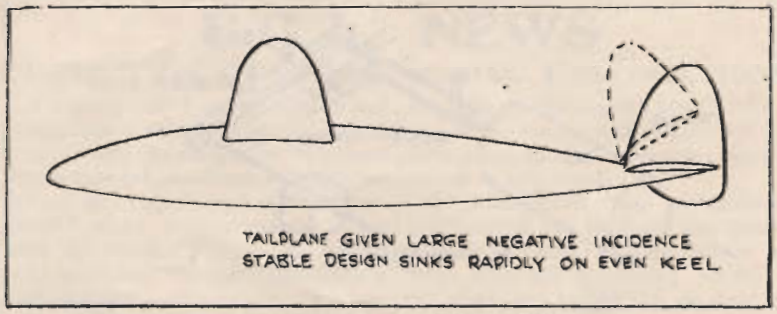


Fig. 2. Goldberg-type dethermaliser.

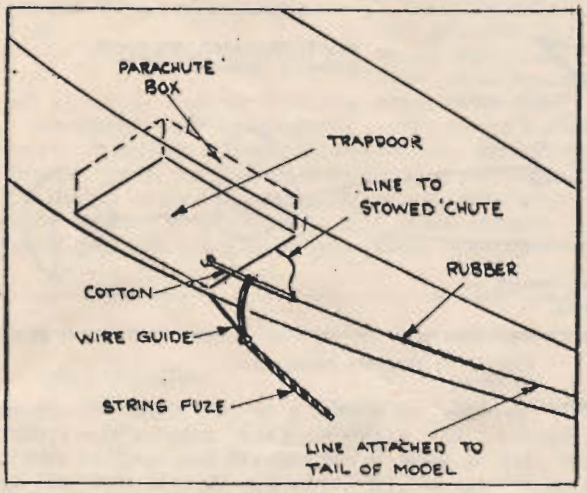


Fig. 3. Fuze dethermaliser.

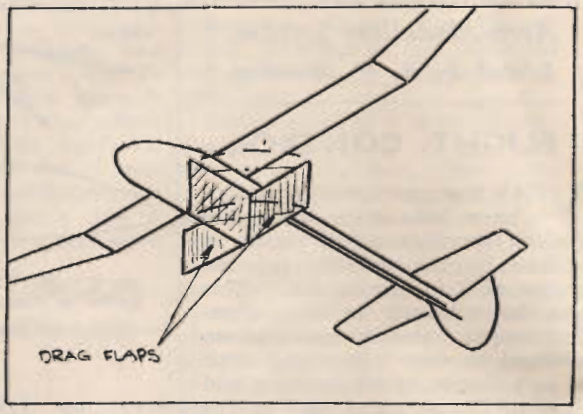


Fig. 5. Fuselage drag flaps.

to operate and efficient in action. The British application differs from the original American parachute-dethermaliser in that we attach it to the rear of the fuselage and trail it behind the model, whilst the Americans preferred to attach their 'chutes to the fuselage or wing centre section.

Other types of spoilers, such as actual wing spoilers, drag flaps, etc., do not appear to be very effective on models unless exaggerated in size as contrasted with full scale practice.

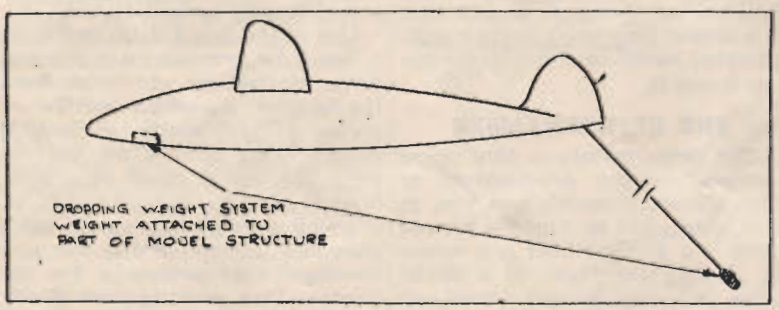


Fig. 4. Dropping weight.

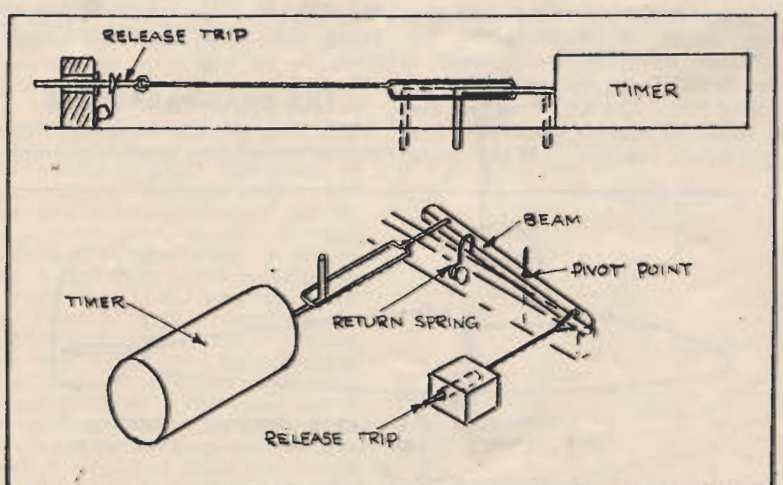


Fig. 7. Two simple operating mechanisms.

SUITABLE TIMESWITCHER

But this is only part of the story. The main factor retarding the universal adoption of dethermalisers has been lack of suitable lightweight timeswitches or delayed-action mechanisms. Suitable timers may be grouped as follows :—

(i) Airdraulic timers.
(ii) Clockwork timeswitches.
(iii) Other mechanical types.
(iv) Chemical action.

Main requirements of the dethermaliser timer are that it should be small and compact, very light, positive in action and reliable in operation over times of up to ten minutes.

The simplest " timer," and one which can be made by anyone, is the elementary fuze, consisting of a length of string impregnated with saltpetre (Fig. 3). Fine quality " butcher's string " is best, soaked in a saturated solution of saltpetre for about 10 minutes and then thoroughly dried. This burns at the rate of about 75 seconds per inch and is very difficult to put out, once lit.

Clockwork timeswitches can be made or adapted from alarum

clocks, etc. A train of four or five gears is used, the final gear having a simple air brake attached to govern the motion.

THE AIRDRAULIC TIMER

Undoubtedly the best timer is the airdraulic type—essentially the same as the airdraulic petrol model timer, but adjusted to operate over a longer time. In fact, almost without exception, American modellers use a standard petrol

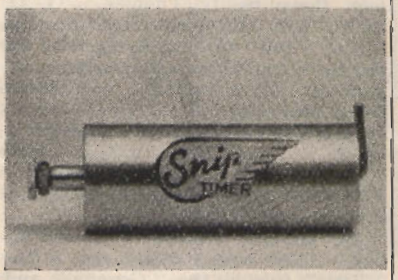


Fig. 6. Commercial airdraulic timer. The first specifically produced for dethermalisers. Weight .242 ounces.

model timer for their dethermaliser gear.

In this country several of our leading aeromodellers have worked on the development of a special airdraulic timer for dethermaliser units, and one, at least, will be available very shortly at a reasonable price. Undoubtedly this will meet a very urgent demand and should see a more universal adoption of dethermaliser units on all types of duration models.

Various schemes are illustrated in the diagrams accompanying this article, to which readers are referred for further information.

THE NEWCASTLE GLIDING CLUB NEWS

VALIANT efforts on the part of the Secretary and a small band of enthusiastic old sweats are succeeding, against heavy odds, in directing our "will to glide" into useful channels.

During the war the primary site and Club-house at Cramlington, Northumberland, have been requisitioned, and all gear either surrendered or stored in circumstances of doubtful security. Consequently the prospect before us is almost the re-formation of the Club. With the substantial financial assets and goodwill remaining to us, and an unprecedentedly large membership, there is every hope of success.

The first step taken in the New Order has been the formation of an Entertainments Committee, with the dual objects of encouraging members to get together despite the lack of the more obvious Gliding Club facilities, and of adding to the Club funds. Two dances, highly successful in the latter respect, have so far been organised.

In respect of our "amour propre," a temporary centre was arranged in Newcastle, where members could meet, discuss gliding matters, and, becoming tired of inaction, decide to take firm steps along the path to the clouds. In a large room, hired on alternate Wednesday evenings, the Chief Instructor gave an excellent talk on general gliding subjects on two occasions to audiences, eager but disappointingly small. Subsequent evenings yielded almost the same crowd, who are beginning to wonder where the other members are and why they don't turn up. Since amongst the missing are numbered many of the most enthusiastic (as their letters show) a positive answer is to be expected.

It is hoped that in the near future semi-permanent premises will be obtained in which all Club non-flying activities can be carried on. The premises in view are sufficiently commodious to enable constructional work to be put in hand, as well as to provide suitable shelter for the Club bar. The property is, however, semi-derelict, and much effort on the part of members will be required before it becomes sufficiently habitable for our purposes.

AB-INITIO PRIORITY

It has been decided by the Committee that in view of the high ratio of new, *ab-initio*, members to experienced fliers the first essential in the reconstruction programme is the acquisition of primary training facilities. Efforts are being made to recover our old site, and negotiations for alternatives are in progress, should Cramlington be denied us. Manufacturers being unwilling to supply primary machines, drawings of such have been obtained and, with the new premises, constructional work on at least one primary will be commenced. It is hoped that winches and retrieving-cars will become available through the B.G.A., otherwise these will also be made, as will transport trailers.

RESEARCH PLAN

A two-seater glider is to be acquired for training purposes, and advanced training experiments with radio-telephony are proposed. The reaction of the G.P.O. to the latter proposal is awaited, and a sub-committee has been appointed to deal with constructional and operational problems. The co-operation of a prominent radio manufacturer has been promised.

The prospects of the Club include the provision of an intermediate gliding site at Allendale, and advanced flying in the Cheviots and at Hartside. At the latter location, research into the phenomenon of the Helm wind is to be resumed, with the co-operation, as of yore, of the Royal Meteorological Society. This work can be said to be of national interest. The North has no doubt as to the potentialities of the Helm for the raising of the British altitude record.

In view of the obstacles to be overcome, the spirit of obstructionism to be found in certain circles and the loss of many of our pre-war physical assets the immediate prospect is of much hard work. Remembering the Club device: Forward Northern enthusiasts!

B.G.A. NEWS

INSPECTION OF GLIDERS DURING CONSTRUCTION

1. THE Air Registration Board recognises certain organisations as "Approved Organisations" to cover inspection requirements during construction. Individual constructors should make arrangements direct with the Air Registration Board for the approval of their Inspection Organisation.

2. THE Board is preparing a Register of Approved Organisations and, when completed, copies will be forwarded to firms whose Organisation is approved.

3. PENDING the publication and issue of the Register the Board will, on request, furnish details of firms who are approved, provided the applicant states the product in which he is interested.

London Gliding Club

THE " H-17 " belonging to the late Duggie Davie, whose family have generously presented it to the Club, was taken out of store on March 3rd. But we found that the damp had got into its tail, so Bolton and Zander took it away for overhaul, in the hope of having it ready for Easter.

March was a poor month for flying, what with bad weather at first, and later an anticyclone which provided neither winds nor thermals. But the first week-end of April compensated for all that.

On Saturday, April 6th, John Ruffle, Jr., polished off his " B " in the " Tutor " and was all set to try for his " C " the following day, when an excellent soaring wind arrived for the purpose. He worried his father at first by making a down-wind turn, and landed after only 4 minutes, but he tried again later in the day and finished the " C " in good style.

Among other flights on Sunday, April 7th, when the " Tutor " was busy soaring all day, Ruffle Sen. took it up to its greatest height of 1,350 feet in thermal lift. But, like others who found thermals, he had to leave it because the strong wind was drifting the " Tutor " too far away. There were thermals about in odd places all day, but, apart from two tiny cumulus puffs at 11 a.m., nothing to show where they were. Greig and Stephenson found several with the " Blue Gull," and Greig took it up to 3,500 feet. Hiscox arrived later with his " Gull," but the thermals were deteriorating by then.

L. R. Robertson, " Silver C " pilot, recently back from the Middle East, decided to rejoin the Club. He used to fly at Bradwell Edge, and more recently has done some soaring in Egypt, where the R.A.F. took over the local sailplanes and appointed him instructor. Another visitor to the Club was " Cat's-Eye " Cunningham, of night-fighter fame.

ANNUAL GENERAL MEETING

The Annual General Meeting of the Club was held on April 5th. It was revealed that the present membership is 139, and that the Club has on order 2 two-seaters, 2 " Tutors," a " Kirby Kite " and some " Primaries " ; also 3 Beaverettes for retrieving. The following were appointed to the Committee:—Ruffle, Manning, Wright, Hiscox, Ashwell-Cooke, Bolton, Spragg and Arnold, leaving two vacancies to be filled later. Ashwell-Cooke, who took the chair, paid a tribute to Hiscox and Hervey, who had helped to keep the Club going, and they were unanimously elected Vice-Presidents. With regard to the Club machines requisitioned by the A.T.C., he recommended that it would be no use trying to get them back otherwise than through the Ministry of Civil Aviation *via* the B.G.A. Bolton advised against trying to recover these old machines at all, since they were probably no longer airworthy.

OUR VISITORS

Dr. Corbett—is to write an article for next month on " Flight of the Albatross." Doctor of aenesthetics, but devotes most of his spare time to his hobbies of gliding and photographing the flight of birds. During the war he went on a whaling expedition as member of the crew and this is where he obtained his information on the albatros. Also has gathered some observations on cloud formations over icebergs, which we shall be publishing shortly.

Has been gliding enthusiast for years, and much prefers it to power flying, which he says drowns the joy of flying in its noise and speed. Information is hard to get from him because he dislikes talking of himself.

Miss Mary de Bunsen—Aeronautical Journalist who contributes articles to many magazines. Is SAILPLANE's liaison with the Girls' Training Corps Gliding Groups. In 1939 took " C " at Grunau in two weeks, and arrived back in England three weeks before war broke out. Was previously power pilot with many hours flying, and during the war joined the A.T.A., where she flew " Spitfires," " Hurricanes," " Beaufighters," " Warwicks," and most of the advanced single and twin-engined types, totalling about 45 in all.

Capt. Roger Pears—one of the organisers of the new gliding camp at Fforest Fawr. Has recently returned to England from India, being demobbed from the Glider Pilot Regiment. He and two other officers are the only persons holding the special Indian Army Gliding Badge. He wrote an article in 1945 for SAILPLANE on " Dust Devils," and the curious conditions for gliding existing in India.

Derby and Lancs.

17th February.—There was a very strong westerly wind and G. O. Smith, the Chief Instructor, elected to test the new Club " Cadet," delivered the week before, and the new winch at the same time. Owing to the strength of the wind, the winch stalled and left the " Cadet " at 300 feet in a difficult situation. Gerry was very pleased to scramble back on to the ground and hastily put the machine away again, fortunately without any damage. The " Kite " was launched next in bottom gear and reached a height of 1,500 feet, flown by B. Thomas. G. O. Smith had the next flight in the " Kite " and the total flying time for the three flights was 50 minutes. In view of the conditions no further flying took place.

24th February.—Moderate westerly wind. The " Kite," " G.B." and " Cadet " were all out and heights of 1,300 feet were obtained, including some thermal.

3rd March.—Another good soaring day. There were five launches in the " Kite," five in the " Grunau," and one in the " Cadet." Ten members flew and the total flying time was 5 hours 48 minutes.

9th March.—Wind south-south-west, five miles an hour. Two pupils had two low hops in the " Cadet " and two other members did circuits.

10th March.—Wind south-south-west, five miles an hour. The " Golden Wren " was test flown fro the first time since the war, having been reconditioned. Its performance was very satisfactory and the six members who flew it were delighted with the handling qualities. There were twenty-four launches and Thompson obtained an " A " and a " B " and Dixon obtained a " B."

16th March.—The wind was south-easterly and no soaring was possible. The " Cadet " was brought out and four members had circuits and training flights.

23rd March.—There was a strong westerly wind and six members flew the " Kite " and the " G.B." The total flying time was 3 hours 7 minutes. L. R. Robertson returned to the Club after an absence of seven years and had 33 minutes in the " Kite."

24th March.—This was another training day. Twenty pupils and instructors flew. The total number of launches was twenty-nine and the flying time 4 hours 2 minutes. Nelson, one of our A.T.C. cadets, obtained his " A " and Dixon, Thompson and Jefferson obtained " C's."

30th March.—The wind was south-east and seven members had extended circuits totalling 27 minutes. Miss Zita Paddon, whio has just left the A.T.C., did a circuit in the " Cadet."

EASTER SOARING

WHOEVER is responsible for the weather must have known how much gliding people were looking forward to the Easter Open Meeting at Rearsby Aerodrome, because the weather was unstable and full of thermals on every one of the four days.

The Meeting was held on the Aerodrome of Auster Aircraft Ltd., who also provided an " Auster J.I. " for towing, piloted mostly by Geoffrey Edwards, the firm's chief pilot. The Leicester Gliding Club were responsible for the organisation of the Meeting, which ran smoothly throughout. A Miles Messenger Aeroplane was lent by the Miles Company to help out with the towing, and in the hands of the two Hughs (Bergel and Kendall—both experienced sailplane pilots) worked hard throughout the holiday. An occasional " Tiger Moth " completed the towing team.

On the towed, or sailplane, end, there were twelve machines and about 40 pilots. This disparity in numbers was about the only thing which prevented the Meeting reaching perfection, as it meant considerable standing about and waiting for one's turn, instead of being able to put in almost continuous amd profitable practice. It is only fair to say that this lack of machines was not due to the members of the Gliding Movement, who have moved heaven and earth to re-equip themselves efficiently, but to lack of interest on the part of the Government. This has prevented machines becoming available for use during these early vital months of reconstruction.

Many well-known pilots were present, and to some this Meeting was the first since those memorable days of 1939-40. Others present, of course, formed a considerable part of the original Army glider section, and were with the Airborne Division until the end of the war.

Among those who stayed for the whole week-end, P. A. Wills put up the longest flight of the Meeting when he flew to visit the A.T.C. special gliding course at Detling Aerodrome, near Maidstone, Kent, a distance of over 120 miles. He was flying a " Weihe." Greig & Stephenson brought their famous " Blue Gull," and on Easter Monday, Stephenson flew this machine to the London Gliding Club at Dunstable. This flight was also made on Easter Sunday by Dudley Hiscox in his " Gull," following a 70-mile flight to Skegness on the Saturday.

Two Navy pilots who have recently taken to gliding obtained their height and distance for " Silver C." On Rice's " Gull," John Pringle made a fine flight against the wind to Honiley Aerodrome, 37 miles.

Other pilots were Prince Bira (" Minimoa "), Cooper and Wright (" Bussard "), Pat Pringle, Morison, G. O. Manning, Arnold, Ann Douglas, Hughes, Wijewardine, and Doc. Slater (" C.U.G.C. Rhonadler "), Sproule and the Navy (" Olympia " and " Mu 13 "), Charles and Owen Wingfield (" Gracias "), Firmin (" H.17 "), Leicester Club (" G.B. II "), J. C. Rice (" Cantilever Gull "), and Derby and Lancs. Club, including Robertson, A. L. Slater, Swale, Taylor, B. A. G. Meads, Terence Horsley, etc. (" Kirby Kite ").

Four trophies were competed for during the week-end. The Leicester Bronze, presented by J. C. Rice, was to be given for the best out-and-return goal flight. This, however, was not won, although John Pringle made a gallant attempt.

The Dudley Hiscox Tankard, to be given for the best aggregate duration by a club sailplane, was won by the Cambridge Club with over 9 hours' flying.

The two Tankards presented by K. D. G. Instruments Ltd., to be given for the greatest climb (*a*) after an aero-tow, and (*b*) after a winch launch, were won respectively by Walter Morison, who took the " Rhonadler " to 7,700 feet in cloud, and Prince Bira, who climbed " Minimoa " to over 5,000 feet after a 700 feet winch launch.

During the evenings Brains Trusts and Film Shows were organised by J. C. Rice, and Laurence Wright's " Cloud Cuckoo," a cartoon film made by himself, received its usual terrific welcome.

On the last evening there was a Grand Ball, but many of the pilots and crews had migrated to points South and East. It was, however, a fine climax to a very fine Meeting.

AIR DIVISION CLUB DANCE

The Air Division Gliding Club recently held its first dance in the newly-opened Mayfair Dance Hall, in Detmold, Germany.

It was organised by Flight-Officer Hilda Sandys and the Air Division Welfare Section, and proved a great social and financial success.

Among the 800 Service people who attended were representatives of the R.A.F., Army and the Civil Control Commission. As a result, the Gliding Club funds will profit by £70.

Flight-Lieutenant A. Mirsky, the club secretary, said that the members were anxious to glide in the evenings. To meet the extra expense entailed, he hopes to organize a dance every two months.

ANNOUNCEMENTS

ROYAL AERO CLUB GLIDING CERTIFICATES.

We regret that owing to the large number of these now coming forward each month—usually several hundreds—we shall be unable to publish the list of those who gain " A " certificates for some time to come. It is hoped later to include them in a special supplement. For the time being only " B " and " C " certificates will be gazetted in SAILPLANE.

CLUB ANNOUNCEMENTS

NEWCASTLE GLIDING CLUB, Ltd.

(founded Feb. 1930)

Applications for Membership now invited in Reorganised Post War Club.

Special Registration Fee 6/-

Ensures Membership when activities restart.

Further Particulars apply

HON. SEC., 25, HOLME AVENUE, NEWCASTLE 6

THE MIDLAND GLIDING CLUB LIMITED

The Secretary invites enquiries *re* post-war programme at Long Mynd. Subscription rates, etc., forwarded to those interested on application to:—F. G. Batty, F.C.A., 2, Lombard Street West, West Bromwich, Staffs.

DERBYSHIRE & LANCASHIRE GLIDING CLUB,

GREAT HUCKLOW, TIDESWELL, DERBYSHIRE

The Club is now able to undertake *ab-initio* training conversion for service pilots. Full soaring facilities in club sailplanes on the famous Derbyshire Ridge.

Entrance fee, £2. 2s. 0d.; subscription, £4. 4s. 0d.; Associate Members, £1. 1s. 0d.

Full particulars from The Secretary, 87, Fargate, Sheffield 1.

THE SURREY GLIDING CLUB

The Surrey Gliding Club will re-open near Redhill as soon as adequate facilities for members can be made available.

The Secretary is A. Dukinfield Jones, 23, Rose Hill, Dorking; but in the meantime, prospective members are kindly asked not to write for general information.

FFOREST FAWR SOARING

Everything from first lessons to high-performance soaring at our superb soaring site, Graig Fawr, Glamorganshire (near Ammanford).

Dual instruction by full-time qualified flying instructor; full range of Slingsby sailplanes; soaring holidays a speciality.

Address for enquiries: 6, Pine Glade, Farnborough, Kent.

ROYAL AERO CLUB GLIDING CERTIFICATES.

"B" CERTIFICATES—39

No.	*Name.*	*A.T.C. School or Gliding Club.*	*Date.*
2773	Dennis Brian Ballinger	S.W.94. E.G.S., Yate	18.11.45
2961	Derrick Harrison	N.E.30 E.G.S., Sherburn-in-Elmet	2.12.45
3448	Ronald Cecil Dickinson	N.E.30 E.G.S., Sherburn-in-Elmet	23.12.45
3715	Jeffrey George Lovell	N.W.190 E.G.S., Cranage	20. 1.46
3844	David Harold Howard	L.146 E.G.S., Fairlop	24. 2.46
3833	Frank William Odell	M.49 E.G.S., Burnaston	10. 3.46
2452	Bryan Henry Trunkfield	N.W.186 E.G.S., Speke	10. 3.46
2023	Donald William Roy Bond	Derby & Lancs. G.C., Camphill	1. 8.45
2102	Albert Reginald Hester	N.W.182 E.G.S., Samlesbury	18.11.45
2675	Harry Dobson	N.W.183 E.G.S., Woodford	27. 4.45
4279	Edward John Saunderson	S.E.163 E.G.S., Portsmouth	26. 8.45
2780	Jack Percival George Rogers	S.W.94 E.G.S., Yate	18.11.45
4235	John Howard Gaston	S.W.92 E.G.S., Charmy Down	10. 2.46
4205	Walter Reeves	C.123 E.G.S., Bray	13. 1.46
4208	Joseph Henry Gore	Quaggaport 75 A/S	25. 9.42
4209	Albert Edward Sageman	N.W.189 E.G.S., Kingstown	25.11.45
4210	Leonard Arthur Barnes	N.W.189 E.G.S., Kingstown	25.11.45
4172	Robert Richardson Monk	B.A.F.O. Gliding & Sailplane	24.11.45
4173	David William Lane	B.A.F.O. Gliding & Sailplane	21.10.45
4190	John Lake	C.126 E.G.S., Booker	30.12.45
4195	Robert Marshall Martin	R.A.F., Shobdon	5. 7.43
4255	Denzil Anthony Corbett-Thompson	84 Group Gliding Club, Germany	12.10.45
4256	Peter Franklin	C.127 E.G.S., Panshanger	27. 1.46
4257	Denis William Corrick	C.127 E.G.S., Panshanger	27. 1.46
4258	William Harold Durrant	C.127 E.G.S., Panshanger	10. 2.46
4259	Brian Mark Underwood Bennell	B.A.F.O. Gliding & Sailplane	22.10.45
4260	Keith Gordon Chapman	E.108 E.G.S., Desborough	27. 1.46
4261	Richard Henry Corthorn Brousson	B.A.F.O. Gliding & Sailplane	30.12.45
4266	Andre Constantin Choremi	Air Division Gliding Club	20. 1.46
4278	Bernard Ambrose Wheatley	Mynde, Midland Command A.T.C.	5. 5.43
4280	Cyril Yule Buckley	N.E.30 E.G.S., Sherburn-in-Elmet	13. 1.46
4300	Jack Leonard Stringer	N.W.190 E.G.S., Cranage	24. 2.46
4306	Douglas William Palmer	M.49 E.G.S., Burnaston, Derby	16. 2.46
4341	John James Welch	E.105 E.G.S., Cambridge	17. 3.46
4343	David Charles Evans	L.142 E.G.S., Stapleford Tawney	17. 3.46
4352	Kenneth Hugh Varney	M.41 E.G.S., Hockley Heath	10. 2.46
4354	Henry Anthony Jackson	R.A.F. Gliding Club, Oerlinghausen	1.12.45
4355	Philip Reuben Miller	R.A.F. G.C., Oerlinghausen	16. 1.46
4358	Gerald Bernard Warner	E.108 E.G.S., Desborough	16.12.45

"C" CERTIFICATES—16

No.	*Name.*	*A.T.C. School or Gliding Club.*	*Date.*
1789	Horace Edward Spragg	London Gliding Club, Dunstable	24. 2.46
1943	Adrian Frederick Rex Stedman	N.E.30 E.G.S., Sherburn-in-Elmet	16. 9.45
4002	Lionel Harold Huntley	Air Division Gliding Club	27. 1.46
3998	George Dennis Ivor Neale	Air Division Gliding Club	19.12.45
3991	Ronald Henry Hamlin	Air Division Gliding Club	19.12.45
1729	Dudley Stanley Bradford	London Gliding Club, Dunstable	10. 2.46
3506	George Carpenter Abel	B.A.F.O. Gliding & Sailplane	6. 1.46
2023	Donald William Roy Bond	Derbys. & Lancs. G.C., Camphill	2. 8.45
4354	Henry Anthony Jackson	R.A.F. G.C., Oerlinghausen	25. 2.46
4355	Philip Reuben Miller	R.A.F. G.C., Oerlinghausen	2. 2.46
4255	Denzil Anthony Corbett-Thompson	84 Group G.C., Germany	13.10.45
4259	Brian Mark Underwood Bennell	B.A.F.O. Gliding & Sailplane	27. 1.46
4261	Richard Henry Corthorn Brousson	B.A.F.O. Gliding & Sailplane	3. 2.46
4208	Joseph Henry Gore	Quaggaport 75 A/S	12. 5.43
4172	Robert Richardson Monk	B.A.F.O. Gliding & Sailplane	17. 1.46
4173	David William Lane	B.A.F.O. Gliding & Sailplane	3. 2.46

THE BRISTOL GLIDING CLUB PTY. LTD.

Resumption of Activities

A General Meeting will be held in the near future. Meanwhile a new Register and Mailing List is being prepared, and prospective members are invited to write to the Hon. Secretary of the Organising Committee at the address below, mentioning any previovs flying or gliding experience.

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MRS. R. H. HADDOCK, "LENHURST," HARRIETSHAM, KENT.

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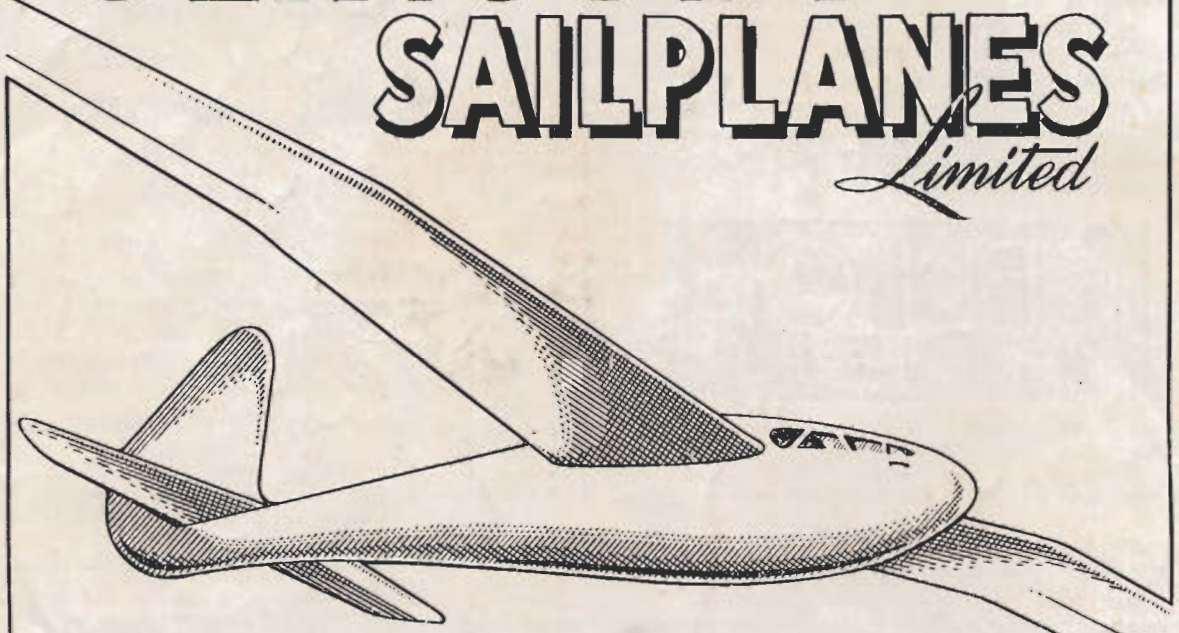

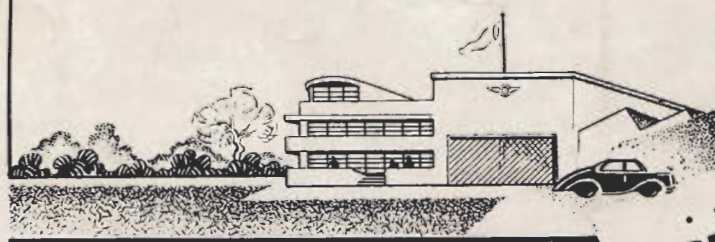

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