NOVEMBER, 1947

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The First Journal devoted to Soaring and Gliding



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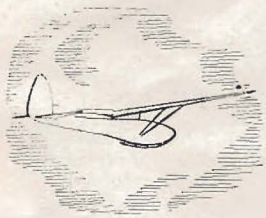
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THE FIRST JOURNAL DEVOTED TO SOARING AND GLIDING

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Front Cover: *The Camp's MOTH on heavy duty at Alleberg in Sweden. In tow is the KRANICH—of nearly the same weight as its tug. The towing cable is only about fifty yards long. Alleberg's thermal reputation is outstanding, and photographs such as this one can be taken on many days of the year.*

Editorial

THE report of the Special Advisory (Whitney Straight) Committee on private flying to the Ministry of Civil Aviation will be public property before these notes appear in print. Nevertheless it may be possible to appraise their recommendations even at such short notice.

Let it be said at once that the Report is at once exhaustive and staggering. A complete survey of the cost of light flying, gliding and soaring, of regulations, licences, landing fees, social activities, availability of sites and even the possibilities of engines for light flying is the prelude to recommendations which are comprehensive, perspicacious, and astonishing in regard to their scope.

The two points which will mainly appeal to gliding enthusiasts are as follows:

(1) "Airmindedness" in itself is not enough.

(2) The extent of the financial aid to Ultra Light flying and Gliding which is recommended.

In regard to the former, the Committee observes:

> "For centuries Britain has been a sea-faring nation; the prosperity and high standard of living which this island country has enjoyed were directly related to its ability to maintain world-wide communications. To-day this is more important than ever, but now we are at the threshold of the 'Air Age,' and consequently, if we are to preserve our position in the world, we must in future be as strong in the air as we have in the past been strong on the sea. We must now take the lead as an 'Air-faring Nation.
>
> "That there is no lack of the air-faring spirit is clearly shown by the eagerness displayed for service in the air during the war when immense forces were recruited from all sections of the community. The man in the street to-day wants to fly and to use air transport for business and pleasure—only the opportunity is lacking.
>
> "The Committee are strongly of the opinion that the respective activities of model-making, gliding, and power flying should be co-ordinated on a national scale. These activities, starting with modelling by young people still at school, form a natural chain in the progress of aviation training. Together they constitute a healthy, educational and constructive occupation offering full scope for development of the ingenuity and individuality inherent in the British race."

The Committee go on to recommend the formation of Aviation Centres at which all the above activities can be carried on with a central theme of Aviation as the background. They then go on to formulate their financial proposals to the Ministry. When it is said that for gliding alone they recommend a subsidy of a gross sum of £490,000 spread over five years plus a further £170,000 for the production of two hundred gliders over two years, it will be seen that their imagination has been given full rein. There is not space to provide a full resume of their recommendations but on the basis of no entrance fee and the maximum subscription of 6d. per week they recommend that a grant of £10 should be made to the Club on the issue of a 'B' certificate, £20 for a 'C' certificate, and £90 for a Silver 'C.' On this they estimate that two-thirds of the total cost of each certificate or badge will be provided for by the State.

To provide for the lack of Gliding instructors for Clubs they recommend the establishment of a central Civil Gliding Instructors School. Their five year programme for Gliding Clubs envisages 20 Clubs in being with 2,000 pilots at the end of the first year, rising to 100 Clubs with 20,000 pilots at the end of the fifth year. The proposed subsidy will rise from £49,000 in the first year to £147,000 in the fifth year.

Elsewhere the Committee remark that immediate financial assistance to gliding clubs is essential.

If ten per cent of these proposals are realised the effect on the gliding movement will be electrical. The question is whether the Ministry will recommend anything so far reaching as this to the Treasury and whether the Treasury will agree, or can agree.

One thing, however, is certain that even the publication of this report in the National Press must have the effect of an undoubted stimulus to the movement, and for this, it is extremely welcome.

NEW INTERNATIONAL RECORD

On July 12th, the last day of the Swedish Championships at Örebro, Lieutenant Per Axel Persson, Swedish Air Force, created a new International Record by reaching a height of 8,200 metres in a "DFS Weihe" after an aero-tow to 600 metres by a "Fokke Wulf Stieglitz."

AFTER the release Mr. Persson found a termic bubble in a cumulus cloud, which gave him an altitude of 3,500 metres with a climbing speed of 2—3 metres/second. In the middle of that cloud he met a hailstorm and tried to observe the ice-congelation on the airplane in order to learn the usefulness of the "glykol," he had smeared on the wings, fuselage, stabilisor, etc, before the start. There was a slight ice-congelation on the fore-edges of the wings but none on the upper side despite he passed a section of the cloud with very severely under-cooled water. The air-driven turn-indicator was in function up to a height of 4,000 metres.

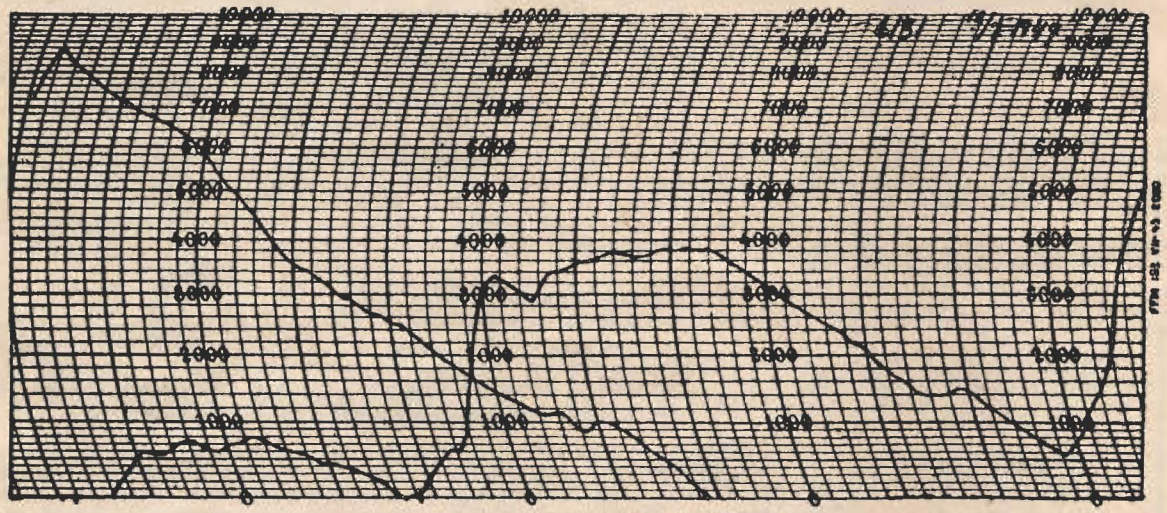
In the first cloud it was not possible to reach higher than up to 3,700 metres. For that reason he left it and then observed in the south-east another cumulus-cloud with a very strongly built top. Being convinced that the gain of height was likely to be decisive for the days' results and perhaps for the whole competition too, he decided to examine that cloud without consideration of the existing possibilities for gain in distance.

In this cloud the climb was slow, only up to 1 metre/second. It was hailing severely there too. In spite of all his efforts he did not succeed in reaching higher than up to 3,900 metres. For that reason he left on a north-easterly course. The air-driven turn-indicator continued to function, but the electric-driven had stopped owing to contact-trouble.

Despite the north-easterly course Persson was driven by the comparatively heavy wind in a south-easterly direction. Above him fairly dense cloud veils had been formed quite covering the sun. He supposed them to be remainders of cumulus-numbus clouds. Northwards high cloud-top were scarce, while there seemed to be better chances in south-easterly direction and therefore he headed that way.

After a while he observed traces of a heavy thunder-cloud front in the south-east and decided upon making an attempt to reach it. Between him and that "front" there were scattered a few cumulus-clouds, which he considered fitting to use in order to lessen the loss in height. Those cumulus-clouds were, however, too "weak"; the airplane was losing height all the time. Persson therefore decided to take his chance with reaching the front directly. His height was only 600 metres when he arrived there.

It was raining peltingly from that cloud, but the underneath side was well marked and the upper part of it grew constantly. Persson was prepared for a landing if the cloud should not be able to "carsy" him. However, he crossed the rather narrow shower of rain; on the other side he made out two hawks, circling persistently. He steered towards them and got just after that a climb of about 2 metres/second. Immediately he turned and began curving. After a while he had reached the cloud-basis, and entering it, the climbing speed had increased to 5 metres/

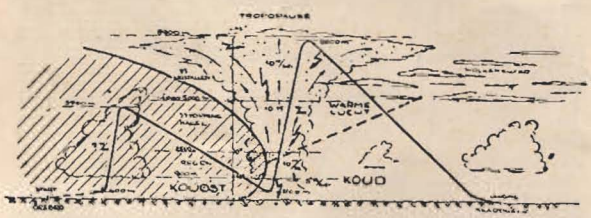


Persson's barograph, greatest height (about 9,000 metres) on extreme left.

second at an altitude of 2,000 metres. The climb continued steadily. At a height of 4,000 metres the climbing speed had increased to 10 metres/second, and so it went on (10—12 metres/second) during the whole climb. At 5,000 metres he put on the oxygen (gasmask) and climbed steadily up to nearly 9,000 metres. All the time the termic bubble was comparatively calm and even, and the pilot had no difficulties to handle the airplane correctly even when the instruments had stopped functioning at a height of 8,000 metres owing to the severe cold.

At a height of 8,000 metres a heavy thunderstorm began. Lightning and thunder-claps followed immediately one after another, and the airplane vibrated severely at every electric release. Static electricity in the airplane resulted from this ; loud clicks could be heard and the pilot got several shocks through the lever. The discharges became by degrees so severe that Persson decided to leave the cloud as soon as possible in order to avoid risking the airplane. The climbing speed was then still about 10 metres/second and the height on the altimeter 8,850 metres. The whole body of instruments, except the compass, were out of function, and the pilot handled his airplane merely by the aid of the compass, the sound and the pressure on the lever. The temperature on the top-height was estimated at —45 deg. C. The ice-congelation was still very small ; only about 3 cm. on the fore-edges of the wings. In all probability this fact was due to the slight rainfall within the cloud as well as the rapidity of the climb, about 15 minutes from 600 to 8,850 m.

Leaving the cloud, the pilot found a cloud-covering beneath. As there was no ground visibility he proceeded on his way in a north-easterly direction. At a height of 4,000 metres Persson sighted the



Meteorological conditions during Persson's flight. Cold air, coming from the left, rushes under the warmer air, and forces it up. The result is an enormous Cu-Nb cloud of "Atom-bomb" shape, reaching into the Tropopause where it spreads out.

ground again. Owing to the previous severe cold and the difficulty to keep the airplane on the course (there was a heavy turbulence) Persson used the air-brakes in order to descend as rapidly as possible. After having sighted the ground, he steered for Stockholm and Skarpnack, gained 300 metres in a small cumulus-cloud on the way and, arriving at Skarpnack, he had still a height of 600 metres. The landing took place at 2 p.m.

It should be observed that the two barographs were functioning faultlessly during the whole flight. After having been calibrated and controlled re-



Lieutenant Persson discusses final details before taking off on his record flight.

peatedly the experts have calculated the gain of height thereon to at least 8,050 metres, which will accordingly be the new international record.

OTHER FACTS ABOUT THE RECORD FLIGHT AND THE RECORD HOLDER

Lieutenant Persson is an instructor at Ljungbyhed, one of its training schools. Born at Boras, Sweden, on Februrary 6, 1922. *Swedish gliding certificate nr* 331 *of September* 12, 1945.

Örebro is a town situated about 100 *miles west of Stockholm.*

Start : 10.18 *a.m. from the aerodrome of Örebro ; altitude of aerodrome* : 28 *metres above sea ; height of release* : 600 *metres.*

Lieutenant Persson took off earlier in the morning of the same day but without result. A little while later he landed on the flying field at Orebro to wait for better weather.

Landing : *After the record flight was made at Skarpnack, a little aerodrome south of Stockholm, at* 2 *p.m. Time of flight* 3 *hours* 42 *minutes.*

Type of barographs : *Luft nr* 6131 *and* 6133.

1,200 METRES IN SIX MINUTES

By
DUDLEY HISCOX

THE last Sunday in August was in the middle of the hot spell when the wind was easterly day after day. Nevertheless it had a peculiarity; no low clouds formed.

My prototype "Olympia" was at that time at Redhill aerodrome, and before setting off I had listened in to the 8.30 weather "gen" on the 1,200 metres broadcast, and completed a T—ϕ gram. This showed that the freezing level was between 700 and 750 millibars. According to my limited knowledge of the subject it seemed that thermals would be active when the ground temperature was 70 deg. or more, and it was certainly likely to become as hot as that. I was surprised, therefore, to see no particular joy registered by members of the Surrey Gliding Club assembled at the aerodrome. The Auster tug had not been got out even. Sunbathing was apparently the order of the day.

The combined meteorological knowledge of the B.G.A. No. 1 Test Group was surely of some account, and its judgment of the conditions was "nothing doing." Accordingly I felt that my interpretation of the position must have been due to wishful thinking. The sky, still cloudless at noon (summer time), certainly seemed to point that way. Nevertheless, I noticed the wind stocking indicated variations in wind direction and wind strength; so I suggested an early lunch and the possibility that if anything developed that day it might be expected around one o'clock.

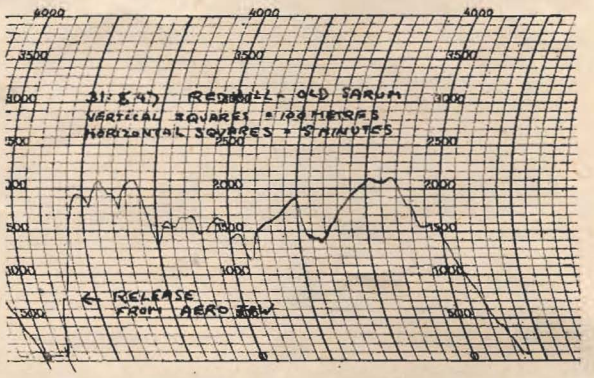
While we were in at lunch there was a considerable flurry of wind outside, and a dustbin lid blew off. Moreover, the extra wind strength persisted for more than the usual few seconds. That sort of thing doesn't happen for no reason at all. I didn't say anything, but when the C.F.I. asked if I would like an aerotow (price 12/6) and others expressed the opinion that it would be a noble gesture to consent to be a guinea pig and test the air in the still cloudless sky, I readily agreed.

Soon we were airborne; there was the usual rough stuff at the aerodrome boundary, and then we settled down to a normal tow. After gaining some 600 feet we turned towards Redhill town and soon ran into something. The tug pilot took me round the area in as small a circle as he dared, and all went normally, up to 1,700 feet. Then the aeroplane must have flown out of the uplift, for I suddenly found myself high above it. It seemed a good idea to release. I did, and turned back on the track, struck the thermal and the green ball of my variometre went to the top. There it stayed most of the time while the sailplane was circled at 25 seconds per turn.

I usually keep a check on my rate of circling by the rough method of counting one and two and three until an obvious landmark comes round to view again. On this occasion the air was rough and I didn't attempt to tighten the turns. Soon I realised that I was climbing at speeds varying from 10 to 20 feet per second, so it was not surprising that it seemed rough. I was therefore quite prepared to put up with it, and with a song in my heart watched the altimetre register 3,000, 4,000, 5,000, and finally 6,000 feet.

On the way up I began to speculate on the possibility of making the Golden "C" 10,000 feet without tears or fears in a cloudless sky. Then I remembered that the T—ϕ curve had shown a distinct upward kink around 650 millibars; in other words an inversion. That was one reason why the climb ceased soon after passing 6,000 feet. Searching around I found some more lift that put on a further 500 feet, but 7,000 feet was apparently the ceiling.

The next thought was of the obvious possibility of making a cross-country trip; so unfolding a map and putting on my reading glasses, hastily planned a trip *via* Odiham to Worthy Down. The inattention to the variometer cost 1,000 feet in seven minutes, but another spot of lift put me back at close on 7,000 feet. Guildford was ahead and yielded the next good lift. From there Farnborough was in view, so were several heath fires. I noticed the smoke of two of these drifted at angles converging towards each other. Judging that the imaginary point of intersection was the location of a thermal I made for



the locality. Lift was there alright and up we went to 6,000 feet. By then Odiham was beneath and to the south-west, Lasham could be seen. That aerodrome was reached and Worthy Down came in sight, and of course Winchester. A lot of altitude was expended making for the city, but immediately east of the airfield an excellent thermal took me quickly back to 7,300 feet. Chilbolton to the west was the only aerodrome "left" on my map, so I made for it, found no joy there and, wrongly I suppose, pushed on further west. The air became as calm as at evening time, although it was only a little after three o'clock. Without me being able to feel the entry into lift, the green ball indicated a rise of a few inches a second over the river Test. Five or six minutes of circling gained me no more than 100 feet and then it ceased. Again I pushed west along a

ridge of hills, and being off my map I didn't know quite where I was making for. Presently a city with an aerodrome hove in view. I circled the place twice, hoping it would give off lift, but it did no more than slightly reduce the rate of sink. The presence of a Cathedral gave me the idea it was Salisbury below, and five minutes later I put down before the Watch Office at Old Sarum just before four o'clock. With the knowledge of after the event, I believe that when the dead flat air was suddenly encountered after leaving good lift at Worthy Down I should have gone back to the Winchester area, and if I could have climbed again, have then made off either in a southerly or a more northerly direction. I'll remember that for next time.

SOARING IN FRANCE

By
GUY BORGÉ

SINCE 1940, French Soaring has rapidly progressed, and I am glad to have the opportunity to tell readers of SAILPLANE something of its history, and of its achievements to date.

Let me first go back to those sad days in 1940, when German troops invaded France and cut her into two regions. They forbade flight of power planes, so the late French Government decided to develop the authorized activities—Aeromodelling and Soaring—for training pilots—as the Huns had done after 1919—and for producing air-minded youth.

Sailplanes were few and old, so the new " Service of Air Sports " ordered from the Aircraft Constructors a number of modern one- and two-seaters, each one



" Caudron C 800 " two-seater.

to be designed, and built with two prototypes. This job needed much time to complete. The Service then began to repair the pre-war machines and to order some new ones, derived from ancient types : " Avia 152 " (nacelled primary), " Castel 30 " (training), " Avia 40 " (performance), and " Castel 242 " (performance two-seater). Also some " Spalingers S.18 " were bought in Switzerland. Flying one of the latter Eric Nessler broke in 1942 the world duration record with 38 hours 21 minutes at La Montagne Noire.

Nessler received the title of " General Inspector of French Soaring." He studied a new method of instruction, using performance two-seaters instead of the common primaries. Using this method, some instructors, formerly pilots of power planes or sailplanes, were trained in two centres : at La Banne d'Ordanche and La Montagne Noire, where 12 Silver " C " were gained with several thousand hours of soaring. The Aero-clubs of the Free Zone began to fly, but against heavy odds, especially in regard to the small number of sailplanes available and the lack of petrol. Cars and winches were equipped with gazogenes burning wood-coal, but results were not always successful.

In September 1942, Huns invaded the free zone, and forbid gliding and soaring. Clubs then based their activities on aeromodelling, and organized some aeronautical courses with official examinations under the control of the Board of National Education. Their members, more and more numerous, formed a spring of future pilots waiting impatiently the moment when, free, they could fly.

Meanwhile, the Service of Air Sports sought in all the country the best sites for soaring, and mapped them.

All this patient work accomplished during occupation explains why the start of soaring is so fast when freedom arrives at the end of 1944. Special teams bring from Germany 450 sailplanes : " Kranichs," " Goeviers," " Minimoas," " Meises," " Habichts," " Rhonbussards," " Mu 13s," " Weihes," " Grunaus," " Wolfs," " SG 38s."

The Air Ministry orders over 1,000 sailplanes, of which the prototypes had been tried in 1941-42. Here are the characteristics of these machines.

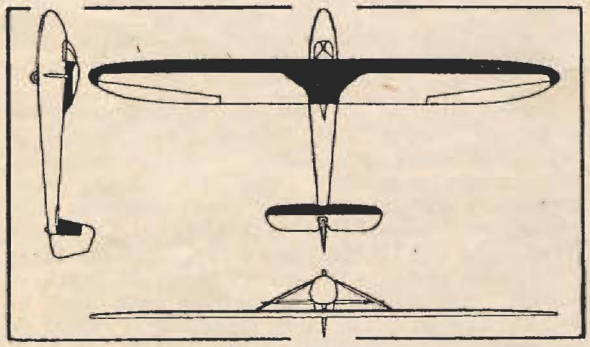
First the side-by-side two-seater " Caudron C.800." 250 have been built, and each Club has one of them. This machine is easy to fly, has a good performance, excellent visibility and endurance. Instructors give pupils a complete tuition in it before the pupils compete for the " B " badge in a training glider (the Service suppressed the " A " badge). This method, based on the scientific flying with instruments produces the best results.

Characteristics of the C.800 :—Span 53 ft., max. glid. ration 19 at 45 miles/hour. Aspect ratio 11.6, min. sink. speed 3.1 ft. at 40 m.p.h. Wing area

237 sq. ft., max. authorized speed in calm air, 100 m.p.h. Empty weight 530 pounds. Full weight 930 pounds.

Equipment consists in dual control, spoilers, single wheel with brake, elevator trimmer, complete panel of instruments. Though the Service names the C.800 a school two-seater, it has made a few performance flights:—Climb to 17,000 ft. at St. Auban, on the 11th November, 1945 (non-official French record), French duration record at Avignon, 17 hrs. 10 mins. French goal record, Beynes-Chateaudun (63 miles).

Another two-seater, also side-by-side, the " Castel C 25 S," has been ordered in a batch of 100. Its performances are better than the C.800, but it is more suitable for training than school.



"Caudron C 800" two-seater

Characteristics:—Span 53 ft., max. glid. ratio 21. Aspect ratio 12.8, min. sinking speed, 2.65 ft./sec. Wing area 215 sq. ft., sinking speed 6 ft./sec. at 63 m.p.h. Empty weight 550 pounds. Loaded weight 950 pounds.

The most popular training sailplane is the " Castel C.301 S." (225 made), for getting the " B," " C," and even Silver " C " badges. It has the standard panel of instruments: ASI, variometer, altimeter, bank indicator.

Characteristics of the C.301 S.:—Span 40 ft., max. glid. ratio 18 at 37 m.p.h. Aspect ratio 10.5, min. sink. speed 2.95 ft./sec. at 31 m.p.h. Wing area 158 sq. ft., sink. speed 8.5 ft. at 63 m.p.h. Empty weight 287 pounds. Full weight 495 pounds, max. authorised speed during aero-tows, 56.

The S.A. 103 " Emouchet " is admirably suited for thermic soaring, since it can fly at 20 miles/hour without spinning! It sometimes happens that an " Emouchet " remains in the air when a performance glider lands. It is very strong, and aerobatics can be attempted during tests. Best flights, 95 miles for distance and 10,500 ft. for altitude. 150 have been made.

Characteristics of the " Emouchet ":—Span 41 ft., max. glid. ratio 17.2 at 37 miles. Aspect ratio 9.5, min. sink. speed 2.9 ft./sec. at 31 m.p.h. Wing area 177 sq. ft., max. authorized speed in calm air, 160 m.p.h. Empty weight 270 pounds. Full weight 490 pounds.

When the French-built " Grunau 2b " was renamed " Nord 1300," some alterations were made, as a result of which the former remains inferior. But 250 " Nord 1300 " have been built, although the " Caudron C.811 " and the " Castel C.310 " are better in this class than the " G.B."

This " Castel C.310 P." (60 were made) differs from the " Castel C.310 " by a longer and new wing, some spilers, and an enclosure cockpit. She has given many pilots—including the author—the distance of the Silver " C." Delightful to fly, she has a wider speed-range with best performances then the " Grunau."

Characteristics of the C.310:—Span 46 ft., max. glid. ratio 22 at 37.5 miles/hour. Aspect ratio 14.3, min. sink. speed 2.45 ft./sec. at 34 m.p.h. Wing area 146 sq. ft., sinking speed 6.6 ft./sec. at 63 m.p.h. Empty weight 315 pounds. Loaded weight 510 pounds.

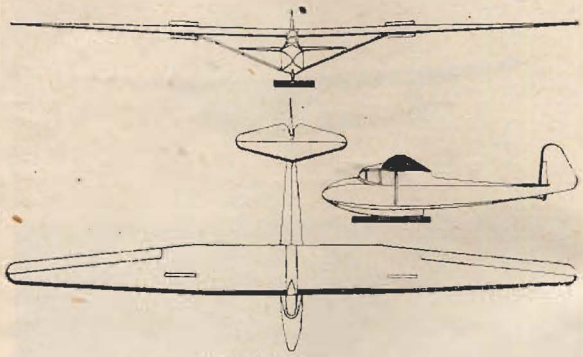
In the performance class, one sailplane has been ordered with a production of 100: the " Nord 2000 " (French built " Meise ").

Lack of space prevents me describing other French sailplanes at present in the prototype stage.

Training class: " Guerchais 107," " Caudron C.811," " Guerchais 105 " (two-seater), " P.M. 200 " (two-seater).

Performance class: " Guerchais 70," " Fauvel A.V. 17 " (tailless), " Castel C.M. 7 " (two-seater), " Castel Jalon " (two-seater for meteorological research), " Air 100 " (winner at Elmira 1947), " SOP 1 " (all-metal).

Six National Centres have opened:—Beynes-Thiverval, near Paris (Thermic Soaring); Pont St. Vincent, near Nancy (Slope Soaring); La Montagne Noire, near Toulouse (Slope Soaring); Challes les Eaux, near Chambéry (" Thermo-Dynamic " Soaring); Saint Auban sur Durance (between Grenoble and Marseille), Djebel Diss (Algeria), (Standing Wave Soaring).



"Castel C 310 P"

Each Centre, which has an exceptionally good situation in its meteorological class, uses numerous sailplanes (from 20 to 30), tow-planes, winches, lorries, cars, trailers, and a link-trainer. Its staff includes instructors, mechanics, joiners, cookers. A Centre teaches future instructors in the Clubs. It also perfects good pilots by giving them opportunities to carry out outstanding flights. During a month-course, one gets at least 2 legs of the Silver " C," and soars between 30 and 50 hours. There is a charge of 120 francs a day (5 shillings) for sleeping and feeding accommodation, and an entrance fee of 1,000 francs (2 guineas). Flights are free.

The 5 National Centres of Beynes, Pont, Montagne Noire, Challes and Saint Auban got the following results for 1946 :—51,561 flights ; 13,601 hours ; 328 " B " badges ; 302 " C " ; 30 Silver " C " ; 2 Golden " C " ; 389 legs of Silver " C," and 21 legs of Golden " C." Official statistics for the first months of 1947 show a large increase on these figures.

There are many differences between French and English Aero Clubs. Generally, the former have 4 main activities (Aeromodelling, Gliding and Soaring, Power Flying, Military Air-Training) that remain dependent. For instance, those under 21 must make models and take an official examination, the " Elementary Certificate of Air-Sports," before beginning to glide.

Another difference to the English G.C. : French Clubs receive on loan all their sailplanes, tow-planes, winches, trailers, parachutes, jeeps—from the Service of Air-Sports, which also pays instructors, equipment of airfields, and repairs of planes.

Because of Government aid, Aero-Clubs have made great progress and given the inhabitants of even the smallest town the opportunity for gliding and soaring cheaply. Members of certain clubs can get " B," " C " and Silver " C " certificates in less than a year. Their flights have enabled the meteorological situation of many regions to be known and they have been responsible for the discovery of new phenomena. For instance, the Clubs of Soissons, Marseille, Lavelanet, and Lyon, discovered standing waves on their fields.

Owing to the lack of official statistics the number of active clubs, their results, number of badges, flights and hours are not known. But according to certain papers, at least 50,000 pilots are soaring to-day, but it is difficult to verify this figure.

In spite of progress, there have been mistakes : the Government has given sailplanes to some Clubs who do not use them, or use them very infrequently. Through lack of experience many machines have been broken, and some people have died in accidents. But all things considered the Government have realized the errors which will be a lesson for the future.



" Castel C 310P "

In the Paris area, the Service of Air-Sports met great difficulties in organizing Soaring. Many members of one hundred Aero-Clubs wanted to fly, and it was impossible to supply to each one sufficient equipment, while airfields were scarce. The creation of Inter-Clubs Centres (C.I.C.) solved the problem ; each one shares a field between 10 and 20 Clubs, and has numerous planes, instructors and equipment. Seven Inter-Clubs Centres surround Paris to-day : Chelles, Lognes, Meaux, Persan-Beaumont, St. Cyr

l'Ecole, Mantes-Gassicourt, Etampes. A few other C.I.C. exist in the country : at Troyes, Angers, Puivert.

To 1945, the only French Golden " C " pilot was Eric Nessler (Istus number 4, whilst Philip Wills has the number 3). He has 8 companions to-day : Didion, Marcelle Choisnet (the only woman to hold this certificate ; she also possesses 5 world records), Gasnier, Charron, Lepanse, Capgras, Vinsonneau and Voisin.

Silver " C " pilots exceed 200 instead of 50. It would be too long to relate the performances higher than 300 km. and 3,000 metres accomplished during these last years.

At Beynes-Thiverval, several Golden " C " altitudes were got inside some cumulo-nimbus clouds. But St. Auban possesses the best position with its famous standing wave during the winter and spring when the north wind (" mistral ") blows. Its record is 17,000 feet after a winch-launch, but the lack of equipment (oxygen and heating) has often prevented the pilot reaching the ceiling of the wave.

For distances, the best centres are Beynes and Pont St. Vincent.

No National Soaring Competition existed since 1939. But in 1946, the Albi Aero-Club organised a contest between 35 picked pilots. Valette made the longest distance : 90 miles, limited by the Spanish Border, and De Lassageas won the speed-race on the circuit Albi-Cordes-Carmaux-Albi (34 miles) in 1 hour 41 minutes.

In 1947, M. Siretta, a journalist, presents the " Siretta Cup," the amateur pilot getting the best gain of altitude in only thermics and after a wind-launch. Successive winners are to-day :—

René Dumortier, at Constantine (Algéria), gain 1,200 ft. in an " Avia 40 P."

Jean Pierron, at La Ferté-Allais. 8,600 ft. in an " Emouchet."

Laurent Albert, at Albi. 7,800 ft. in a " Castel 310."

Jacques Brézun, in Lyon. 7,600 ft. in a " Castel 310."

Josette Blusson, at Tours. 5,500 ft. in an " Emouchet."

And five other pilots, at Mantes, Sarreguemines, comme Soissons, Beynes and Chelles.

At Wichita Falls (U.S.A.), Nessler in an " Air 100," Valette in the same machine, Didion in a " Nord 2,000," and Lepanse in a " Sop I," made some outstanding flights. Twice the French distance record was broken : by Valette (275 miles), afterwards by Nessler (316 miles). Lepanse in his all-metal " Sop 1," broke the French goal record wth 220 miles. But they arrived two days after the beginning of the contest, and they only took the 5th, 8th and 17th places.

Two-Seater Design Competition

THE Judging Committee has now finished its deliberations and has chosen the winners of the first prize of £125, presented by the Duke of Sutherland, and of the second and third prizes of £50 and £25 respectively, which were added by the Royal Aero Club. Their decision has been confirmed by the Council of the B.G.A.

Place.	*Entry No.*	*Entrant.*
1	30	H. Kendall.
2	39	D. J. Farrar & L. G. McFarlane.
3	51	A. O. Mattocks.

The runners-up were :—

4	22	T. A. Brown & J. C. Reussner.
5	50	B. S. Shenstone & — Czerwinski.
6	53	C. J. Goodwin.

The Chairman of the Judging Committee has made the following comments :—

" The entries were generally of a high standard and the first six were so close that allocation of an order of merit was a matter of great difficulty. In general it was found that entries tended to show merit in one or other of the aspects (1) aerodynamic design, (2) structure or (3) general layout.

" The outstanding entry which showed excellence in all fields was not found.

" This being so, the Committee decided to give greatest weight to aerodynamic excellence. Structural design and layout from the pilot's viewpoint were rated nearly equal, and each of about half the importance of aerodynamic design, with production of maintenance features having least weight.

" This basis of assessment was arrived at on the assumption that certain structural design features would certainly have to be modified when detailing and furthermore, that considerable redesign for production would be necessary if trials on a prototype proved the design to be of sufficient merit to warrant construction in quantity.

" Entry 30 has therefore been placed first on a combination of good aerodynamic design and layout from the pilot's point of view. The structural design was not considered outstanding.

" Entry 39 was considered slightly inferior on counts (1) and (2), but better on structure than 30.

" Entry 51, strictly speaking, came outside the span limitation for the competition. It was considered to be the best entry structurally but lost points relative to entries 30 and 39 on aerodynamic design and layout."

A VISIT TO SWEDEN

By A. MIRSKY

IT has been the writer's good fortune to visit a most attractive soaring site in Sweden last August. The name of the camp is Alleberg, a few miles from the town of Falköping, in the province of Vastergötland.

Alleberg is ideally situated on top of an oblong hill, approximately one mile in length, rising steeply on all sides from an extensive plain. The top of the hill is almost flat, comfortably accommodating an airstrip 850 yards long and about 400 feet above the plain. On either side of the hill are large emergency landing fields which are also used for S.G.38/catapult training for beginners. The photograph gives some idea of the site, although the real thing looks very much more attractive.

The site is the property of the Royal Swedish Aero Club (K.S.A.K.) and has been built, and is being maintained with the help of a considerable govenment subsidy.

The purpose of Alleberg, as the central Swedish Gliding School, is to train instructors, raise the standard of advanced glider pilots, as well as to train beginners. Flying competitions are also held there from time to time. Courses are run in the summer on the basis of a well laid-out training programme, and blend happily with odd experienced gliding visitors to the camp. Altogether, about 40 people can be accommodated on the camp.

Strictly speaking, the site is intended for Scandinavian pilots only; but a party of Czechs had come by special arrangement this year, and the writer himself from this country was received and encouraged to visit the camp in a most cordial manner by Mr. Bergman of the K.S.Ak. in Stockholm, chief of Swedish gliding, and Mr. Norrvi, the camp commander.

There is a number of huts on the camp not unlike those one saw on war-time R.A.F. stations—of quite adequate comfort—and a very well kept, though simple, canteen with excellent cooking facilities, and a more than adequate and diligent domestic staff. There is also something like a tuck shop that amply covers one's needs from chewing gum to boot laces.



"Grunau" parade of a "C" certificate course. Note trolleys underneath each glider.

The surrounding landscape is very pleasant indeed; so much so, that one can do very well without the use of the daily transport to Falköping for a week or two, and live happily without alcohol in this state of splendid isolation.

Thermal Conditions.—The area around Alleberg has an exceptionally high reputation for good thermals, relatively high average cloud base, and vigorous cloud development. This year alone a number of flights to over 15,000 feet have been made, several cross-country flights of over 300 Km., and about 20 flights of over 200 Km. Even during the exceptionally dry spell in August, at the time of the writer's visit, flights to over 4,000 feet were relatively easy, in spite of Met's threats of inversions around 1,000 feet. August, of course, is not a favourable month; as a rule June is the best time for thermals at Alleberg.

Gliders.—The collection of gliders at Alleberg is more than one could wish for. Here is a list of the ones packed into one large hangar with sliding doors at two ends :—

Three " Weihe," three " Olympia Meise," one " Kranich 1," six "Grunau 11b," one "Fl " (Swedish aerobatic machine), one " Schweizer SGU " (American metal two-seater trainer), six S.G.38.

Of powered aircraft there are one " Tiger Moth," one " Klemm 35, for towing ; and one " Piper Cub " for private hire.

The last three are kept in a separate hangar in which there is plenty of room for visiting aircraft.

In addition a link trainer purchased from this country is available for practice.

What seemed even more impressive than the collection of aircraft was the degree of serviceability, and the very high standard of maintenance of both gliders and auxiliary equipment. Also, the care with which all gear is treated reflects most favourably on good planning and teaching by the staff of the K.S.A.K. in general, and efficient camp management on the part of Mr. Norrvi in particular.

Launching and Retrieving Methods.—Aero tows are made at the rate of about 25 a day. The " Tiger Moth " is used very largely for this, and is driven by a very competent pilot employed by the camp. Although the " Moth's " rate of climb with a heavy glider in tow is perhaps not all it might be, it has proved to be an eminently suitable club towing machine ; in fact it is doubtful whether on an overall comparison of several features—such as cost of aircraft, reliability, ease of maintenance, petrol and oil consumption, and hangarage—another aircraft could be found that would score above that of the well-tried " Moth " for the purpose to which it may be put by a gliding club.

There are three winches on the site. One Pfeiffer winch of German design with a V8 Ford 4.5 Litre engine, and one Oldsmobile and one De Soto, both of which are cars adapted for winching. The adaptation is of Swedish design, and both incorporate automatic paying in gears.

On the West side of the hill there is an interesting launching ramp used for hill soaring flights, and beside it an electric retrieving winch used after landings on the emergency field below. A special timber track is laid the whole length of the slope. This track is designed to fit the trolleys on which the gliders are ground handled. Each glider has its own trolley, not so much a luxury as a skid saver, and therefore a sound investment. During the retrieving operation three people must accompany the glider and walk up the long row of steps, which on a hot day can appear a painfully long one, especially if the winch operator is in a hurry. Between the wheel tracks are mounted steel rods at about one foot intervals, over which a safety catch, attached to the trolley, is made to trail. If the cable snapped, or, if the winch stopped, and the drum brake were to fail, the safety catch would—with a little luck—arrest the glider.

On the East side of the hill a similar arrangement exists with the difference that the retrieving winch is a petrol engine.

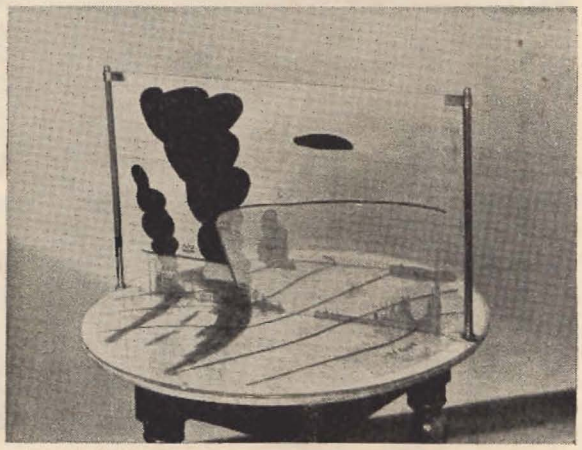
The elementary training launches with " S.G.38 " and catapult are made from approximately half-way up the slope on either side of the hill. A jeep is used here for retrieving gliders. " A " and " B " certificate training can be practiced comfortably and safely because of the wide fields at the bottom of the hill.

Vehicles : The camp is in the lucky position to own :—Two cable retrieving cars, one Jeep, one Volvo—light truck, one lorry—to fetch camp provisions, and four trailers for retrieving gliders from outside landings.

Camp staff : The staff consist of :—The camp commander, four flying instructors, one towing pilot, three mechanics, four skilled aircraft joiners, one domestic manager, seven cooks and waitresses, and one secretary.

To be continued

Dimensional Briefing Model



The illustration shows a device utilised at Dublin Airport, by which the surface weather chart is combined with a vertical cross-section of the atmosphere over a particular flying route. Coloured crayons are used to indicate diagrammatically on sheets of perspex the salient features of the weather prevailing along the route.

CORRECTION

In the report of the B.A.F.O. Gliding Competition on p. 15 of the October issue, the B.A.F.O. Gliding Club was credited with winning the " A " competition. The Secretary of the 140 Wing G.C. has informed us that the winners of that Contest were, in fact, the then 2 Group G.C., who changed their name to 140 Wing G.C., on June 1st this year; that the team consisting of F/Lt. F. M. Reafe, Capt. R. E. Claudi and F/Lt. R. M. Williams, won the Contest by a comfortable margin of points from their closest rivals, the 84 Group Club from Salzgitter, and the B.A.F.O. G.C. team came third, although they won the " B " Contest.

ULTRA LIGHT AIRCRAFT ASSOCIATION

(*Extracts from Bulletin No.* 11).

GROUP NEWS

South Warwickshire Group. The first meeting of those interested in this Group was held on the 30th August at Leamington Spa and it was unanimously agreed that the Group should be formed. It will consist of two sections, namely a Technical and Constructional Section and a Flying Section, this latter section to cover flying instruction as well as ordinary sport flying. The question of a suitable site for a flying field was discussed and although several suggestions were put forward, none was completely satisfactory because, in view of the large area covered by the Group, some or other of the members would not have easy access to the proposed sites, a situation not improved by the elimination of basic petrol for road users.

Pending a decision on petrol supplies for ultra lights, it was suggested that members of the Group might receive gliding instruction at nearby gliding clubs both with a view to gaining useful experience and also to keeping the Group active until powered flying could be started. The possibilities offered by the use of Ground Trainers were also discussed and it was agreed that construction of one of these would be relatively easy and would make a good starting point for the Group. It was thought that the material required for a Ground Trainer could be obtained from various sources at very little cost to the Group.

The Aerotec Research Group, Bristol, has now affiliated to U.L.A.A. Mr. MacFarlane, Secretary of the Group, has asked us to correct an error contained in a recent Press hand-out which has been published widely in the aviation press. Commenting on the cost of operating the Groups projected "Sportsman," the hand-out stated that "when equipped with two annual season tickets, each costing £5 and issued by the Ministry of Civil Aviation, the owner pilot would have the right to land at any private or state-controlled airfield in the British Isles." As pointed out by the Royal Aero Club, this is not quite correct, only certain State-controlled airfields and private airfields whose owners are members of the Aerodrome Owners Association really being served by these season tickets.

DESIGN SUPPLEMENT

(*Contributed by G/Captain E. L. Mole, Chairman, Design Sub-Committee*).

SLINGSBY MOTOR-TUTOR

The first prototype Motor-Tutor, powered with a 24 h.p. Scott Flying Squirrel engine, has now been completed at Messrs. Martin Hearn Ltd., Hooton Park, and is starting its flight trials. The second prototype is being built by Slingsby Sailplanes Ltd. but its completion is being held back so that any modifications found necessary as the result of the trials of the first prototype may be incorporated.

Messrs. Martin Hearn Ltd. have informed us that the Motor-Tutor will definitely become available in kit form but at the moment they are unable to quote a price for such kits, or for the completed aircraft, since this will depend upon the type of engine specified. We hope to have further news on this point before very long.

TWO-STROKE ENGINES

In Design Discussion Point No. 4 published in the August Bulletin, we summarised the main advantages and disadvantages of two-strokes in comparison with four-strokes, as regards their suitability for ultra light aircraft. We showed that the simple two-stroke gained as regards mechanical simplicity, smooth torque and power/weight ratio (except at high r.p.m.). Certain of its main faults were due to the poor volumetric efficiency of crankcase compression which led to starvation of the induction charge at high r.p.m. and to poor exhaust scavenging. We suggested these faults could be overcome by the adoption of a blower instead of crankcase compression, together with a "uniflow" system for the induction charge.

It was, therefore, of great interest to us to receive a technical paper by Mr. G. Sartoris, Chief Designer of Messrs. A.B.C. Motors Ltd. (makers of the early u.l.a. "Scorpion" engine) in which he enlarged on the possibilities of uniflow (or end to end) scavenge systems for two-stroke engines. He considers that pure air should be used for scavenging, compressed by means of a high-speed Roots type blower or centrifugal fan, with petrol injected after the inlet port has closed. With such a system, he says, a two-stroke engine at 2,000 r.p.m. should give $1\frac{1}{4}$ to $1\frac{3}{4}$ times the power output of the four-stroke of similar capacity.

Mr. Sartoris describes two forms of end-to-end scavenging systems, e.g. the double piston type, and the single piston with sleeve valve. The double piston engine can be of three forms: (a) two crankshaft type; (b) beam engine type and (c) syphon cylinder type. The first two eliminate the cylinder head which, he says, is attractive; the latter is lightest but does not permit a straight scavenge air flow.

He considers that double piston type engines will be heavy and bulky, as the pistons control the ports and must, therefore, have a length equal to the stroke plus height of port, and their cylinders and connecting rods will be proportionately longer. This is exaggerated by the fact that a long stroke is necessary to ensure good scavenge. The total weight might easily amount to 1.4 times the weight of a four-stroke engine of similar capacity and thus off-set the power/weight advantage of the two-stroke.

In the sleeve-valve engine, the pistons do not control the ports and may, therefore, be of normal length together with their cylinders and connecting rods. The engine will thus be lighter and of smaller overall dimensions than the double cylinder type and be expected to show better power/weight ratio at about 2,000 r.p.m. than a similar four-stroke.

At increased r.p.m., however, the two-stroke tends to lose its advantage and at 4,000 r.p.m. the

four-stroke may give a better power/weight ratio than the two-stroke, even including the weight of propeller gearing—advantageous at such r.p.m. to allow an efficient propeller speed to be chosen.

Mr. Sartoris concludes by saying that a high output two-stroke engine will probably suffer lubrication trouble with piston rings and gudgeon pin bearings, as the explosion pressure occurs at every stroke and the load fluctuates, far less than with a four stroke, on them. This may, however, be less with sleeve valve type engines as the piston head can be cooled by incoming scavenge air.

DESIGN DISCUSSION POINT No. 5.

Twin versus Multi-Cylinder Engines.

Small multi-cylinder engines have a lower power/weight ratio than twin cylinder engines of the same capacity and they are more costly to make on account of the larger number of components. They are, however, smoother and quieter, and small cylinders are less prone to overheating troubles than big ones.

With the smaller sizes of ultra light aircraft engines as used for motor-glider types (20/30 h.p.), twin cylinders may be recommended owing to their cheapness and simplicity. In larger sizes, however (40 h.p. and upwards) twin cylinder engines tend to become rough and unpleasantly noisy, and multi-cylinder types become desirable despite their greater cost.

Should one cylinder cut out for any reason when cruising with a twin-cylinder engine, a forced landing is unavoidable; whereas with multi-cylinders the aircraft is likely to be able to maintain height. This consideration is, of course, less serious in the case of motor-glider types with which a successful forced landing is reasonably easy to carry out.

We would be glad to receive opinions as to the desirability of twin or multi-cylinder engines for ultra light aircraft. A summary of views received will be published in a later Bulletin.

PETROL ALLOWANCES.

We understand that flying and gliding clubs may soon be able to claim allowances of petrol to assist members to reach airfields remote from public transport. Discussions on this matter are in progress between the Ministry of Civil Aviation and the Ministry of Fuel and Power, and a statement is expected soon. It is anticipated that the allowances will be sufficient to enable the operation of communal transport to and from the nearest station and bus route and likely to be granted to clubs rather than to individual members.

DEFENCE GLIDING CLUB

By G. B. HEIGHTON

ONE of the largest and best organised gliding clubs in South Africa is the Defence Gliding Club (D.G.C.), which has its H.Q. at Quaggapoort, near Pretoria.

Its members are all serving personnel of the U.D.F. (Union Defence Forces), and the Club is officially recognised by the military authorities.

Up to the time of my departure from the Union, the Club's "flyable" equipment comprised—2 "Kirby Kites," 1 "Slingsby Baby," and 2 "Grunau IX" open primaries.

The maintenance inspections, etc., are all carried out by the members themselves, many of whom are qualified tradesmen in the S.A.A.F.

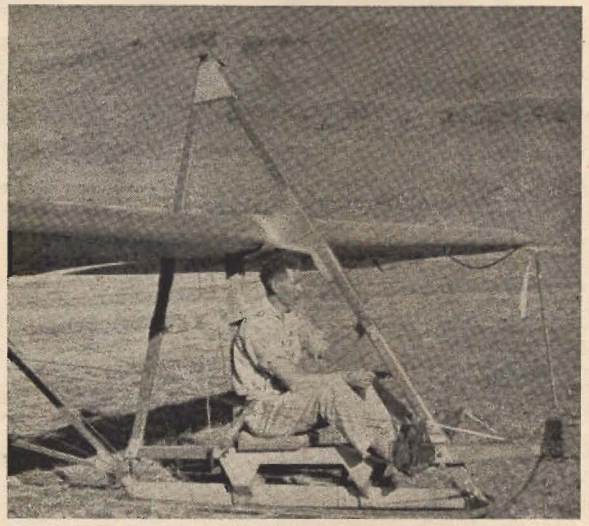
The Club possesses two hangars, and quite a nice club house, where tea and cakes and lunches are provided by the members' wives—entirely free of charge ! !

Quaggapoort lies in a valley running approx. East to West, the ridge on the South side being about 400 feet. Since the prevailing wind is N.E., the site offers plenty ot opportunity for ridge soaring. Most of the senior members, however, prefer to go "thermal hunting."

The Club Captain, Corporal "Pikkie" Hammond (S.A.A.F.) gained the South African height record in November last with a height of 15,200 feet in a "Kirby Kite." (See Sept. issue.)

Launching is by winch. The winch being a converted Ford V.8, mounted on a bomb trolley chassis for ease of transport. Communication between winch and launching point is by a field telephone system that is first-class. The usual height on release varies between 800—1,000 feet, depending on conditions.

In my opinion, members of the D.G.C. have every reason to be proud of their Club and its achievements, and should South Africa enter the next International Contests, I have no doubt but that members of the D.G.C. will be well to the fore.



C. Heighton "Ready for the cable."

GLIDING IN HOLLAND

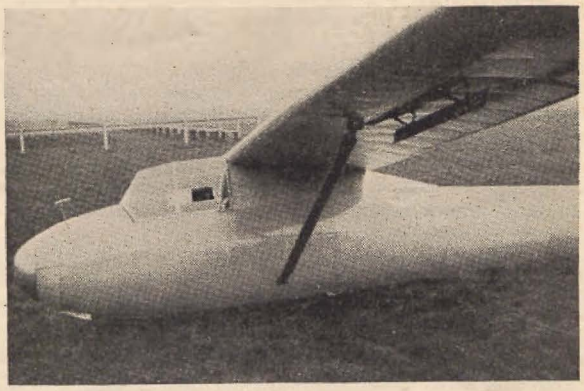
DURING the last months of 1946 the activities of most gliding clubs in Holland were brought to a standstill or slowed down considerably due to the unfavourable weather conditions. But meanwhile the building programme of the Royal Aero Club was in full swing. Fokker delivered 30 ESG ("Grunau 9") primaries in the course of the summer and autumn, and "De Schelde 6" specimen of their dural version of this glider which now is the standard type for *ab initio* training in Holland. At the end of 1946, after the successful conclusion of the trials with the prototype, the construction of the 24 "Grunaus" was started.

These gliders are of the "IIb" type, and therefore fitted with airbrakes. A number of them is now flying with the clubs, while several others are still held in reserve. Five "Olympias" are nearing completion, the first one of the series of 6 machines being flown in recently. So there are still only 6 gliders of the 72 ordered by the Royal Aero Club to be built. These are the "Goevier" two-seaters.

Quite a number of instruments for the "Olympias," "Grunaus" and "Goeviers" were bought in Switzerland. The "Olympias" get the following instruments: altimeter, variometer, air-speed indicator, compass, turn-and-bank indicator and fore-and-aft inclinometer. The "Grunaus" will be provided with the same except the last two. The Swiss instruments have very little dimensions, compared with the German instruments we used before the war.

Besides this a number of parachutes will be available for the gliding clubs hiring these sailplanes. All types except the primaries are fitted with the centre-of-gravity hook. This hook is officially approved by the Dutch authorities, after the very successful flight tests last-year.

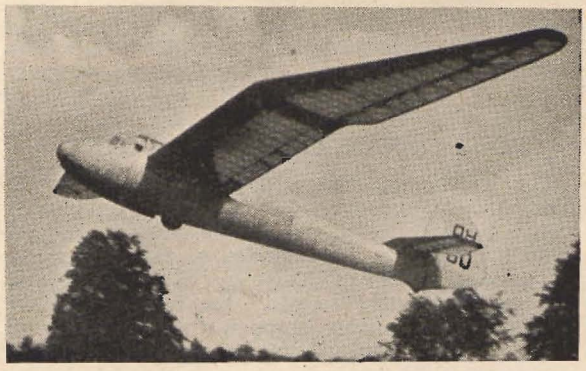
Thus gliders and sailplanes are no more a problem, but in other domains many difficulties are still to overcome. Airfields, hangars, winches and retrieving-cars are a headache for many a club council. Although there is no petrol rationing in Holland, cars and tyres are still very scarce. With the help of the Aero Club several clubs were able to buy a surplus jeep for retrieving work.

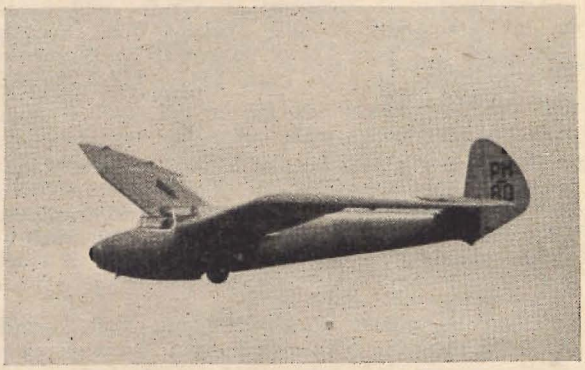


The "V20," constructed by Mr. R. Sheller, built by N. V. Vliegtuigboun at Deventer, Holland.

Only a few cross-country flights were made in 1946. Mr. A. L. Bauling made with 45 miles the longest distance. 53 "A," 25 "B" and 15 "C" licences were issued, while several height legs for the Silver "C" were made.

The gliding section of the Aero Club, with its new secretary, Mr. D. Dresselhuys, began the organisation of a national soaring centre at "Terlet," 5 miles north of Arnhem. This site will be a permanent one, with brick buildings, and will be used for *ab initio* two-seater training as well as for the school of soaring. The costs of such a centre are enormous, and without a government subsidy it would be impossible to fix it. We hope that this gliding school, which supplies a long-felt want, will be opened early next year. Until then a mobile instruction group with a "Kranich" two-seater, a "Grunau" and a "Tiger Moth" tug teaches the club members the art of soaring. This system was only a few days working at Teuge airfield when the "Kranich" was blown over by an exceptionally strong gust and heavily damaged. After several weeks of negotiations a new "Kranich" was bought in Switzerland and flown over behind a "Miles Gemini" in 5 hours by Mr. Dresselhuys.





Two views of the "Minimoa" owned by the Netherlands Aero Club.

The instruction group then worked with great success and many pilots, after some " Kranich " flights, soloed on the " Grunau " in aero-tow.

This summer a great number of club camps were held, and more licences were issued than in any previous year. At the time of writing the exact results are not yet known.

The Aero Club now owns a considerable fleet of gliders which are at the club's disposal. It has not yet been decided if the " Olympias " are to be hired to the clubs or to be stationed at the central gliding school. All other machines can be hired to the clubs at a very reasonable rent. The fleet consists of :

34 ESG primaries.

25 " Grunau Babies IIb."

6 " Goeviers " (still under construction).

6 " Olympias."

1 " Minimoa." Which makes a total of 72.

Together with the aircraft owned by the local clubs, there are now 97 gliders and sailplanes in Holland.

H. SCHWING.

National Gliding Records

passed by the B.G.A. Council, 5.9.47.

CATEGORY 1 (Single Seaters)

1. *Distance.*

C. J. Wingfield, in EON "Olympia," from Sheppard Field, Texas, U.S.A., to Buffalo Lake, on 13th July, 1947.—216 Statute miles (347.6 km.).

2. *Out-and-Return.*

C. J. Wingfield, in EON "Olympia," from Sheppard Field, Texas, U.S.A., to Quanah, Texas (73.6 miles) and return, 16th July, 1947.—147.2 Statute miles (236.9 km.).

3. *Goal Flight.*

P. A. Wills, in "Weihe," from Yeovilton (Somerset) to Ratcliffe (Leicestershire) on 17th June, 1947.—140 Statute miles (225.3 km.).

CATEGORY II (Multi-Seaters).

1. *Distance.*

Commander C. Nicholson, R.N.V.R., and Lieutenant Commander (E.) G. P. Blake, O.B.E., R.N., in " Kranich II," from Yeovil (Somerset) to Bramcote (Warwickshire) on 17th June, 1947.—118.2 Statute miles (190.2 km.).

2. *Goal Flight.*

Commander C. Nicholson, R.N.V.R., and Lieutenant-Commander (E.) G. P. Blake, O.B.E., R.N., in "Kranich II," from Yeovil (Somerset) to Bramcote (Warwickshire) on 17th June, 1947.—118.2 Statute miles (190.2 km.).

3. *Height.*

Flight-Lieutenant R. M. Williams, D.F.C., and A. C. Kann, in " Kranich," from Oerlinghausen (Germany) on 2nd June, 1947.—8,399 feet (2,560 metres).

NEWS IN BRIEF

84 GROUP CLUB, Salzgitter, record 12,000 launches, with 900 hours' flying, up to 1st September. The Club is developing a new method of winching and retrieving—by electric gear.

THE London Gliding Club has received adequate petrol allowance for launching and retrieving at Dunstable for the rest of the year, and a charabanc can be laid on every Sunday morning from London to the Club and back. Proposed starting place, Londonderry House, at 09.00, stopping *en route* to pick up members at several points (including Victoria, before reaching starting place). This service will be started as soon as sufficient members take up the twelve weeks' season tickets, which will cost £2.

A. C. KAHN, of the B.A.F.O. Gliding Club, recently climbed 10,500 feet above release in a " Weihe."

F/O. JOCK FORBES and Wing Commander Hanks carried out a formation flight in two " Weihes " on 4th September, covering 132 miles. Maximum height, 2,200 metres. Duration, 4 hours 5 minutes.

8,500 LAUNCHES, 950 hours' flying, recorded by 140 Wing Club, Oerlinghausen, during first eight months of this year. The Club so far have 9 completed Silver " C's " and 35 people with one or two conditions. Captain Claudi has two Golden " C " conditions—Duration and Height. He missed his distance by 7 km. shortly before his release last month ; previously missed by about 9 km. during May competitions. A./C. Sorbie recently failed to release through not exerting sufficient strength on release toggle and carried several hundred metres of cable behind him until eventually released before his approach.

NAOMI ALLEN, one of the British Team which competed in the 14th American National Soaring Contests in July, was before the war professional instructor to the Cambridge University Gliding Club—and at that time the only member of the fair sex admitted to the Club. Naomi first " hit the headlines " in 1936 when she climbed to over 8,000 feet from Darmstadt in a cold front storm. She recently exceeded that height by soaring to 14,400 feet at Twenty-nine Palms, California.

BACK NUMBERS OF SAILPLANE

We have uncovered a large selection of back numbers dating from 1934 onwards, the majority 1940. If readers desirous of obtaining copies will state their precise requirements we shall endeavour to accommodate them. There is a wealth of interesting and instructive detail in the matter of these numbers and, glancing through them, one cannot fail to be impressed at the progress made in the movement which was in its infancy in the early 1930's. Price 2/6 per copy, post free.

NEWS FROM THE CLUBS

LONDON GLIDING CLUB

August began with our 2-weeks' Summer Training Camp, attended by 19 people and most expertly managed by Lawrence Wright, to whom our sincere thanks are due. The weather for this event was not quite all that it might have been, as we had soaring conditions during the first week but not at the end of the fortnight. However, much primary training was done, and we feel sure that, had a soaring wind appeared at the end of the camp, the members would have collected another dozen " C's."

Another group of A.T.C. instructors spent a week at Dunstable during this month, but were unlucky owing to the prevalence of east winds. Although they were not able to do much soaring, one of their number treated us to some brilliant aerobatics in the Czech " Krajanec " (Zlin 24).

The third camp in this month was a small but very select party, consisting of the first three members of the Women's Junior Air Corps ever to do any actual piloting themselves. By the end of the week we had added three very charming " A's " to our score.

Generally, the above-mentioned east winds restricted our soaring activities, but we had a few good days, including the exceptionally good Wednesday, 6th August, which produced 38 hours 14 minutes of flying time; if only that had been at the week-end !

During this month, three members, Arnold, Ross and Rowley did the " 5-hour " legs for their Silver " C's." Ross had to have two shots at it, failing the first time by just 5 minutes.

Just to show what can be done by single-minded application to this gliding business, we would quote the case of O. W. Neumark, who stationed himself on the London Gliding Club premises on 21st March, 1947, and departed thence on 27th August of this same year. When he arrived he possessed his " C " certificate and had a few hours in his log book. When he left he had gained his Silver " C " and had logged another 80 hours' flying (35 hours in " Tutor," 20 hours in " Gull," and 25 hours as " driver " of the 2-seater). Most of us, unfortunately, are unable to spare the time to do likewise, but it only goes to show, doesn't it ?

SUMMARY.

	Number of launches.	Hours flown
Club flying ..	1,024	90
A.T.C. flying ..	285	15
Grand total ..	1,309	105

Certificates gained: " A," 15; " B," 10; " C," 7; Silver " C " legs (Duration), 3

September. Although the total of the flying hours for this month shows a slight improvement upon August, we were unable to put up a better day's score than on August 6th, so that with the shortening days it appears unlikely that this year we shall exceed the 38 hours logged on that occasion. Nevertheless, Sunday, September 21st, was a close runner up with 33 hours 27 minutes, and the following Sunday, the 28th September, almost equalled this with 32 hours 6 minutes. On this latter date flying was carried out entirely on hill lift under stable 10/10ths conditions, resulting in the horrific spectacle of 8 machines being confined at one time to an air space which could not have exceeded 1,000 x 50 x 50 yards ! At this time, altitudes did not exceed 300 feet above hill top level, the wind being S.S.W., but the congestion eased when the wind veered later and pilots were able to spread themselves out along the full 2 miles of our beat. (Another ½ mile can be added to this by adventurous souls who proceed beyond the " Lion " to Dagnell village.) On such occasions, when " saturation point " is reached, we have no alternative but to cease launching further machines until someone lands voluntarily or is recalled by ground signal. There is always the danger under these circumstances of the " dew point " being reached as a result of a falling wind; " precipitation " then takes place fairly rapidly.

The previous Sunday, September 21st, was quite different. A high degree of insolation provided ample lift to enable the entire club fleet to spread itself out over several miles in two dimensions, and almost one mile in the third. The new " Red Olympia " of the Anson-Buckley-Hurry syndicate took two of its owners (Anson and Hurry) on consecutive flights to 4,600 feet and some miles upwind towards Leighton Buzzard. The club's No. 4 " Tutor " was conjured also to 4,600 feet by the crafty Reilly, who, incidentally, has become the new tenant of the " Neumark flat " and looks like repeating the latter's flying record. The club " Gull " flying later in the afternoon, had to be content with 3,300 feet on the Dagnell-Edlesborough beat. Outstanding performance of the day, however, was by Tudor Edmunds, in the No. 3 " Tutor." This craft is normally reserved for " C " aspirants, and accordingly is devoid of all instruments. As on this day it appeared to lack customers, Tudor Edmunds took it up and immediately circled to great heights. This caused considerable consternation in the upper stratum (where he arrived unheralded), as there was no precedent for No. 3 circulating at a high level. We doubt whether a finer exhibition of sensuous soaring has been seen since the days of Eric Collins, but we understand that it is nothing new to Tudor Edmunds. Someone should persuade him to put his methods on paper; they should prove of considerable interest.

This difficulty of finding customers for the club fleet, even on good soaring days, has been noted during this summer. Admittedly it occurs mostly during the morning or late afternoon or evening, and would, therefore, appear to have some connection with what is known as " thermal activity," so we welcome any suggestion for dealing with this situation where an increasing proportion of the club shows complete disdain for flying except between 13.30 hours to to 14.30 hours !

The only week-day to show any number of flying hours this month, was Tuesday, September 23rd, when 15 hours 29 minutes was

achieved. This was only possible with the assistance of Hawkridge Aircraft Limited, whose Board has proved extremely helpful whenever week-day flying has been in danger of cancellation for lack of winch drivers, etc. On this occasion they were instrumental in enabling Pereira to complete his Silver "C" duration test, carried out on No. 2 "Tutor," and faithfully recorded on his new Chowles pocket barograph.

The last Sunday in the month was also noteworthy for the re-appearance of two old friends; Lauderdale returned from Canada and the "Camel" whizzed along the hill under Ivanoff's careful guidance, its performance seeming none the worse for war-time storage. The Pasold Brothers (minor and minimus) reappeared with their "Yellow Buzzard" earlier in the month.

This month also saw the first recruits to our new monthly membership scheme, which looks like becoming popular with B.A.F.O. "sky-sailors" on demob leave. We extend to them a hearty welcome, regret we have no "Weihe," but are quite prepared to design a kit-bag with false bottom to carry one!

A very successful dance and social evening was held on the last Saturday of the month, and we hope to repeat this performance on November the 29th before the expiry of everyone's petrol ration. The war-time club house at Totternhoe has now been vacated, and all our facilities are once again available on the club site; Dormy House and Bar are in full swing.

We have been granted petrol for club use which will last us until the end of this year, and at the same time we are organising for a coach to take members from London each Sunday; details of this from the Secretary.

SUMMARY FOR SEPTEMBER.

Number of Launches ..	302
Hours Flown	120
Certificates Taken	3 "A," 4 "B," 4 "C"
Silver "C" Tests ..	1 Duration

BRISTOL GLIDING CLUB

Our latest important development in a year of important developments is the recent affiliation with the Somerset Aero Club. Life at Weston-Zoyland having been made very difficult for the Somerset people by the loss of their hangar and the threatened loss of the site itself, they are moving lock, stock and barrel to Lulsgate. Although both Clubs will retain their separate identities, there will be complete interchange of facilities, and a levelling up of charges, so that everybody flies and works on an exactly equal footing. The mutual gain from this arrangement is expected to be high, as apart from the considerable increase in the scale of aircraft and launching equipment, we will have the benefit of the services of Mr. "Bunny" Wheatley, whose work at Weston Zoyland this summer has been most impressive. He will continue to run weekly courses as he did there, thereby making much fuller use of the equipment than we have been able to do, and also will be able to deal with the maintenance of aircraft and vehicles, so that the maximum amount of flying can be done by the week-end people.

The hill-site, at present abandoned for lack of "basic," will also be developed and used jointly.

Second prize in the two-seater design competition has been awarded to two of our members, Lyndon McFarlane and David Farrar, to whom hearty congratulations. The progress of their brain-child, which embodies many of the features that the designers have from personal experience found found to be desirable in a high-performance club sailplane, will continue to be watched with intensified interest by everybody. We are looking forward to seeing a prototype at Lulsgate in the soarable part of 1948.

Thermals are now a thing of the past; it seems we used the last ones during the September "At Home." Consequently, flying has been confined to circuits, and the winter training programme is being organised. The converted Wild winch is now in action, with one drum only so far, and its smoothness, quietness and ample power reserve are a revelation and a just reward for the ingenuity and hard work put into it by members under the leadership of our Ground Engineer, Tony Heron. We can now operate three winch lines when desired.

To supplement the instructions given to pilots on the aerodrome, a series of briefing notes is being prepared. On starting training, and on converting to each new stage, the member will be given a sheet of gen appropriate to that stage, which he can keep and digest at leisure, thereby acquiring much more information than the overworked instructor is likely to be able to impart in the field.

SCOTTISH GLIDING UNION

Summer has passed very pleasantly at Balado, with a good turn-out of enthusiasts every week-end. Members and prospective members arrive from all over Scotland, and we expect a new cycling record to be set up from Glasgow to Balado after October 31.

The fine weather has encouraged the winning of ten "A" and fifteen "B" Certificates. We enjoyed a visit from Basil and Mrs. Meads, of the Derbyshire and Lancashire Club, on the week-end of 23rd August, and from Ron Claudi, late of 140 Wing Gliding Club in Westphalia, on 14th September. The latter arrived in a downpour to discover the airfield swathed in Scotch mist, but a week later David Hendry in the "Tutor" found the last thermals of summer and was rewarded for weeks of hard work on the winch by obtaining a well-earned "C." We now hope for an autumn of steady west winds, and a spot of hill-soaring.

LEICESTERSHIRE GLIDING CLUB

A painting in glorious technicolour showing chairman Jack Rice towing Summer out of Leicestershire in his scarlet "Tiger Moth" against a background of flaming sunset would not be altogether inappropriate. His machine has performed yeoman service in giving members aero-towing experience, and many will associate this year's fine flying weather with pleasant memories of sun-spoiled Rearsby vibrating to the drone of the "Tiggy."

Ginger-bearded Ted Felce might be included in the scene—the whole entitled "The Squire and Messiah," since that was the self-applied description that Jack and Ted touted round Peterborough when the Club swooped down upon Upwood R.A.F. Station for the Battle of Britain celebrations.

In his "Olympia," Jack parted company with the cockpit canopy

during an exhibition of aerobatics. The resultant turbulence over the elevators brought him down in rather a hurry. Despite the single mishap, Jack, Ted, Arthur Sheriff, Dave Jephcott, and Doreen Knight all had a thoroughly good time " with the Service."

Amongst newcomers to aero-towing technique was Frank West, who is now as well-known to Leicester as to Dunstable folk, and a couple of ex-Navy pilots who found hanging on to the end of the string rather different from pulling it.

No. 85 WING GLIDING CLUB

Gliding is in full swing at the No. 85 Wing Gliding Club located at Royal Air Force Station, Ueterson, Germany, the site a flat surface, one does not expect very much in the way of thermals, etc. This, however, has not deterred the members of the club ; for example, six members have obtained " C " certificates this summer, especially good shows being Derek Bolton's flight in the " Olympia Meise " of three hours and twenty-one minutes, this time being achieved in a very strong morning thermal having entered cloud base at 4,770 feet, and reaching a height of 5,750 feet.

Unfortunately, not having very much cloud flying experience, Derek, having seen his tie come up to the level of his nose, decided to pack in the cloud flying there and then.

Bert Malaney, with F./O. Norman Allsop as passenger, took the " Kranick " up to 6,300 feet in a very strong 3 metre up thermal, but also had to come out of cloud, ably assisted by Norman, another case of lack of cloud experience. On. this trip Bert unfortunately omitted to carry a barograph, otherwise the flight, at that time, would have beaten the British twin-seater height record.

Special mention is also due to Petty Officers Tasker and Britton, R.N., who, after only five months' flying, have obtained their " C " certificates, and in addition one leg of their Silver " C."

This past few months has seen the departure of many of our old friends, one especially being Silver " C " Mark Twomey, who, I understand, is starting a gliding club in Kent. Mark has all the very best wishes for the future ; he was an inspiration to the club as an instructor, and I am sure will succeed in his new venture, so once again good luck, Mark " 2ME." As for our other demobbed members, may we also say good luck and good gliding wherever you may be to F./Lt. Jimmy Green, our late C.O., Cpl. Pollard, Jock Leith, and F./O. Norman Allsop.

I think also, that before we close our chapter, that a special " thank you " should also go to S./Ldr. Paddy Seymour, who held the very unsought-for position of C.O., Officer i/c. Repair, O.C. Flying, etc., a job of work not often thankful, but I'm sure was appreciated by all members alike. Our loss, however, is R.A.F. Lubeck's gain, as he is now a member of Lubeck Gliding Club.

To all our past demobbed members we extend all our good wishes, and hope for a reunion next summer at Mark Twomey's.

T.A.M.

DERBYSHIRE AND LANCASHIRE GLIDING CLUB. September.

1st. Wind S. 5 m.p.h. A few members made arrangements to spend the week at the Club ; Mrs. Smith and Mrs. Kaye kindly arranged to cater for them. The first day was unsuitable for soaring, but Midwood, Benton and Thomas shared thirteen circuits in the " G.B. II."

2nd. Wind S. 5 m.p.h. Gerry Smith and Cyril Kaye had their " Olympias " out but only for circuits. The " Cadet " was brought out for Robin Dolan. In view of his promising form he was sent for his first circuit and obtained about 600 feet on the launch. To lose this unusual height, he merely threw a couple of circles before coming in to land, an excellent performance which gained him his " B " Certificate.

3rd. Wind W.N.W. 15 m.p.h. A beautiful soaring day. First off, Harry Midwood failed to find sufficient lift, but was quickly followed by two " Olympias " which soon reached cloud base at 3,000 feet. Harry tried again in the " G.B." and was soon well up. Gerry Smith followed in the " Spalinger " with his son Roger, who enjoyed almost every minute of his flight. Cyril Kaye had four flights, three in his " Olympia " and one in the " Spalinger " with young Michael Kaye, totalling 1 hour 40 minutes. G. O. Smith had two flights in his " Olympia " and two in the " Spalinger," totalling 3 hours 19 minutes. Harry Midwood had 3 hours 20 minutes in the " G.B.," " Kite " and " S.25." Eddie Swale had 2 hours 15 minutes in his " Olympia," and various other members had flights of approximately one hour each. The lift died down at tea time, but as soon as the sun was low the evening thermal started, and the " Spalinger " came down through the strongest lift of the day as darkness fell.

4th. Wind S. 5 m.p.h. Like the day after the Lord Mayor's Show. Thursday was good for a few desultory circuits only by R. Dolan in the " Cadet."

5th. Wind W. 15 m.p.h. Ron Claudi came down from Scotland to spend a few days with us. We would have liked him to have been with us on Wednesday. However, although Friday made a poor start without any results until after 3 p.m., it developed into quite an interesting day. After several unsuccessful attempts Gerry Smith eventually managed to get well up, joined by Cyril Kaye and Claudi. The wind then was south of west and all the lift seemed to be under the heavy threatening clouds which were drifting over. Most of the soaring was done several miles east of the site. Shortly after 4 p.m. a front approached from the north-west, veering the light wind on to the north-west slope. Robin Dolan was launched in the " Cadet " to attempt his " C " Certificate. The " Cadet " climbed rapidly to 1,000 feet and Robin stuck it for an hour until the storm broke and washed him out of the sky. The storm cleared after tea and an "Olympia " was launched but was immediately enveloped in cloud. The pilot found his way back ten minutes later, to be welcomed by his co-partners with touching solicitude.

6th. Wind W. 15 m.p.h. The light westerly wind persisted and few pilots managed to strike a good patch. George Thompson contacted a cloud in the " G.B." and spent nearly an hour around 3,000 feet almost entirely in thermal. Fred Breeze in the " Kite " and Harry Midwood in the " G.B." managed to have good rides. Gerry Smith took off in the " Olympia," and after hanging

about over Hathersage for two hours eventually set off down wind and landed at Woodhall Spa about 65 miles away. Cyril Kaye and Stan Armstrong gave passenger flights in the " S.25."

7th. Wind S. 10 m.p.h. The wind was insufficient for hill lift on the south slope. The only pilots who managed to catch thermals were Robertson, Coleman and Faulkner in " Olympias " and Leech in the " G.B." The latter put up a black by misjudging his approach and having to land at the bottom.

13th. Wind W. 15 m.p.h. Midwood was first off in the " Kite " and went up to 2,350 feet quickly. Later on the lift gradually deteriorated, Alf. Verity and Stan Armstrong had an hour each in " Olympias " and ten trainees flew the " Tutor."

14th. Wind S. 30 m.p.h. In spite of an adverse forecast, conditions seemed fit after lunch. Armstrong was first off in the " Olympia " on the south slope, but applied his brakes almost at once to keep out of cloud. Duncan Swale, Charles Verity, Faulkner, Shepard Coleman and Taylor flew " Olympias," Jefferson and Midwood flew the " Kite," and Richardson, Wardale and Margaret Swale flew the " Tutor."

20th. Wind S. 10 m.p.h. Robertson and Tony Dolan nearly contacted a small front which came over from the west, and Armstrong and Louis Slater each managed about a quarter of an hour in " Olympias." The " Tutor " and the " Cadet " did high hops and circuits. Geoff Russell, after a particularly sinuous high hop, during which he managed to squeeze in at least four tight turns, was sent for a circuit, which he managed in good style.

21st. Wind W.N.W. 40 m.p.h. The wind was very strong all day and at first no effort was made to begin flying until Stan Armstrong started things going. Unfortunately he lost the toss and Robertson, his partner, flew first. Thompson flew next in the "G.B." and Harry Midwood was put in the " Kite," but before the all out signal was answered the " Kite " took off and moved slowly backwards on the wire about 15 feet up. It came to rest with a bump, which loosened the main fittings slightly. Midwood needs more practice in flying backwards.

Pilots soon became accustomed to the sticky take off and kept air brakes on until they were well off the ground. Launches were started from half-way down the hill.

27th. Wind W. 20 m.p.h. Conditions were poor in spite of the strong wind. Roger Dickson struck a good patch at 5 o'clock and went to over 2,000 feet. Leech at 6 o'clock also managed nearly half-an-hour, but no one else managed to stay up at all.

28th. Wind W. 20 m.p.h. All types of machines soared throughout the day. Margaret Swale had 1 hour and 40 minutes in the " Tutor " and Robin Dolan had 25 minutes in the " Cadet." Three " Olympias " and the " G.B. II " were also out. Altogether 23 pilots shared 39 launches and 19½ hours' soaring between them. Later on Geoff Russell did two circuits in the " Cadet " to complete his " B " Certificate.

The weather during September has continued mainly fair and warm, but on one or two occasions a strong wind presented an opportunity to get back into practice for the more robust hill soaring conditions of winter time. There has been little or no rough weather since Easter, and newly-qualified pilots spoon-fed for months on thermals and smooth lift may find that there is still something to be learned about plain hill-soaring. Recent experience has shown that machines with efficient air brakes can be handled on the ground in conditions quite unsuitable for machines without them. For some time ground handling has been the limiting factor in rough weather at Camphill, and no doubt other Clubs are fully aware of the fact that good air brakes frequently mean that a machine is in the air instead of in the hangar.

Heartiest congratulations and good wishes to Heck Booth and George Benson. Mr. Hesketh Booth and Miss Audrey Hart were married in Altrincham on September 27th, and Mr. George Benson and Miss Barbara Lavelle were married in Derby on September 25th.

Summary of flying for September :—Launches, 347 ; flying time, 103 hours ; certificate, 2 " B " and 1 " C."

YORKSHIRE GLIDING CLUB

Flying.—A little sick of recording poor weather and its effect on flying times, and even more weary of the new difficulties which appear in the path ahead, the tale of this month's flying will not take long in the telling. On the 6th, with sketchy hill-soaring conditions, there were 11 launches for 43 minutes' flying—Morison qualified for his " C." On the 7th, with a light westerly wind, Burningham tried conditions in the " Kite," and after about ten minutes of getting nowhere (in the vertical sense) he essayed to land on top near the road. The telephone wires—8 pairs we understand—disputed his right of way, and the " Kite " looks like a write-off. This is a tragedy, as we have no other machine of that class, and nothing German has come our way so far. For the day, 7 launches for 30 minutes' flying. The 13th was a pleasant Saturday afternoon, and six members, including two from Newcastle, took advantage : 8 launches and 4 hours 18 minutes' soaring. The 14th brought gusts up to 40 m.p.h., and there were only three rough trips, totalling 90 minutes. On the 27th, with a very light westerly wind, there were two flights—30 minutes in all. The 28th provided a good " old-fashioned " soaring day—nothing brilliant by ancient standards, but in the light of this year, a real humdinger ! Several flights in " Tutors " over 1,500 feet, and Coulson up to 2,200 feet on one occasion. Good fat thermal current for soaring practice, and 9 passenger trips—even a policeman in uniform called in for a ride ! Total of 24 launches and 11 hours' flying. Total for the month, approx. 18½ hours' flying time.

General.—Even the diehards who go to Sutton Bank every week-end get to the stage where patience ends ; then comes a day like the 28th, and it all seems doubly worth while again. A man once said that you don't have to be round the bend to glide—but it helps ! The A.T.C. is running a course for the Royal Engineers S.M.E. Staff at Ripon—the flying is being done at Topcliffe Airfield. There has been good progress with the training—all *ab initio*. On the 20th, Hartness (senr.) demonstrated with the " Falcon III " at Topcliffe for the Battle of Britain Week flying

display. The A.T.C. hangar is now almost complete, and the new club house needs only finishing touches to the structure.

It might not be out of place to comment on the B.G.A. circular, published in the SAILPLANE, calling upon clubs to legislate against manufacturers flying their development aircraft at club soaring sites. The Yorkshire Club will certainly do nothing of the kind, but it will promise the B.G.A., and any respectable manufacturer who does us the honour of testing at our site, that pilots whose abilities are little more than glib tongues, and who just cannot keep their sticky paws off other folks' aircraft, will be kept under control to the very best of our ability ! We deplore the tendency to sterilise soaring and would rather fight against unwelcome legislation than construct irksome laws of our own " lest worse be thrust upon us. . . ." A very cowardly outlook. British gliding should fight to retain the freedom to run its own show in its own way—it has had this freedom for many years and has never abused it, so, let us have a more bellicose B.G.A. !

The accident recorded this month was the third to the same machine, and on each occasion an experienced pilot was in charge. When aircraft are broken for the sake of a few minutes' flying, and therefore not available on the next grand day, what a pity it is that we don't take the lesson to heart permanently.

Tailpiece.—In these glorious days of the " seller's market " we hear of a " buy-and-flog-it " type who complained bitterly that he had been twisted over an aircraft deal :

" They said it was a " Fuselage," complete," he moaned, " but when it arrived, it hadn't any ruddy wings ! "

135 WING GLIDING CLUB

On August 27th, 1946, 135 Wing Gliding Club was formed and the first launch made. Now after one year we have completed over 4,000. To most of the dozen or so people, who became the first members of the club, gliding was an entirely new experience. Even the language seemed different, words such as " thermal " and " lapse rate " conveyed little or nothing to them. Thanks, however, to the untiring efforts and excellent tuition of the chief instructor, Herr Kronefeld, and his colleagues, the mystery gradually unfolded.

Most of the early enthusiasts were R.A.F. pilots, who, after a hop and circuit in the primary, went straight on to do a circuit in the other glider—a " Grunau 11 1b.' The non-flying members started entirely from first principles with the orthodox ground slide, low hop routine.. Members with previous experience in the A.T.C. showed a greater aptitude during the primary stages of the training than most other *ab initios*.

Almost immediately after the inception of the club, a telephone was fitted from the Chief Instructor's caravan to the winch driver's cabin ; this ensured perfect understanding of the nature of each launch. Initially the primary was pushed back to the starting point, some 1,000 yards from the winch, after each ground slide or hop. Later we introduced the system whereby only half of the full launch was used for elementary flights, then a more experienced member would get in the glider and fly it back to the launching point. In this way the length of the cable was utilised to the full and a lot of work, as well as time, saved.

Gliding continued all through the winter despite the extreme cold. Day temperatures as low as .20C were by no means rare. During February and March, however, we were reluctantly compelled to discontinue our meetings because of the heavy snowfall.

By Easter the snow had all melted and we were able to recommence activities. The warmer weather brought thermals of increasing vigour ; this became obvious when the existing endurance record of 17 minutes was quickly boosted to 24 and then to 90 minutes. In order to take full advantage of thermal activities, all the sailplanes were fitted with gravity point hooks and the cable lengthened to 1,850 yards. We were then able to get an average of 2,000 feet on a full launch ; on one occasion a height of 2,500 feet was attained. This happened late in the day when the air was stable, the wind being about 10 m.p.h.

It should be mentioned here that we are entirely dependent on thermal activity for the prolongation of flight. Being situated as we are in the centre of the North German Plain, there are no hills from which to get orographic lift

With the approach of midsummer we started gliding in the evenings, this relieved the pressure at week-ends and allowed us to go ahead with intensive training on the primaries. By the end of May, thanks to the excellent repair work done by the staff, our machine strength had increased to six—2 primaries, 3 " Grunaus," and 1 " Rhone Bussard." More recently we have obtained a " Kranich " two-seater, which is used to give instruction on soaring to the sailplane pilots.

June was our best gliding month, when 1,100 launches were made—more than one quarter of the total for the entire year. On the first day of that month, the club's secretary, F./O. P. A. Latham, remained airborne for 5 hours, 25 minutes in the "Bussard." Another member, F./O. A. D. Rudin, climbed over 11,500 feet in the fully-canopied " Grunau 11." Next evening the secretary also attained Golden " C " height, the last 3,000 feet being in cloud. It was only when his instruments and wings severely iced-up that he had to abandon the climb.

Other members put up good shows at this time, both LAC Beck and AC Pratt exceeded 70 minutes' endurance. The former member qualified for Silver " C " height in June ; Pratt has since achieved this distinction, as have seven other members.

August 13th was a remarkable day for the club—all the gliders were flying simultaneously. The " Bussard " and the " Grunaus " stayed up for over 2 hours. The sextet was completed by ACGold with a 12 minute, 20 second flight in the primary.

Despite the numerous opportunities and favourable conditions for cross-country flying, we have been unable to undertake them because of the acute transport situation. We have, therefore, had to confine our activities to endurance flights and height climbs.

Of the 70 members of the club, during its first year

54 have qualified for 'A' certificates
38 ,, ,, ,, 'B' ,,
23 ,, ,, ,, 'C' ,,

as well as the other achievements mentioned previously.

The baby, 135 Wing Gliding Club, has grown into a vigorous child since it was born one year ago ; we hope its development will be equally satisfying next year.

Are you forming a Gliding or Flying Club? If so, a brochure on how to do this, written by an expert, may be obtained from the offices of SAILPLANE & GLIDER, price one shilling, post free.

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LETTERS TO THE EDITOR

An unusual phenomenom was witnessed near my home one summer evening.

A small copse of trees about 50 yards by 100, was giving off a continual cloud which formed some 6 ft. above the top of the trees, and rose to a height of 50 or 60 ft. in some cases before dissolving. These clouds appeared to be stationary at their bases in some cases, and the movement in them appeared to be quite violent. The diameter of the largest cloud would be approximately 6 ft.

It would be interesting to know if this has been previously noted, as it is certainly the first time that I have ever heard of a visible " Evening Thermal."

W. G. EDWARDS.



" Evening Thermals."

I must apologise for troubling you with a letter in very bad English, but my reason is as follows :—" I have been so happy to get a copy of your SAILPLANE AND GLIDER which does interest me so much that I would like to discuss some of the aviation problems with a young man who is, like me, interested in aviation and gliding. I am twenty-five years old and would be happy if you would give my address to a young glider pilot.

Referring to your publication I would like to say that in my opinion it is a most interesting magazine, and I am sorry that I cannot get it regularly. Do you deliver nowadays to Germany, too ?

Many thanks in advance.

MAMFRED LANDECK,
Meldorf, I Brieter Weg 5,
Germany.

The Secretary of the British Gliding Association wrote me that he sent my last letter of the 28th July to your office. He think that you will be able to assist me in communicating with a gliding enthusiast of your country. I hope that an exchange of our minds will be a little step towards understanding and friendship between the nations.

You will know soaring is forbidden in Germany. But the German aviators have their heart in the right place. So in Gottingen and Stuttgart Model Glider Clubs are founded. This day I spoke with an American officer concerning the German youth activity. He will help us by founding a Club in Frankfurt, and I hope that we can begin to work within a few weeks. All this will take a long time and be difficult, but you and all comrades of the other parts of the world can make this way easier by showing us that we are not outside the intercourse. A discussion about past and future German soaring will clear very many problems and questions and perhaps it will give us more hope to the end of our work.

Apologising for troubling you.

HANS DEUTSCH.

(16) Frankfurt A.M.,
Ruppertshainerstr 14,
U.S. Zone, Germany,
Land Hessen.

Next year the International Competition will be held, and we all hope the British team will walk away with it, but what machines are we going to give them to back them up with? Switzerland is coming out with many new designs, including a "laminor flow" single-seater of colossal performance (on paper): Czechoslovakia is doing the same, and from America comes news of many new types like the "Prue 160," "Roy Ranger 2," and "Super Albatross." No doubt Sweden, and all the other countries



F./Lt. H. Neubroch stands aghast at his own ignorance regarding the modern technique of front soaring. Mrs. Platt will stand no nonsense. Raison d'être: (letter to the Editor.) (August issue.)

---

entering are doing likewise. What will the British pilots fly? Are we going to let them fly old machines like the "Weihe" (designed 1938) and the "Olympia" (designed 1939), or are we going to produce something new backed by the experience gained during the war?

Surely we can produce something "Post-war" for them—something capable of beating all other types, and so proving Britain's superiority not only in piloting but in design and construction of sailplanes. No doubt the "Olympia" is an excellent machine, as proved by its wonderful performance in America, but I rather fear many of the Continental designers have something up their sleeves, and we must not be caught napping.

That Britain can produce this "super-sailplane" is obvious, judging by the difficulty the B.G.A. is having over judging the entries for the two-seater design competition.

I suggest that the Technical Committee of the B.G.A. really gets down to this matter, and draws up a design board comprising of the entrants and judges in this competition to join forces and combine to make Britain's entry a really super one. I know that in most of the entries there were many unusual and very fine ideas incorporated, both in design and constructional methods, and I would most emphatically impress upon people the necessity to join forces, discuss the various schemes thoroughly, and eventually put forward a design that will be a justice to British design, skill and construction.

These are my feelings about the two-seater design competition too, and we shall not really advance unless we build a machine which incorporates all the best ideas from the 20 entries sent in for the competition. It is obvious that no individual entry can be so perfect in itself that the original idea in the other designs cannot be adapted and incorporated into producing a really fine two-seater sailplane which will be of great use to the clubs, as well as help in the export drive.

However, time is short, and if we are to have a machine designed and built by the time the Internationals are on us, we must start work straight away, and it is up to the Technical Committee of the B.G.A. to get cracking.

I am sure the designers will not fail them, nor will any enterprising firm of constructors like Elliotts of Newbury.

P. R. WIJEWARDEN.

It seems likely that auxiliary engined sailplanes may soon be produced in numbers not, perhaps, very large, but still sufficient to raise problems as to whether flights made by them are, or are not, to be recognised as soaring flights for certificate or record purposes.

A glider or sailplane is an aircraft to which an external source of power—catapult, winch, or towing plane — may be temporarily attached for launching purposes, but which has no source of power permanently attached.

Auxiliary engines will probably divide into four classes.

(*a*) An engine unit which may be attched to a plane for transport, *e.g.* back to the starting point after a soaring flight.

Without the engine the plane would be a pure sailplane, and any soaring flight it made would be recognised ; but what would be the position if the pilot carried the engine packed away inside the plane on his soaring flight, and unpacked and fitted it after landing, in order to fly back ? Again, the engine might be a fixture, and only the propeller need to be fitted for power flying.

(*b*) An engine unit attached to the plane for launching only. Once the plane is in lift the engine may be jettisoned, to return to earth by parachute. (This would never be allowed in this country, of course, but would be quite practicable in the " wide open spaces.")

This would be a method of getting very high launches, with complete control by the pilot, and once the engine was away the plane would undoubtedly be a pure sailplane.

(*c*) An engine unit permanently attached to a plane for launching only, being stopped and retracted or otherwise faired over once the plane is in lift.

In this case, though the flight would be by soaring, the machine would not be a pure sailplane, having an engine permanently attached.

(*d*) A retractable unit, similar to (*c*), but capable of being re-erected and re-started whilst in flight.

With this, any claim to have made a soaring flight would have to be accompanied by proof that the engine had not been re-started after the launch. This might be done, say, by connecting the ignition switch to the barograph, and recording on the chart whenever the switch was " on."

It will be seen that there is plenty of room for argument, and I think that the authorities should issue some quite definite rules at an early date, so that people who would like the advantages of an auxiliary engine, but do not wish to be debarred thereby from attempts at certificates or records, may know just how they stand.

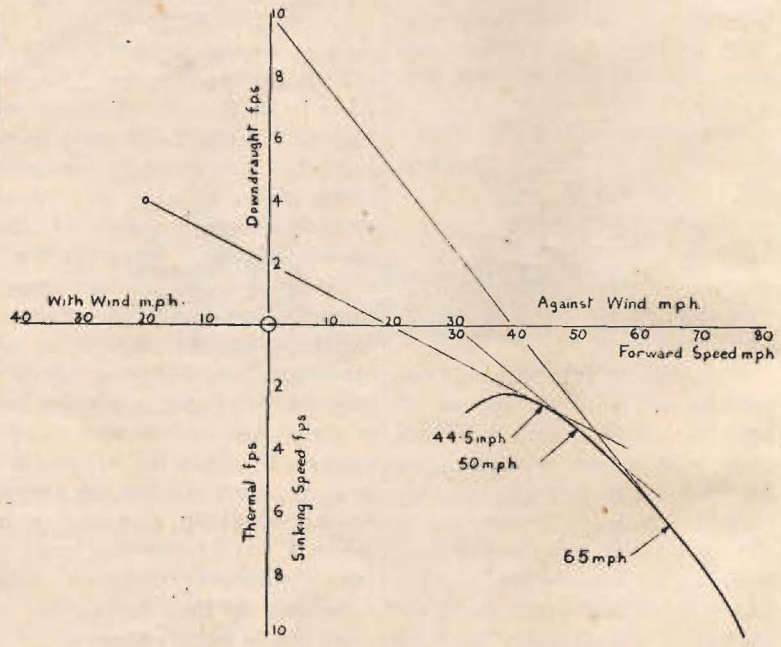
F. P. NEWLEY,

Collier Row, Essex.

It seems that the discussion of best flying speeds will remain with us as a hardy annual. I only write now to draw attention to a letter published in your September 1938 number, which for me is the first and last word on this controversial subject.

I realize that the only 100 per cent. method of knowing the correct airspeed for any given set of conditions is to take Mr. Wills along as passenger, but for those that do their flying from an armchair I can thoroughly recommend the following method to save wear on the slide rule. I did discover the method independently but was only convinced of its validity after reading Mr. J. C. Wilson's letter to you as mentioned previously. A description follows.

Take any sailplane performance graph and extend the x axis to the left, and the y axis upwards. Step off on the negative branch of the x axis wind speeds to the same scale as the forward speeds. Step off on the upward branch of the y axis downdraught speed values to the same scale as the sinking speed. The figure shows the arrangement.



The best air speed in still air is found by drawing a tangent to the curve from the origin. This is common knowledge, but what seems to be so often overlooked is that other tangents can be drawn by " displacing " the origin. These tangents touch the curve at the best cruising speed to give the optimum " extraction " rate under any chosen set of conditions of wind and vertical currents. Examples best illustrate the method.

1. What is the best speed against a wind of 30 m.p.h. with no vertical component.

Place ruler to cut x axis at 30 m.p.h. on " Against Wind " scale and position it tangential to curve. The point of tangency is at approximately 50 m.p.h.

2. What is the best speed to cross a downdraught of 10 f.p.s. ? Place ruler to cross y axis at 10 f.p.s. downdraught and point of tangency is 65 m.p.h.

3. What is best speed to cross downdraught of 4 f.p.s. with following wind of 20 m.p.h. ? Place ruler at point with co-ordinates 20 m.p.h. " With Wind," and 4 f.p.s. downdraught. Ruler touches curve at 44.5 m.p.h.

For use in the air I suggest either a chart, or a small board with a thin plywood curve glued on in the correct position. A series of displaced origins should be marked and drilled with a 1/16 inch drill. The ruler should have a pin in one end in line with the edge.

A. G. PAYNE.

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GLIDING CERTIFICATES: "A" .. 192 (6951—7142)
"B" .. 89
"C" .. 73

SILVER BADGES: 12

No.	*Name*	*A.T.C. School or Gliding Club*	*Date taken*
	"B" CERTIFICATES		
1940	James Morrow	44 G.S.	10. 8.47
1952	Donald Anthony Victor-Trott	4th Armoured Brigade	27. 8.47
2000	Edward Ernest Geall	151 R.U. (A.)	20. 4.47
2183	Herbert John Adams	London G.C.	9. 8.47
2485	John Herbert Granville White	B.A.F.O. G.C.	29. 8.47
4726	Roy Brooke	29 G.S.	12. 7.47
2901	Dennis Allen Monckton	84 Gp. G.S.	8. 6.47
4012	John Henry Holder	4th Armoured Brigade	31. 8.47
5757	Christopher John Clayton	143 G.S.	22. 8.47
5920	Ronald Gotts	161 G.S.	10. 8.47
6441	Thomas Porteous	Scottish Gliding Union	10. 8.47
6631	Philip Caro	Leicestershire G.C.	30. 8.47
6799	Frank Roy Padgham	143 G.S.	22. 8.47
6808	William Henry Tweedy	London G.C.	10. 8.47
6829	John Archbald Little	Newcastle G.C.	31. 8.47
6871	David Alfred Whitworth	Derby and Lancs.	31. 8.47
6877	William Morris Brady	167 G.S.	17. 8.47
6903	George Rowland Edwin Constantin Gregory	Surrey G.C.	23. 8.47
6951	Ajeet Singh Judge	84 Gp. G.S.	21. 6.47
6960	Peter William Dowty	50 G.S.	27. 7.47
6961	Peter John Ayres	135 Wing	5. 4.47
6962	John Frederick Godley	London G.C.	11. 8.47
6963	John Walton Hill-Wilson	84 Gp. G.C.	14. 7.47
6965	David Henory	Scottish Gliding Union	13. 7.47
6968	William F. Jorden	Surrey G.C.	7. 3.47
6971	David Carwardine	85 Wing G.C.	28. 6.47
6972	Henry Bownass	140 Wing G.C.	31. 6.47
6975	Dennis Victor Spence	Somerset G.C.	24. 8.47
6977	Stanislaw Felix Szymanski	Polish G.C.	18. 8.47
6978	William Edward Warcup	29 G.S.	23. 7.47
6979	Robert Thomas Taylor	167 G.S.	17. 8.47
6980	Eric George Smith	84 Gp. G.S.	25. 7.47
6983	Robert George William Meades	140 Wing G.C.	8. 3.47
6884	Peter Charles Sandeman Tupper-Carey	140 Wing G.C.	1. 8.47
6985	Gunnar Hegg	84 Gp. G.S.	10. 5.47
6986	Gordon Anthony Boddington	151 R.U. (A.)	22. 6.47
6988	Iowerth Roberts	Lubeck G.C.	14. 7.47
6990	Alfred Williams	B.A.F.O. G.C.	10. 8.47
6992	Authony James Latter	4th Armoured Brigade G.S.	4 8.47
7000	Harold Charles Thomas Robins	95 G.S.	31. 8.47
7001	Raymond Hartley	B.A.F.O. G.C.	30. 7.47
7014	Reginald Pater Merritt	Surrey G.C.	23. 7.47
7015	William Anthony O'Neill Waugh	84 Gp. G.C.	23. 7.47
7020	Philip Kefford	Somerset G.C.	25. 7.47
7021	Kenneth Willie Costin	12 Gp. G.C.	16. 8.47
7022	Edward Charles Lane	Ditto	8. 8.47
7024	Gerald Herbert Goodair Threlfall	Lubeck G.C.	21. 5.47
7029	John Aubrey Brown	50 G.S.	28. 8.47
7032	Peter Johnson	84 Gp. G.C.	17. 7.47
7038	Alaistair Chalmers	135 Wing	24. 6.47
7039	David Andrew Coomber	82 G.S.	17. 8.47
7040	John Beech	50 G.S.	13. 7.47
7041	Sidney Richard Painter	Ditto	27. 7.47
7048	Charles James Bede Jarrett	R.A. Aero Club	21. 5.47
7049	Richard Lawrence Leach McCullough	64 Gp. G.C.	19. 6.47
7050	Alfred George Winter	London G.C.	9. 8.47
7052	John Robert Cecil Manners	84 Gp. G.C.	22. 7.47
7056	Syduey John Crawley	166 G.S.	29. 8.47
7059	Frederick David Bowles	84 Gp. G.S.	15. 7.47
7060	Richard Victor Watson	Surrey G.C.	27. 4.47
7065	Ronald Shutes	B.A.F.O. G.C.	25. 6.47
7066	Henry John Walker	151 R.U. (A.)	26. 7.47
7068	Michael Vadim Adamchick	Derby and Lancs.	31. 8.47
7069	Gordon Stuart Lane	R.N. Gliding Unit	29. 8.47
7070	John Hurry	London G.C.	30. 3.47
7074	Robert Rollo Gillespie	84 Gp. G.C.	30. 7.47
7075	Ian Ludwig Turk	B.A.F.O. G.C.	13. 7.47
7077	Gordon Edwin Donaldson	Lubeck G.C.	16. 8.47
7085	Richard Cosby Keary	146 G.S.	10. 8.47
7087	Launcelot John Rimmer	Martin Hearn Flying Club	29. 5.47
7089	Dewi Brennig James	London G.C.	6. 7.47
7091	John Noel Gladish	161 G.S.	10.11.46
7093	Alec Salter	18. 8.47	18. 8.47
7095	Paul Leon Albert Raes	16. 8.47	16. 8.47
7096	Robin Patrick Derek Dolan	Derby and Lancs.	5. 9.47
7097	Donald Edward Bremmer	140 Wing G.C.	30. 7.47
7098	Eric Macrae Stewart	Lubeck G.C.	25. 5.47
7100	James Derek Robinson	B.A.F.O. G.C.	13. 7.47
7102	Ronald John Blocksidge	95 G.S.	1. 6.47
7104	Albert Edward Harrison	R.N. Gliding Unit	24. 8.47
7105	John Jamieson Neave	12 Gp. G.C.	30. 8.47
7107	Donald Alexander Shivas	135 Wing	17. 6.47
7111	Derek Murray Tough	12 Gp. G.C.	4. 9.47
7112	Timothy Egerton Herbert Beck	135 Wing	24. 5.47
7132	Arthur Fitzroy Sugden	4th Armoured Brigade	26. 5.47

GLIDING CERTIFICATES—*continued*

No.	*Name*	*A.T.C. School or Gliding Club*	*Date taken*
7133	William Halstead Key	Ditto	3. 9.47
7138	Laurence Bernard Hill	84 Gp. G.S.	12. 8.47
7139	Eric Charles Bean	4th Armoured Brigade	28. 6.47
7142	William Neil Tonkyn	Surrey G.C.	12. 7.47

"C" CERTIFICATES

2000	Edward Ernest Geall	151 R.U. (A.)	26. 5.47
2085	Frank Patrick Geary	44 G.S.	26. 7.47
2101	Harold Bercival Rhodes	183 G.S.	3. 9.47
2181	Denis William Heightman	145 G.S.	7. 8.47
2333	Peter Rankin Wilson	183 G.S.	16. 8.47
2425	Cyril Coleman	186 G.S.	16. 8.47
2495	John Herbert Granville White	B.A.F.O. G.C.	29. 8.47
2645	Lionel Frank Savery	Midland G.C.	3. 9.47
2935	Maurice Riddihough	Ditto	25. 8.47
3003	Peter John Royce	Imperial College	28. 8.47
3522	G. Lewis	68 G.S.	24. 8.47
3620	John Sinclair Macpherson	85 Wing, B.A.F.O.	23. 8.47
2731	Francis Mullany	183 G.S.	16. 8.47
2901	Denis Allen Monckton	84 Gp. G.S.	31. 8.47
3287	Eric Anthony Robert Humpston	49 G.S.	26. 7.47
3838	Cyril Richard Taylor	85 Wing	31. 8.47
3855	Herbert George How	148 G.S.	23. 7.47
3948	Arthur Hobkirk	94 G.S.	26. 8.47
4393	Denis Lennard Coate	144 G.S.	16. 8.47
4441	Philip Bruce Atkins	R.A.E.T.C. G.C.	31. 8.47
5333	Thomas Albert Browning	92 G.S.	28. 8.47
5667	Stuart McKenzie Morison	Yorkshire G.C.	6. 9.47
5967	Paul Gruenberg	140 Wing	9. 8.47
5781	Lyndon George McFarlane	Bristol G.C.	25. 8.47
6148	Michael Jepson Drabble	Midland G.C.	25. 8.47
6268	Anthony John Mander Smyth	84 Gp. G.C.	31. 8.47
6317	John Michael Hintom	Bristol G.C.	31. 8.47
6334	Jerzy Mariam Marderwald	B.A.F.O. G.C.	20. 7.47
6447	J. K. Lance	Bristol G.C.	6. 9.47
6458	James Marston Heron	Ditto	31. 8.47
6581	Charles Theodore Lynas	B.A.F.O. G.C.	30. 8.47
6601	James Edwards	85 Wing	4. 8.47
6603	Alan Frederick Groves	151 R.U. (A.)	10. 8.47
6636	R. J. R. Dyer	84 Gp. G.C.	5. 9.47
6637	John Franklin Seddon	Bristol G.C.	17. 9.47
6711	Michael Turner	B.A.F.O. G.C.	31. 8.47
6876	B. B. Storey	R.A. Aero Club	26. 8.47
6888	Robert Hugh Garnett	Surrey G.C.	17. 8.47
6960	Peter William Dowty	50 G.S.	16. 8.47
6961	Peter John Ayres	135 Wing, 84 Gp.	5. 4.47
6963	John Walton Hill-Wilson	84 Gp. G.C.	18. 7.47
6971	David Carwardine	85 Wing G.C.	4. 8.47
6977	Stanislaw Felix Szymanski	Polish G.C.	11. 7.47
6982	Leslie Holton	29 G.S.	11. 7.47
6983	Robert George William Meades	140 Wing G.C.	17. 8.47
6985	Gunnar Hegg	84 Gp. G.S.	6. 7.47
6986	Gordon Anthony Boddington	151 R.U. (A.)	2. 8.47
6988	Iowerth Roberts	Lubeck G.C.	10. 8.47
7014	R. P. Merritt	Surrey G.C.	3. 9.47
7015	William Anthony O'Neill Waugh	84 Gp. G.C.	29. 7.47
7024	Gerald Herbert Goodair Threfall	Lubeck G.C.	17. 8.47
7032	Peter Johnson	84 Gp. G.C.	20. 8.47
7049	Richard Lawrence Leach McCullough	28 G.S.	29. 8.47
7052	John Robert Cecil Manners	84 Gp. G.C.	30. 7.47
7058	David Alan Imlay	84 Gp. G.C.	6. 8.47
7059	Frederick David Bowles	84 Gp. G.C.	31. 8.47
7060	Richard Victor Watson	Surrey G.C.	3. 9.47
7066	Henry John Walker	151 R.U. (A.) B.A.F.O.	26. 7.47
7069	Gordon Stuart Lane	R.N.G. Unit	29. 8.47
7070	John Hurry	London G.C.	26. 5.47
7075	Ian Ludwig Turk	Air Hq. G.C. B.A.F.O.	31. 8.47
7077	Gordon Edwin Donaldson	Lubeck G.C.	16. 8.47
7087	Launcelot John Rimmer	86 G.S.	29. 8.47
7089	Dewi Brennig James	Loudon G.C.	5. 8.47
7096	Robin Patrick Derek Dolans	Derby and Lancs. G.C.	5. 9.47
7097	Donald Edward Bremner	140 Wing G.C.	17. 8.47
7098	Eric McRae Stewart	Lubeck G.C.	4. 9.47
7100	James Derek Robinson	Air Hq. G.C. B.A.F.O.	31. 8.47
7104	Albert Edward Harrison	R.N. Gliding Unit	24. 8.47
7107	Donald Alexander Shivas	135 Wing B.A.F.O.	20. 8.47
7112	Timothy Egerton Herbert Beck	135 Wing B.A.F.O.	31. 5.47
7132	Arthur Fitzroy Sugden	4th Armoured Brigade G.S.	18. 6.47
7139	Eric Charles Bean	4th Armoured Brigade G.S.	2. 8.47

SILVER BADGES

104	P. C. Bolt	(6458)
105	D. L. Pratt	(5264)
106	A. H. Blyton	(6265)
107	J. A. C. Hoare	(6256)
108	G. A. Winter	(6323)
109	C. A. Kaye	(480)
110	W. A. O'N. Waugh	(7015)
111	R. E. Bears	(1006)
112	R. Smith	(5271)
113	J. F. Archbold	(6954)
114	James McCallum	(6324)
115	R. H. Garnett	(6888)

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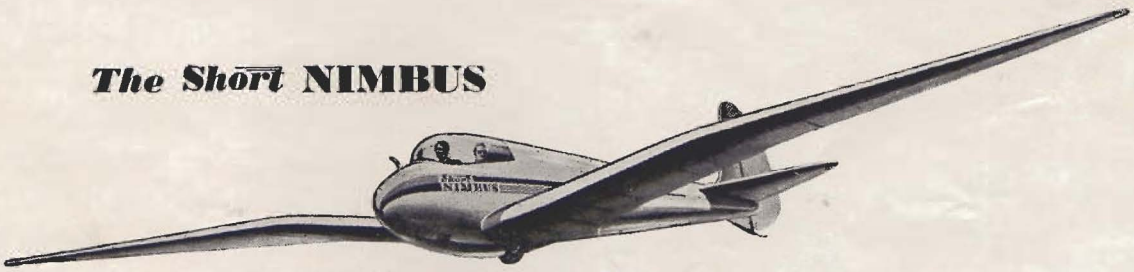
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PERFECTED after exhaustive experiments by Short's team of aeronautical engineers with sailplane experience, the Nimbus presents new features of interest to sailplane enthusiasts.

A low-wing, two-seater, the Nimbus has a comfortable cockpit with the widest possible field of vision for both front and rear occupants. Important features are: dual controls; longitudinal trimming; dive brakes; and the added advantage of Aileron Droop adjustment while in flight. The air frame is also fully bonded to latest requirements.

With its wood monocoque fuselage, Perspex coupé and unobtrusive centre-wheel undercarriage, the Short Nimbus is a sailplane of clean, distinctive design. Ideal for instruction and aerobatics. Launched by winch or aero-towing, it is ideal for dual instruction in advanced soaring.

SHORT NIMBUS SAILPLANE

Wing Area	240 sq. ft.
Span	62 ft.
Overall Length	27 ft. 4 ins.
Aspect Ratio	16
Empty Weight	800 lbs.

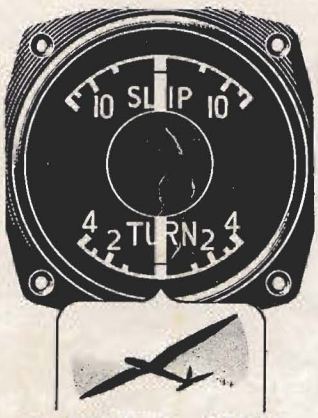
Sea-Level Condition—2 Crew, each weighing 200 lbs.

Minimum Gliding Angle	1 in 25.8
Sinking Speed	2.3 ft. p.s. at 38 m.p.h.
Stalling Speed	35 m.p.h.
Recommended Approach Speed	42 m.p.h.
Maximum Permissible Speed	130 m.p.h.

***Short* NIMBUS**
sailplane

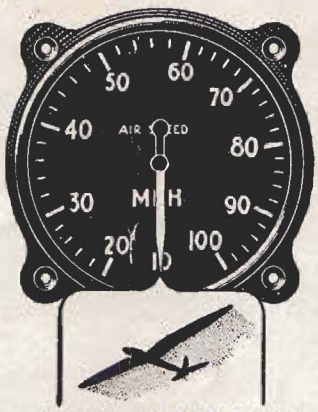
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Essential Equipment



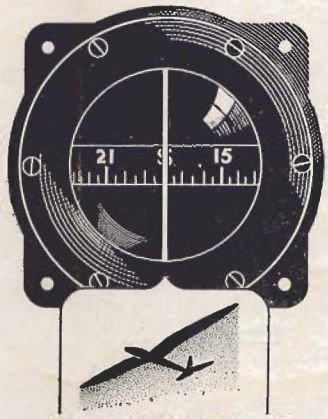
TURN & SLIP INDICATOR

12v. Electrical
Weight—1 lb. 11 ozs.
Operated by dry-cell batteries



AIR SPEED INDICATOR

Special Sailplane Calibration
20/100 M.P.H. *(Single circle)*
or 20/150 M.P.H. *(Double circle)*
Weight 9 ozs.



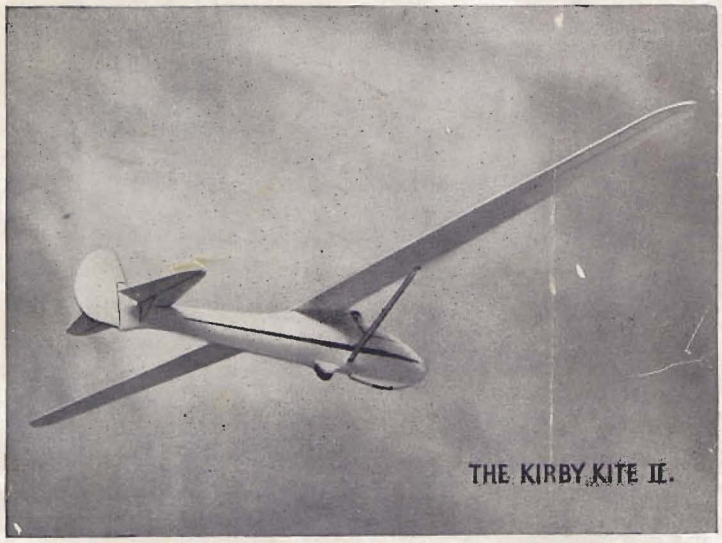
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