SAILPLANE & GLIDING

February — March 1965 3s 6d

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SAILPLANE & GLIDING

OFFICIAL ORGAN OF THE BRITISH GLIDING ASSOCIATION

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Cover photograph: On top, Harland Ross with passenger in R-6; middle, George Moffat in HP-8; below, J. C. "Red" Wright in Sisu 1A, flying over the prairie near Marfa, Texas. Photo by Alex Aldott.

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Vol. XVI No. 1

1965 WORLD GLIDING CHAMPIONSHIPS

THE provisional entry is 31 nations and 87 gliders. The Standard Class is now closed at 47 entries. Some extremely interesting new gliders are coming, including Zefir 3 from Poland, Havukka-Standard from Finland, Standard Elfe from Switzerland, KAI-19 from Russia, D-36 from Germany, ES-60 Boomerang from Australia, HP-12 from U.S.A. and our own Dart 17. If anyone is interested in seeing what can be done in the field of refined design and high-quality aircraft engineering, they should come to the Championships and inspect this display of superb aircraft.

The Organization is working itself steadily into top gear, one of the problems being the very large number of people wanting to visit the event. In order to cope with this influx, the following arrangements have been made:—

HOTELS.—Anyone wanting hotel accommodation in the area during the Championships period should write to Thos. Cook & Son Ltd., Berkeley Street, London, W.I.

CAMPING.—There will be a field opposite the main entrance to South Cerney airfield where gliding people who are not directly involved in the Championships can camp. They must bring their own tents or caravans, but washing facilities are available. There will be a small charge of £1 for a site for a caravan, 10s. for a tent site, and 5s. for a small one-man tent site. These charges cover the period 28th May-14th June, with no reduction for short periods. There is a shop where food, etc., can be bought, and light refreshments will be available on the airfield.

The Opening Ceremony will be on Saturday, 29th May and the Closing Ceremony on Sunday, 13th June. The Prizegiving will be at 13.00 hrs., followed by the final banquet lunch for all competitors and helpers. This will enable those who have to be at work next morning to have time to pack up and journey home on the Sunday evening.

ANN WELCH

CHARGE FOR PRACTICE WEEK.—The number of entries has grown to the point where it has been possible to reduce the charge for the practice week, which accordingly is now £4 per day (per glider, 4 people) with no extra charge for the team manager.

Acknowledgments. — The following donations and offers of equipment are gratefully acknowledged:—

DONATIONS from:
Robert B. Clark (U.S.A.)
Arthur Doughty
Julian R. R. Portal
Grace Whelay
J. Wotherspoon.

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FRED SLINGSBY'S RETIREMENT

MANY are the men, from Lilienthal and Pilcher onwards, who have devoted the major part of their life to the furtherance of the science and art of gliding. Progress in any branch of science of course depends entirely on the practical man who can mould the results of scientific researchers into a usable commodity. Future historians of gliding will undoubtedly accord a place of high honour to Frederick Nicholas Slingsby, who retired on 31st August last from the post of Managing Director of Slingsby Sailplanes Limited.

Born in Cambridge on 6th November, 1894, Fred Slingsby evinced at an early age an interest in practical mechanics and an enquiring turn of mind. As a youth he became aware of the experiments in aviation which were being conducted by the Wright brothers, and not long after the turn of the century he had himself constructed gliders, albeit as models only.

As he grew up this interest developed into an enthusiasm for flying which led him, in March, 1914, to join the Royal Flying Corps. Posted to Belgium in that autumn he served first as an Air Mechanic, and a year or so later on promotion to Flight Sergeant as an Observer/Gunner. He was twice shot down over the lines, and was awarded the Military Medal for gallantry.

After "demob" he took a partnership in business in Scarborough as a furniture manufacturer. In 1930 he founded the Scarborough Gliding Club, and when the early gliders flown by Yorkshire enthusiasts needed repairs it was inevitable that they should be worked on under the supervision of a fellow Scarborough Gliding Club member, a man with long experience of early military aeroplanes, himself now fast becoming a devotee of gliding.

Fred Slingsby gained his C at Ingleby Greenhow in 1931 in a Falcon of his own manufacture, based on the German Falke design. He visited many clubs and entered numerous contests with considerable success. Orders for this aircraft and for the Falcon 3 two-seater started to pour in, to such an extent that larger workshop premises became essential. In 1934 the Yorkshire Gliding Club had been formed at Sutton Bank, and by good fortune contact was made with Major J. E. D. Shaw, himself a pilot with two aeroplanes of his own, who owned considerable property around Kirbymoorside. By the time World War II started, Slingsby Sailplanes Limited was well established in a factory specially built on the Shaw estate.

The works were well adapted to the manufacture of troop-carrying gliders, orders for which, however, did not materialise for some time. It was not, indeed, until 1941 that the factory could be said to be fully engaged on this work and on the construction of gliders for the Air Training Corps. It was these war years, on top of the strain of building up the business from small beginnings, that built into Fred Slingsby's character an element of shrewd caution and conservatism, combined with a willingness to consider new ideas, which has ever been the mark of truly great men.

The post-war years saw the evolution of improved designs, notably the Sky, which won the World Championships in

Spain in 1952, flown by Philip Wills, and the series of Skylarks with three-piece wings. These aircraft have been consistently successful in gliding competitions all over the world, and it is certain that the tally is by no means ended.

The death of Major Shaw in 1955 put the firm in a somewhat difficult position. He had been the major shareholder, and the Inland Revenue was calling for death duties. The problem was solved by the sale of the share capital to the Shaw Slingsby Trust. This body was created by Philip Wills for that special purpose in order to preserve the factory from the doubtful fate of a sale on the open market and thus to ensure for British gliding clubs and pilots the continuance of the supply of Slingsby sailplanes.

The outstanding abilities of Fred Slingsby have not passed without remark. In 1958 he was awarded the Paul Tissandier Diploma by the Fédération Aéronautique Internationale. In that year also he was elected to be a Fellow of the Royal Aeronautical Society whose Council awarded him their Silver Medal for Aeronautics in 1962. On his retirement he was offered and has accepted the title of Vice-Chairman of his firm, and he will remain in close touch with gliding clubs and gliding personalities all over the country. J. E. G. H.

IMPERIAL COLLEGE GOES TO BRUNSWICK

"PLEASE may I see your gliding licences authorising solo flying, aerobatics, instructing and passenger-carrying?"

"We don't have anything like this in England."

"May I see your glider documents then?"

"Here's the C. of A.; will that do?"

"What's the glider's registration number?"

"It doesn't have one."

"But it must; all German gliders have a registration number."

"Ah! But we've a British prototype."

At this, the control tower official at Brunswick Airport, near Hanover, chewed the end of his pencil, carefully scrutinized the C. of A., and with Teutonic thoroughness printed the letters D-ART in the airport log book. With officialdom satisfied, the four of us set forth to rig the Dart in preparation for its first flight over German soil.

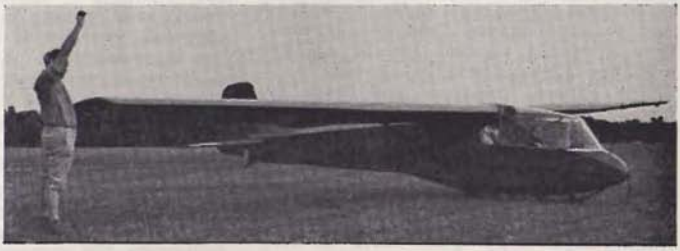
The 1964 OSTIV-IDAFLIEG flight-testing course at Brunswick had already been under way for the first of its three weeks' duration during August, as Karl Doetsch, Bill Kronfeld, Des Lampard and John Bridgewater, representing the Imperial College Gliding Club, began to rig the maroon-and-white Dart prototype in the midst of about twelve other glider types of many different shapes and sizes; 11.5 to 19 metres span, butterfly to high-flying tailplanes, wood to metal and fibreglass construction.

Inquisitive onlookers soon gathered as each diminutive half of the Dart tailplane was carefully placed on the ground and the cable tweaked to start the fuselage rolling out of the trailer. As the wings emerged and were attached, so the number of spectators increased. Not only were photographs taken from all possible angles within and without the glider, but the trailer fittings themselves received their fair share of attention. With the D.I. completed, the assembled Dart was rushed to the aero-tow launch point.

We soon found ourselves taking part in the flight test programme. General handling assessment, stick force measurements, observation of the stalling speeds with brakes open, brakes closed, with and without turn and slip, and estimations of the time needed to reverse a 45° banked turn were but a few of the many tests performed. The tests were carried out with perspex protractors hanging across the inside of the canopy, tape-measures hooked between the instrument panel and the stick, plus sundry springs, stop-watches, microphones and radio aerials filling every available

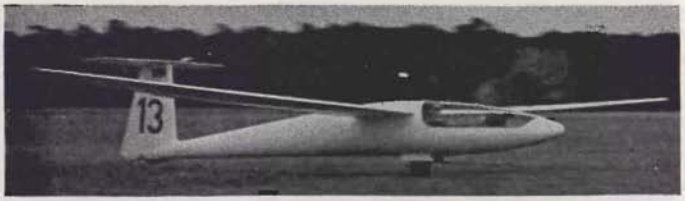
D-34(D)

D-36



Polyt 3

Kria



SB-7

space in the cockpit. In addition, comparison glides were carried out by the Dart with both the K-6 and the Darmstadt D-34(D). The pilot of a chasing Piper aircraft carefully observed any relative changes in height that occurred at selected airspeeds. As expected, the Dart proved superior to the K-6 at the high-speed end, but not quite as good as the D-34(D), an experimental 12.5-metre glider. The mass of information obtained is now being collated in Germany, and it is hoped that a report will be available soon.

Fourteen different types of gliders were available. These ranged from the tailless Fauvel AV-36 and a diminutive 12-metre machine called the B-Spatz to production gliders such as the Ka-6, Ka-8 and to sophisticated "one-off" laminar-flow machines typified by the D-34(D) and the Kria. These latter two 12.5-metre gliders, designed and built by "Akaflieg" student groups, using mainly fibreglass, had advanced laminar-flow section wings with the maximum thickness point located very far aft. Excellent surface finish and refinements, such as retractable or droppable wheels and trailing-edge flaps, gave them a very good straight glide performance, but uncomfortable cockpits and excessive control friction marred their thermalling potentialities.

Experience gained from the aerodynamic and fibreglass techniques used in the construction of these smaller machines was clearly applied to the "next generation" D-36, SB-6 and SB-7 gliders which also put in an appearance at Brunswick. These very advanced gliders were strictly reserved for pundits only. The loss of one of them following an aero-tow incident, and references to vicious laminar flow separations, demonstrated the wisdom of this decision. Since the D-36 will probably be representing Germany at South Cerney, its "hot" performance capabilities will be awaited with considerable interest.

Perhaps the glider that aroused the greatest delight and amusement was a mammoth two-seater designed and built by the students of Copenhagen. Officially this was christened the Polyt, but unofficially it was called (amongst other things) the "flying omnibus"! Despite its prehistoric looks, Clark Y section, and uncertain controls, the Polyt seemed to be under the guiding hands of "Saint Tuborg", to judge from its unbelievable ability to maintain altitude over other gliders in thermals.

In case the reader has arrived at the mistaken impression that the OSTIV-Braunschweig Idaflieg flight-testing course was nothing but drag polars and slide-rule pushing, it should be pointed out that whenever the weather obliged (as it often did), variometers rapidly replaced stop-watches in importance and thermalling soon took priority over evaluation flying. On such an occasion John Bridgewater was fortunate enough to find himself in possession of the Dart, the others having been eliminated by the careful manipulation of a coin. Following the successful completion of a 300-km. triangle the previous day by no fewer than seven pilots, it was decided to attempt a similar task with Lüneburg and Nienburg as the turning points. Here follows John's account of his flight:—

"At 11.30 I pulled off in a blue thermal and started climbing at 6 knots. By the time 5,000 feet had been reached, a small cumulus cloud had formed overhead, and with others starting to form I set off for the first turning point, Lüneburg, in company with a K-6 and the Kria. Navigation presented no difficulties at this stage; it was just a case of following the road.

"However, the second leg was almost

dead into sun, and the haze made visibility very bad. There were no good landmarks, so I flew a compass course for a while. A large lake appeared where there was none marked on the map, and from this I concluded that the compass had an error of about 90°. This was quickly confirmed by the position of the autobahn. Returning to track, I made contact with a K-6 and a Kranich, but soon left these behind. By the time Nienburg had been rounded, the lift was getting weaker, and when it finally died away I was at Grossburgweddel, still 50 km. from Brunswick. There was no difficulty in finding a suitable field. There were plenty of soft ploughed fields, one of which produced a very satisfactory retardation on touch-down. People appeared from all directions, and three cars had stopped on the road by the field before the Dart had stopped rolling."

In due course the trailer arrived behind Bill Kronfeld's Cortina G.T. After thanking the multitude of helpers, we took our leave and returned to Brunswick, where we learnt that four out of eleven aircraft had completed the task.

With cloud base around the 6,000-ft. mark and good lift everywhere, it became a routine custom to fine pilots a crate of beer each time they overflew two hours' duration. The same imposition was applied to pilots who indulged in mild undershoots and to pilots who climbed into the cockpit from the starboard side — this, we were told, was an old German custom! Until then we had wondered why it had been decided to change the canopy hinge position to the port side on the Dart. Needless to say, there was never a shortage of beer at the several very enjoyable barbecues arranged by the German students.

At the conclusion of this extremely pleasant and instructive OSTIV-IDAFLIEG flight test course, the Dart prototype had been flown by over 20 foreign pilots and had amassed a total of nearly 40 hours' flying in two weeks. It compared favourably in performance with German 15-metre machines and was undoubtedly more refined in cockpit comfort and control systems. The keen interest it aroused has created a very favourable continental climate of opinion towards the products of Slingsby Sailplanes Ltd.

There were many contributors to the success of our expedition. Thanks are due to Slingsby Sailplanes for the loan of the Dart prototype, to Pye Telecommunications for the loan of the Bantam and Cambridge radios, which proved invaluable during comparison flying, and to Imperial College Union for its ready assistance. Finally, we would like to thank our friends in Brunswick for their splendid hospitality.

KARL DOETSH, BILL KRONFELD,
DES LAMPARD, JOHN BRIDGEWATER

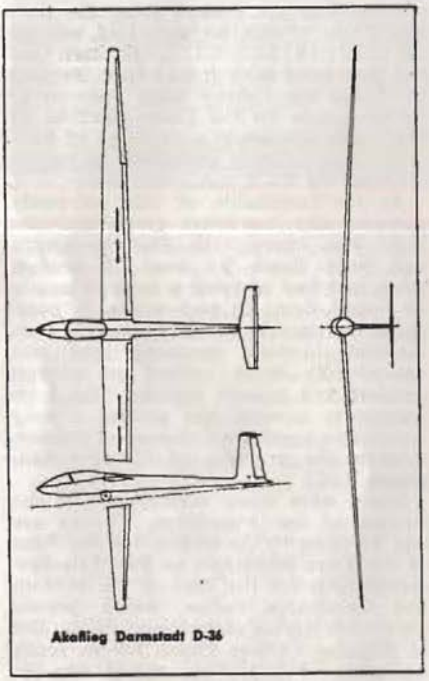
THE DARMSTADT D-36

By GERHARD WAIBEL AND WOLF LEMKE

Translated and abridged from "Aerokurier"

THE D-36 was intended to achieve the maximum possible cross-country speed in weak lift. This requirement was decisive for the design layout. Great attention was therefore given to good performance in circling in thermals. The high strength of the fibreglass-reinforced plastic allowed an aspect ratio of 24 with a wing-section thickness of 13%, which has proved to be the optimum for maximum performance in circling flight. This approach brought the advantage that, if the optimum wing-loading was overstepped, the cross-country speed was relatively little reduced.

It is difficult to maintain laminar flow over a fuselage with a Reynolds Number of 1.5×10^7, yet its drag has a decisive influence, so the blown plexiglass canopy was divided in two and the forward portion attached rigidly to the fuselage. As wind-tunnel measurements by F. X. Wortmann at Stuttgart showed the pitot fitting at the front end of the fuselage



Akaflieg Darmstadt D-36

to have a very disturbing influence, this has been transferred to below the wing junction, and the pressure tube is at the tip of the T-tail. This T configuration was chosen because in aircraft with high aspect ratios it gives the lowest drag compared with other types of tail. The extra weight of the T-tail does not matter in a sailplane of these dimensions.

The flaps occupy 17% of the chord; the hinge is at the lower surface of the wing and airflow through the slit is prevented. The ailerons occupy 25% chord and move in conformity with the flaps. The flap movement ranges from about 10° down in slow flight to about 10° up at extreme high speed. The angle of incidence of the wing and fuselage do not alter with changes of speed.

Speed when circling in thermals lies between 70 and 80 km./h. (38-43 kt.). Time for 45° bank to 45° opposite bank is 5 seconds.

In the construction of the machine balsa-reinforced glassfibre sandwich was used, as developed by the Brunswick group.

Data

Span, 17.8 m. (58 ft. 5 in.).
Length, 7.35 m. (24 ft. 1 in.).
Wing area, 12.8 sq. m. (138 sq. ft.).
Aspect ratio, 24.
Wing section: inner, F.X. 62-K-131; outer, F.X. 60-126.
Empty weight, 282 kg. (622 lb.).
All-up weight (max.), 410 kg. (904 lb.).
Wing loading (max.), 32.0 kg./sq. m. (6.55 lb./sq. ft.).
Safety factor, 10.
Max. permissible speeds: calm air, rough air and aero-tow, all 200 km./h. (108 kt.); winch launch, 110 km./h. (59 kt.).

Calculated Performance

Best gliding angle, about 1 in 40 at between 80 and 100 km./h. (43-54 kt.).
Minimum speed, 65 km./h. (35 kt.).
Minimum sink at 70 km./h. (38 kt.), 0.5 m/s (1 ft. 7.7 in./sec.).

* * *

FLYING THE D-36

By GERHARD WAIBEL

THE machine has shown itself well suited for competition flying and, considering its span, has very good manoeuvrability. It can be made to perform very steep turns. It could hold its own with the K-6 and even climb above it in steady flying conditions.

The flexible wings take up a large dihedral angle. The chief advantage of this great flexibility is that landing jolts and sensitivity to gusts are damped down. The whole aircraft behaves as if sprung, somewhat like a heavy vehicle on the motorway. This, however, has also some disadvantages, and the recumbent posture contributes to the fact that one's sensations are reduced, so that when one enters a thermal, one's perception of the accelerations is too feeble. What is an advantage in strong turbulence is a disadvantage when turbulence is weak.

With the brakes out, the lift is displaced towards the wing-tips, and the flexing of the wings increases. Because of this, there is good ground clearance on the approach, although the wing in

its normal position lies very near the ground. During the very first flights, owing to our lack of experience, it sometimes happened that the wings would brush the ground, but apart from this there are no problems on take-off by aero-tow or by winch launch.

It appears that at high speeds the calculated polars are achieved. In slow flight some improvement was shown to be needed, due not to the profile but to the fact that some air leaked through the airbrake slots.

The landing turned out to be surprisingly simple. The brakes, of which there are two pairs altogether, are very good, although no airflow is possible from below to above through the brake boxes.

The flaps and the new profile have provided a definite reserve performance. This means that in almost all weather situations the D-36 has approximately a 15 km./h. greater cruising speed than the K-6; this naturally gives it a noteworthy lead in a competition. Consequently it is difficult with this machine to join a gaggle [German: *Sperrholzwolke* = plywood cloud], since one is continually getting above and ahead. In addition, visibility below and behind is poor, so that one easily loses sight of the others.

It was a great thrill to fly alongside the Phoebus. The D-36 mostly gained height somewhat, owing to its better performance in turns. It was very interesting to fly with the Phoebus because both aircraft kept well alongside at high speeds. But in slow flight the greater experience of Rudi Lindner gave him a great advantage.

TENTH O.S.T.I.V. CONGRESS

THIS congress will be held at South Cerney during the World Gliding Championships. The provisional programme is:—

Wednesday June 2 or Thursday June 3	Official Opening of the 10th OSTIV Congress.
(Thursday June 3)	(Technical sessions).
Friday June 4	Technical sessions.
Saturday June 5	Technical sessions.
Monday June 7	Technical sessions.
Tuesday June 8	Joint Technical and Meteorological sessions.
Wednesday June 9	Excursion for OSTIV participants.
Thursday June 10	Meteorological sessions.
Friday June 11	Meteorological sessions.
Saturday June 12	General Conference and Closing Party.

Call for Papers

TECHNICAL PAPERS are desired on Aerodynamics, Structures, Airworthiness Design Criteria, Instruments, Training, Equipment—Ground Handling and Sailplane Launching.

Some suggested subjects are: Results

of Flight Measurements—Aerodynamics, Flutter, Fatigue, etc.; Work on Laminar Airfoils at Low Reynolds Numbers; Structures Using New Materials and Methods; Design of Flight Control Systems and Control Surfaces; Analyses of New Sailplane Designs.

METEOROLOGICAL PAPERS are desired on, but not limited to: Meteorological Flight Reports on Record or other Exceptional Flights; Satellite Observations of Interest to Sailplane Pilots; The Flow Profile of Thermals: Advances in Instrumentation; High Altitude Soaring—Experience and Theory.

COMBINED TECHNICAL AND METEOROLOGICAL SESSIONS.—The theme for this session will be: Matching weather, contest task and sailplane characteristics.

Some suggested titles are: Soaring Climatology of Contest Sites; Optimum Meteorological Conditions for Specific Tasks; Optimum Sailplane Characteristics for Specific Contest Tasks; Optimum Overall Sailplane Characteristics for Specific Geographical Conditions.

Authors must submit titles as soon as possible, and completed papers by 15th April, 1965, to:

Scientific Chairman: Dr. Joachim P. Kuettner, 2919, Thompson Circle, SE, Huntsville, Alabama, U.S.A.; or—

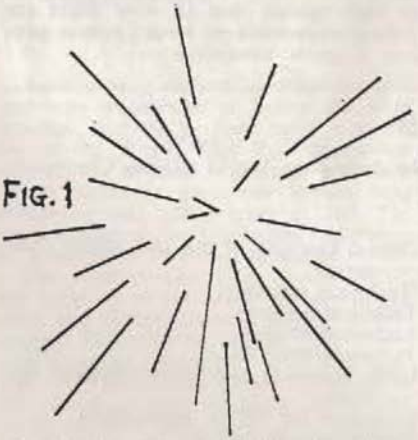
Technical Chairman: Lt.-Col. Floyd J. Sweet (Rtd.), 5649 Massachusetts Ave., Falls Church, Virginia 22043, U.S.A.

Mr. Alan Yates's address during the week is: Coombe Lodge, Blagdon, Nr. Bristol (Tel. Blagdon 503); but he can still be reached at Technical College, Bath.

PICTORIAL ANALYSIS IN FLIGHT

By BRENNIG JAMES

WHEN you fly, you are looking at a picture which is steadily growing and appearing to radiate from a central point which we shall call the point of zero parallax (Fig. 1). At a good altitude



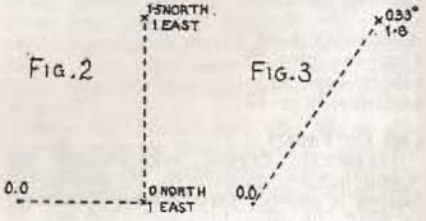
this effect is too slow to be clearly apparent, but flying through rain or snow it is a dramatic sight.

Clearly the point of zero parallax is your destination. The recognition of this point is rapid and instinctive, if, for example, you skid your car; as it begins to spin, your head and eyes will automatically turn to stay fixated on the P.Z.P.

This skill is not specially related to flying, but it is one of the main means whereby you navigate when you walk or run; the effect experienced by a dog when it runs through long grass must be very dramatic and is clearly pleasurable. (If you ever see an object steadily increasing with zero parallax, duck!)

The P.Z.P. tells you where you are going; how do you know where you are? When you are airborne, the earth is your most important navigational aid, since its position will tell you where you are. On the drawing board you establish a position by Cartesian co-ordinates (Fig. 2), but in the air your instinctive position sense is based on radial co-ordinates (Fig. 3).

Three-dimensional positioning is based on the diagnosis of perspective, and it is



well that you should understand how it is done, as it will make your judgment of height and position in the air more easy and accurate. It is best that you should practise this by holding a book in your hand and studying its change of appearance with change of position. Pretend that you are a fly coming in to land on it, having just returned from a mission to the larder. As you fly vertically over the book, you see it in plan view (Fig. 4); you now throttle back and wing-over into your cross-wind leg; another turn and you are on your approach. Two, four, six, all legs down and your airfield looks like Fig. 5. Note that, as you are a good way away, the near and far boundaries look about the same length. As you get nearer, the far one will stay about the same size but the near one will appear to get longer, a process called foreshortening.

Look out—you are much too low (Fig. 6); you know this because the airfield looks too wide in relation to its depth, so shove on full throttle till it looks like Fig. 7; hold it and ease yourself down to a nice gentle six-pointer.

Now keep on practising with your book; it's the cheapest flight simulator you'll ever get!

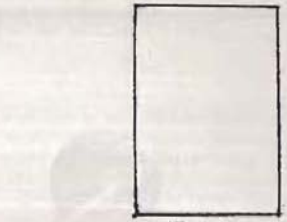


FIG.4

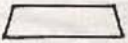


FIG.5

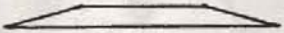


FIG.6

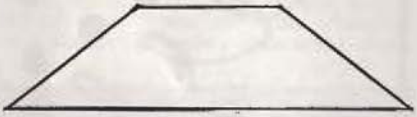


FIG.7

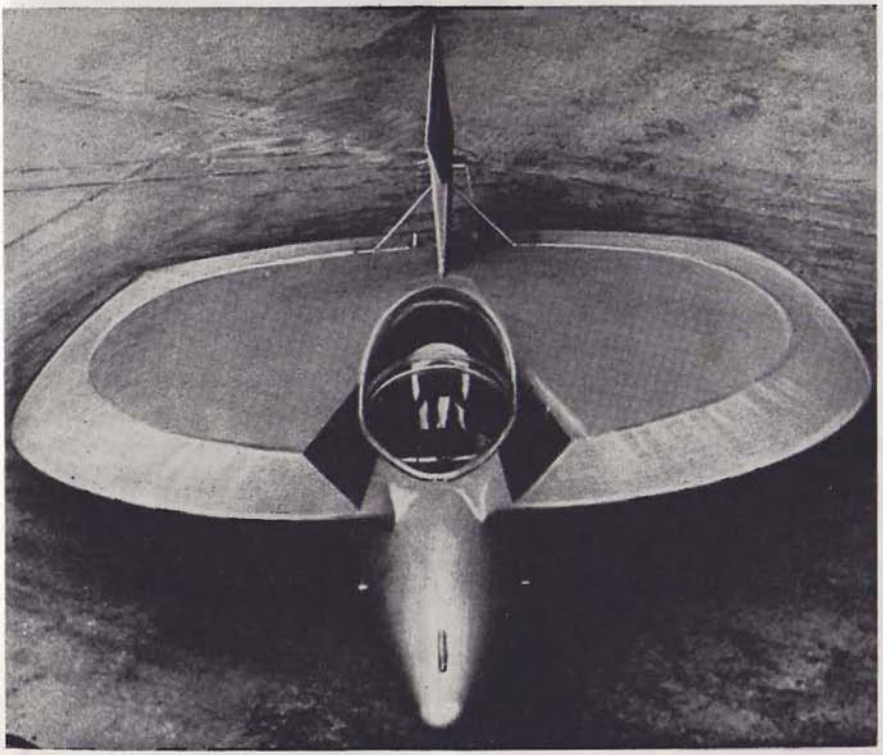
TESTING A SOVIET DISCOPLANE

By V. IVANOV

SPEAKING of sailplanes, one always pictures a slender craft with long, narrow wings resembling a bird. The object that I was to start testing was far from any of these usual conceptions.

Climbing into the cabin of this unusual sailplane, I recalled the stories about "flying saucers", mysterious intruders from strange planets soaring above the Earth at colossal speeds. Several years ago I had already piloted a sailplane with a disc-shaped wing. The Discoplane-1—as the craft was then called—confirmed that a "flying saucer" was not just fiction. The scientific theory, to which M. V. Sukhanov has devoted almost 30 years of his life, insists that the circle is a shape that has equal rights with, and in some aspects is even superior to, the delta-wing which we are used to see on supersonic aircraft.

Imagine a very large bicycle wheel almost five metres in diameter and covered with canvas. From its central hub to the outer rim (called the circleron) there run thousands of spokes made of piano wire. This simple and original construction has proved to be light-weight and robust. One side of the disc houses the pilot's cabin. Its nose, which resembles a rocket head, imparts a streamlined form to the sailplane. There is another disc in the tail part: a similar bicycle wheel but of a smaller diameter. This is the direc-



tional rudder. Two deflecting planes—elevons—are positioned on the rear edge of the wing. They have replaced the elevator and ailerons.

I remember the first time I climbed into the Discoplane cabin. It turned out to be quite spacious and comfortable. There were the same controls and instruments as in a conventional sailplane. True, the field of vision could have been better—the cabin is integrated in the wing and the latter's surface obstructed downward vision. But I could see the ground ahead of me quite well, which was extremely important in landing.

The group that tested the Discoplane had thoroughly prepared for the flight. They had studied carefully the results of runs in the aerodynamic test tunnel—they had to know while still on the ground everything that might happen to the craft in the air. They checked all the craft's assemblies, control system and instruments again and again. Recording devices were installed to give a detailed account of the sailplane's behaviour in flight and to record accurately every movement of its control surfaces.

Everything seemed to be ready. I went through a series of runs and take-offs to a few metres' high. This was essential to determine the craft's stability during the run, for our Discoplane has only one wheel. The designer is of the opinion that this single "leg" is quite enough for the craft to take off into the sky. The engineers proved to be right—the Discoplane is stable, keeps its direction well during take-off, and does not heel over. Only after this very important testing stage were we allowed to make our first flight.

The sailplane was brought to a field near Moscow. It was immediately surrounded by enthusiasts, many of whom knew about my flights on a similar sailplane in 1956. They were amazed at the new craft. They showered us with questions, wished us luck, and immediately christened the Discoplane "Pancake".

The first take-off was scheduled for early morning. We wanted to fly in a calm atmosphere. But the wind started blowing and the first cumuli—heralds of upward currents — started appearing. Soaring pilots usually welcome their appearance, but this time we roundly

cursed. The designer looked despondently at the sky: "Well, are you going to fly?"

I didn't feel like waiting, and decided to take off.

We had a short conference round the sailplane, defined the first assignment: to check the chief flying properties of the Discoplane. Then we made arrangements with Galina Sokolova, the pilot of the towplane, to watch carefully the behaviour of the sailplane and to make an immediate decision if anything untoward happened.

I could see blue gas coming out of the exhaust of Galina's "Yak", I looked around, checked the straps and the parachute lock. I tried the controls with my hands and feet—everything was OK. Then I closed the cabin hood. The tow-cable was attached and we were ready for the take-off.

"Stretch the tow-cable!" came Galina's command. The plane started taxi-ing. I switched on the recording devices, which had to operate from the very beginning of the take-off.

Everything went as usual at first. But when the tow-plane gained speed, I found it more and more difficult to keep the sailplane at the same altitude—the strain on the handle had increased a great deal. The sailplane did not want to climb and I soon found myself far below the tow-plane. I could not right the sailplane by pulling the stick. Moreover, the Discoplane heeled over and only with a great effort did I manage to set it straight again. The flight was getting increasingly difficult. The tow-cable was tearing at the plane. I managed to climb up to 200 metres, but that was the limit. The airfield was close by, and it was a suitable moment to release the tow-cable.

We decided to try again and change the towing speed. Everything went much better next time. There was no heeling over, no jerks of the tow-cable. Obviously on the first flight the speed had been too high. The tow-plane seemed to have stopped dead on the horizon in front of me. There was no strain or anxiety. I could hear only the whistling sound of the air current and the hum of the recorders.

We tried over and over again, with the assignments growing more complicated as the days went by. Minimum speed tests . . . every pilot knows how troublesome and sometimes even dangerous the loss of speed can be, how unstable the plane gets. The surprising thing was that it was the minimum speed that proved to be the Discoplane's stablest régime. And finally came the spin test. I did everything I could to make the sailplane spin, but it was no use, the Discoplane refused to do it.

Strangest of all was the landing. Due to its shape, the sailplane created an air cushion underneath as it approached the ground. This made it exceptionally stable and reduced the landing speed. At the height of a metre or a metre-and-a-half I just stopped all movements of the controls. The Discoplane, without any intervention on my part, would land softly on the ground. I would call it an almost "automatic" landing.

The testing has been completed. It has yielded information of great practical importance. Is there a future for the circular wing? Time alone will tell.

ALAN DEREK PIGGOTT

LASHAM today is known and respected throughout the Gliding World. A great deal of the credit for this happy state of affairs must go to Derek Piggott, who has been our C.F.I. for ten years.

It was in 1953 or 1954 when I met Derek at Farnborough during an Air Show. The Surrey and Army Clubs had just decided to operate jointly at Lasham, and we were looking for a C.F.I. Derek (known in the Air Force as Alan) had been C.F.I. of the Home Command Gliding School at Detling, and his praises were sung throughout the R.A.F. and A.T.C. Gliding Schools. Before joining Detling, he had been an A.1 R.A.F. Flying Instructor on the examining flight of the Central Flying School (that is the top top in Service Instructing).

We offered him the job at Lasham and were delighted when he accepted. Not only did he come to Lasham, but he even brought his glider repair genius—one Cpl. Warren Storey—with him.

Since then the world knows of Derek's achievements. He is absolutely fantastic. The man never walks, he runs. He never stands still, he is always doing something. He worked so hard that he wore out shoes at a faster rate than even the Shoe Trade Research Institute could do. Various shoe firms were persuaded to offer him their indestructible shoes but each time Derek managed to wear them out at Lasham in under six weeks. Eventually a special pair was made which seemed to last nearly six months.

What of his achievements? In soaring he had held the two-seater height record by reaching 18,000 feet in an open T-21 with a cadet. He reached 25,000 feet without oxygen in a thunderstorm which killed numerous people on Ascot Day. The glider was struck repeatedly by lightning but Derek did not mind—he says that he cannot remember certain parts of the flight due to lack of oxygen! He flew the English Channel in an open Primary for the Daily Mail Air Race. Having reached Paris, he returned, jumped into an Olympia 419, was towed to the coast of France and soared to Paris.

He has taken part in various National Championships—always doing extremely well although each time he was flying a new and strange glider. He tested gliders for Elliotts and Slingsby's; he has done most things. One could go on and on —jumping out of the Bocian over the Airwork hangar, Manpowered flight, where he was the first person to get airborne by his own exertions, his aerobatics . . .

This is a *Valete*—and yet we hope that one day Derek will get fed up with the make-believe world of the cinema and return to us. Now he has a film behind him—entitled "Those Magnificent Men and Their Flying Machines". Next year he hopes to do another. During the winter he wants to write another book (his first one—"Gliding; A Handbook on Soaring Flight"—is superb) and work on his pet scheme of the powered trainer which will probably revolutionise gliding training.

Derek Piggott—this is your life. From the start—Aviation. Winning the Model Aircraft World's highest trophy, taking part in the World Model Aircraft Championships in America, winning a Royal Aero Club medal for services to gliding, all your fantastic achievements in the field of gliding and flying, your clever schoolmistress wife and your two children, both of whom have won scholarships to Millfield School—surely a unique family.

We will remember you for the thousands of hours you have spent on the ground and in the air at Lasham, helping us to fly; giving pleasure, encouragement, teaching, advising, correcting, enthusing—being Derek.

The life of a full-time instructor in gliding is a fairly unrewarding task. In the main, gliding types tend to be rather selfish and ungrateful. But I am certain that there must be hundreds of glider pilots throughout the world who do say with pride and sincerity—I was taught to glide by DEREK PIGGOTT.

All of us surely say that too—thank you, Derek, for your ten years of work, inspiration and unceasing efforts on our behalf.

WALLY KAHN.

(*Reproduced from "Lasham & Gliding"*)

SECOND NEW ZEALAND CHAMPIONSHIPS

HOOD AERODROME, MASTERTON 21st to 28th NOVEMBER

By ROSS MACINTYRE

EVERYTHING from wave to thermal was experienced during practice week before the champs. Several pilots flew in the wave at heights up to 30,000 feet but no great distances were logged.

Weather conditions during the period of the Championships were rather variable. A north to north-west airstream ahead of an advancing depression from the Tasman Sea prevailed on the first two days, which gave mainly wave conditions though of only moderate development. Weak thermal activity occurred for short periods, but little advantage could be taken of this.

With a stationary anticyclone north of New Zealand and deep depressions passing to the south, the following four days covered a period of strong or very strong westerly winds which produced on two days very marked waves to heights over 30,000 ft. Unfortunately periods of severe turbulence in the lower levels prevented these days from being contest days.

Saturday, 21st November

The Championships were opened at 9 a.m. Saturday morning by Mr. I. F. B. Walters, the Divisional Controller of Operations for the Air Department.

The Contest Director, John Messervy, gave the task as Free Distance. Launch height was 4,000 feet and X was 30 miles.

From the configuration of the country, north was the direction for maximum distance, but a northerly component in the wave-producing west wind stopped thoughts in this direction. Instead, most headed south. The first report back of a landing over X was also one of the longest flights, 51 miles to Cape Palliser lighthouse — about as far as it was possible to go without wet feet. The pilot, Gordon Hookings (Skylark 4), was later joined by Alan Cameron (K-6CR) and John Cooper (K-6).

Cooper (last year's champion) had the misfortune to hit a wingtip on landing, which put him out of the contest. Only 10 out of the 27 crossed X, so that maximum points for the day were only 569.

Sunday, 22nd

A 100-km. Triangle race was set with turning-points at Featherston and Te Wharau. An expected slackening of the wind did not occur, and considerable difficulty was experienced on the first into-wind leg. Launches were to 2,000 feet. With the increasing wind, wave developed, marked only by a line of good cumulus right down the valley like a cloud street at right angles to the wind. Some pilots didn't recognise the wave and did the whole trip on thermals and ridge lift.

Alan Cameron was first to go around. He did so in 1 hour 36 mins., which broke the existing N.Z. 100-km. triangle record. He flew the first leg on thermals, struck the wave, where he climbed to 11,000 feet, then set off on a straight glide.

Ross Reid in a K-6PE went around in

R. C. Reid, Open and Standard Class New Zealand Champion

1 hour 53, then set off again. He was observed low on his final glide the second time, but his calculations must have been dead right for he crossed the finish line with 6 inches height still in hand. His time, 1 hour 32.5 mins., has to be confirmed as the new New Zealand record.

Immediately after this, Hookings (Skylark 4) and Wood (Olympia 463) were seen on their final glides, but they landed just ¼ mile from the 'drome. The farmer wasn't too happy about this. The paddocks held his Stud Rams worth £3,500 each — more than the two gliders together!

Several competitors had trouble sighting the second turning point because the village of Te Wharau consists only of a school and hall and a couple of houses. Most local farms have as many buildings on them. The experienced navigators had no trouble on this score, however.

Results: Reid, 1,000 pts.; Cameron, 980; Carmichael, 924.

Monday, 23rd

The task once again was a small one, 110-km. out-and-return to Pirinoa. Thermals were forecast but over-development started early, and large rain squalls dotted the Wairarapa Valley.

Ross Reid was the nearest to Masterton on the return leg, getting within nine miles of home under a completely leaden sky. Gerald Westenra (Skylark 4) was next, with the rest of the field all the way to the turning point and back.

Two aircraft were slightly damaged and unable to compete next day.

At least it proved that the Wairarapa Wave didn't always work, and thermals do occur here.

Results: Reid 1,000; Handley, 981; Westenra, 925.

Tuesday, 24th

With a most unlikely sky outside, Ted Eadie forecast that good wave would appear, and it did. The task was a 300-km. out-and-return to Gwavas forest and thence free distance.

Of those that reached the turning point, most lost the wave and had to thermal their way back. Ross Reid was the only one who managed to slip back into the wave, and he got back to Hood aerodrome. No one else did this, and so he won the day again.

A K-7 flown by John Edmundson and Ted Hardy flew 85 miles on this task, beating many single-seaters. Three pilots threw away their chances of long distance flights when a K-6 crashed near Mt. Bruce. The pilot broke both legs and extensively damaged the glider. The

Dick Georgeson, who broke a world record on 6th January with his Dart *(see page 53).*

Official rest day.

three pilots assisted with radio messages and Ron Wood in the Oly 463 landed nearby to give assistance. All three had second launches, but it was too late in the day for really effective distance to be run up.

Results: Reid, 1,000; Handley, 601; Fowke, 577.

Wednesday, 25th

Official rest day. Wave did develop later in the day, and Andy Gough, visiting from England, managed to work it up to 15,000 ft., but wasn't able to get his Diamond gain of height.

Thursday, 26th

The task was set as distance around a 75-km. triangle as many times as possible. However, it soon became apparent that no one was making headway against the wind although the thermals were there, and the day was declared "no contest". Wave once again appeared very high up, and some took launches into it later in the day. Greatest height reached was 15,000 ft.

Friday, 27th

Wave again. Hope springs eternal — and another task — a big one. Distance to a turning point at Lake Waikaremoana (190 miles), thence free distance. A start was made on launching, but there were reports of extreme turbulence. Two Rhönseglers were flipped on to their backs at about 12,000 feet in rotor turbulence, and the tug pilots were getting worried. So John Messervy recalled those that could be, and cancelled the task.

Four aircraft without radio could not be recalled and shot away on the task. The fifth, John Day, in an Oly 463, asked permission on the radio to attempt the task. This was granted. John came back to the aerodrome after a long flight. He had been to Hastings and back at about 31,000 feet. Of the others, Ian Dunce, in a Skylark 3B, Ross Carmichael, in a Skylark 2B, and Alan Cameron, in a K-6, reached Gisborne — 200 miles. All required Gold Distance. Howard Scoffin (Standard Austria), who overflew Gisborne to land at Tokamaru Bay, some 240 direct miles away, also required Gold Distance. (This flight won him the "Most Meritorious Flight" award presented each year.) Ian Dunce had declared Gisborne and so receives

his Gold C with two Diamonds. This to a pilot who has only been gliding seriously for six months or so and won his Silver C only three months ago. He works as a top-dressing pilot, flying a Piper Pawnee.

Saturday, 28th

Declared a no-contest day because of high winds. Tigers couldn't operate, although wave was in evidence.

So ended the second New Zealand Championships — in many respects a disappointing contest with only four contest days. For the second year in succession, high winds tended to spoil the flying. It can only be hoped that there will be good thermal conditions for next year's Championships, wherever they will be.

FINAL RESULTS

Pilot(s)	*Glider*	*Pts.*	*Posn. O.*	*S.*
Reid	K-6PE	3284	1	1
Handley & Menzies	Skl. 3F	2442	2	–
Fowke	K-6CR	2346	3	2
Cameron	K-6CR	2186	4	3
Westenra	Skl. 4	1888	5	–
Day	Oly. 463	1865	6	4
Court	Skl. 4	1738	7	–
Hookings	Skl. 4	1714	8	–
Georgeson	Dart	1482	9	5
Wright	Oly. 463	1456	10	6
Carmichael	Skl. 2	1280	11	7
Heginbotham	K-6CR	1275	12	8
Wood	Oly. 463	1120	13	9
White	K-6CR	912	14	10
de Frere, Reed & Dunce	Skl. 3B	642	15	–
Van Asch	Sagitta	575	16	11
Molloy	K-7	556	17	–
Williams	K-6CR	505	18	12
Edmundson & Hardy	K-7	431	19	–
Trotter	Skl. 3F	354	20	–
Te Ua & Carr	K-6CR	291	21	13
Cook	K-6CR	278	22	14
Evans	K-7	38	23	–

EDITORIAL NOTE.—The table of final results sent to us contains two lists of "cumulative points", but with no explanation. The second is not very different from the first (given above) except that Nos. 16 and 17 in the Open Class change places.

1965 COURSES AT LASHAM

THE 1965 course programme is designed to offer facilities for *all* types of gliding training to members of Gliding Clubs in the United Kingdom and overseas.

Courses will use the Lasham school fleet of three T49 Capstans, a Blanik all-metal high performance two-seater and two Slingsby Swallows for solo flying. Skylark 2's are also available to suitably qualified pilots as temporary members of the Surrey Gliding Club.

All courses will include full food and accommodation in reconditioned heated bunkhouse from supper on Sunday until breakfast on the following Saturday morning. Briefing on Monday at 09.15 in the Flight Planning room to "pair off" instructors and students.

Ground lectures will be arranged in the event of bad weather. All course members with previous experience should bring their flying logs, totalled and signed by their C.F.I.

Dual car and winch launches 8s. 6d. Dual aero-tows to 2,000 ft. 27s. 6d. Solo car and winch launches 5s. 6d. Solo aero-tows to 2,000 ft. 22s. 6d. Bunkhouse 4s. per night. £2 deposit on all bookings.

COURSE SYLLABUS

COURSE TYPE "A".—Basic ab-initio instruction for members of clubs other than Lasham and members of the public. There is a possibility of reaching solo standard after two consecutive weeks' training without previous experience as a pilot.

Launches guaranteed: 3 dual aero-tows for initial handling or pre-solo spinning checks; 15 wire launches, dual or solo in T-49 Capstan; free soaring.

COURSE TYPE "B".—Conversion to Swallow. Available to members of clubs other than Lasham who have reached at least solo standard in their own club. The T-49 Capstans will be used for dual checks and solo as necessary, with Blanik for spinning checks.

Launches guaranteed: 3 dual aero-tows; 15 wire launches dual or solo; free soaring. Extra launches at club rates if required.

COURSE TYPE "C". Pre cross-country advanced training. Available to pilots near to cross-country standard in own club. Instruction will be given on an individual basis, depending on experience of student, as follows:—

T-49/Blanik. Aero-towing, full spinning, field landings, field selection (from Auster), instrument flying (simulated or actual), dual cross-country, aerobatics. Aircraft available for solo flying will depend entirely on students' ability and experience.

A basic charge of £10 will be made to cover cost of food, accommodation, membership and instruction. All flying to be charged at normal club rates. Launching facilities available for private or club solo aircraft if pilots wish to bring one.

COURSE TYPE "D".—Power pilot conversion to gliding. Power pilots with a minimum qualification of a Private Pilot's Licence have no difficulty generally in reaching solo stage on gliders between 12 and 20 launches. One can expect to get *some* soaring instruction on all courses between March and October.

Instruction will be given by experienced power/gliding instructors on the T-49 side-by-side enclosed two-seater. Solo in same aircraft with full spinning, aerobatics and soaring in the tandem all-metal Blanik.

Launches guaranteed: 3 dual aero-tows, plus 15 wire launches for circuit training. Lecture programme in event of bad weather. All-aero-towing training available at extra rates if required.

COURSE TYPE "E".—Instructor Training. Instructors' courses will be run in accordance with the B.G.A. Syllabus for categorisation of instructors. A full ground lecture programme is included in the course fee.

Aircraft available for course will be T-21, T-49, Blanik, Eagle, Swallow, and Skylark 2.

Launches guaranteed: 3 aero-tows, 15 wire launches. Dual, solo or mutual flying as required.

Courses in 1965 will be run by Derek Piggott, with preliminaries on Sunday evening if possible. All applicants must have recommendation from their C.F.I. and be cleared for carrying passengers.

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LEE WAVE "GEN" FOR AEROPLANE PILOTS

"DETECTION AND AVOIDANCE OF MOUNTAIN WAVE SYSTEMS — SAFETY HEIGHTS OVER HIGH GROUND" is the title of a Civil Aviation Information Circular issued by the Ministry of Aviation and numbered 92/1964. It introduces the subject with an account of how a Lockheed Lightning pilot arrived in the Bishop Wave region of California to find that a dust storm prevented his landing below; so he soared his 13,500 lb. machine in the upcurrent of a wave for over an hour until the landing ground cleared. He estimated the upcurrent at 8,000 ft./min., and the circular points out that, if he had not been so knowledgeable about waves, he could have got into an equally strong downcurrent with disastrous results.

The circular then gives general information about waves, remarking that their presence is revealed by the aircraft's altimeter and vertical speed indicator, and points out that "a height coupled autopilot, when in use, will attempt to counteract any height fluctuations induced by wave motion, thus bringing about marked variations in airspeed. It is therefore advisable either to disengage the height lock, or to revert to manual control in severe conditions, because the speed variations may otherwise be so marked as to bring the aircraft to a stalled condition."

Then comes a warning about rotors and an account of how a Boeing B-52 recently lost most of its fin and rudder in one. Here we have the first mention of "safety heights", for which, for the avoidance of rotors, the recommended clearance margin above high ground is "at least half the height of the mountains above the surrounding terrain". This is immediately followed by a warning that, to counteract the downcurrents of waves, a much higher "safety height margin" might be needed.

The next section, "Downdraughts", deals at once with this problem, saying that the effects of vertical currents depend largely on the aircraft's performance and on the direction of its track relative to the alignment of the high ground which initiates the waves. What should the pilot do if caught in a continuous downcurrent? The answer given is:

"Unfortunately, because of the many variables involved, no hard and fast rules can be laid down, but generally the best course would be to turn upwind or downwind and seek rising air in another part of the wave system. If the aircraft's terrain clearance is already marginal it will be desirable to turn downwind, i.e. away from the initiating high ground." The reader is referred to an Appendix for more detailed information.

Three more hazards of flying over high ground are then mentioned. First, air forced up a slope will cool at the adiabatic rate and eventually become colder than other air at the same height, so its freezing level may be lowered. Second, winds over mountains may deviate in direction and vary in speed. Third, altimeters may not read correctly; however, the errors due to airflow effects are small.

A paragraph headed "Conclusions" in this section begins:

"For most operations, a nominal safety height margin of 2,000 ft. may be judged sufficient to ensure safety of flight. If, however, there are reasons to expect strong mountain wave effects, e.g. from the available forecasts or in-flight reports, from the appearance of clouds or from the pilot's previous experience of the route, the best insurance against encountering severe rotor zone turbulence or sustained down-draughts is an adequate height margin above any high ground on the route."

APPENDIX.—A ten-page Appendix follows the four pages of general information. This goes into details and gives much of the information to be found in Mr. C. E. Wallington's "Meteorology for Glider Pilots", so there is no need to repeat it here. The disastrous gale which damaged more than half Sheffield's houses on 16th February, 1962, is attributed to the fact that, below the level of maximum wave amplitude, the horizontal winds are strongest in the wave troughs and weakest in the crests.

How best to escape from a sustained downcurrent is again discussed: "The choice between seeking an upcurrent a few miles towards, or away from, the high ground upwind depends upon the circumstances. If the aircraft is already so near to the high ground that the downcurrent is obviously descending the lee slope itself—as distinct from a lee wave further downstream—no rising air is likely to be found unless the ridge is crossed. In such circumstances it is normally wiser to look for rising air further downstream, subject to there being a sufficient height margin available in that direction." Also, "where no attempt is made to counteract height changes, the aircraft's height variations when flying into wind are out of phase with any airstream waves, so that the aircraft is liable to be at its lowest height when actually over the highest ground."

The points already made about autopilots, rotors, wind deviations, icing, and altimeter errors are further elaborated, and then we come to the pamphlet's most novel feature—a method of calculating safety heights for a variety of terrains and of flying tracks in relation to the terrain.

First, to get the safety height over an isolated hill, you take the height of the crest above the foot of the slope (h), multiply by the wind speed at flight level (V) and divide by the aircraft's ground speed (G). The result, $h \times V/G$, is the amount of height you could lose (or gain) when flying directly up or down wind over the hill. (The foot of the ridge is the lowest ground within 5 miles in Britain or within 10 miles in Alpine-type regions.)

To allow for flying along a continuous downcurrent parallel to a ridge, you multiply by a factor K, which is the ratio of the length of the ridge to the horizontal distance between its crest and foot. This makes the formula $Kh \times V/G$. (It is applied if your course is within 30° of the line of the ridge and the wind direction is within 30° of the perpendicular to the ridge.)

Then, if there is wave motion as well, the upward or downward flow may be even steeper than the hill slope, so you add another 50 per cent, giving finally:

$$1.5 \times Kh \times V/G$$

To save time in applying this formula, you can prepare your maps beforehand by drawing lines (isopleths) of equal Kh, using $K=1$ for isolated peaks. But you are recommended to draw your isopleths 10 miles further out, to allow for wind deviations upsetting your navigation.

It is emphasised that all these safety heights are not merely to be measured from the tops of the hills or mountains; they are to be added to the "normally accepted terrain clearance heights".

After this long section, which occupies two pages and is headed "Assessment of Safety Heights", comes a final list of "Conclusions", and a pair of airflow diagrams. One diagram shows the flow over the Peak District on the day

of the Sheffield gale. The other is a generalised drawing of two mountain waves, one occupying the position of the normal upward and downward slope currents and the other containing a roll cloud and rotor, while both contain lenticular clouds and the mountain top is immersed in a cloud cap; an aeroplane is also shown, about to come to grief.

Comment.—There is a world of difference between this circular, which says virtually all that needs to be said, and a circular on the same subject put out in 1953, which was, if anything, worse than useless, because it not only gave the vaguest information about waves, but kept harping on "turbulence" so that the reader would think he was quite safe as long as he flew in smooth air.

How does the present circular stand up to certain important questions?

First of all, there is that menace, the "safety height" fiend, who is still with us in large numbers. "All I ask," he says, "is to be told how high I must fly so as to avoid all these currents and things." On seeing a document like this, he skims through it in search of the expression "safety height", and, having found it, looks for an accompanying figure expressed in height units, makes a mental note of it, relaxes and says: "That's all I want to know; now I needn't bother with all that tedious stuff about what goes on lower down."

How will he fare with this circular? In para. 6 a rule for avoiding rotors is given, but it involves a calculation for each specific case, though a figure is given for one such case. In para. 10 an actual figure of 2,000 ft. "for most operations" is given, and he might accept this if he doesn't read on. However, the complicated safety-height calculation in the Appendix should shake him out of his complacency.

But the only certain way of scotching the "safety-height fiend" is to point out that he can *never* climb above the "influence" of mountains on airflow, even if he goes up to 80,000 ft. The circular gives this figure in one place, at the end of para. 2.2 of the Appendix, stating: "There is evidence that waves extend to a height of 80,000 ft. in some circumstances in winter." It is true that the

evidence is scanty, because it comes from the rare wave-like "mother of pearl" clouds, which probably form only when the air at that height is abnormally moist, and anyway can only be seen when they are in sunlight and the ground below is in darkness. But there seems no reason to believe waves are not present at other times too. If one of the many stratosphere sailplane projects is ever completed, we may get further evidence.

For the rest, two features of Dr. R. S. Scorer's wave theory are omitted. In stating that a wind shear helps the formation of waves, he said that this is true not only when the wind increases with height, but also when it decreases with height; in fact, one of the most notable wave flights of the R.A.F. Pennine Wave project was made when the wind decreased with height and the Met. Office told them there would be no waves that day. Also, Dick Scorer believes that the Bernoulli effect, according to which pressure decreases as air velocity increases, has a greater influence on wave formation than the "gravity wave" effect mentioned in para. 2.1 of the Appendix; however, as no expert seems able to explain the working of the pressure/velocity effect in plain English, its absence here is not surprising.

The only other point on which more might have been said is the normal downcurrent to leeward of a mountain; this nearly brought the 1933 Mount Everest fliers to grief because they had been given a "safety height" which they couldn't reach. This downcurrent is indeed mentioned in the text, but both the diagrams in the circular only depict it as part of the wave system, not as independent of any waves.

In summary, this circular maintains the conception that there is a "safety height" from which a pilot can descend through a downcurrent region without hitting anything before he comes to the end of it. To this old-standing conception it adds the new one that safety heights vary according to circumstances, though in such a way that they can still be calculated if enough is known about the terrain below. Finally, there is specific advice on how to escape from a downcurrent — a welcome admission that it is not enough to know your safety height. A. E. S.

WORM'S EYE VIEW

Elizabeth Rietberg

IT wasn't just having to get used to a trailer—the car was something of a change too. An aged and irascible cow, of a noble and now extinct line; and in comparison to the delicate manoeuvrability of the Sprite I'd been used to, she felt like a rusty tank.

And then, of course, there was the trailer, all 30 miles of it—I beg your pardon—feet. At least it was no wider than the car, and comparatively light, but the prospect of having to cope with it—and in public at that—appalled me.

My first introduction to the business was relatively easy, apart from having to hitch the trailer on to the noble cow by myself, which turned out simpler than I'd expected, since by sheer luck I'd placed the car in exactly the right spot to lower the hitch on to the ball.

Hanno and 999 had landed only 10 miles away, but between us lay the full surge of a town's rush-hour traffic. I negotiated the airfield gate without taking a post with me, and prepared for the chaos to come. It was just as well that I had forgotten to put the number-plate on the back—I'm sure a lot of people would dearly have loved to report me for everything from nearly taking the corner of a house with me, to holding up all the traffic in three directions at once.

By the time I eased the noble cow and contraption on to the main road I was near to being a total wreck—I personally, that is, not the trailer.

I found 999 without any difficulty; she was conveniently parked by the road. Bursting with pride at my remarkable efficiency, I slid alongside and waited smugly for the well-deserved praise due to me. Hanno slanted an eye at the tow-bar and then at me. "Next time, try locking the hitch in place before you start," he suggested.

I deflated rapidly to knee-high-to-a-gnat size, and watched his competent supervision of two worshipful yokels dismantling and stowing 999.

On the return trip Hanno graciously allowed me to drive. 999 hung behind, heavy as my sense of responsibility.

"Come on, you can go faster than that," urged Hanno.

"I can't—she keeps yawing."

"Then you're just not handling the car properly!"

I gritted my teeth and said nothing. The noble cow wallowed down the road, trailer trundling spongily. "I think I'd better drive," said Hanno firmly.

Cringing with humility, I changed places with him.

We continued at a fairly smart pace, when suddenly the trailer slewed across the road, heaving the car into a series of violent metronomic yaws. Hanno's knuckles gleamed whitely on the wheel, and we waltzed gradually to a standstill. "I think I'd better check the tyre pressure," he said.

It wasn't exactly necessary, being all too obvious that one tyre was very tired indeed. Hanno made no further mention of my inefficiency on the way home.

The next occasion provided no pitfalls; a long haul to Moreton and some difficulty finding 999. I spent ages tacking in the dark across a one-time airfield,

pimpled with straw bales, until I nearly ran down the glider, neatly derigged and minus Hanno.

I had visions of having to search for him in every house in Moreton when, to my relief, he materialised out of the dark, accompanied by a complete family of enthusiastic ground crew.

Hometrek uneventful—apart from a sick distributor. Have you ever tried to borrow a screwdriver at two o'clock in the morning? And then had to listen to the owner's life history as well?

Another retrieve, somewhere near Kettering. Hanno hadn't succeeded in enticing an extra crew, and strode purposefully down a side street in search of any citizen stupid enough to be interested. I leaned against the parked trailer and smiled sweetly at a couple of gentlemen whiling away those quiet moments before tea, digging in their front gardens. Ten minutes later Hanno returned, empty handed. I and my four stalwart aides were waiting, ready and eager.

Inaccessible-maunderings-of-farm-lanes away 999 nestled cosily against a hedge, her nose brushing a stout post. Hanno conceded that he'd had a little brake trouble. I didn't like to enquire further.

My preliminary training now over, I was ready to tackle anything. Of course, Hanno may not have considered me expert enough to crew in a competition, but willing crew are hard to come by.

Hanno, already having achieved a name for himself, made me aware that, in the atmosphere of punditry surrounding the Regionals, only a taken-for-granted efficiency would be tolerated.

A run to Edgehill started the ball rolling. My feeling of importance as I eased the trailer down the slope from the L.G.C. clubhouse was quickly dissipated by my almost phenomenal lack of skill backing the blasted contraption out of a narrow lane near Leighton, which turned out to be a dead-end. It's bad enough backing a car, but when you have to work out the seeming illogicality of turning the car in the opposite direction to where you want to go, down a lane the corners of which you can't see round, the whole spiced with urgency because your pilot's last radioed message was a blurred mumble, the blow to one's conceit is almost traumatic. Ten minutes of terrified fumbling deflated my ego almost beyond repair.

It's taken me years to get over being fearful of a telephone, and the radio did nothing to ease my pains. I could never remember whether I'd twiddled all the necessary knobs, and anyway, Hanno's car transmitter didn't work very well.

Things finally under semi-control again and Hanno obviously well on his way, I headed for Buckingham, stopping on the outskirts for petrol. Wrapped in apathy, the garage attendant stood guiding the glugging hose into the tank. The trailer apparently impressed him not at all—but Hanno, transmitting clear as a bell, did. "999 to Mobile. 999 to Mobile. Am at Finmere. Four thousand and climbing. Over."

The attendant's eyes bugged slowly. Gratified by his attention, I rose to the occasion with the aplomb of 007. Knowing full well that Hanno couldn't hear me, I picked up the mike. "Mobile to 999. Am reading you loud and clear. Roger and out."

The attendant's jaw sagged gently to snag on his Adam's apple. I picked my receipt out of his limp palm. "Keep the

change, my man," I said grandly, and jolted out into the road, ego teetering at cloudbase.

Buckingham is a town full of narrow streets and charm—and one particular corner which presents for a trailer more or less the same problem that the eye of a needle does for a camel. I must have seriously discommoded at least half the local populace in my negotiation—so called—of a right angle even a Mini might have baulked at. By the time I sweatily pulled into the straight my ego was about clutch level again.

Passing through Finmere I saw a parked trailer beside a telephone box, and matily shared a phone call back to base. Hanno was fine—all I had to do was wait.

From a cottage across the road bounced an ebullient blonde female, twittering with enthusiasm. What were the trailers for, she wanted to know. We explained, and she went into a spasm of superlatives: "Too absolutely marvellous—I absolutely adore flying—too divine—so poetic—terribly brave—our dahling flying boys . . ." and so on—a babble of admiration culminating in a hoarse invitation to tea.

We munched and gulped in a wash of compliments, and returned to keeping an ear on the radio. Hanno, suddenly—"Back over Brackley; circling."

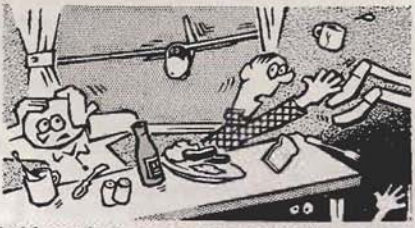
"What's he flying—a jet?" I thought, and crunched the noble cow into gear.

The corner in Buckingham seemed to have shrunk. I discommoded the other half of the local population.

The radio refused to give me any further information, so a few miles outside Bletchley I phoned in again. Control sounded as if they thought I had a touch of the sun. "What do you mean you heard him say he was on his way back? He just phoned in to say he'd come down at Edgehill!"

Buckingham is a town full of narrow streets and charm—and one particular corner . . . oh, well.

Next run, Yarmouth. I actually had an assistant crew. Great luxury. Hanno decided to be original and landed at Lowestoft instead, at a kissin' cousin-to-Butlin's sort of holiday camp. I gathered from Control that he wasn't too popular with the management who had telephoned with some asperity claiming that



he'd made a near miss of their canteen and a shambles of both playing field and general morale.

We found the camp without mishap. 999 sat sedately in a patch of long grass—playing field, my foot; at least 400 yards away from a group of rather tatty buildings. I had some difficulty persuading the gatekeeper to let me bring the trailer into the grounds. He seemed to feel it would be much more convenient to shove the glider bodily through the hedge and derig in the middle of the A.12.

Logical argument made no impression, so I opened my eyes wide, leaned towards the old . . . er . . . gentleman, and breathed heavily. Visibily wilting he allowed me by.

As we struggled with the centre section, a lugubrious figure approached, an inmate of the camp, trailing long thin legs through the grass. We exchanged vague politeries, and I asked if we could get something to eat in the famous canteen.

His already mournful face dropped into extreme gloom. "I wouldn't go there if I was you," he said, "the food's terrible!" He rolled bloodshot eyes upwards. "Everything's terrible—and the worst of it all is I've paid for a fortnight's 'oliday and there's still ten days to go!"

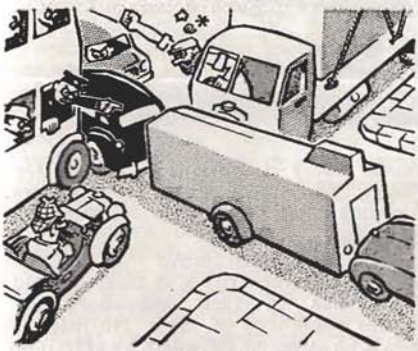
The bags under his eyes sagging with the weight of unshed tears, he turned and trudged back to his money's worth, towing his misery like wisps of cirrus behind him.

It was hot the next day, following Hanno in brilliant sunshine, very hot—boiling, in fact. The noble cow had a very efficient heater. There was only one thing wrong with it—I couldn't turn it off. And the hood was stuck. I was driving in my own personal oven.

Ipswich is one of those convenient places reached by several alternative

routes. It's all a snare and a delusion—whichever one you choose is sure to be the longest.

Caravanserais of transports and dawdling holiday traffic kept my speed to a crawl. Bury St. Edmunds was a choked chaos and Stowmarket worse, where, neatly blocking a crossing, I came to a



grinding halt behind a string of cars. In a sweaty welter of embarrassment and leant-on horns I sat through four light changes, before the molasses ooze of traffic further on put an end to my predicament.

By the time I reached Ipswich the interior of the car was hot enough to fire pottery and I had trouble seeing straight. For 20 minutes I struggled through the town until I realised I'd been driving in circles, round a maze of one-way streets. Six helpful citizens and a contradiction of directions later I finally arrived at the airport, on the verge of apoplexy.

Hanno was waiting, cool and imperturbable. I brought the trailer alongside, opened the car door and fell out into the blessed freshness of air and grass. The sky wheeled over me, and my skull felt as if it were opening along the seams. Hanno sauntered over and gazed down at me; I tried desperately to focus and look intelligent—without success.

He raised an eyebrow. "If you're going to be like that," he said, "I'll have to get another crew."

You just can't win, you know!

Not every retrieve is fraught with adventure. Sometimes the run's up the M.1, it's not too hot, the car behaves and you have time to sit, parked on the highest point of some country lane, miles from anywhere. You munch a few sandwiches, slurp from a thermos, and watch the landscape roll into the distance, full circle to the horizon.

Far away a tractor chugs faintly, overhead a lark trills a summer's worth of joy, the peace is tangible enough to touch—and a raucous voice blares out of the radio: "Hey, George, have you seen my bloody glider anywhere?"

. . . Oh well, back to the grind . . .

CERTIFICATE OF AIRWORTHINESS RENEWAL FEE

AS explained in a separate notice, the B.G.A. has appointed a Chief Technical Officer. In order to encourage Clubs and Inspectors to make the fullest use of his services in the interests of improving standards of airworthiness, no charge is to be made for his visits. However, notwithstanding generous financial assistance from the Department of Education and Science, his appointment involves an additional financial burden on the Association. In order to help in meeting the increased outgoing, the Council has approved an increase of 10s. 6d. in the fees for renewal of Certificates of Airworthiness, which now become as follows from 1st January, 1965:

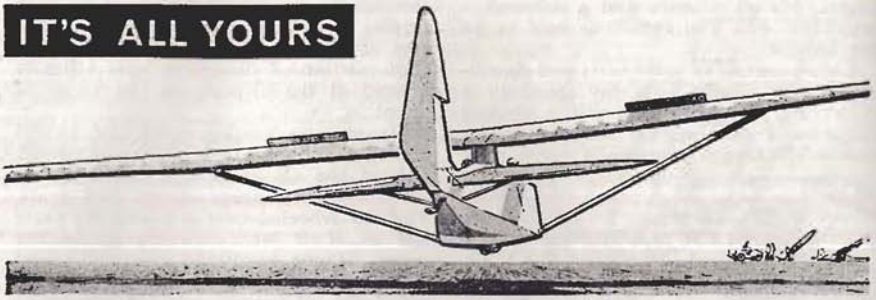
Where the owner/group is	
a member	£2 12s. 6d.
a non-member ...	£4 14s. 6d.

The fee for initial application for grant of a Certificate of Airworthiness remains unchanged.

In this way the extra funds required are to be obtained from the gliding movement as a whole. I hope that glider owners and operators will bear with us in this effort to spread these costs as lightly and widely as possible.

F. G. IRVING, *Chairman, B.G.A. Technical Committee.*

IT'S ALL YOURS



THE ability to cloud-fly properly is an essential part of the soaring pilot's repertoire. It requires considerable training and practice to achieve competence, just as does landing in fields, or centring in a thermal. Too often a couple of successful sorties in small clouds is regarded as solid experience. It is not, and many glider pilots avoid the cloud-flying which could give them better cross-country flights, simply because they have once frightened themselves silly.

The following article by Flight Lieutenant Douglas Bridson is an excellent introduction to pilots who want to learn how to fly properly on instruments. It will be followed by a second one in the next issue on cloud flying technique.

ANN WELCH

CLOUD FLYING IN GLIDERS
Part 1 (Basic)

THE best way to learn instrument flying is in a two-seater glider with a competent instructor. However, this is not always possible and many glider pilots teach themselves.

Some recent articles in SAILPLANE & GLIDING on this subject did not differentiate sufficiently between the ab-initio cloud flier and the pilot who had already gained some experience. This article is intended for the ab-initio cloud flier.

A reasonable approach to self-tuition is itemised as follows:—

Information

As much information as possible on the subject should be obtained from authoritative sources and this includes a thorough briefing. Joe Bloggs, who always has a "hairy" experience when he flies in cloud, is *not* an authoritative source. Every club seems to have a Joe Bloggs, and he only alarms and confuses intending cloud fliers with his stories.

Observation

The gyro instruments should be switched on when flying in clear air and note taken of their indications for various conditions of flight. No attempt should be made to fly solely by reference to the instrument for long periods, because of the very real need to maintain an adequate look-out.

First Cloud Penetration

The cloud chosen for this occasion should not have massive vertical development, and fairly small "summer" cumulus is ideal. If things then go wrong, there is very little distance to travel before breaking out into clear air.

Gaining of Experience

Do not run before you can walk. One should be a reasonably competent instrument pilot before tackling the very large cumulus and cu-nimb. If, because of enthusiasm, caution is thrown to the winds and a penetration of one of these large clouds is undertaken before a reasonable competence in cloud-flying has been acquired, then, despite necessity being the mother of invention, necessity will not of itself produce competence, and the resulting situation could become *extremely* dangerous.

To expand on the foregoing, it is necessary to consider some of the flying instruments and their interpretation.

The Artificial Horizon

It is beyond the scope of this article to write about specific types of artificial horizon, and it is necessary to generalise. The limitations of this instrument, if fitted, should be known. Most modern

electrical horizons have complete freedom in roll and do not topple when the pitch limit (usually 85°) is reached. Some gliders are fitted with a non-topple attitude indicator (euphemism for artificial horizon) with a "meat-ball" presentation. At the other end of the scale are the horizons with a limited roll-and-pitch capability and which topple when their limits are exceeded.

Without getting too technical, artificial horizons possess certain basic errors, e.g. during and immediately after completing a turn, there are small bank-and-pitch errors. These errors are reduced by various means, but the degree of error reduction depends upon the type of horizon used.

Because it takes time for the gyro rotor to reach its operating r.p.m., a certain time elapses after switching on, during which the instrument indications are not reliable. This time can be as little as twenty seconds or more than two minutes, depending on the instrument.

If a caging device is fitted, the instrument should only be uncaged in straight and level flight. Similarly, if a fast erection system is fitted, it should only be used when flying straight and level.

Interpretation and Technique

The artificial horizon replaces the true horizon and its indications are fairly easy to follow. It should be noted that small indications of attitude change can produce fairly large changes of airspeed. There is nothing new about this — it happens when flying in the clear, but the artificial horizon brings this point home.

Small control movements should be used and airspeed chasing avoided. If the airspeed is incorrect, a small attitude adjustment should be made. The new attitude should be held for sufficient time to allow the airspeed to change. (It should be remembered that the glider's inertia prevents the airspeed changing simultaneously with an attitude change.) If the airspeed changes to the desired figure, the new attitude should be maintained and the aircraft *trimmed*. If the airspeed does not initially settle at the desired figure, further *small* adjustments should be made until one succeeds. The aircraft should then be trimmed.

The correct use of the elevator trimmer is important. Having to overcome out-of-trim loads only makes the flying of the aircraft more difficult.

Easing the control column back when entering a turn and relaxing this back-pressure when straightening up, comes fairly naturally when flying in clear air; but on instruments, a conscious effort is required. This applies even more when flying without an artificial horizon, using a turn-and-slip indicator. Because one has to *think* about this particular control movement in cloud, it often seems to be of a greater magnitude than that required when flying in the clear. This is an illusion.

Turn-and-Slip Indicator (Interpretation and Technique)

Proficiency in the use of a turn-and-slip indicator is necessary because, in many gliders, it is the only gyro instrument, and in gliders equipped with an artificial horizon it serves as a second reference and stand-by instrument. The turn needle provides an *indirect* indication of bank angle, and this instrument is less easy to interpret than the artificial horizon.

Pitch, or attitude, is determined by reference to the A.S.I.; and a steady airspeed, or, in turbulence, an airspeed fluctuating about a mean, indicates an unchanging attitude. A changing airspeed indicates a changed or changing attitude, and the rate of airspeed change indicates the degree of attitude change. Airspeed chasing becomes more difficult to avoid, but it *must* be avoided, otherwise over-controlling results.

To give an example: if the speed is too high, one naturally eases back the control column. Because of the glider's inertia, the speed does not reduce immediately, so the backward movement of the control column is continued until it registers with the pilot that the speed is decreasing. By this time the attitude change is too great and the airspeed decreases rapidly to below the desired figure. The control column is then moved forward, there is a pause because of the aircraft's inertia, a further pause because of the pilot's inertia (reaction time), and the speed shoots up to beyond the desired figure.

To combat this, and taking the

example given, the initial backward movement of the control column should be small. After this small backward movement, the control column should be returned to approximately neutral and held there. The airspeed will stabilise at a new, lower, reading. Further small adjustments may be necessary, and when the speed is correct the glider should be *trimmed*.

As stated, an *indirect* indication of bank angle is given by the turn needle. With the turn-and-slip indicators centred and with a steady airspeed the glider will be flying straight and level. With the turn needle displaced to one side, the slip indicator centred and a steady airspeed, the glider will be in a properly balanced turn. The needle deflection indicates rate of turn which indicates the angle of bank.

The turn needle doesn't differentiate between a balanced turn and a yaw. It indicates both. A yaw is indicated by the movement, in opposite directions, of the turn and slip indicators. In practice, the slip indicator is usually too well damped to indicate small amounts of short-duration yaw. This short-duration yaw is indicated by movement of the turn needle. This is particularly evident when flying in turbulence, the turn needle oscillating rapidly, but the slip indicator remaining centred. The rate and magnitude of the oscillations depends on the degree of turbulence and the glider's directional stability. Maintaining level flight or a constant rate of turn under these conditions, requires the needle fluctuations to be centred on the desired mean.

There is one further complication. In a turn, and assuming that a constant angle of bank is being maintained, increased back pressure on the control column increases the rate of turn, and conversely, decreased back pressure decreases the rate of turn. It is therefore quite easy to imagine the bank angle changing and to make corrections for this, when in fact the bank angle has remained unchanged, the indications (which are rate of turn indications, remember) being caused by vigorous use of the elevator.

It would be wise to re-state that the turn needle provides only an indirect indication of bank angle.

Finally, the turn-and-slip indicator takes only a few seconds to wind up, and is able to give reliable indications almost immediately after switching on. It doesn't topple but can only indicate up to a certain rate of turn.

Some basic points to remember when first attempting instrument flying are:—

1. LOCALITY — Make sure you are in an area where cloud flying in gliders is permitted.

2. INSTRUMENTS — Switch on the gyro instruments in good time, particularly the artificial horizon. Fly by reference to the instruments before entering cloud, allowing oneself a short period of adjustment before being committed. Use *all* the appropriate instruments without *over*-concentrating upon one. Obviously, some instruments require more attention than others, but they all have something useful to tell you.

3. MANOEUVRE — Initially, there is no requirement for rapid manoeuvring when flying on instruments. A slow entry or exit from a turn is easier to control than a rapid one. Speed can come with practice.

4. RECOVERY — If the situation gets out of hand, endeavour to centre the turn needle and fly straight. Settle down and try again. If the airspeed builds up rapidly and uncontrollably, use the airbrakes. (Caution: airbrakes tend to suck open at high speeds, at least on some gliders. This tendency should be anticipated and restrained. It is possible for structural damage to be caused by the airbrakes crashing open against the stops.) More about this in Part 2.

5. NAVIGATION — Instrument flying requires concentration. This means that time can pass quickly and, depending on the wind strength and the evolutions in cloud, it is possible to emerge some distance from the point of entry. This obviously ties in with sub-paragraph 1. If unsure of position, fly into wind and familiar territory should re-appear.

6. SEAT OF PANTS — Do not trust "seat of pants" indications. Trust the instruments.

It is beyond the scope of this article to cover every eventuality and to qualify everything requiring qualification. It has been necessary to generalise on certain aspects of instrument flying; but, in the main, cloud flying in gliders is not very difficult and is not the exclusive preserve of pundits. However, one can come seriously unstuck by diving into the nearest, fat, cumulus on a first attempt at cloud flying, hoping to muddle through on part-remembered "advice" received from dubious sources. If possible, obtain dual instruction on instrument flying with its attendant briefing on the subject and follow this up by observing the gyro instruments in action when flying in clear air, before attempting the first cloud penetration. (In a not too massive cloud.)

DOUGLAS BRIDSON

H.F. RADIO CHANNEL

NEGOTIATIONS are in hand with the G.P.O. for an allocation in the H.F. Band.

The proposed use is for ground/air and ground/ground retrieve communications in addition to the two VHF Channels.

H.F. is distinguished by the following characteristics:—

(a) Low efficiency of small aerials—needing greater power than V.H.F. and more critical matching circuits;

(b) Sky and Space wave propagation gives rise to the possibility of glider/car communication after landing;

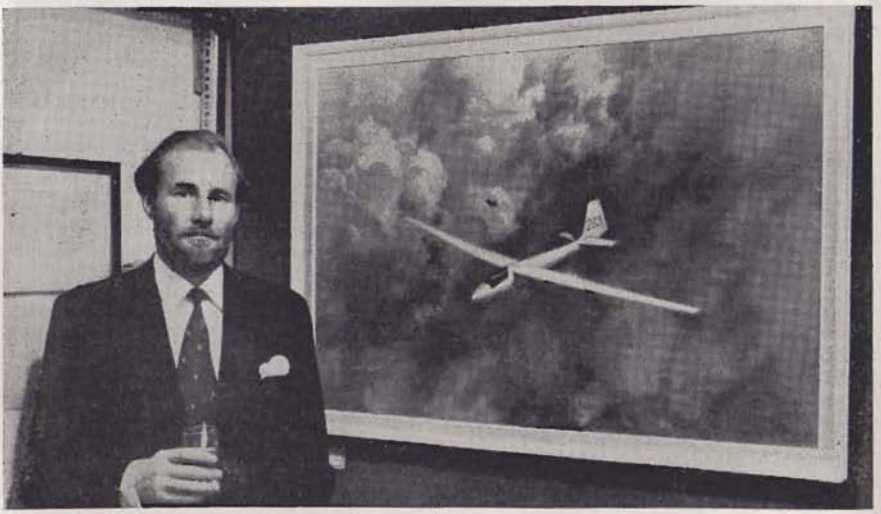
(c) By virtue of (b) above, greater interference from co-users of the channel;

(d) Less room for allocatable channels in the H.F. Band (3.30 Mc/s) than in the V.H.F. band (30-300 Mc/s), augmenting (c);

(e) The easy possibility of Single Sideband Operation (S.S.B.). This mode of working gives a worthwhile increase of effective power from a given valve or transistor and also halves the required channel width;

(f) Power transistors are available for transmitter construction, but there are no commercially made lightweight sets in England. Car sets using the S.S.B. mode are available.

R. BRETT-KNOWLES,
B.G.A. Radio Co-ordinator.



Top: John Stonehouse, M.P., is shown round by Margaret Kahn, the overall winner.
Bottom: G. Davison-Coulson, one of the Judges, standing by his winning picture in the professional class.

Opposite page top: Norman Hoad's drawing of Sailor Malan.
Bottom: l. to r., Lightnings by G. Davison-Coulson, Zeppelin by E. Egerton-Cooper and a painting by Arthur Sturgess.

Photographs by courtesy of "Flight"

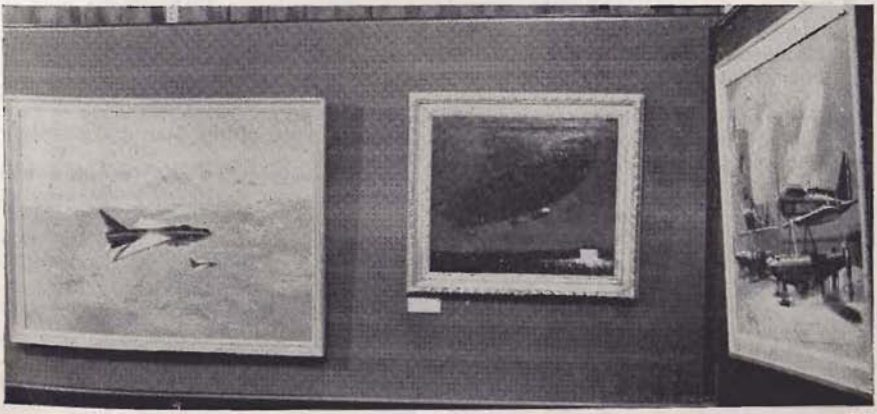
1964 KRONFELD ART EXHIBITION AND 1965 WORLD CHAMPIONSHIPS ART EXHIBITION

THE seventh Annual Exhibition which was reported briefly in the December issue was held in the club premises during all November. Over £500 worth of paintings were sold, which is more than ever before and some exhibits could have been sold several times over. The club was honoured by a visit of the newly-appointed Parliamentary Secretary to the Minister of Aviation, who purchased a painting of a helicopter by Tom Eccles which had been highly commended by the judges.

The Kronfeld Club is organizing an art exhibition in conjunction with the World Gliding Championships at South Cerney in May/June, 1965. It is hoped to hang a record number of paintings and drawings of gliders and other aviation subjects which will be suitable for competitors and others to purchase to take home as souvenirs. Artists are being supplied with photographs of the competing gliders. It is also hoped that one or two artists will visit the site to take commissions and sketch on the spot.

The exhibition will be opened by Peter Scott during the training period and will continue until the end of the championships.

Anyone interested in entering exhibits from either at home or abroad should write for details to the organising secretary, Mrs. Yvonne Bonham, at 14 Little Brownings, S.E.23. Y. C. B.



GLIDING CERTIFICATES

GOLD C COMPLETE

No.	Name	Club	1964	No.	Name	Club	1964
128	G. W. Mackworth-Young	Army	9.8	130	L. S. Hood	Phoenix	30.8
129	L. A. Boyer	Yorkshire	29.8				

GOLD C HEIGHT LEGS

Name	Club	1964	Name	Club	1964
G. W. Mackworth-Young	Army	9.8	P. C. Davies	Portsmouth Naval	22.8
D. S. Wigglesworth	Cambridge	11.9			

GOLD C DISTANCE LEGS

Name	Club	1964	Name	Club	1964
L. A. Boyer	Yorkshire	29.8	L. S. Hood	Phoenix	30.8

SILVER C CERTIFICATES

No.	Name	Club	1964	No.	Name	Club	1964
1534	M. H. Livesay	Heron	29.9	1546	B. C. Walker	Bristol	4.7
1535	J. McLaughlin	Scottish	27.9	1547	V. S. Ovenden	Kent	27.9
1536	A. M. Wray	Devon & Somerset	22.9	1548	W. J. Dean	Surrey	12.9
1537	G. C. Weeks	Oxford	27.9	1549	G. B. Atkinson	East Midlands	31.8
1538	C. J. Gill	R.A.F.G.S.A.	27.9	1550	A. K. Edgar	R.A.E. Farnborough	24.8
1539	L. C. A. Haynes	Derby & Lancs.	28.6				
1540	R. H. Arden	Bristol	17.9	1551	R. W. Baldwin	West Wales	20.9
1541	H. B. E. Middleton	Eagle	20.9	1552	K. H. Doetsch	Imperial College	3.8
1542	A. Hardie	Newcastle	12.7	1553	R. J. Teesdale	Four Counties	15.5
1543	R. Rumsby	Moonrakers	27.9	1554	M. R. S. Medland	R.A.F.G.S.A.	21.8
1544	I. L. Smith	Moonrakers	29.8	1555	J. C. Rieley	Imperial College	21.8
1545	J. J. Boyle	Army Soaring	22.8				

PILOTS' RATING LIST 1965-1966

1965 CONTEST FLYING

THE Council at their meeting on the 9th December unanimously agreed that the success of the 1965 World Gliding Championships is of paramount importance to the British Gliding movement as the enhanced prestige will materially affect such things as obtaining sites, restricting airways and obtaining recognition generally. Therefore it was felt that anything which might detract from the great effort needed to achieve that success was to be avoided.

This led to discussion on Competitions which might be held during 1965, and the effect on the Rating List.

The following unanimous decisions were made:

1. There would be no British National Championships in 1965.
2. That the Rating List would be frozen at the end of 1964 until the end of 1966, when competition flying during 1966 will be used in the preparation of the 1967 list.
3. That no competition in 1965 would count towards the Rating List.
4. That Clubs should be asked not to hold competitions during or near the time of the World Championships.

It is hoped that these decisions will open the way for experiments during 1965 in, possibly, setting new kinds of tasks, "trainee" competition flying, and trying out new kinds of scoring systems.

PHILIP WILLS, *Chairman, British Gliding Association*

EDITORIAL NOTE.—This means that the Midland Club's Easter Rally, mentioned in our last issue (p. 460), will not now count as a Qualifying Competition.

Order	Pilot	League Points	League in 1964
1.	Spottiswood, D.	753	1
2.	Stone, A. J.	744	1
3.	Williamson, J. S.	735	1
4.	Strachan, I. W.	728	1
5.	Dunn, R. A. E.	727	1
6.	Fielden, J. S.	719	1
7.	Gough, A. W.	709	1
	Warminger, A. H.	709	1
9.	Kearon, N. W.	674	1
10.	Burton, G. E.	670	1
11.	Innes, D. S.	653	1
12.	James, D. B.	649	1
13.	Jones, J. D.	645	1
14.	Carrow, D. D.	644	1
15.	Fairman, M. C.	633	1
16.	Dimock, H. R.	620	1
	Kahn, W. A. H.	620	1
18.	Scott, P. M.	612	–
19.	Burns, Anne	611	1
20.	Bentson, C. W.	608	1
21.	Wills, P. A.	591	1
22.	Deane-Drummond, A. J.	579	1
	Piggott, A. D.	579	–
24.	Coatesworth, G. A.	578	2
25.	Dawson, P.	573	1
26.	Mann, R. A.	571	1
27.	Delafield, J.	565	1
28.	Garrod, M. P.	564	1
29.	Ellis, C. A. P.	559	1
30.	Burgess, P. G.	556	1
	Shephard, E. G.	556	1
32.	Jefferson, J. B.	552	1
33.	Cretney, F. D.	548	–
34.	Carr, V. C.	546	2
35.	Jerzycki, E. B.	545	2
36.	Purnell, A.	543	1
	Bird, M.	543	1
38.	Stephenson, G. H.	541	–
39.	Smith, D. A.	539	1
40.	Cardiff, J.	538	–
41.	Smith, M. J.	527	2
42.	Goodhart, H. C. N.	516	–
	Ince, D. H. G.	516	–
44.	Wills, C.	514	–
45.	Pennycuick, C. J.	509	2
46.	Barnett, R. C.	507	–
47.	Richardson, C. G.	505	2
48.	Riddell, D. M. R.	491	2
	Kerridge, D. C.	491	1
50.	Doughty, A. W.	490	2
51.	Sandford, R. A.	483	2
	Collins, G. T.	483	2
53.	Willbie, R. T.	482	2
54.	Rutherford, R.	476	2
55.	Irving, F. G.	475	1
56.	Jeffery, C. P. A.	473	1
57.	Hurst, C. R.	472	2
58.	Mackworth-Young, G. W.	467	1
59.	Minton, P.	463	2
60.	Hunt, M. S.	460	2
61.	Morison, S. M.	458	2
62.	Daniell, J. G. B.	450	–
63.	Shepard, F. W. L.	449	1
64.	Snodgrass, D.	448	2
65.	Waller, R. S.	444	2
66.	Hanneman, P.	440	1
67.	Lane, P. H.	429	–
68.	Neaves, R. A.	424	–
69.	Bacon, G. McA.	421	–
	Fitzroy, K. C.	421	2
71.	Wilkinson, K. G.	417	2
72.	Stark, E.	416	1
73.	Harwood, Rika	414	2
74.	Martin, P. A.	413	–
75.	Camp, G. W. G.	409	2
76.	Findon, J. A.	405	2
77.	Kaye, D. M.	402	–
78.	Mettam, H. S.	401	2
79.	Tonkyn, W. N.	399	1
80.	Zealley, T. S.	397	2
81.	Dorman, C.	396	2
	Hood, L. S.	396	–
83.	Loveland, A.	387	2
84.	Gregg, H. N.	386	2
85.	Wheeler, J. H.	384	–
	Goldney, L. P.	384	2
87.	Sutcliffe, A. O.	382	2
88.	Philpot, P. R.	379	–
89.	Kevan, P. D.	378	2
	Meddings, E. J.	378	2
91.	Neumann, G. S.	375	2
92.	Redman, S. J.	374	–
93.	Pozerskis, P.	372	–
94.	Donald, C. C.	366	–
	Procter, R. G.	366	2
96.	Stubbings, D. H.	363	–
	Costin, J.	363	–
98.	Dickson, R. D.	362	2
99.	James, P. W.	360	2
100.	Newholm, K.	357	–
	Evans, J. A.	357	2
	Pick, R. C.	357	2
103.	Neilson, P. J.	351	–
104.	Wilson, M. J. C.	350	–
105.	Collier, P. E.	346	–
106.	Green, C.	343	–
107.	McMullin, T. A.	337	–
	Riddell, J. C.	337	2
109.	Thomas, B.	336	–
	Croshaw, J. G.	336	2

Order	Pilot		League in Points	1964
111.	Midwood, H. U.		319	2
112.	Holding, D. F.	=)	315	–
	Paul, I.	=)	315	2
114.	Alexander, A. L. L.		305	–
115.	Stevenson, N.		309	–
116.	Scallon, D.		303	2
117.	Trott, R.		296	–
118.	Aldridge, K. R.		293	2
119.	Whitfield, G. R.		292	–
120.	Lapham, A. J.		290	–
121.	Bayley, J. L.		289	–
122.	Corrick, D. W.		286	2
123.	Gaze, F. A. O.		281	1
124.	Jeffries, J. R.		273	–
125.	Wills, S. F. E.		272	–
126.	Ibberson, J.		271	–
127.	Somerville, A.		261	2
128.	Hands, J. M.		260	–
129.	St. Pierre, A.		258	–
130.	Duthy-James, C. D.		257	2
131.	Browning, H.		256	–
132.	Hill, A. D.		254	–
133.	Stowe, D. W.		248	–
134.	Fisher, G. F.		243	2
135.	Stoddart, R. E.		242	–
136.	Perrott, R. H.		241	–
137.	Welsh, J. H.		240	2
138.	Pickles, J.		238	2
139.	Blake, K. W.		233	–
140.	Smoker, J. L.		226	2
141.	Tarnow, A.		224	–
142.	Mead, S. B.		223	–
143.	Lowe, D.	=)	222	–
	Tomlin, S.	=)	222	–
145.	Tarver, R.		219	2
146.	Wilkinson, N.		218	–
147.	Swift, R. B.		217	–
148.	Ware, E. J.		215	–
149.	Berriman, J.	=)	213	–
	Brenner, J. B.	=)	213	–
	Goddard, J. J.	=)	213	–
152.	Seth-Smith, M. P.		210	–
153.	Tanner, L. E. M.	=)	208	–
	Dodd, S. R.	=)	208	–
155.	McDonald, A.		203	–
156.	Austin, D. C.		197	2
157.	Chubb, R. G.		195	–
158.	Stafford Allen, R. C.		193	2
159.	Caiger, M. T.		191	–
160.	Chandler, J. T.		189	–
161.	Harwood, J. E. G.		188	–
162.	Newell, R. W. B.		187	–
163.	Marshall, R.		186	–
164.	Wills, S. B.		184	–

Order	Pilot		League in Points	1964
165.	White,		183	–
166.	Davey, B. J.		180	1
167.	Greenaway, H. J.		177	–
168.	Blackmore, J. H.	=)	176	–
	Reilly,	=)	176	–
170.	Kurylowicz, L.		173	–
171.	Hiscox, D. G. O.		168	–
172.	Crabb, D. J.		165	2
173.	Everitt, J.		163	2
174.	Corbett, D. J.		162	–
175.	Glennie, G. A.		161	–
176.	Tweedy, J.		160	–
177.	Roberts, D. W. H.		159	–
178.	Adam, J.		156	–
179.	Ross, C.		155	–
180.	Torode, J.		152	–
181.	Docherty, T. P.		148	–
182.	Smith, R. E. F.	=)	147	–
	Jones, R.	=)	147	–
184.	Coulson, A.		146	–
185.	Darbishire, D. H.		145	–
186.	Chubb, E. J.		144	–
187.	Prince, J. T.		143	–
188.	Mansell, K. R.		142	–
189.	Wilkin, R.		130	–
190.	Grime, P. V.	=)	129	–
	Thompson, A.	=)	129	–
192.	Gee, M. I.		128	–
193.	Inglesby, J. V.		127	–
194.	Goodhart, G. A. J.		126	–
195.	Barrell, G.		125	–
196.	Brett-Knowles, R.		123	–
197.	Bailey, N. L.		121	–
198.	Lee, G. H.		114	–
199.	Walker, R.		112	–
200.	Eldridge, M. E.		111	–
201.	Baynes, A. H.		109	–
202.	Watson, B. B. C.		108	–
203.	Reeves, E. E.		105	–
204.	Scarfe, D. H.		100	–
205.	Brown, K. R.		95	2
206.	Bagnall, M.		93	–
207.	Thorburn, A. J.		80	–
208.	Tarr, J.		79	–
209.	Phillips, J. G.		69	–
210.	Marpole, D. J.		59	–
211.	Parkinson, R.		57	–
212.	Lastowski, B.		53	–
213.	Warwick-Fleming, S.		49	–
214.	O'Riley, K.		49	–
215.	Gunter, B.		37	–
216.	Schmidt, Anita		33	–
217.	Brett, N. A.		32	–
218.	Moseley, K.		4	–
219.	Glover, L. A. G.		0	–

RHODESIA'S FIRST 500 KILOMETERS

By E. P. HODGE

I CAME out to Rhodesia in 1962 after learning to fly with the Kent Gliding Club, and since being here I have really enjoyed good soaring conditions for a change. If you do not stay up for an hour at least every time you fly, you feel very hard done by. Out of the 52 week-ends in the year, 50 are soarable.

Last year, in an Olympia, I managed to get my Gold C and Diamond for Goal with a flight out-and-return to Umniati—312 km.

Early this year four of us formed a syndicate and bought a Ka-6 from Tim Biggs of Johannesburg, and up to the start of the Central African Gliding Championships, held in Salisbury, none of us had done any cross-country flights in this machine, mainly due to getting the trailer fixed, etc.

Alf Thompson and I were flying the Ka-6 in the competitions, and both of us were pleasantly surprised how well it goes for an aircraft that doesn't look much better than an Olympia.

On Thursday, 15th October, 1964, the task set at the Championship was a free distance around optical turning points of Enkledoorn, Chatsworth and a declared turning point of Fort Victoria African Township giving a 500.8 km. out-and-return.

I had been trying very hard to get 500 km. set as a task, and today I had my way. The weather didn't look too promising with a strong 15-kt. southerly wind; our hope was that the wind would drop towards the afternoon as it usually does. Luckily enough, that's what happened.

I was first in line for take-off, and at 10.15 a.m. John Colban, flying the Tiger, dropped me off in a nice thermal at 1,300 ft. over the strip. Lift wasn't very strong, 1-2 metres, but the strong wind was drifting me nicely on track. At 3,000 ft. lift faded out and I set course. Towards the south, Cu was beginning to form very nicely, and as I went along, thermals were getting stronger and higher all the time; some 40 miles out, lift was 3-4 metres up to 6,000 ft.

At Enkledoorn, 90 miles out, all the clouds ended—nothing but blue sky ahead; it didn't look very nice at all. At this point, between Enkledoorn and Chatsworth, you have to leave the main road and cut across country: not a nice place to have to land—hardly any farms, just bush and 6 ft. high ant-hills.

Heading into the blue, my spirits sank lower as the Ka-6 sank lower. 3,500 ft. and still nothing; 3,200 ft. and up goes the vario 1 metre. Really winding the Ka-6 round to stay in it, I am slowly gaining height. The higher I go the better it is—4 metres showing now. 8,000 ft., 9,000 ft. and still going up. 9,500 ft. and the lift gets turbulent; I am at the top. Further south, little wispy clouds are beginning to form—one every five miles or so. Under these I found strong lift and only under them. It was a waste of time looking anywhere else. By now, my operating height was between 11,000 ft. and 7,000 ft.—that is, 16,000 ft. above sea level, and I cannot say that I noticed any effects from lack of oxygen.

It had certainly turned out to be a lovely day. Over Fort Victoria and with my turning-point photographs taken at 1.45 p.m., I turned homewards—height 10,000 ft. I was feeling on top of the world.

Ten miles out from Fort Victoria I saw Jimmy Arnott in the Vasama thermalling below me, and I called him up on the radio and we wished each other the best of luck. Jimmy had not yet been around the turning point.

I was determined to keep as high as possible, and deviated off course to go under each cloud because I was approaching the blue stretch of sky between Chatsworth and Enkledoorn. In the distance I could see plenty of cloud over Enkledoorn and it was there that I came to my first thermal under cloud since Chatsworth; it wasn't very strong, and the nearer I went to cloud base the stronger it became. At 4,500 ft. it was two metres, and near cloud base four to five metres; 5/8 Cu had formed along this stretch at 8,500 ft. Staying as high as possible, I took lift under every cloud, never getting below 6,000 ft.

From Enkledoorn I called up base and got through perfectly—90 miles range on

V.H.F. to my car with just a whip of aerial on the roof was very good, seeing that the radios we were using, ex-R.A.F., had only cost £12 10s. each.

Ahead I could see a very nice cloud street stretching some way on track. When I arrived at its near end I wound the Ka-6 up and then set off underneath it at 150 km. per hr. on the clock, and nine minutes later the cloud street ended and I was still at the same height. Very nice; I could do with a few more of these. In the haze, in the distance, I could just see Salisbury; all I needed was three more thermals. The last one I took up high, too high in fact, but it was so nice to sit there and let the Ka-6 go flat out for the last few miles and to know that my Diamond was "in the bag" and that the first 500-km. flight in Rhodesia was over. Time 4.45 p.m.

On the ground again, started the long sad wait, listening on the radio as others gradually got lower and lower and finally landing just short. Same old story—"just one more thermal".

In Rhodesia the day is not very long; by 6 p.m. it is dark. The conditions have to be good to fly a long task in such a short day.

PERFORMANCE POLARS

Glider Weight Considerations

FOR a really fair comparison between glider types, it is best if the weights of each are referred to some standard. The first idea that springs to mind is to adopt a standard pilot + parachute weight of, say, 200 lb., and to add this to the empty weight of each test glider. However, the empty glider weight may vary widely within an actual type range because of slight differences in manufacture and because of such things as the varying moisture content of wooden structures. The standard performance polar would thus be different for each glider. We have therefore decided to standardise on maximum A.U.W. which is invariant unless drastic modifications are made to a glider type.

To correct a polar from a given weight, W_1, to a new weight W_2, all that is necessary is to multiply the scales of *both* axes by the ratio $\sqrt{W_1} : \sqrt{W_2}$.

We have redrawn the Skylark 3F polar given in the October issue to allow for our new reference weight. To provide some idea of the magnitude of change in performance of a glider with different A.U.W.'s, we have plotted two Ka-6 curves for a difference in weight of 56 lb.

Polars

The polars published this month are as follows:

K-6 CR .....Schleicher Segelflugzeugbau
SKYLARK 3F ...Slingsby Sailplanes Ltd.
SKYLARK 4 .... Slingsby Sailplanes Ltd.
OLYMPIA 460 . Elliotts of Newbury Ltd.

The Ka-6 CR and the Skylark 3F curves are from the same source as last time, namely, H. J. Merklein and H. Zacher.

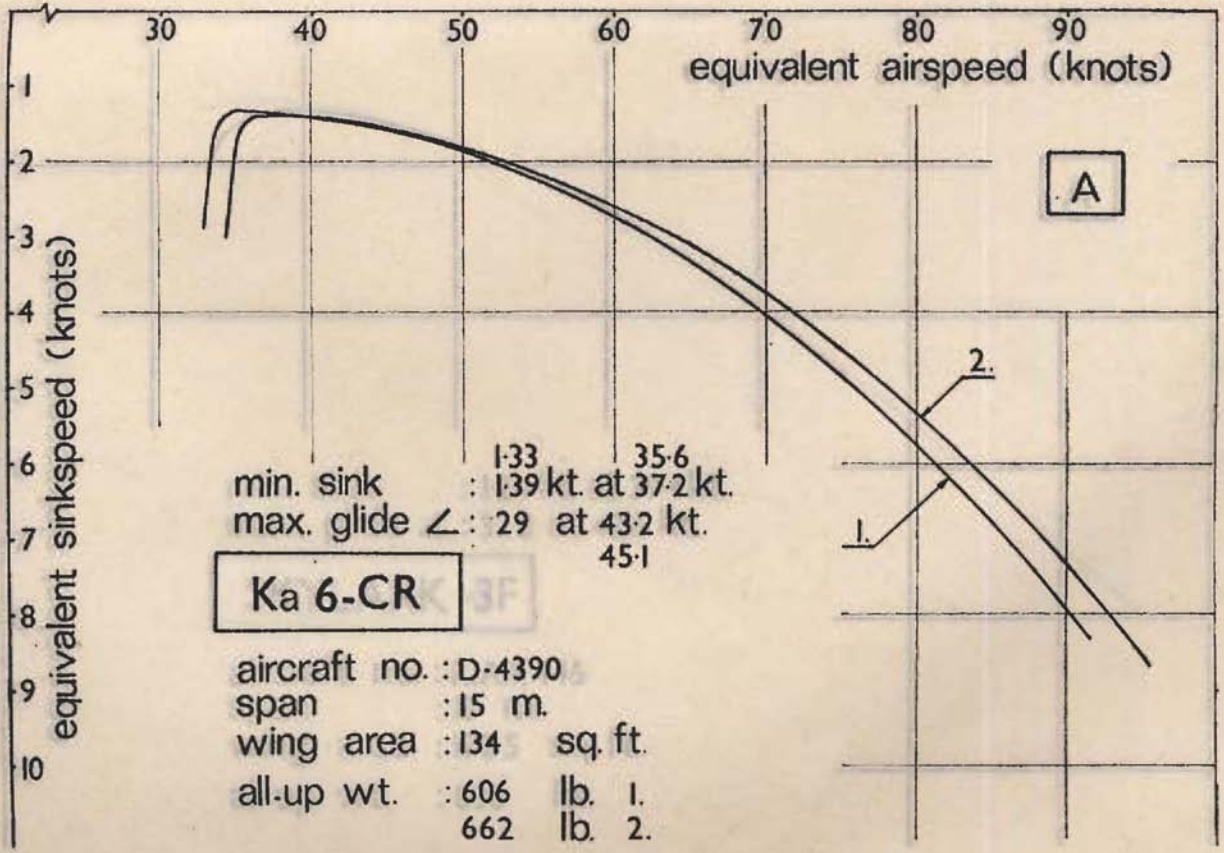
The Skylark 4 measurements were made by R. H. Johnson in the U.S.A. and are deemed reliable. The polar obtains an "A" Category.

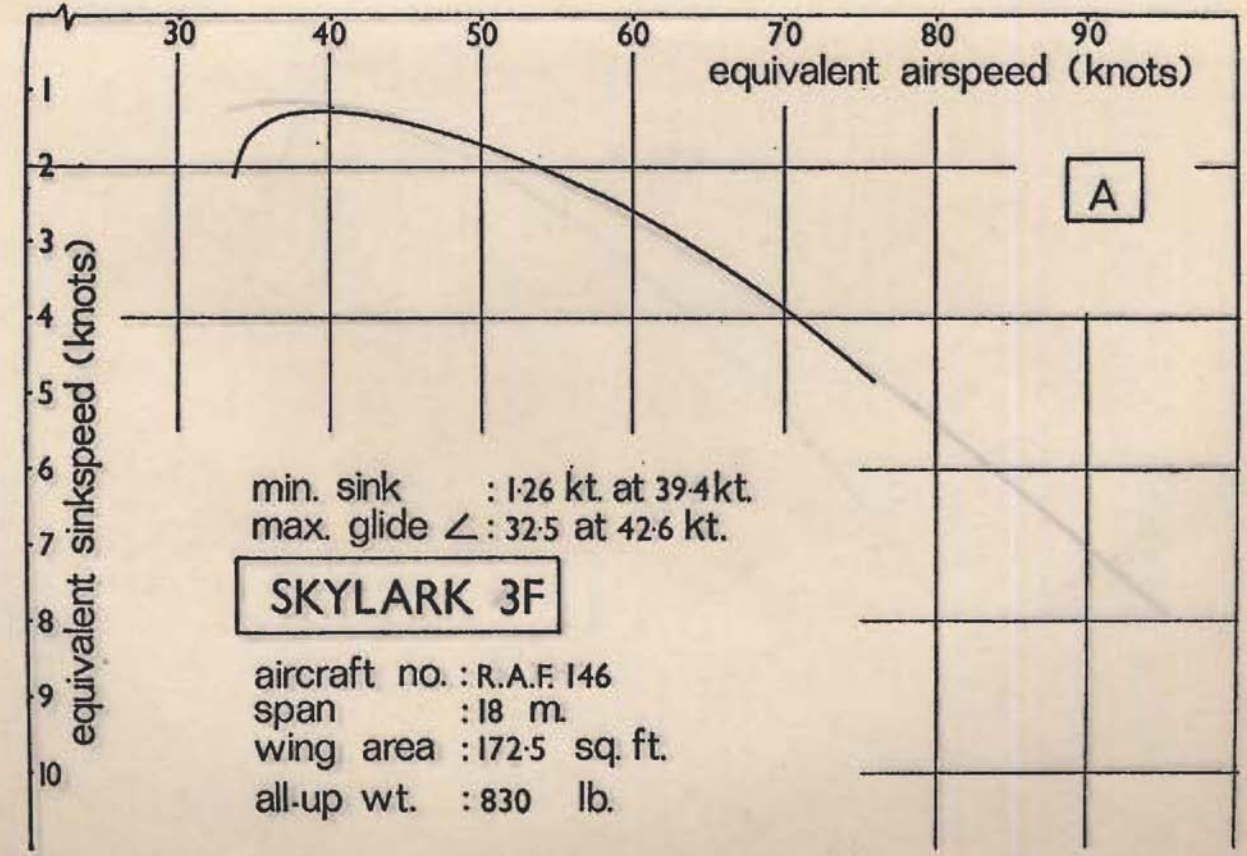
The Olympia 460 polar, obtained from G. R. Whitfield, was derived from a single photographic comparison flight with a Skylark 2 at three speeds. It thus only obtains a "B" Category. The 460 tested was the prototype with the bulbous wheel fairing and without the skid.

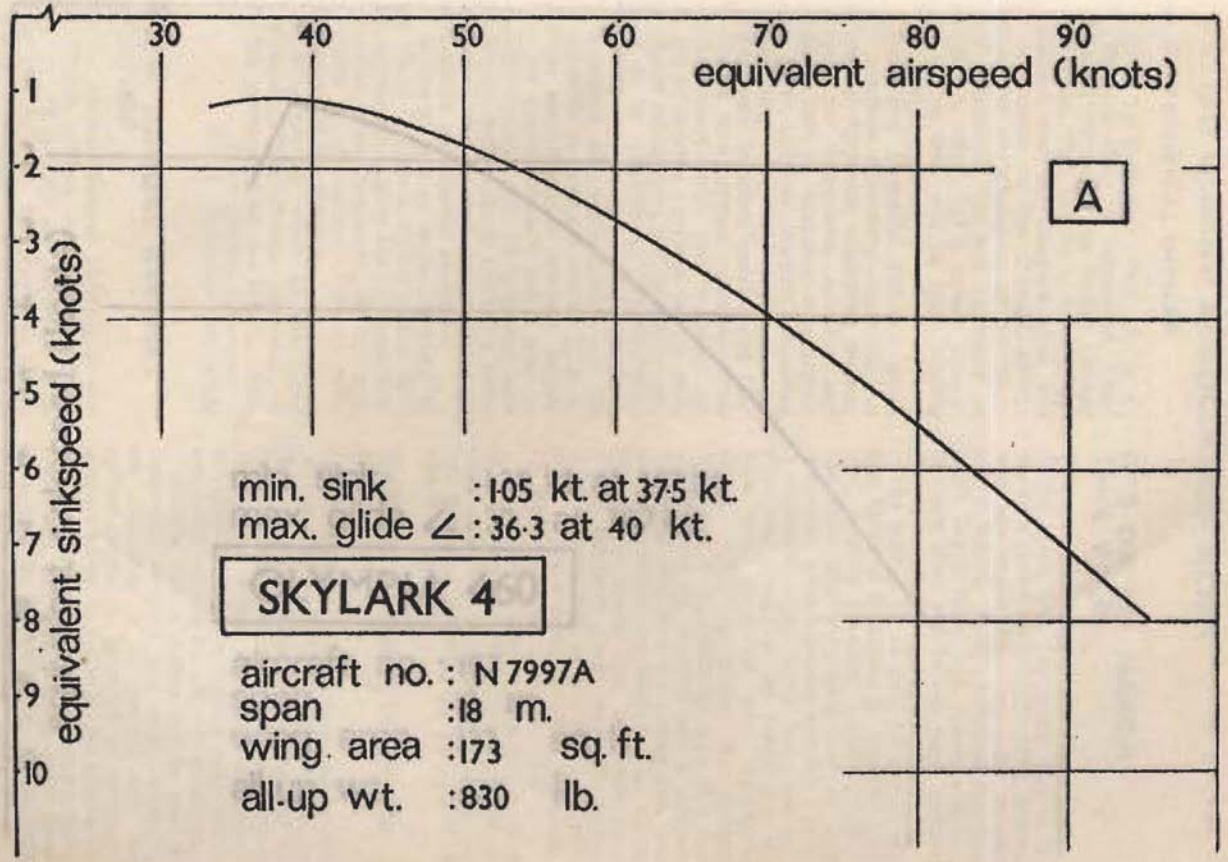
We must apologise for last month's polars not lining up with the centimetre graph paper. This was due to the inability of the blockmakers to scale accurately.

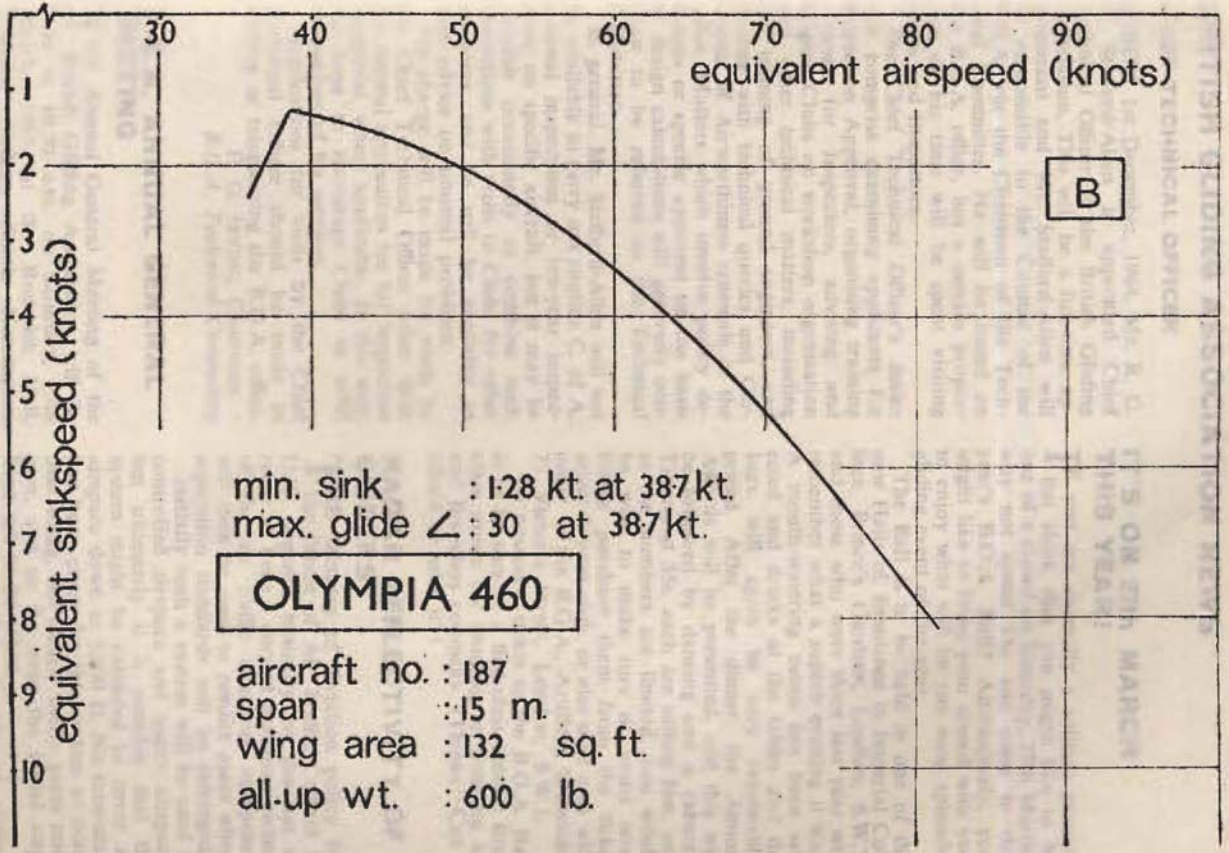
K. H. DOETSCH, D. LAMPARD,
Aeronautics Dept., Imperial College, Prince Consort Rd., London, S.W.7.

EDITORIAL NOTE.—We will not be able to publish any more of these polars for several months.


30
40
50
60
70
80
90
equivalent airspeed (knots)
1
2
3
4
5
6
7
8
9
10
equivalent sinkspeed (knots)
A
2.
1.
1·33
35·6
min. sink : 1·39 kt. at 37·2 kt.
max. glide ∠ : 29 at 43·2 kt.
45·1
Ka 6-CR
aircraft no. : D-4390
span : 15 m.
wing area : 134 sq. ft.
all-up wt. : 606 lb. 1.
662 lb. 2.


30
40
50
60
70
80
90
equivalent airspeed (knots)
1
2
3
4
5
6
7
8
9
10
equivalent sinkspeed (knots)
A
min. sink : 1·26 kt. at 39·4 kt.
max. glide ∠ : 32·5 at 42·6 kt.
SKYLARK 3F
aircraft no. : R.A.F. 146
span : 18 m.
wing area : 172·5 sq. ft.
all-up wt. : 830 lb.


30
40
50
60
70
80
90
equivalent airspeed (knots)
1
2
3
4
5
6
7
8
9
10
equivalent sinkspeed (knots)
A
min. sink : 1·05 kt. at 37·5 kt.
max. glide ∠ : 36·3 at 40 kt.
SKYLARK 4
aircraft no. : N 7997A
span : 18 m.
wing. area : 173 sq. ft.
all-up wt. : 830 lb.


30
40
50
60
70
80
90
equivalent airspeed (knots)
1
2
3
4
5
6
7
8
9
10
equivalent sinkspeed (knots)
B
min. sink : 1·28 kt. at 38·7 kt.
max. glide ∠ : 30 at 38·7 kt.
OLYMPIA 460
aircraft no. : 187
span : 15 m.
wing area : 132 sq. ft.
all-up wt. : 600 lb.

BRITISH GLIDING ASSOCIATION NEWS

CHIEF TECHNICAL OFFICER

FROM 1st December, 1964, Mr. R. C. Stafford-Allen is appointed Chief Technical Officer to the British Gliding Association. This will be a full-time appointment and Mr. Stafford-Allen will be responsible to the Council of the B.G.A. *via* the Chairman of the Technical Committee. He will be based on the B.G.A. office, but a certain proportion of his time will be spent visiting Clubs and Inspectors.

The Chief Technical Officer's duties will comprise examining applicants for Inspection Approval, organising training courses for Inspectors, advising and helping Clubs on workshop organisation and other technical matters, including the training of ground engineers, and dealing with technical queries and Certificate of Airworthiness renewals in the office. Matters which involve policy decisions or specific approval on the basis of design calculations will generally continue to be referred to the Technical Committee.

In general, Mr. Stafford-Allen will not be available to carry out routine C. of A. renewal inspections or ten-year inspections on specific aircraft, but it may be possible occasionally to combine such inspections with visits to Clubs for other purposes, and he will be available to give advice on unusual problems.

No charge will be made for visits by the Chief Technical Officer other than the normal application fee for Inspection Approval, where applicable. In this way, we hope to encourage Clubs to avail themselves of his services.

Applications for visits by the Chief Technical Officer should be made in writing or telephoning the B.G.A. office.

F. G. IRVING, *Chairman,*
B.G.A. Technical Committee

B.G.A. ANNUAL GENERAL MEETING

THE Annual General Meeting of the British Gliding Association will be held at 10.30 a.m. on Saturday, 27th March, 1965, at the Roderick Hall, Imperial College, South Kensington, London, S.W.7.

IT'S ON 27th MARCH THIS YEAR!

IF you are normally a solitary person, but think that you might like to be one of a crowd on Saturday, 27th March; why not spend 35s. and come to this year's B.G.A. Ball? Alternatively, you might like to bring your crowd with you to enjoy what will be THE most splendid gliding event of the year.

The Ball is to be held in one of the new Halls of Residence in Imperial College, Prince's Gardens, London, S.W.7, and those who were there last year will remember what a superb evening it was. A mouth-watering menu has been selected and drinks at the tables and the bars will again be very reasonably priced. After the dinner, the Annual Awards will be presented, and this will be followed by dancing and a cabaret. Tickets at 35s. each are selling fast, and as the numbers are limited, you would be wise to make sure of yours *now*. Either purchase them from the ticket seller at your club, or else send cash with order to the B.G.A., Artillery Mansions, 75 Victoria Street, London, S.W.1.

To possess a ticket to the B.G.A. Ball is to be sure of a first-class dinner; first-class music for dancing or listening to, and first-class company. (Thinks: Can I afford to miss it?)

RADAR REFLECTIVITY OF GLIDERS

THE Ministry of Aviation policy for the future of Air Traffic Control in U.K. depends basically on the use of radar to keep a current real-time picture of the air traffic situation; computers will then be used to predict cases where separation standards will be infringed.

Initially such a system will be used in controlled airspace and upper airspace, but ultimately it is possible that the system might be extended to cover all airspace down to 5,000 ft. No time-scale has been given for this system to come into being, but clearly many years must pass, and so far even the initial steps have yet to be taken.

From the point of view of gliding,

the first and most basic question is the radar reflectivity of gliders. The Ministry of Aviation must obviously be satisfied on this point if gliders are to be integrated into the system, and for this reason they have placed a contract with the Marconi Company for research into this problem. The results of this research have not yet come in but a recent press release from Marconi indicated that they are experimenting with metal foil applied externally on some of the glider surfaces.

H. C. N. G.

HOW TO FALL OUT OF A CLOUD WITHOUT REALLY TRYING

By RAYMOND JONES

ASK the average pundit how he manages to maintain his balance and he will probably either give you a blank look, or mutter some incoherent nonsense about semi-circular canals in the inner ear. It is generally regarded that these organs in the inner ear are mainly responsible for keeping the human frame the right way up. This, however, is only half the story.

Few people are aware of the very important part played by the eyes in maintaining balance, a large proportion of the information received by the brain from the inner ear being modified, if not completely reversed, by information received from the eyes. Experience has taught us that we should be parallel to trees and buildings, and perpendicular to the ground; so we unconsciously maintain this position when moving about. So great is the part played by the eyes that I would even venture to suggest that they are the body's most important organ of balance. Without going into a detailed study of the anatomy of the inner ear, let us see why this is so. I feel that a little understanding of the situation may be of some help to pilots contemplating their first attempt at cloud flying.

Briefly, there are three semi-circular canals, and these constitute the main balancing organ in the inner ear. Each canal is perpendicular to the other two, and is itself in either a vertical or a horizontal plane. One end of each canal opens into a roughly spherical chamber with a number of sensitive hairs attached to the inside wall. The whole canal is filled with fluid. The idea is that, when the head moves in any direction, the fluid tends to get left behind due to its inertia, the hairs therefore being deflected. An electrical impulse is triggered off and this carries the relevant coded information to the brain.

All very nice. However, if the motion continues, the fluid catches up and the hairs return to their normal position. An electrical impulse is again sent to the brain indicating, this time incorrectly, that the motion has stopped. When the motion does in fact stop, the inertia of the fluid tends to make it carry on, the hairs being deflected the other way. Once again a message is faithfully transmitted to the brain indicating, again incorrectly, motion in the opposite direction.

It can be seen therefore that, statistically, approximately two-thirds of the information received by the brain from the inner ear is incorrect. We are not, however, blissfully ignorant of our movements for approximately two-thirds of the time. This is because, whenever incorrect information from the inner ear reaches the brain, it is politely rejected in favour of correct information received from the eyes. Over a long period the brain has become conditioned into accepting as correct, information from the eyes, whenever it conflicts with that from other organs of orientation. So strong are the overriding visual impressions that we are not normally even aware of the false sensations from the inner ear, unless the rate of change of motion is very violent.

If we close our eyes, we are left to the mercy of our semi-circular canals. These are, however, merciless; just try going into a 360° turn with the eyes closed, and then coming out, opening your eyes only when you think your

wings are level. If you can do this reasonably well twice in succession, I respectfully suggest that you are either deformed or a very good cheat.

When cloud-flying, one has to replace the normal familiar image with a less familiar one. If an artificial horizon is used, no great difficulty is encountered, since the visual image is then very similar to the one that would normally be experienced. A few minutes' practice is normally all that is required for the brain to become conditioned into unconditionally accepting the indications of the instrument. But how many high-performance club aircraft are fitted with an artificial horizon? Potential pundits all too often have to have their preliminary instruction (if they have any) in the T-21 fitted only with a turn-and-slip indicator. Here one has to relate one's position in space to a pair of very agile but unco-operative pointers, and to an A.S.I. that is often prone to attacks of epilepsy. The result is that our budding young pundit successfully manages to come screaming out of the bottom of his cloud after only a minute or two during his first few attempts.

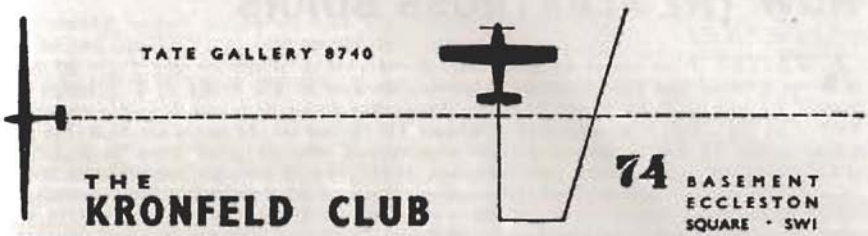
The trouble is that the false sensations of motion can be so strong that the brain does not know whether to accept them, or the visual interpretation of position in space. There lies a hidden danger here since, when this happens, some people are prone to attacks of nausea similar to airsickness. This condition usually only occurs when there are equal but conflicting impressions from two separate organs of orientation. It is interesting to note here that it is almost impossible for a pilot to make himself airsick while he is in full control of the aircraft, no matter how many violent manoeuvres he may perform, even if he is prone to the condition when flying as a passenger. This is because he is constantly aware of his attitude, the visual interpretation of position overriding any false sensations from his inner ear.

How can our young pundits benefit from this knowledge? The important thing to realise is that, when moving about, we are continuously subjected to these false sensations from the inner ear. The brain, however, has over a long period been conditioned into disregard-

ing those that conflict with the visual sensations experienced. The key to successful cloud-flying lies in making our visual interpretations of the turn-and-slip readings so familiar that the brain accepts them unconditionally. The answer is simply to practise reading the turn-and-slip, although this need not necessarily be in cloud, providing some sort of eye shade is used. Manoeuvres should be performed gently at first, gradually increasing their severity as one gains confidence. Practice while thermalling is also very useful.

It is important that there should be a clear-cut decision to enter cloud long before cloud base is reached. The last 500 ft. before reaching cloud base should be flown on the turn-and-slip, making no outside visual references. Nothing will make the attempts of the novice at cloud-flying more doomed to certain failure than if he is suddenly confronted with having to interpret the unco-operative needles of the turn-and-slip in an unprepared state of mind. Confidence in one's own ability is half of the battle. If one enters cloud in full control, flying on instruments alone, one is much more likely to retain control. Every effort must be made to ignore any sensations of motion that conflict with the indications of the instruments. Remember, the more rapidly one changes direction, the stronger will be the false sensations from the inner ear, and the more difficult it will be for the brain to reject them in favour of visual impressions of the instruments. If concentration is relaxed for as little as a couple of seconds during the first few attempts, the semi-circular canals will take control with disastrous results.

If control is lost, or if there is the slightest feeling of nausea, airbrakes should be opened and the quickest possible exit made from the cloud. Any attempt to fight the slightest feeling of being unwell is likely to be detrimental to later attempts at blind flying. Remember, "he who fights and runs away, lives to fight another day". I cannot guarantee that, if the few crumbs of wisdom given here are faithfully digested, potential pundits will automatically become immune to falling out of clouds. I do, however, guarantee that they will stay in command of the situation a little longer before falling out.



THIS time last year we were on the brink of the upheaval which has resulted in the Club as we know it now. At the beginning of the year the builders were in and the turmoil had begun. And then there were the long months of toil after the builders had finished and we were at grips with the formidable task of redecorating and refurbishing the premises. The pound of the hammer and the rasp of the saw went on far into many a night. The walls were decorated with scribbled, cryptic notes. The deadline date of the Official Opening, set months in advance, loomed closer and closer and seemed almost unattainable, until with a tremendous effort by the many working members over the last few weeks everything came together with a rush, and we were in business.

After the hustle and bustle that had gone before, the summer was a quiet period of consolidation, of working ourselves in to what seemed like a new abode. Plans were laid and new equipment acquired. A cash register for the bar, a refrigerator, and a new projector for the lecture room.

Autumn started off with a bang. For the first time in our history we were open every evening of the working week. From Monday to Friday people could be sure of a welcome and an open bar. Another first was the admission of Associate Members of the Royal Aero Club to the facilities of the Club. Never before had they had a meeting place to call their own. We hope to see much more of them and other power enthusiasts during 1965. DAVID SCALLON

DIARY OF LECTURES

and Film Shows Wednesdays at 8 p.m.

„ 27. Hawker P.1127 Strike Fighter, by Bill Bedford.

Feb. 3. Motoring Films.
„ 10. Motorised Gliding, by Godfrey Harwood.
„ 17. Powered Flying, by Tiny Marshall.
„ 24. Amateur Aircraft Construction and Development, by H. Best-Devereux.
Mar. 3. Manpowered Flight, by B. S. Shenstone, Chief Technical Officer, B.O.A.C.
„ 10. B.P. Films.
„ 17. In Search of Flying, by Ian Scott-Hill, Traffic Director, B.E.A.

* * *

INSTRUCTIONAL LECTURES

Mondays at 8 p.m. Admission 5s.

(Special terms for four or more lectures booked in advance.)

Jan. 25. The Theory and Technique of Soaring, by Derek Piggott, Britain's foremost gliding instructor.
Feb. 1. Part II of the above.
„ 15. Navigation and Map Reading, by John Neilan, B.E.A.
„ 22. U.K. Airspace — Organization and Regulation, by Capt. H. C. N. Goodhart, R.N.
Mar. 1. Away Landings, by Lorne Welch.
„ 22. Sea Breeze Fronts, by John Fielden, British Gliding Champion.
„ 29. Flying for Speed, by Ian Strachan.
Apr. 5. Advanced Meteorology, by C. E. Wallington, National and World Gliding Championships forecaster.
„ 12. Part II of the above.
„ 28. Wave Soaring.

HOW THE ALBATROSS SOARS

A LETTER from an Australian, Mr. Kenneth Campbell, on the flight of birds in general and the albatross in particular, sent to the Duke of Edinburgh and passed by him to Peter Scott, has been forwarded to us. It is too long for reproduction with detailed comment, but it shows the writer to be unaware that the first observations of the albatross by an experienced soaring pilot were published in THE SAILPLANE AND GLIDER *for February, 1935. As this notable contribution to the elucidation of the "mystery" of the albatross is now out of print, the 30th anniversary of its appearance would seem a suitable occasion for its reproduction. Mr. Hamilton was an early member of the London Gliding Club and left for Australia in 1933, making these observations on the way. The shearwater is a smaller relation of the albatross.*

Sir,

IT might be of some interest if I describe one or two of my own personal observations of the flight of ocean birds.

Firstly, the shearwater, which, in making use of a combination of wind deflection soaring and dynamic soaring, is enabled to travel in a general direction against the wind, not with it, as in the case of pure dynamic soaring.

While travelling west across the Australian Bight against a storm from a direction approximately W.S.W. I watched a shearwater for fifteen minutes, and during that time, without flapping, it kept level with the ship, flying in a big zig-zag course alternately close to, and then far from, the side of the ship. It would rise almost vertically over the crest of a big wave, due both to the deflected current and to the fact that the wind speed increased with height, until it had reached its maximum possible altitude, then it would retract its wings and go into an almost vertical dive into the trough of the wave in front and flatten out a few inches above the surface. It would then continue at great speed in the "dead" air to leeward of the advancing wave and parallel to it, either working towards or away from the ship. The rollers not being in truly parallel lines but mostly criss-crossed, the bird would always pick a roller whose crest was not quite at right angles with the wind direction, and thus found it possible not only to fly against the wind but to be able to keep up with the ship, giving an air speed in the ship's direction of something like 40 m.p.h. While remembering the erratic course taken by the bird, an actual air speed of considerably more than this figure must have been attained.

From my own observations I am led to believe that the albatross and other sea-birds are unable to soar by making use of the fact that friction alone over the water slows down the air at the surface, as described by Capt. Needham in his article, possibly because the friction is not great enough. In suggesting this I am quite aware that the plover and, I think, the ibis perform in this way over land, where the friction might be expected to be greater. I contend that there must be fairly large waves which allow a bird to soar simultaneously by wind deflection and dynamically, making use of the "dead" air in the troughs of the waves. I have three reasons for believing this:—

Firstly, I have never seen an albatross nor any other bird soaring dynamically over land-locked water, where waves are of small size even in a strong wind. I have seen quite a number but always in flapping flight or soaring over an obstruction.

Secondly, in watching ocean birds soaring other than in the up-current over a ship, they always fly down into the hollow and up over the crest of a wave, and thirdly, the following incident. While running with rather a big following sea between the Cape and Australia I was watching about 200 sea-birds of all descriptions soaring behind the ship, travelling with the wind in this case, and all soaring in the same manner, down into the hollow and up over the crest. A sudden squall came up from a direction at right angles to ours and approximately parallel to the wave crest lines. As soon

as the squall struck us, about half the birds settled on the water and the other half attempted to continue to soar but had to resort to a lot of flapping. Not a single one, as far as I could see, continued pure soaring flight. The reason for this, I believe, was that the wind blowing parallel to the waves had the same speed in the hollows as on the crests, was not deflected upwards by the crests, and that the frictional slowing-up on the water was insufficient for pure dynamic soaring. The fact that none of the birds attempted to soar in the new up-current to windward of the ship I do not think in any way extraordinary, because in a strong wind a bird's wings would have to be retracted to such an extent for it to keep pace, that it would be in danger of colliding with the side of the ship. This statement is borne out by the fact that I have seen birds soaring in this manner only in light to moderate winds.

I might describe one more incident which demonstrates a method of soaring in a dead calm which is sometimes used by the albatross. One morning, there being no wind but an occasional very heavy roll, I noticed six albatrosses flapping behind the ship on the look-out for refuse. Suddenly one bird started flying off to one side and was almost immediately followed by the five others. I watched and, at first, wondered why, but soon realised that the first one had seen an extra large roller coming towards us, crest parallel to our direction, the others had followed, and that they were now "sitting" on the advancing front and soaring with about six inches to spare! On reaching the ship they discarded the roller at the prospect of food, but a short time later the performance was repeated.

From the above remarks one might conclude that the particular method of soaring used by an ocean bird depends more on the wind strength than any other factor. In a dead calm the albatross soars in front of an advancing roller; in a light to moderate wind any sea-bird will soar over a ship or a cliff; while in a strong wind the combination of wind deflection and dynamic soaring appears to be the only method used.

F. M. HAMILTON

EDITORIAL NOTE.—This letter was accompanied by another from Dr. J. C. Mottram, a less experienced member of the London Club, who had been on marine scientific expeditions. He wrote that albatrosses "take a zig-zag course,

one leg along the trough of the wave and the other leg at right angles to the wave and up wind . . . When on the trough of the wave they fly close down to the water and on the lee side of the waves . . . Having proceeded thus for 30 to 100 yards, they then make a quick right-angle turn up wind . . . and then shoot upwards and forwards to a height of about 50 feet."

Note that the upcurrent is over the *lee* side of the wave, where the advancing wave slope lifts up the stagnant air in the trough — stagnant because it is slowed up by contact with smaller waves. There is practically no upcurrent above the windward slope, because the biggest waves move almost as fast as the wind.

A. E. S.

SAUCER OVER MICHIGAN

By HAROLD DREW

I imagine that most of us are inclined to be rather sceptical on the subject of Unidentified Flying Objects — until we sight one. Last summer, flying out of Big Beaver Airport in Michigan, I sighted such a one.

I had taken a winch launch after having landed for a perfectly innocent lunch and was relaxing in a well-defined thermal. I was climbing steadily, glancing around now and then, half expecting a fellow member to come in and share my thermal. My glance fell on the U.F.O. and remained rivetted to it for the two or three seconds until it disappeared under my wing.

I did quite a bit of quick thinking during the following 180 degrees before it again came into view. Here was the traditional saucer on edge with the lens-shaped cabin at the centre; true, it was quite a way off, although at about my altitude; true, I could not yet distinguish the characteristic inclined windows; true, that I had seen nothing more than a profile.

When the U.F.O. came into sight again, I could take a longer and more dispassionate look. Doubts began to assail me. The body of a bird like the Heron, seen in profile, might look as if it could be lens-shaped. Its legs, trailing behind the body, might look like one side of the rim of the saucer. However, I have never seen a Heron in soaring flight, nor does the Heron fly with his neck extended so that the neck could be taken for the other side of the saucer rim, seen on edge.

The third time round left me with few further doubts. I could distinguish the blob formed by the head, I thought I saw a slight wing movement and the bird was more nearly head on, so foreshortening the neck and legs. I decided to head for him the next time round. However, the decision came too late for I did not see our friend again.

With a sunny day on our hands in New York during the fall, we drove out to the New York Zoological Park in the Bronx and sought out Mr. J. Bell, the Assistant Curator of birds. He listened patiently to my tale and suggested that the bird was a Crane, probably a Sand Hill Crane. These birds, he told us, stick their necks out in flight, are not unknown in Michigan and are reputed to soar, at least in ridge lift. He directed me to an open-air aviary where a pair formed part of the collection. The birds were, of course, pinioned and so could not be seen in flight, but, bearing in mind Mr. Bell's description of their flight attitude, one of this species could have been my U.F.O.

I also took this opportunity to talk with Mr. Bell about the migratory habits of the birds we call Chicken Hawks in Michigan. He thought that they would be the Broad Winged Hawk, which he stated to be common in Michigan and elsewhere in the U.S.A.

In the fall of '62, I completed a modest goal flight from Big Beaver to Marion Ohio County Airport. En route, I was working a highly perfumed thermal triggered off from the Miami River refinery at Toledo. I looked up from my instruments to find myself surrounded by perhaps four or five hundred Hawks. We climbed together to

about 3,000 feet, at which altitude one or two leaders peeled off and headed down wind. The others immediately followed. Their course was about S.E. but mine was more southerly, so that I soon lost them. However, for as long as I could see them, they were in gliding flight.

Mr. Bell was a little vague about the use by birds of regular thermalling techniques when migrating in flocks, nor had he ever seen so large a flock of Hawks. He did say that birds frequently use ridge lift when migrating in flocks.

A few weekends after my experience over Toledo, Chuck Kohls, of the Toledo club, came over to Big Beaver with his Ka-7, so that we could try out winch launches with this on our rather small field. (We subsequently bought one of these ships.) He told of an exactly parallel experience which occurred at about the same time as mine.

A look at the map will suggest that the chances of such an encounter in the Toledo area in the fall may be considerable. If the Hawks regularly use thermalling techniques when migrating, then, like us, they will be compelled to skirt Lake Erie. This means that all the Hawks from a large area of Canada will converge on Toledo. Here is an opportunity for an ornithologist interested in the migratory habits of soaring birds to get aloft in a sailplane at the appropriate time and place.

EDITORIAL NOTE.—The use of thermals for migratory flights is common with storks, who have been observed to land when the thermals give out and take off when they start again next morning. An interesting observation by Admiral H. Lynes was recorded in 1909 in *British Birds* (Vol. 3, p. 36) and reprinted by A. Landsborough Thomson in his book "Bird Migration" (1st Edn., 1939, p. 55):—

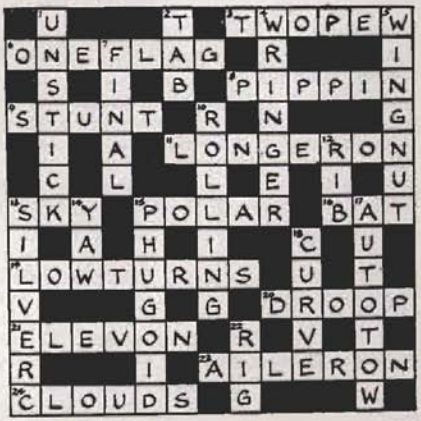
"During September, 1906, H.M.S. Scylla was at anchor off Alexandretta, in the Gulf of Iskanderun, at the very north-east corner of the Levant. For an hour or so during the forenoon (from memory I think it was about 10.30 to 11.30), for several days in succession, there was a considerable stream past the ship of white storks, about eight or ten every hundred yards, steering a dead straight south-easterly course. They appearad to be flying in rather a leisurely way, between ten and fifty feet above the surface of the water, and were obviously just crossing, by the shortest route, the mouth of the gulf, a distance across the water of some twenty-five miles. On reaching the far shore of the gulf (our side), they stayed their progress a little to assemble, wheeling around and mounting higher and higher, about five thousand strong — an impressive spectacle. Gradually they drew away, still circling round and still apparently rising, until finally, perhaps half an hour after the last of the pack had passed the ship, the whole concourse of storks became lost to view at an immense height over the hills in the direction of Aleppo."

DART GAINS WORLD RECORD

THE world Goal-and-Return record was broken on 6th January by S. H. ("Dick") Georgeson with a flight of 466 miles from Omarama in South Island to near Blenheim, at the north-east tip of the Island, and back, in a Slingsby Dart which had been assembled from a kit. He flew mostly at about 20,000 feet, so evidently used the Southern Alps wave. The previous record, 434 miles, was set up by M. Jackson in South Africa on 8th January last year.

CROSSWORD

SOLUTION



TIME TO THINK

By M. C. WOOLDRIDGE

TODAY I had my first ever glider flight where I had time to think. On previous occasions my mind has been taken up with either circuit-planning or searching for thermals, and trying to remain in them once they were found.

All this changed with hill-soaring. After 10 or 20 minutes of beating up and down the Dunstable ridge, looking for the best lift, I realised that my altimeter had settled down to a steady 580 ft. and did not want to budge one way or the other, despite all my efforts to get higher, and despite my occasional slipping turns and other imperfections.

I was thus freed from constantly watching the vario, and could concentrate on other aspects of flying. For the first time I realised how important it is to allow for drift, since this problem is accentuated when one is trying to maintain a track a few hundred feet above the crest of a hill with a strong wind constantly trying to blow the aircraft beyond this crest.

Secondly, some of the air laws, drearily learnt for the C test, sprang to life. Since the lift is confined to a fairly narrow belt, flying in this belt can be likened to driving on a road. Laws about overtaking, meeting head-on, and turning outwards become essential. However, there is the additional factor, not encountered on roads, of height. How high does the glider, approaching head-on, have to be in order not to worry about "turning right"?

Thirdly, I really had time to investigate the lift distribution over the ground, knowing that if my survey led me out of lift I merely had to point back towards the easily visible hill crest (as compared with the invisible core of a thermal) for a "power injection".

My method of finding the best lift was to fly on a zig-zag along the ridge. After repeating several times, to allow for fluctuations in wind strength, I had a fair idea of where the strongest lift occurred, by watching the P.Z.L. needle.

Apart from spending more time in thinking about flying, there was also more time to appreciate the view. One of the excitements of hill-soaring is the fact that on one side of you there is a drop of, say, 580 ft.—a safe height for planning one's final approach, while on the other side the ground may be less than 300 ft. away. Low flying in powered aircraft is fun, and when such flying can be done safely in the serene quietness of a glider it is exhilarating.

However, after a while some of the novelty of apparent low flying wore off, and I was looking for new interest. I began to look forward to the turns at the ends of the beat and experimented with shallow turns, steep turns, fast turns, and climbing turns (nose down first).

I also started venturing further along the ridge before turning back. My first beats had been within easy gliding range of the airfield. However, as I became more confident that the lift was not likely to fail suddenly, I made my southerly turns further and further away.

It so happens that Whipsnade Zoo is south of Dunstable, and I remember being tremendously excited when I looked down past my wing-tip and saw some penguins. As my beats became longer and longer I took in all the animals—polar bears, buffalo, zebras, camels, and tigers (I would not like to pick their enclosure for a landing!). It was all very interesting and educational.

After an hour and 20 minutes I looked down at the airfield and saw some of my friends walking out from the canteen, and making wild hand signals. I took this to mean that they too wanted to view the Zoo, and so I landed, having had a very instructive and exciting flight, with plenty of time for real enjoyment.

TRUE FLIGHT—A FABLE

By M. BIRD

LOOKING back at it, it was strange that it should have taken Fred so long to switch from power-flying to gliding. At his old flying club he always talked about "Man's age-long dream of flight", "imitating the birds" and all that sort of guff, in an obsessional way which even the keen pilots thought rather unhealthy.

Anyway, one afternoon he put his Gemini down at our site, took a joy-ride and that was it.

This was "true flight, the real, natural thing". Nothing unusual in that, but Fred said it with an intensity that no one had seen before.

In a week he had sold the Gemini and ordered one of those breathless Continental sailplanes with retracting undercarriage, radio, flaps — the works, in fact. He was pretty intolerant of being told how to do things and we all predicted he would break his neck in no time.

But no. Fred winded us all by getting two diamonds and a fistful of records within the year. He was a natural-born flyer or something. He seemed to be enjoying himself all right, but towards the end of the season he started grumbling that this was not "true flight". "Too artificial", he said. All those instruments and gadgets, the enclosed cockpit — it was unnatural. "I want the wind in my face, flying by the seat of my pants", etc. He was off again.

We weren't at all prepared for his next move. He could certainly afford something better than a Cadet, but he insisted that this was just what he was looking for.

It had no instruments — none that worked anyway — and flew just like a Cadet. Fred was delirious. The real thing, at last! He strapped himself in, declared Glasgow, gave "All Out!" and was gone.

With his third diamond out of the way we felt that he would surely settle down to enjoy his gliding like a normal chap. Yet the old restlessness seized him before long. Why must he sit cooped up in a box, a barbarous mechanism of wires and pulleys between his muscles and the air? Downright unnatural. Not real flying at all. He knew just what was needed and shortly set to work.

* * *

The Committee were adamant. No, Fred would not be allowed to jump off the Bowl hanging from his Pilcher-Lilienthal thingumajig. Look what happened to Pilcher and Lilienthal, they said. Which for anybody but Fred would have been a convincing argument. He took Umbrage, High Dudgeon and worse. He resigned his membership on the spot, packed his bamboo and canvas contraption in a rucksack and marched grimly out of the gates. The same day he was sighted heading north at cloudbase after successfully launching himself off Ivinghoe Beacon. It was the last any of us saw of him.

From time to time climbers in mountainous parts would tell stories of a great winged figure swooping silently out of the mists and vanishing as suddenly as it appeared . . .

That wasn't quite the last news of Fred. Last year one of the Skylark 3 pilots in the Caledonian Competitions was nibbling cautiously at the edge of a vast cu-nimb when a lean, leathery figure flashed contemptuously past. A slender web of feathers, stretched between his outspread arms and feet, formed his entire means of flight. He flew straight to the dark centre of the up-current, wheeled sharply and soared up into the enveloping murk, uttering an eerie cry of triumph.

The transformation was almost complete.

NOTES BY AN 18th CENTURY BALLOONIST

DR. J. W. S. Pringle, for many years president of Cambridge University Gliding Club and now Linacre Professor of Biology at Oxford, sends the following extracts from the second edition of the Encyclopaedia Britannica describing a balloon ascent by a Mr. Baldwin from Chester in 1785:—

"The perspective appearance of things to him was very remarkable. The lowest bed of vapour that first appeared as cloud was pure white, in detached fleeces, increasing as they rose; they presently coalesced, and formed, as he expresses it, a sea of cotton, tufting here and there by the action of the air in the undisturbed part of the clouds. The whole became an extended white floor of cloud, the upper surface being smooth and even. Above this white floor he observed, at great and unequal distances, a vast assemblage of thunder-clouds, each parcel consisting of whole acres in the densest form: he compares their form and appearance to the smoke of pieces of ordnance, which had consolidated as it were into masses of snow, and penetrated through the upper surface of white floor of the common clouds, there remaining visible and at rest. Some clouds had motions in slow and various directions forming an appearance truly stupendous and majestic."

Later in the account:—

"In the course of the balloon's tract it was much affected by the water (a circumstance observed in former aerial voyages). At one time the direction of the balloon kept continually over the water, going directly towards the sea, so much so as to endanger the aeronaut: the mouth of the balloon was opened and he in two minutes descended into an under-current blowing from the sea."

DUST DEVIL ON SEA-BREEZE FRONT

WHEN a "very well-developed" dust whirl tracked across Idris Airport, 16 miles south of Tripoli, on 31st May, 1964, its centre moved directly over the control tower and meteorological office area, breaking a window, throwing radio equipment off a table, and making "a noise like a small explosion".

The dust whirl was estimated to be moving at about 10 kts.; its base was about 50 yards in diameter and its top, estimated to be at about 2,000 ft., had a diameter of about 250 yards. It had come across mainly cultivated land so did not contain much dust, but a large number of pieces of paper and vegetation were "circling cyclonically at all heights". As it passed, the met. office barograph showed an instantaneous fall and rise of 3.5 mb.

This was the only dust whirl seen that day. As it passed, the north to north-east sea breeze penetrated to Idris, its speed being 10 kt. initially, increasing later to 15 kt.

J. B. McGinnigle, who describes the event in the *Meteorological Magazine* for Oct., 1964 (Vol. 93, pp. 313-6), comes to this conclusion:—

"The combination of the very unstable air mass, large positive energy area (as shown on the tephigram) and very high air and ground temperatures, further allied to the marked horizontal convergence of the sea-breeze front, would be highly conducive to the formation of a vigorous vortex which would develop on the front as a wave depression. The vortex would move along the sea-breeze front with the direction of the wind in the lower levels and the circulation would probably be maintained to a few thousand feet. The Wheelus Field (upper air) ascent gives the wind at 2,000 ft. at this time as 290°, 8 kt. It is therefore suggested that this very large dust whirl was a small vigorous wave depression on the sea-breeze front.

OBITUARY

ANGUS MACAULAY

THE Aberdeen Gliding Club has suffered a very sad loss with the death of their C.F.I. Angus Macaulay, who died on 28th November after a short illness. Angus, who was 40, served for some years as a pilot with the R.A.F., where he gained flying experience on many types of aircraft. When he returned to civilian life he joined our club and soon became an instructor, being appointed as C.F.I. in 1961. His kind nature and understanding of pupils' difficulties has helped so many of us. He was also responsible for our Tug aircraft, which he organized with that keen efficiency which was so typical of him.

We shall all miss him very much.

He leaves a wife and three young children.

J. P. W.

BOOK REVIEW

Great Flights and Air Adventures, by NORMAN MACMILLAN. Published 1964 by G. Bell and Sons Ltd., London. Price 21s.

THIS book is subtitled "From Balloons to Spacecraft", and the 22 chapters certainly show variety. The first is an account of Gordon Cooper's orbital flight in 1963, the next of a distance record by balloon from England to Russia in 1907, the third of the earliest cross-Channel flights, the fourth of the first crossing of the Alps by aeroplane, and so on.

Captain Macmillan uses published material almost entirely and rewrites it in journalistic style. Yet my favourite Macmillan book remains his first, "The Art of Flying", published in 1928, in which he wrote about the ways of the air like a sailplane pilot. But he seems to have "written himself out" on the subject in that one book, for he never took up gliding, and his 19 subsequent books have been almost entirely about other people's flights, though this one includes a flight of his over the Andes.

In the present book, gliding gets only two chapters, both devoted to the flying career of Hanna Reitsch and evidently based on her autobiography (except that he places the Rossitten gliding centre in Pomerania instead of East Prussia). The first of the two starts with her first cloud flight, in which she lost control in a cu-nim, and the second ends with her imprisonment for 15 months by the American authorities because they thought she had been Hitler's pilot. (The identity of Hitler's private pilot has since been disclosed in a book, "Hitler's Pilot", by Hans Baur, published in English translation in 1958; he held down the job from 1932 till the last days in the Berlin bunker.) In between, much flying in various aircraft is described, including a detailed account of her crossing of the Alps in a Sperber Junior from Salzburg to the Piave valley in 1937.

The last five chapters are devoted to space travel and include most of the manned flights. The book would make interesting reading for any young aviation "fan".

Some Further Observations from Aircraft of Temperatures and Humidities near Stratocumulus Cloud, by J. G. MOORE, B.Sc. Meteorological Office Scientific Paper No. 19. Published 1964 by H.M. Stationery Office, London. Price 3s.

STRATOCUMULUS cloud sheets are known to be formed from water vapour lifted by convection and turbulence from the moist layer of air just above the earth's surface. Yet, although sailplane pilots have often found thermals below stratocumulus, they never seem to have been lifted by these thermals right into the cloud.

This paper gives observations from 11 meterological flights below, through and above stratocumulus — eight in the daytime, two at night and one at sunset, all in the Farnborough area. In each flight, runs were made at every 250 ft. level except for the first 500 ft. above the cloud top, where they were made at every 100 ft.

This paper is not interested in thermals as such, but it gives temperature readings at the various heights, plotted on a tephigram, and from these one can assume that the air has been stirred by thermals at any level where there is an adiabatic lapse rate. So here is a summary (by the reviewer) of the findings, giving the time and date of each flight:—

(1) Dry adiabatic lapse rate up to and through the cloud layer to its top: 10.00-13.00 G.M.T., 24th October; 10.10-12.50, 19th March.

(2) Dry adiabatic rate up to and part of the way through the cloud layer: 15.20-17.30, 18th March; 18.00-20.30, 23rd Oct.; 18.00-20.30, 3rd Nov.; 10.30-12.30, 25th March (most of the way through a layer 1,500 ft. thick).

(3) Dry adiabatic rate up to cloud base only: 14.30-16.30, 22nd Oct.; 14.30-17.00, 26th Nov.; 12.00-14.30, 21st Nov.

(4) Stable below cloud layer: 13.40-15.40, 4th Nov.; 11.00-13.00, 9th Feb.

In so far as any lesson can be learned from these few examples, it seems to be that the morning should be the best time to try climbing into strato-cumulus from below.

Die Kunst, Sicher zu fliegen, by Flugkapitän F. RITZ. Published by Luftfahrtverlag Walter Zuerl, Steinebach Wörthsee, W. Germany. Price DM 5.20.

THIS book on "The Art of Safe Flying" won the 1963 Flying Safety Prize of the International Flying Safety Foundation, New York. It takes 40 different safety rules in turn: each has a page to itself, starting with a report of an actual incident or accident, followed by a discussion of the factors involved and ending with a short summary in heavy type. On the opposite page in each case is an amusing cartoon; seven of these show sailplanes in awkward situations. The book is well done and deserves translation into other languages.

A Colour Guide to Clouds, by RICHARD SCORER and HARRY WEXLER. Published by Pergamon Press, Oxford, London, Paris, Frankfurt, and by The Macmillan Company, New York. Price 12s. 6d.

PROFESSOR R. S. ("Dick") Scorer is well known in British gliding; the late Dr. Wexler was a distinguished and versatile American meteorologist, whose last job, we believe, was analysing the photographs from the first Weather Satellite.

This is a beautiful collection of 49 colour photographs of clouds, selected from a larger "Colour Encyclopaedia of Clouds" by the same authors. "The object of the book," they say, "is to enable the reader not primarily to give the right name to a cloud but to get to know how it occurs." Many of the clouds are seen from above, taken from high ground, aircraft or space vehicles. Each photo is described on the opposite page, and there is also a substantial introduction on "Cloud-building Motion Patterns", with many diagrams.

Some useful hints on observing, measuring, photographing and sketching clouds are given at the end. But if you sketch an ordinary cumulus only every 5 or 10 minutes, as recommended, you will have at most two or three sketches.

According to the authors, "The sky changes most rapidly at sunrise and so in an hour's observing then you will usually see more changes than at any other time." That is why Dick Scorer got us all up at sunrise on a course at Dale Fort Field Centre. And that is why, at the World Gliding Championships at Madrid, he went up on to his hotel roof every sunrise and thus became the British team's "secret weapon" which brought victory.

Of Flight and Flyers: an aerospace anthology compiled by OLIVER STEWART. Published 1964 by Newnes, London. Price 35s.

THIS is one of the best histories of aviation ever compiled. It consists of extracts from the most significant writings on the subject — mostly narrative — interspersed with well-informed and often spicy comments by Oliver Stewart. There is no room here for even a summary of its contents; they take the subject up to space travel, and cover the past 60 years in detail, with a bit at the beginning about balloons and early flying experimenters.

Mr. Stewart thinks the glamour accorded to the Wright brothers has led to other early inventors being given insufficient credit, and regards the first successful powered flight as that by Clement Ader in France in 1890, though admitting the machine's lack of control. He regards speed as the outstanding factor in aviation progress, saying: "The picture I seek to present is a picture of speed development through aviation to space flight." Of aviation he writes: "Its period of growth, development and expansion is over," and though "aviation as a means of transport

will go on into the foreseeable future", "as a progressive technology it has played its part."

There is a large number of excellent historic photographs, but only one of a glider — Lilenthal's. Perhaps, now that progress in sailplane design is almost exclusively aimed at increasing cross-country speed, Mr. Stewart will transfer his interest to this subject.

A. E. S.

CORRESPONDENCE

A GUIDE TO CLOUD-FLYING

Dear Sir,

I hesitate to add further to the already voluminous correspondence on this subject; my only excuse is that the central topic has drifted from the basic know-how to the consideration of emotional factors in flying and flying training.

Going back to my article "The Nature of Accidents" (December, 1963, p. 454), the plain fact is that you can have an accident simply because you get too frightened to cope. You cannot guarantee that in your flying you will never get frightened, because even if you get so good that you will never frighten yourself (which for most of us is unlikely), you can be pretty sure that there will be plenty of other pilots around to do the frightening for you. The solution therefore is that, by taking numerous small doses of anxiety over a long period, you can increase your ability to tolerate anxiety, so that when the big fright comes along, as come along it will, you will not be incapacitated by it.

There are situations which are dangerous and frightening like climbing a tree, and evolution made it so 100,000 years ago. There are situations which are dangerous but not frightening like driving a car too fast (but in another 100,000 years our descendants will have developed an instinctive fear in this situation). Finally, there are situations which are frightening but not dangerous, like diving off a high board, and I think it is fair to say that sensible aerobatics and cloud-flying fall into this category.

If you are going to increase your tolerance of anxiety, a factor which may well be necessary for your eventual survival in the air, you must get skirt-weaned from your instructor at some stage of the game. When you take up cloud-flying your biggest problem is to overcome your fear of going into cloud, and in my honest opinion I think you should do this alone.

Marlow, Bucks. D. BRENNIG JAMES.

THE ARM-CHAIR PILOT

Dear Sir,

I have always found Anthony Edwards's articles both interesting and amusing. His able work on the trapping of polars, and on cross-country flying, would surely win him a place in any International Team of arm-chair pilots! I certainly do not wish to discourage him from writing more, but I fear that his practical work has been sadly neglected of late. It may be revealing to see this erudite theoretical work put into practice. The theories unfortunately fail to take account of a pilot's previous experience, and its effect on the chosen course, which often includes more thermals than the bare statistics suggest! Even on my best flights, the barograph does not display that orderly array of shark's teeth which is popularly represented as a *sine qua non* of punditry!

No doubt renewed practical acquaintance with glider driving will enable Anthony to enlarge on his basic theories, to include additional factors. Unfortunately they will probably then be beyond the comprehension of most of us!

I would also like to add my support to Dr. James's views on cloud-flying. My experiences with artificial horizons are similar, but I feel that any pilot should

demonstrate to his own satisfaction the ability to fly straight and reasonably level on the T. & S. alone, before venturing into a large cloud using the horizon; few gliders have their batteries charged before every flight.

Since the advent of dive brakes, has there been any accident directly attributable to loss of control in cloud? If not, let the pilot decide whether his cloud-flying shall be learned dual or solo, subject to the usual safety criteria.

JOHN FIRTH.

HANG ON TO THE WINCH

Dear Sir,

The interesting and unexpected correspondence in your December-January edition prompts me to answer some of the questions raised.

The rhetorical Scot, Pensator, poses some good questions: he asks what is the safe weight that a glider will/can carry to 2,000 ft. This depends on the type of cable that is used. The hook is stressed to withstand a tension of 1,000 lb., at which point, we are led to believe, the cable weak link fails. This weak link should therefore support cable up to ½ lb. per foot at a height of 2,000 ft., assuming that it was above the winch and there was no tension on the cable. If there were, then the aircraft would be sinking at a greater rate than it need, or the cable would break. Such a cable is similar to the 11 s.w.g. piano wire used by most Clubs.

The launching cable is, of course, a catenary form during the launch. As the glider rises, it has to support an increasing load of cable as well as the down load created by the pull of the cable. The secret of high winch launches is to ensure maximum rate of climb in the early stages. (I didn't say pull hard back straight off the ground—that can be most disappointing.) Very little height is gained after the glider subtends an agle of more than 80 degrees to the winch. Thus it is that the highest winch launches are achieved in moderate wind conditions of 20 kt. and more.

The simple assessment of power required to raise a glider to 2,000 ft. in the duration of 60 seconds of one winch launch is about 70 h.p. This also depends on a number of variables which are difficult to determine: that is, the drag of a glider at varying angles of incidence. However, the output of the engine needs careful matching to the winch drum so that the engine is rotating at sufficient speed to give the torque, and thence cable tension, to suit the speed of the glider through the air. Large drums and high gear reduction are preferred as the large drum reduces cable tangle problems and does not need to revolve so fast.

I cannot agree with Alistair Wright that the Ford V.8 is a really suitable power unit. Frankly, its power curve is too steep, and hasn't a wide enough plateau over the speed range that a glider winch launch requires. Recent experience has suggested that the Gardner or Leyland or A.E.C. diesel engines of 100 h.p. are more suitable. They are little more expensive than the Ford or Bedford unit but use cheaper fuel and less of it.

Mr. Wright's questions are relevant, but he misses the really important one which is: are Clubs really able to spend £1,000 on a winch when they often find it difficult enough to buy aircraft without sources of H.P. finance?

The impression remains that whenever someone gets up in Committee and suggests a substantial outlay on a winch, the less informed start up the cry that they can make one for much less. After all, they know of a suitable engine/bus/lorry that a kind man will let them have for next to nothing. Unless you are lucky, or know where to find a little-used unit, such machinery is teetering on the edge of despair.

There are 51 civilian Clubs in this country, and assuming that they have the optimistic figure of two serviceable winches and one retired winch, this gives a total market of 150 units. Assuming that a winch lasts 10 years, then this is a replacement figure of between 10 and 15 units a year. At £1,000 each, this is a turnover of £10,000 to £15,000 per year, which is too small a volume of business for a separate engineering unit to be supported; however, some larger concern might look upon it with favour. Such enthusiasm tends to be short-lived.

I feel that the home-made winch will be with us for a long time, and what is necessary is a better understanding of the principles underlying the construction of a winch. I will be pleased to enter into private correspondence with anybody interested.

Yorkshire Gliding Club. J. C. RIDDELL.

A VISITOR TO OERLINGHAUSEN

Dear Sir,

At the end of October I spent a very pleasant week at the "Segelflugschule" at Oerlinghausen, with a view to the "five hours", and I would recommend it particularly to someone who wants to do non-competition gliding "somewhere different", or who wants to practise German while learning to glide. While cross-country flying is considerable in the summer, they do not talk so much of 300 km. as of the size of traffic, and I have the impression that the site is more than anything else a good school.

The C.F.I. is "Vater" Rademacher, who is most friendly and helpful and who, on the ground, speaks good English. The school is run by the Government and its equipment and organisation is good (on 26th October, during seven hours, using 15 people, 4 gliders and a two-drum winch, we flew 91 launches; they average 120-150 per day in the summer). I was with a course of instructors-to-be from other clubs who generally felt this to be the most efficient site in Germany. Accommodation is good and the food "wholesome institutional". The site is about 1 km. in front of a long ridge facing the south-west. The countryside has a good reputation for thermals in summer (again, 26th October was a good example for me when I scraped 50 minutes below 1,200 ft.—well outside my season) and "five-hours" there are common.

A snag lies in the licence requirements, which I do not fully understand. I had to have an official medical examination by the local doctor, which cost me about £2. If I was to fly unsupervised (i.e. across country) I would have had to take an examination similar to the written test for the English P.P.L., but I understand that the Ministry may accept the P.P.L. as a substitute. That is: Minister von Transporten (Abteilung Luftfahrt), Bonn.

I am sure that other visitors like me will be very welcome. Indeed, several English people, I think, have taken their aircraft there, which saves them trouble about the licences.

R. L. S. BUTLER.

This card, sent by Irene and Roman Zabiello, travelled by sailplane mail from Leszno 180 km. north to Tokio, a small town in Poland.

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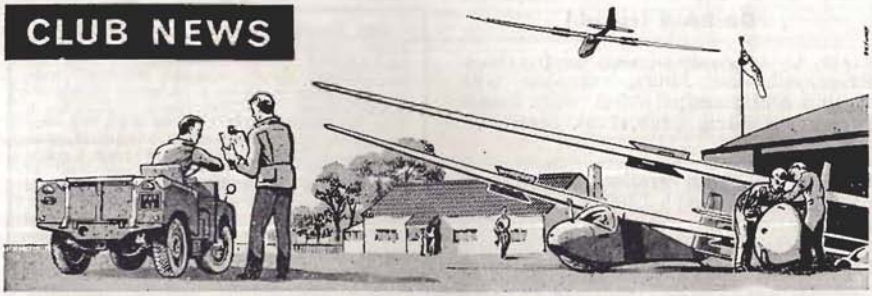
CLUB NEWS



THIS issue we have a bumper number of reports including for the first time news of the Lincolnshire club flying from the Burnaston airfield who were airborne within two months of their inauguration meeting. The Land's End Club who are to fly from the disused Land's End Aerodrome. Also the R.A.F.G.S.A. Mendips Club at Weston-super-Mare, who, although they have not reported before, have been in existence about a year.

The contribution from Canada mentions David Parsey who many will remember as a stalwart of the Southdown Club before his departure a number of years ago to the Western Hemisphere.

Copy for inclusion in the April issue, typed, double-line spaced on foolscap, should reach me at 14 Little Brownings, S.E.23, not later than Wednesday, 17th February, 1965.

YVONNE BONHAM (MRS.),
Club News Editor.

AVRO

FIFTY past and present members and friends attended a social evening recently, during which John Ekman was presented with the Annual Pilots Award, a trophy for the best solo performance during club year 63-64, by our chairman, Jimmy Orrell. The occasion also gave us a chance to wish Peter Lock a pleasant journey and good soaring. He will be in New Zealand by the time this is in print.

1964 appears to be the best year since the club was inaugurated 11 years ago. By the end of the year we will have done over 3,200 launches at Woodford, also a number of away visits with the Skylark have gained us several Silver legs.

J. A. K.

BRISTOL

WITH the close of the thermal season eyes are constantly scanning the sky for the first signs that the ridge may be working. This it seems to do not infrequently and on one sunny Sunday in late November no fewer than 12 pilots were comparing performances on the west ridge. On this day Brian Pratt did his five hours in the club Olympia.

Another Olympia 460 syndicate is busy trailer building. The owners say their trailer is stronger than most and therefore heavier, but those of us who have tried to lift it know it is stuck to the workshop floor!

Two more solos: Roy Gunner and Liz Saint are to be congratulated and added to the year's record list of achievements. With Colin Pennycuick's Ka-6 in the workshop it would seem he intends to be with us for some time.

Friendly relations with other clubs continue and we welcome visitors to the newly-decorated bar. Particularly those from Dunstable who may care to return "Rudolph" before we plan our next public relations campaign.

Finally, congratulations to Jean Sutcliffe who produced a daughter on 30th November. Hope we're going to see a lot more of ex-C.F.I. Alwyn than of late!

R. G.

BLACKPOOL AND FYLDE

Presentation of Certificates: l. to r., Terry Hogben, A. N. Other, Mr. Liver, Jane Murdoch, Malcolm Eaves, Len Clarkson, Derek Raymond, Richard Aldous.

CAMBRIDGE UNIVERSITY

THE first of the two unexpected experiences of 1964 we seem to have shared with most other clubs: a splendid late summer and autumn. The second one we shared with few: a surge of success at the Regionals.

Cambridge pilots took part in four regional contests. John Firth won the Dunstable meeting in a Skylark 3F, and Colin Pennycuick the Royal Naval G.S.A.'s contest at Dunkeswell in a Ka-6. In the Western Regionals, John Brenner and Siegfrid Neumann came 2nd in the Club's Olympia 2, and in the Northern Championships Lionel Alexander and George Whitfield gained 5th place in the Olympia 460.

Our most successful pilot, of course, was John Firth. Apart from winning the first contest in which he took part, he completed his Gold C with a 190-mile dog leg from Cambridge to Moreton via Norwich. For full measure he proceeded to bag the U.K. 200-km. Triangle Speed Record on 20th August.

The larger part of our mileage in 1964 was flown in August and September. A memorable day was 22nd August when seven sailplanes starting from Cambridge covered a total of 715 miles. One of the seven pilots was Simon Redman who completed a 152-mile out-and-return to Witney in his Skylark 4.

At the end of September Gerard Downing flew the Swallow to Woodbridge and thereby gained his Silver C distance. The last cross-country of the year was flown on 10th October, a 52-mile triangle. Local soaring at Cambridge continued until 7th November when Richard Fortescue reached 5,000 ft. in cloud, flying the Olympia 2.

Our September Camp at the Long Mynd will be remembered for the massive wave soaring we had. Alan Purnell and David Wigglesworth gained their Gold C heights in wave lift, David covering 67 miles in the process. Bluebell, our T-21, joined into the fun and reached 7,000 ft., furtively flapping her wings no doubt.

G. S. N.

CORNISH

THIS is the time of year when, like Janus, we try to look both ways, back at 1964 and forward to the 1965 soaring season. 1964 was the Club's best year for cross-country flying, not so much for great distances as for the fact that more people were trying; more Silver C legs were flown than in the previous seven years put together. This has been something of a break-through against the peninsular climate and it is hoped that it can be maintained in weather less favourable than 1964's.

It is sad to report that financially it was a poor year, and perhaps we've been a bit self-satisfied and not made full use of our facilities. It looks as if we shall have to tighten our belts and work the treadmill harder this year. We have some keen new members and it is hoped that an increase in launch rate will benefit their training.

The winter has given the odd flying high spots and some days in late November were interesting. When a cold north-westerly blows off a relatively warm sea, not only does the cliff give its lift, but thermals are often stronger than in summer.

On the social side the ladies have once again been working hard, organising the firework party and annual ball, which were both well attended and much enjoyed.

J. E. K.

COVENTRY

ON 5th December our Annual Dinner Dance was held at the Coventry Aeroplane Club with Doc Gregg in the chair. As in past years, it was organised by the Mays, with the help of Gus Cunningham, our C.F.I.

After the dinner the Club Trophies were presented by Mrs. Gregg. The Founder's Trophy (awarded for the best progress by a lady member) went to Sue Stephenson; the Coventry Evening Telegraph Cup (best progress by the other members) was awarded to Lou Franks, who unfortunately, was not present to receive it. The cup for the longest flight of the year in a club machine (President's Trophy) was awarded to Doug Sadler who also retained the Ludgate Turner Trophy.

The Jimick Trophy for the most outstanding flight of the year was presented to Mike Smith for a cross-country flight during this year's Nationals, on a day when almost no other pilot got away. The Boomerang Trophy for the longest out-and-return flight was also awarded, but the person who was adjudged the winner declined to accept the trophy as he felt, quite correctly, that his flight did not qualify. No re-award has been made at the time of writing. The Performance Pile award was not presented as no claims had been received for this year.

The Annual Dinner also marked the end of our activities at Baginton, as with the completion of the hangar, the Club has now ceased to operate on this airfield and will in future fly at Husbands Bosworth. The hangar door was tested and successfully hung on 7th December.

At the end of November an Extraordinary General Meeting was held for the purpose of explaining the results of the recent disagreement between the Shaw Slingsby Trust and the Inland Revenue. Philip Wills attended the meeting and explained how the outcome of this disagreement was going to affect the gliding community and our gliding club.

Unfortunately, the outcome has been that the Club has to repay the loan

which we had from the Shaw Slingsby Trust on our new site at Husbands Bosworth. This has come as a blow to our finances; however, with the aid of life memberships, sundry personal loans to the Club, and advance payment of subscriptions, we should be able to meet our commitments, although the Treasurer will be busy making ends meet for a little while.

C. D. D.-J.

DEVON AND SOMERSET

WINTER flying continues at Dunkeswell with even more popularity. No doubt our "cosy" Capstan contributes to this. In November Reg Chubb had an excellent flight of over two hours in his new Olympia 460 which just seems to float on nothing. John Fielden also had an hour and a half flight but had to land eventually, his Skylark 3 having no landing lights!

Our Tiger Moth is even busier with aero-tows and also gives members the chance to go on "met" flights in search of wave soaring conditions, "on top" around 5,000 ft. in brilliant sunshine in an open cockpit is well worth the trip.

We hope to add a Skylark 4 to the Club fleet in anticipation of another '64 type summer.

We are disposing of the T-31 Tutor type gliders in favour of the Capstan to Swallow programme. Our Club continues to improve the control tower as its clubhouse where all week-end meals are available to visitors. We would extend a hearty welcome to other clubs to visit us by air or car.

N. P. H.

DONCASTER

WE are settling down to a winter training programme after the best soaring season the Club has had. The competition week for Club members, held in June, seems to have provided a stimulus for a spate of cross-country flying. Five Silver C's have been completed, and many legs. Jack Tarr to complete his Gold C was towed to Ringstone (Halifax Club) and made a dog-leg to Great Yarmouth for distance and Diamond Goal.

Les Muncaster and Peter Grime, on different days, found themselves at Gold C height whilst struggling out of cu-nim. On 6th December an attempt to contact wave was made by Bill Bailey in one of the syndicate Olympias.

After being towed to 8,000 ft. wave lift was contacted several times but alas no great climbs resulted. He eventually found himself above complete cloud cover and landed at the A.T.C. Gliding School at Kirton-in-Lindsey. On the same day the T-21 had a thermal flight of some 19 minutes—not bad for December.

The successful flying has been in no small part due to the three diesel winches and the Tugmaster. (We have not found a suitable diesel yet for the Auster.) The experience gained on building self-propelled diesel winches at reasonable cost will be passed on to any Club interested.

Ab-initio flying membership has been temporarily closed, but the position will improve with the arrival in the New Year of a second T-21. Jackie Bowers—after years of patient waiting—went solo on his 16th birthday. He is now walking round the Dart with a hungry look.

The Northerns are being held at Doncaster from 4th-11th July, 1965. Volunteers are now being press-ganged and anyone wishing to help please contact

Harry Keeble, our Hon. Sec., at the Club.

Peter and Honor Grime, with daughter Elaine, are leaving us for the wilds of Wales. They take with them our best wishes and hopes for the future.

D. AND G.

DUMFRIES AND DISTRICT

ALTHOUGH 1964 was disappointing in some respects we had some good flying and made progress generally. The number of launches at about 1,400 was slightly less than the previous year, but the flying time increased by about 20 hours, due to the great improvement in solo flying and soaring time. Most of the increased soaring time was due to the arrival of an Olympia 460 acquired by the former Prefect syndicate whose machine was sold to the Club.

The 460 has proved very suitable for our conditions and has regularly done 20 minutes from a normal winch launch—beating the Skylark 2 hands down. Our first Silver C cross-country was gained by Alf Winter with a flight to Crosby Airport, Carlisle, and there have been several local flights of over an hour. We have gained this year six A and B's, nine C's and two Silver C legs.

As a result of making a great effort to get out of the usual financial wood we have unfortunately sustained a disastrous loss on one function. This has made further fund-raising essential and put paid temporarily to some of our more ambitious ideas. It has also meant taking a realistic look at our costs and subs and if this results in more efficient running it will be a good thing.

We have at present a good many keen members from all over the south of Scotland and Cumberland and are looking forward to a very busy year.

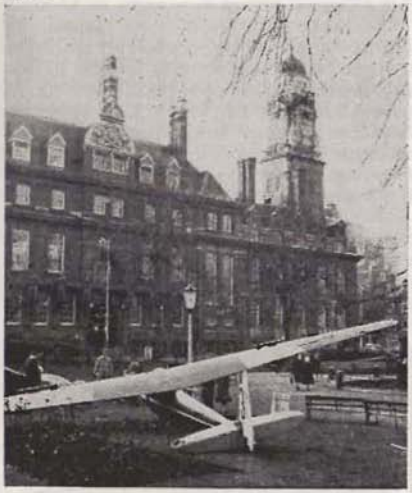
G. J. K.

EAST MIDLANDS
(Leicester)

IN spite of our troubles, including the loss of our Club Tiger, last year was an extremely successful one for gliding at Rearsby. There were the following certificate gains: 9 A and B; 11 C's; 2 Silver Heights; 5 Silver Distances; 6 Silver Durations; 3 Complete Silver C's; 1 Gold Distance; 2 Gold Heights; 1 Complete Gold and one Diamond Goal (subject to confirmation). 1,850 miles were flown from the Club site and approximately 1,000 miles from other sites.

Chris Simpson started 1964 off very well indeed with a very-early-in-the-year blue thermal flight to Devon (nearly Cornwall) in the Skylark 4.

Mick Allen gave us a real surprise at the very end of last year's soaring season by finding the only patch of up of the day under a grey, solitary cumulus and staying with it for half an hour to gain his C.



At the end of November all our syndicate aircraft were rigged and displayed in Leicester city centre. This event was in support of the Lord Mayor's John Kennedy Memorial Appeal Fund. Club members—including Chairman and C.F.I.—collected the magnificent sum of £98 10s.

Throughout 1964 the clubhouse has been given a series of gentle face-lifts by many willing hands. Special thanks go to Ivy Moseley for doing such a grand job, with her team of helpers, cooking and tea-mashing in the kitchen. Thanks, too, from everyone to Doc Cameron, our hard-working and enthusiastic tug-master. Doc really loves his tigers!

Finally, three cheers go to Ernie Smart for making us our mobile Control Tower, Office, Cash desk. Known colloquially as the Spaceship, this invalu-

able piece of Club equipment was built entirely by Ernie and put into service in time to bring the Club even better results in the New Year.

D. H. A.

ESSEX (North Weald)

IT is some months since the E.G.C. appeared in these columns but activity has been constant each week-end since the last notes. By the time these appear we will have notched up well over 4,000 launches this year, mainly on one winch; plus 10 first solos, 7 C's; two by young Peter Perry and Wally Shead, after only six Swallow flights following their first solos.

Pete Treadaway completed his distance leg to gain his Silver C and Gordon McRae and Brian Hockley both gained their Silver heights.

Our home-made Bedford winch is at present "running-in" after undergoing an extensive engine refit, most competently carried out in their spare time by Messrs. Woods, Allcorn and Kenney.

Bill Coyte, our Chairman, has now relinquished the post to take up the far more congenial one of running the Foxhunter Inn at Hereford. Good luck, Bill, and our thanks for all you have done for the Club.

C.F.I. Jim Robinson has taken on the task of Chairman in addition to his C.F.I.'s duties. The question now is, will this weight of power enable him to persuade another aircraft out of the "powers that be" in addition to our T-21 Swallow and our syndicated Weihe?

We operate, as other Clubs may know, from North Weald R.A.F. aerodrome which is now running down and will shortly close, although we may remain in residence for an unspecified time. Up till now, we are without an alternative site. Anyone who might perhaps help in this direction please contact our Club Secretary, John Unsworth. In the meantime, we are always pleased to see any other Club members who may fly in.

A. C. M.

GLASGOW

WE had our first real taste of winter on Sunday, 29th November, with the arrival of snow and ice and a bitter north wind. As this wind was cross, flying was again disrupted and the day lost.

Our winter indoor programme commences on Friday, 11th December, with a "Beer and Blether" evening open to all members and friends. At this gathering the first of a series of training lectures will be given by the C.F.I. and instructors. This will be a monthly feature and is expected to meet a clamant demand.

The Technical Branch will also be busy. Our Tutor is to be modified and the newly-acquired trailer requires alteration, ready for the new season's cross-countries.

T. J. G.

HANDLEY PAGE

WE conclude this most enjoyable and successful year, having achieved a record number of around 1,500 launches. There are now 11 Skylark and 23 Tutor pilots; this provides another record for the Club.

Fortunately the weather has not yet called a halt to our flying, and on 6th December we enjoyed a fairly successful day of aero-towing.

Mick Goodwin excelled himself by landing six inches from the marker in our two spot-landing competitions.

Our hopes of a diesel tow-car and home-built radio have now materialised, and our first clubhouse, in the form of a caravan, should arrive shortly.

F. E. V.

KENT

WELL, that's the end of the 1964 season. The courses were well attended and everybody concerned thoroughly enjoyed themselves, certainly the customers did. There are a lot of newly hatched glider pilots fluttering about the field, also several brand new Silver C badges are just visible, partly covered by the flyingsuit collars, thus advertising the owners' achievement and modesty at the same time.

The Annual Dinner and Dance on 31st October went off very well. 116 members and friends turned out, all looking extremely smart and quite different, with not a splash of mud or oil on any of them.

Work on the clubhouse continues and we expect to move in before the spring. The wood block flooring is now being laid. It is thought that the hot air emanating from the clubhouse bar will pro-

duce such a profusion of thermals that Diamond C heights will be commonplace in 1965.

F. M. K.

LAKES

MR. and Mrs. Len Redshaw honoured us with their presence at the Club's Annual Dinner Dance at Windermere Hydro on 27th November. Mr. Redshaw, in a brief speech, said he hoped that the Club, in the flush of its success, would not fall into the trap of concentrating too much on advanced flying at the expense of neglecting its new members who were the life-blood of the movement.

Mrs. Redshaw then presented the trophies. The Lord Lonsdale Trophy, for the longest flight from home base, went to Gerry Wilson. Gill Haslam received the Leighton Hall Trophy for the most note-worthy flight of the year. The Dodd Cup for outstanding service to the Club was presented to our Chairman. The events of the year versified by one of our members gave the reason:

"1964 AND ALL THAT!"

The Gremlins up at Tebay were bored with regularity,
So one day they decided to upset the whole affair.
They did it very thoroughly, causing great despondency,
And topsy-turvied everything—the land, sea and air.

The hangar flew to pieces when gales blew in February,
Rain washed out the courses, and the sheep drowned on the fell.
Winches played us up a bit, and last, to crown our misery,
The members started falling off, and strained was our morale.

But then up spake our Ernie, the Club's dynamic Chairyman,
"I vote we've had enough o' this—it's time we acted bold,
I'll see 'em down at Vickers' and try some native charm on 'em."
He did just that—and presto!—the fairy tales unfold!

At Vickers was a glider man who listened to the tale he told
And acted sympathetic like to fliers in distress.
He got for us permission to take our kites to Walney Isle,
And so began the salvage of a rather sorry mess.

About this time our Chairman fell sick of influenza bugs
And lay in bed a' thinking out the things he had to do.
He delegated duties to able energetic mugs
Among us who were willing for to work (as he well knew).

He led a team of aircraft. He'd another coaxing tractors,
And one to do the cooking, and a fourth one on admin.
And eight of our best pilots for to act as Club Instructors,
The mentors, if you like it, of banana-fingered men!

And still he wasn't satisfied, this most rumbustious Chairyman,
A drivin' of the slaves of his, he'd put to work so well.
"I want the launch rate doubled—and trebled if it's possible."
He worked us so unmercif'ly, the planes went up like hell!

But aims alone are useless unless results "commensurate",
So Ernie, very fittingly, led off with Silver C.
Just to keep him company G. Wilson then repeated it,
And Haslam flew to Hornby. (Many tyros flapped a B).

Solos got monotonous, such was their regularity,
But others we must mention are Reg Wolff and D. Millett.
The first cramm'd in Olympia for five hours solid purgat'ry,
The latter for cross countries that just failed to make a hit.

'Tis a strange tale—our fairy tale—of toil, an' sweat, an' tears an' all,
A weepin', an' a wailin' an' a gnashin' of the teeth.
With little bursts of humour—(a laugh to prop us when we fall)
But has it not been worth it, Ernie?—Sure it has! Good neet!!

F. G. R.

LAND'S END

THIS is a new Club formed in the hope of obtaining permission to use the attractive grass airfield, at present closed down, at Lands End.

Ambitious and detailed plans have been prepared but the only possible Club activity at present is keeping fingers crossed, although permission has been obtained for one or two privately owned aircraft to use the airfield on an occasional basis.

If we are able eventually to go ahead, a small but efficient fleet will be intensively operated by running summer courses, and flying will be available as well as gliding at least five days a week all the year round.

The site offers interesting prospects for soaring, with cliffs in all directions and sea breezes from both sides going up in the middle! South-westerlies are observed to produce streets starting precisely over the field and disappearing up the middle of the county. Wave has also been observed on many occasions.

Cross-country planning is simplified by requiring a track of 060° made good for 160 miles before a choice of direction is offered, but we live in hopes.

Anyone coming our way in the spring (fingers still crossed) will be warmly welcomed—at least we don't think you'll overfly us!

D. T.

LASHAM

WITH 1964 we must have seen one of the best soaring seasons since the art was discovered. Certainly, at Lasham, we have broken all our records for numbers of hours flown and the various soaring clubs will no doubt be reporting their own cross-country achievements. The Society has done its part in producing a near record number of launches.

We are very sorry to lose the full-time services of Derek Piggott who—having tasted freedom this summer whilst filming "Those Magnificent Men and Their Flying Machines"—has resigned from the position of C.F.I. of Lasham in order to concentrate on writing and on his powered-trainer project. However, Derek still remains an active member of Lasham and we hope to see a lot of him as his powered-trainer develops; this could help us all by taking the ache and frustration out of gliding training. Also, Derek is continuing to run our Instructors' courses with that authority and enthusiasm for which he is so well known.

The post of C.F.I. and Manager has been taken on by Derrick Goddard who will be assisted during the winter by Les Creed and Tony Smallwood and during the summer by further full-time instructors, to say nothing of the many voluntary instructors who devote so much of their time and energy.

As usual, Lasham continues to operate through the winter, week-days and week-ends, come rain, hail, ice or snow. The School fleet now consists of three T-49's, two Swallows and, in conjunction with a private owner, a Blanik. At this time of the year—particularly during the week—we are able to extend a welcome to members of other gliding clubs who are able to drop in on a casual basis to fly as day members. Later on in the year we obviously have to give preference to our own members as the queues become somewhat longer, although a reorganisation of the launch-point has greatly reduced frustration.

The new clubhouse and the superb catering have altered the face and digestion of Lasham and made it altogether more comfortable and liveable-in. This will soon be matched by better sleeping accommodation since the bunkhouses are in the course of reconditioning by an Imperial College team, led by Bill Bailey. So perhaps next year we shall really have "gliding in comfort and joy".

A. D. F.

LINCOLNSHIRE (Burnaston)

THE preliminary talks of 4th October, 1964, on our foundation, led to an inaugural meeting on the 18th. Within two months we were airborne and flew 76 launches on our first operational week-end of 28th/29th November.

Jack Nicol has very generously allowed his Westminster to do the best part of our launches—all auto-tow. We use an Austin 7 Ruby as a retriever—hook on top—back of saloon and boot in the down position as a 'chutecarrier. The pick-up technique gets the cable back to the launch point before a T-31 touch down from a 4-minute trip.

The bird we are dating at week-ends is the Club T-31. We are lucky in also having club-minded syndicates with Eon Baby and Olympia 2.

Roy Kyme is talking about giving us an Automatic Transmission auto-tow vehicle. For next week-end we hope to take delivery of a Scamp.

C.F.I. is Siggy Romrig. His open hearted enthusiasm sets a tremendous example. Membership to date is 45 (fully paid), as yet we are fixing no limits—all are most welcome.

E. B.

MIDLAND

THE last week-end in November brought the first real snow of the winter and most of our cars spent Saturday night in Asterton.

Thanks to some strong westerly winds during the last few weeks in 1964 we have recently enjoyed more flying than is usual for this time of the year. Flying statistics for 1964 show an increase over 1963 both for hours and launches.

Although the Southdown Club visited us for the week immediately after Christmas we have not had the usual number of winter visitors.

Recent months have brought us a few more lady members who actually fly. They should do much to brighten the winter scene.

The Snug Bar which leads off the eastern end of the lounge is nearly completed and should prove its worth.

On 12th March our trophies will be presented to their recipients for 1964 at a Dinner Dance to be held at The Belfrey at Wishaw.

The Easter Rally will be held as usual except, we hope, for the weather. Entry forms may be obtained from Peter O'Donald.

K. R. M.

NEWCASTLE

THE unusually mild autumn has given us a flying start to our financial year and we have already completed more launches and flown more hours for this time of year than ever before at Carlton. Given a reasonable winter we should be in a strong position to make 1964-5 a record year. However, when these notes appear in print we may have disappeared under several feet of snow! Still, it's nice to have a good start.

Flyingwise, nothing much has happened since the last club notes were written. Soaring winds have been rather few and too strong to use, and we have not had quite so much wave activity as in previous years.

On the social side, the Annual Dinner in December was another success for its organiser, Andie Hardie, and a film show was held in January. At this year's Dinner three new trophies, generously donated by an anonymous member were presented for the first time.

They were awarded to Chairman Ian

Paul for the best cross-country flight of the year, to C.F.I. Norman Revell for the longest cross-country in a Club machine, and to Ronnie Donaldson for the greatest gain of height in a Club machine. Norman Revell also holds the Club's Runciman Trophy.

Various members have embarked upon a scheme to beautify the clubhouse and if all the many plans are brought to fruition, there should be a considerable transformation in our present abode. There are even dark rumours circulating that the clubhouse is to be turned into a den of alcoholic iniquity by the provision of a licensed bar—what is the Club coming to?

B. W. B.

NORTHUMBRIA

THE Club's Social season got off to a resounding start with a dance organised by Sigrid Hindmarsh and attended by more than 200 members *sans* overalls, with their wives and friends. This was followed by a bonfire on 14th November. For this conflagration, Alan Brown and his band of helpers practically cleared the Club's wood of timber and topped off the pile with several part-used gliders.

The ladies looked after the inner men and women with sandwiches and hot soup to stave off the effects of the gale which had, that very afternoon, produced some phenomenal launches. Best was the Eagle, which had cast off at 3,800 ft. after 11 minutes on the cable.

In the absence of the two-drum winch, the Club's launch rate is still very low, with the red ball of the launchometer still showing too far up the scale.

Since the arrival of the T-21, Alan Brown and Bill Lowrie have been appointed instructors.

Despite poor launch figures, the T-21 is doing sterling service and members are getting in a fair number of circuits. On several occasions, attempts by syndicate gliders to reach the tantalisingly far away Stocksfield ridge have resulted in landings-out or near thing scrapings-back. The sight of C.F.I. Dave Wilson setting off towards the west usually sets members to coupling up the Eagle trailer!

On 6th December, however, the Hedley winter wave struck. Your scribe had the honour of being the first to pay soaring fees for the T-21 after a very rough 14 minutes in the wave and a shocking heavy landing. Turbulence grounded the T-21 until late afternoon but the Ka-7 and Eagle syndicates made hay until the wave collapsed.

In the late p.m., the wave re-formed strongly right over the field, and Alan Brown in the Ka-7 and Dave Wilson soon disappeared into the murk, closely followed by my wife, Neel and Tommy Ruffell in the T-21 who also disappeared in very short order. In due course, the Ka-7 made a flarepath landing and reported 5 up at 70 kts. on the return leg.

The T-21 crew eventually returned on a borrowed low performance scooter, covered in what may have been mud, and smelling strongly of pigs, having had to land out several miles downwind being unable to make any headway.

P. W. L.

OUSE

AFTER some three years of operation at Rufforth, we can now look on our past efforts with a sense of pride and achievement. The Club's small quota of Silver C legs last year have made us aware that we are at last "arriving" in the gliding world, and this season will really see us on the map.

Instructor Bob Plane seems intent on collecting a certain "pot" while colleague Les Bellamy, overhearing a friend discussing goals and the fact that Lasham is 205 miles away, thinks a Diamond for goal may be on the cards very soon. Girls apparently are not the only ones interested in diamonds!

Seriously, though, what does the future hold? Prospects indeed look bright, especially now we can expect a T-21B and a further high-performance job to supplement the Swallow. With two double drum winches and talk of auto-tow pulley launching thrown in, we should be well equipped to take advantage of any stray cumulus. Our more experienced members will be setting course cross-country for their first away flights, let's hope they do well.

The well organised Annual Dinner and Dance last October was our best yet, credit being due to Norman Worthy. Brian Jefferson was our most welcome guest from Camphill, with humour up

to his usual standard. The surprised recipient of the third presentation of the Anthony Forster Memorial Trophy was Colin Stanford.

Congratulations this month go to Alan Simpson and Les Smith (both power converts) and to Cliff Houseman and Barry Fletcher for C flights. Alan went solo in the T-31B on the 30th anniversary of his first solo in a Tiger Moth—this, I might add, was sheer coincidence.

G. L. B.

PERKINS

AN Eagle will be joining our present fleet of Skylark 3, Olympia, T-21B and Eon Baby sometime in January or February, thus putting strutted machines in the minority for the first time. If we manage to obtain a second winch, with the use of the Eagle we should see in 1965 a significant increase in the launch rate and more important, an increase in the number of members who have experienced real soaring flight.

Our Annual Dinner Dance was held on 22nd January with a real live "group", and was most successful.

C. C. D.

SOUTHDOWN

AUTUMN and winter generally see us confined to circuits except when we are lucky enough to have a North or North-East wind when we get excellent hill soaring, and often bungey launching, along the north facing slopes of the Downs. On a good day it is then possible to soar from Alfriston along the Downs to the cement works near Lewes.

Now, thanks to some pioneer work by Chris Hughes in the syndicate 463 we are getting some hill soaring in westerly winds at Wilmington (near the chalk figure of the "Long Man") on the other side of the Cuckmere Valley.

The Club Olympia and syndicate aircraft have made several soaring flights to this new area. On 6th December Chris fulfilled a long awaited plan to fly to the cliffs from a winch launch and to soar them in a brisk South-Westerly wind.

The wind unfortunately was not sufficiently on to the cliffs to enable the whole stretch to be soared from the Seven Sisters to Beachy Head Lighthouse but at least it proves that it is now possible to hill soar in winds from the North-East, North, West and South-West providing they are strong enough.

It is nearly 10 years since the Club did any cliff soaring from its old site at Friston and it now looks as if we may be able to continue it. Members are now looking forward to the Club 460 due for delivery next year.

Joan Cloke, our Club Treasurer, gained her Silver C height at Firle during September and Ian Agutter reached 11,000 in 463. Alan Boyle gained his Silver height and distance in one flight, which was also his first cross-country, from Lasham. Tony Bywater also gained his height on the same day and Derek Pearce and Malcolm Ford have soloed on the Tutor at Firle.

We were glad to welcome Ray Brigden when he flew in from Lasham during September.

The Club Olympia was taken to Shoreham during October for an aero-tow experience session and we hope that this can be repeated to give aero-tow experience to as many members as possible.

P. W.

STAFFORDSHIRE

AERO-TOWING will shortly be added to the amenities at Meir. Our Tiger Moth was delivered on 6th December and as soon as pilots have been checked out for towing, operations will commence. Another addition to our launching facilities in the form of a two-drum diesel winch is expected to undergo commissioning trials in the New Year.

This winch is a formidable sight and has been christened the "Winchosaurus" on account of its terrifying size. It was formerly two lorries and looks rather like one of those nasty accidents you see on road safety posters.

Mild thermal soaring continued until the end of October and beyond with people trying to soar our very weak ridge in South-West winds. P. Felthouse, J. Grieg and I. Killicoats have soloed recently and Alan McLean set a new Club record by obtaining his C after five solos on the T-31.

The recruiting drive has brought in some more ab-initios, our second lady member, Jacqueline Hurst, and our first Gold C holder, Hugh Browning, who

joins us from Imperial College G.C. Hugh was swiftly elevated to the instructing branch further improving our considerable strength.

A second Olympia syndicate has formed with Messrs. Wright, Harvey, Aranyos and Birch taking over the red and white 2B formerly the property of the first syndicate. This brings the total number of gliders on the site to five and with two winches, the tug and three vehicles, not to speak of trailers and two large down huts, we are actually having to plan the hangar packing these days.

A. W. H. L. W.

SWINDON

THE A.G.M. has just taken place and the committee for 1965 is to be small and streamlined. The following have been elected as officers: Chairman, L. Colquhoun; Secretary, G. Turner; Treasurer, R. Clark; Ground Engineer, D. Rawling; Social Secretary, J. Young; Aircraft Engineer, R. Maxfield.

A special vote of thanks goes together with our grateful appreciation to our past Secretary, Miss B. Sanders. She has done us proud since we started, and has been our Secretary for five years. We wish her well, and hope to see more of her on the field in '65.

It is hoped that we shall soon have the use of a new Blanik which should be here by January. One of our new members, Chris Day, has acquired one of these machines and is allowing the Club to use it, as an advanced trainer. The total fleet for 1965 will now consist of a T-21, Swallow, Olympia, Blanik, Skylark 4 and a Grunau.

I now end by introducing Peter Clifford who will be your scribe for the coming year.

D. E. S.

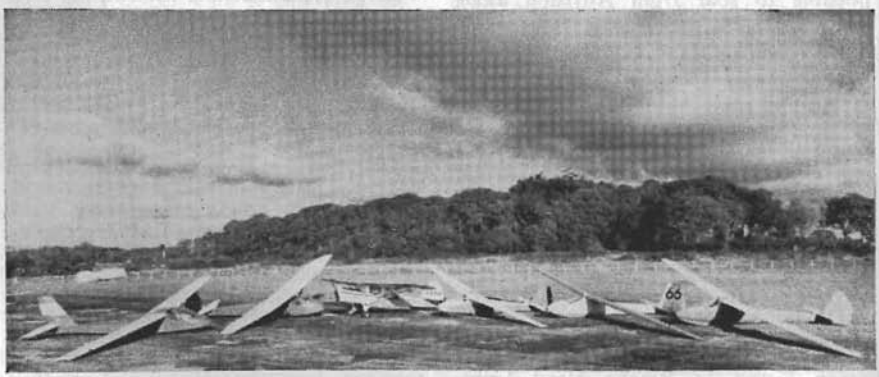
WEST WALES

THE Capstan has established itself firmly in the Club fleet and now that the icy winds of winter have returned it is rather sad to see the T-21 left in the hangar.

However, the two hours' flight it made recently at 1,500 ft. over the 200 ft. Broadhaven cliffs in a 20 knot westerly, is an indication of its superiority and the increased utilisation in tugging we expect this winter.

Its value for cross-country familiarisation was demonstrated last spring when it tagged on behind the Auster when it went to Staverton for quarterly overhaul. The 5 hour return trip up the coast and back through the valleys with cloud base at 1,000 ft. was invaluable for aerotowing and map reading practice as well as in field selection. It is encouraging to find that there are so many reasonable fields available in the Welsh mountains. All credit goes to Bill Shepherd who made our most notable flight this summer in taking the Skylark over 100 miles nearly to Hereford and gained our first Silver C.

We must not forget the retrieve crew who, with absolute faith in their C.F.I., went 70 miles up the road before telephoning back. (The C.F.I. had declared



Streeting of clouds and gliders at West Wales: photo by Squibbs Studios.

Margate before setting off in Sky.) Unfortunately at 2,000 ft. three miles out to sea he funked crossing Carmarthen Bay and landed on the beach outside his home at Tenby. It then became a race between the trailer and the slave gang of holidaymakers pulling the Sky, without wheels, away from the advancing tide over a mile across the beach to the safety of the dunes.

Cliff soaring goes on whenever the opportunity arises and once again the Sky and Skylark completed five hours simultaneously over Tenby in September, a satisfying reward for our hard working Secretary, Arthur Squibbs, and a Silver C completion for 18-year-old Dicky Baldwin.

Chairman, David George, and instructors, Lloyd Edwards and Gil Phillips, revisited Fayence in the South of France this October, this time with wives. Despite a 20,000 ft. Mistral wave for two days, they prefer to draw a veil over the tribulations of French gliding, and prefer to remember the night clubs of Cannes. They wish to acknowledge the unlimited hospitality of Mr. and Mrs. F. S. Coote at Fayence.

The Club is now concentrating on the organisation for its 1965 Holiday Courses and look forward to the pleasure of meeting and satisfying all who visit us in the future.

T. G. P.

WORCESTERSHIRE

WE have now reached the time of year when we can look back to see if our hopes and aspirations of early spring have been realised.

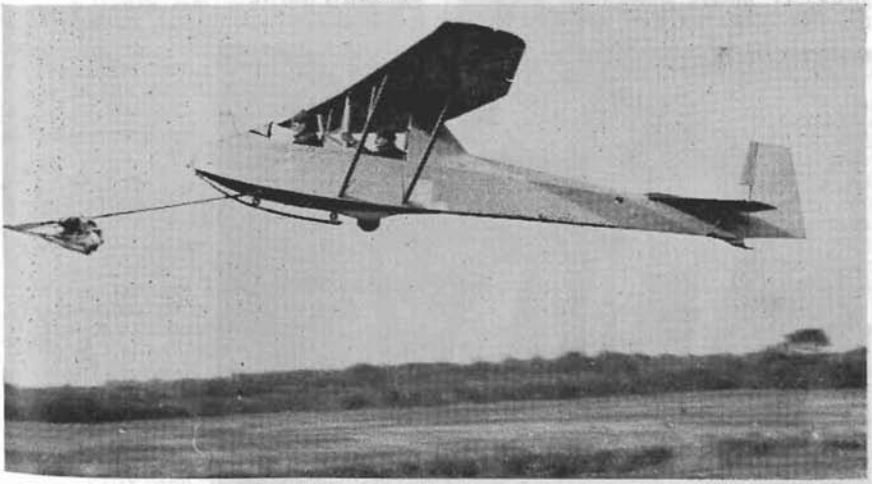
A total of 1,450 launches, some 115 hours, may not look very impressive to longer established clubs, but on the whole we feel a certain amount of cautious satisfaction. Flying started from our new site at Bickmarsh in mid-May and by the end of November six members had obtained A and B certificates in the T-31's and six C flights had been made by the Tutor pilots.

These flights in the Tutor from a completely flat site are especially encouraging and give cause for optimism for the day when we have more advanced aircraft.

We are taking a long, hard look at our ground equipment and it appears that we are assured of plenty to do during the winter. One pair of T-31 wings is being fitted with spoilers which, it is hoped, will reduce the "long slog back" and thereby put up the launch rate.

By the time these notes appear the white pegs in the ground near the hangar should have been replaced by the clubhouse which a member has "obtained". People have even been heard talking of bars and other sophisticated comforts.

R. C. S.



The Worcestershire Club's T-31 takes off on yet another circuit.

SERVICE NEWS

BANNERDOWN
(R.A.F. Colerne)

A RECENT civil aviation circular records that a P38, of all-up weight of some 13,500 lb. was held, in standing wave, for an hour with the propeller fully feathered. The lift was estimated by the pilot to be in the order of 800 ft. per minute. This does indeed give thought to the aspiring soaring pilots of Bannerdown, who on many occasions have observed lenticular cloud above Colerne.

In our last period shorter days have to some extent been compensated by reasonable flying weather and in consequence our record of launches and hours has been quite respectable.

One of the most frustrating expeditions ever fell to the lot of Pete Weavers, Sandy Sandersen, Bob Bryant, Keith Vater, led by Mac McIntyre during October. With much planning and careful attention to logistics they arrived for a week's soaring at Halesland, but wind and weather failed to co-operate and they eventually returned having achieved two 3-minute circuits each for the week.

Work on the ground has continued apace; G meters have been installed, the club room has been redecorated, as also has the coach which now proceeds to the launch point under its own steam (when suitably persuaded by Tiny Whitney!). A Ferguson tractor has been loaned to the Club by P.S.I. and this is already being put to exceptionally fine use. Along with the tractor, Mac McIntyre and Tom Cobold have produced, after much planning and even more hard work, what must be the finest spreader trailer in the G.S.A.

At the last committee meeting the Daniels Trophy was awarded to Roy Gaunt for his seven hour and return to Aylesbury, since then, and in spite of his protests, the Colerne Cup has been awarded to Padre McKenzie. Our most sincere congratulations to the Padre on winning this trophy which is awarded to the member doing best in the air, and most on the ground for the year.

Although major inspections are not due on the two Olympias until next Spring, our Tech Member, Pat Sassi, already has the work in hand to ensure we have an unimpaired soaring season next year.

Our latest excitement came recently when C.F.I. Tug Willson sniffed out our very first local ridge on the west side of Bath Racecourse. He confirmed his estimate of a 15 kt. westerly requirement with a 45 min. flight in the 2B at between 500 and 1,000 ft.

B. J. W.

Cheviots Club Instructors l. to r. J. Allerton, N. Wilkinson, C.F.I., L. G. Stanbridge, B. Lightfoot.

CHEVIOTS (Acklington)

SINCE our last appearance in this magazine we have undergone a few changes in the admin. organization of the club.

On the 7th November we said "Goodbye" to our founder-member, Deputy C.F.I., Secretary and Treasurer, namely Bob Lightfoot, who has been posted away to learn to fly monsters with reheat. A party was held in the clubhouse and we gave Bob a good "send off" which I'm sure he will remember with a slight headache. The open posts have been taken over by Flt.-Lt. Fenton as Secretary and Plt.-Off. Eggleston as Treasurer.

The winter weather has taken its seasonable toll of flyers away but the hardy types have been busy keeping their hands in and competition for the two-seater has been brisk.

At present John Clark and Stan Stanbridge are busy with the loan of a bulldozer clearing our local ridge site to make it accessible and the landing strip safer. At present it is only possible to allow suitably qualified pilots fly the ridge as no dual training on the ridge is available.

Shortly we hope to take delivery of our new diesel type winch which should make some welcome difference to our present launch rate and help to reduce running costs owing to increase in petrol tax.

The Club cordially invites all gliding types in the area to pay us a visit and have a few drinks in the clubroom of a Saturday evening.

N. A. W.

CHILTERNS (R.A.F. Benson)

NOW that the winter months are once again upon us we are settling down to "Four minutes a time" after the excellent summer.

Our new M.T. Member, Barry Nowells, started his job with a bang. Two winches blew up within a fortnight necessitating two engine changes. Both winches are now finished and Barry and workers will be able to take it easy after flying V8's for the last few weeks.

Sue Parry and Celia Harling under the skilled guidance of Dusty Millar are gradually getting our new coffee bar into shape.

The Annual General Meeting was held on Wednesday, 2nd December, when it was decided to revise the flying charges, i.e. the launch and first 20 minutes soaring 2s. and each successive five minutes 6d.

Bill Maltby and John Butler have recently returned from Bicester as instructors so the loss of the civilian instructors has to some extent been offset.

G. H.

CONDOR (R.N.A.S. Arbroath)

UNHEARD of maybe, but extinct—far from it. Despite our rather flat coastal location, 1964 has proved quite a successful year for us. At the beginning of the year emphasis was placed on recruiting some new blood into the Club, and having done this we manage to start a pilot training scheme with the help of a MacRoberts Trust Fund grant enabling us to give any pupil showing interest and ability, 40 flights at reduced rates.

Gordon Glennie handed over as C.F.I. to Dave Holding in September. In the three years that Gordon was C.F.I. he did a tremendous amount to keep the Club going and we are particularly pleased to know that he is to remain as Deputy C.F.I. Dave, who is no stranger to this Club, since he was C.F.I. here during 1959, comes to us from Yeovilton. Amongst other things, he is now our new Ground Engineer in place of Eddy Warburton whom we bade farewell to in September. We wish Eddy best wishes with Portsmouth Naval.

Congratulations to Jim Hardie, Jnr., on attaining his complete Silver C in one week's flying from Portmoak with our Skylark and subsequently achieving his P.P.L.; also to Gordon for winning the Club Championship cup for the best mileage flown; Phil Parsons, our best pupil of the year, and George Farquhar who completed his Silver C and also won the spot landing competition.

Gordon took the Skylark to the Northerns at Camphill and came tenth and Dave followed by taking it to the R.N. Comps. at Dunkeswell earning second place. In addition Fulmar Club took it to Bicester.

As far as home activities are concerned we have now overtaken our target of 2,000 launches by 800. Our Grunau is

again airborne after presenting us with more than its fair share of snags and the T-31, now fully modified, is also earning its keep once again. Eight pilots have gained their A and B, 6 C durations have been flown and 5 Silver C legs completed. In November we held our annual Dinner Dance which was a great success. We have also acquired a bus for use as a mobile control room for which we have to thank Les Tuffley and one of the local bus companies.

C. C. H.

EAST MIDLANDS (Swinderby)

A GLOOMY November has curtailed our flying somewhat, but congratulations go to Gerry Webb and John Watson who soloed in our Tutor.

Chas Morgan, our C.F.I., is off for a spell in the Far East; John Delafield, Deputy C.F.I., has just returned from New Zealand, Don Spottiswood from the United States and Paddy Hogg has been to Malta. Committee meetings under these circumstances can prove difficult!

Dave Roberts' Tiger Moth is now in operation, a valuable addition to our facilities. We expect the full benefits to be reaped next soaring season.

Finally, our thanks go to Jenny Barker, whose efforts in providing catering improved the Club's operation, keeping members at the airfield on bleak wintry days.

J. G. W.

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

AT the end of 1964 we can look back on our best season yet, one in which the hours flown and launches achieved handsomely surpassed those of previous years.

We started the season with a T21, an Olympia 2B and Ray Foot's Skylark serviceable. In June we welcomed Keith Hooper with his Olympia 2B to the Club and at last, in September, the T31 was returned to us, modified and much renovated. The T21 is having a major overhaul during the winter months and so 1965 should start with all our aircraft serviceable.

On the ground our facilities have improved as the season progressed. A Ford

Mike Livesay, Hon. Sec. of the Heron Club, who took five months from first launch to Silver C.

F-100 pick-up, bought with the aid of the Nuffield Trust, has revitalised our launch rate and is a good investment for any club whose airfield has runways. An obsolescent mobile Crewroom has been most successfully converted to a Clubroom which is driven out to the launch point at the start of the day. One end forms the office and the other is equipped for cooking, loafing and encouraging the cooks.

Club aircraft flew in the Junior Inter-Services Competition at Bicester and in the Naval Competition at Dunkeswell. In the latter competition, Dave Holding, our C.F.I., came second, flying Arbroath's Skylark 2. Dave has since been drafted to Arbroath and Eddy Basham, ex-R.A.F., civilian, is our new C.F.I.

Messrs. Neech, Fell, Fallon, Milne and Monkhouse have achieved their A and B, Mackonochie, Neech, Arbuthnot and Carver soared for their C's. Ray Foot, it is rumoured, has actually applied for his Silver C this season, having flown all the legs again and a possible Gold Height for good measure. Keith Hooper and Charles Perry gained Silver Heights.

Mike Livesay, our energetic Hon. Secretary, achieved what might well be

a gliding record. He made his first ever launch in the T21 on 21st April, 1964, and completed his Silver C on the 27th September, 1964 — a shade under six months. In this fine effort he was very lucky to be able to fly from R.A.F. Bicester during his summer leave, where he completed the duration and height legs of his Silver C. The distance leg was flown on the 27th September in the Club Olympia from Yeovilton to Upavon.

The season was nicely rounded off in November when John Fielden, who so successfully ran the Naval Competition at Dunkeswell, was the Guest of Honour at our Annual Dinner.

Despite the problems which flying from an operational airfield entails, we hope for an even better season in 1965.

MENDIPS
(R.A.F. Weston-Super-Mare)

HAVING completed our first year of not uneventful operations, it is time we made ourselves known to everyone. The Club caters for the R.A.F. personnel of Locking in particular and all R.A.F.G.S.A. members in general. Flying is carried out at nearby Weston-Super-Mare Airport on Tuesday and Saturday afternoons and all day Sunday.

Our start was a shaky one, with one serviceable winch and tractor, of dubious ancestry and doubtful future; a T-21 and Tutor, two instructors—Allan Loveland as C.F.I., and Jim Martin assisting. During the year Peter Purdie and Ted Hall gave valuable help with flying training, but not for long. The usual service disease struck and resulted in Peter going to Labuan and Ted to "Civvy Street". Allan also moved on to pastures green.

We were lucky to obtain the services of John Williamson as C.F.I., so our continued operation is assured for the time being. Although the instructional staff has dwindled, the membership has grown steadily as also has our equipment. We now boast a T-21, T-31, Tutor and Grunau 3, two diesel and one petrol winch, two tractors and a Landrover retrieve vehicle.

The last year has seen many improvements and a training achievement that is more than fair, with more first solos than any other G.S.A. Club. We look forward to 1965 with eager anticipation and a firm resolve to improve on the past. Should any of you be in this area, come round and make yourselves known. We will be pleased to see you.

H. P.

PORTSMOUTH (R.N.A.S.)

AFTER a crop of A, B and C certificates and Badge Legs, life seems somewhat quieter at Lee. The training programme continues and our membership continues to increase. We are glad to welcome R.A.F. personnel from Thorney Island who are coming to fly with us.

The few who have visited us so far have shown just the right kind of enthusiasm. Congratulations to Derek Rumsby on his C duration.

The Club is now thinking in terms of building a Swallow from a kit. It is felt that, with Eddy Warburton's know-how, this is a feasible project. The Tiger Moth syndicate continues to flourish and we continue to enjoy the benefits of aerotows.

L. D. V.

WHITE ROSE
(R.A.F. Church Fenton)

THE last few months have witnessed a considerable re-shuffle of our members and the arrival of some new blood has helped cope with all the inevitable hard work after the soaring season.

Gordon Sharp has taken over as C.F.I. from Tony Barnby who has been posted to C.F.S. and Bill Harding and Rick Atkinson, both "ex-Fenlanders", have arrived to swell the ranks.

Pete Rickwood joined us from the East Midlands, and together with Jim Rogers, has done a magnificent job in getting our Granau back into service.

We are continuing the circuit training and our work in the hangar through the winter months, with a view to some good soaring next season.

R. C. A.

CRUSADERS (Cyprus)

FIRSTLY we must apologise to all who read our last newsletter. The apparent disjointedness in the middle was due to our scribe's verbosity being

edited unwisely. We have now completed repair of our T.21 mainly by the efforts of Roy Bullers. Our Swallow has had its C. of A. and is back in action. The club hangar is complete, including door, and the T.21 just passes through with a dainty flick of its tail. We are going to send some of our members on a course to the Mynd to learn how to stack aircraft. Our new T.21 is awaiting collection from Slingsbys but as we are unable to afford the fare, we are looking for anyone coming here for a holiday from U.K. with a hooked aeroplane. Having now got our aircraft sorted out we are frustrated by weather. In the summer we get inversions and in the winter we get rain and mud, even more than Lasham at the last Nationals.

We lose Don Holliday next month and have gained Peter Latham in his place. Chris Williams has also returned to U.K. and his brother, Pete, is shortly to follow, both have been great assets to the club. The Christmas party was very well attended, which is more than can be said for the ground instruction lectures.

J. D. B.

OVERSEAS NEWS

AUSTRALIA

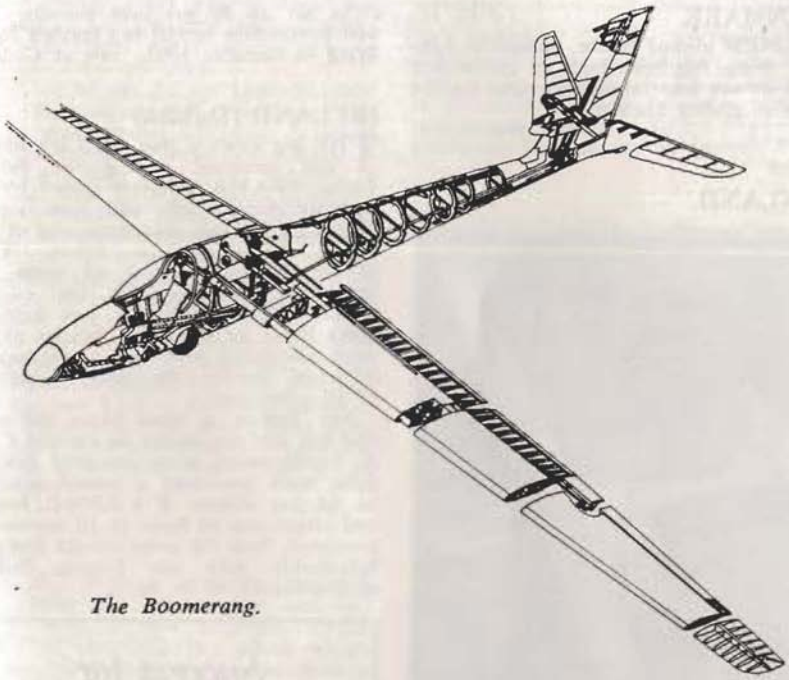
MALCOLM JINKS, aged 19, of Waikerie G.C., won both the South Australian G.A. Winter Trophy and the Orange Week Trophy for the second year in succession. He holds the national goal-and-return record, 240 miles.

Orange Week was held at Waikerie from 1st to 9th August. Six clubs entered 10 aircraft. Nine cross-countries added up to 827 miles, the best being 228 miles by Malcolm Jinks in a K-6. "Such distances in winter have only been dreamed of up till now," says *Australian Gliding*.

Malcolm Jinks made his notable flight on 5th August, after a cold front had passed during the night and brought a 20-kt. S.W. wind. Typical cumulus started at 10.30 and cloud streets formed later with a base at 5-6,000 ft. His flight took 5½ hours.—*Australian Gliding*.

Further details of the 15-metre Boomerang (ES-60), which is expected to take part in this year's World Championships, have been received:

The wing profiles used are the FX series of sections developed by Wortmann. Special techniques have been developed to ensure an accurate and stable wing surface which will be relatively inexpensive and easy to repair. The wing is constructed on an accurate steel tube jib. The main spar is of "improved wood" with normal truss spruce ribs machined against templates to an accurate profile. The thick 2.5-mm. five-ply skin extends behind the main spar to approximately 60 per cent of the wing chord. The leading edge is moulded



The Boomerang.

from a light-weight and stable plastic material.

A feature of the Boomerang is the all-flying high-aspect-ratio swept tailplane. This offers considerable reductions in tailplane drag at high speeds, the sweepback being used to increase the tail movement and improve stable flight characteristics with a normal fuselage length. Two versions are planned—the first to have a skid and wheel undercarriage and the second to have a single forward wheel only.

Push-rod controls are used throughout with the exception of cables to the rudder, wheel brake and release.

The prototype ES-60 was due for its first flight at the end of November.

CANADA (Gatineau)

DESPITE the lateness of the season and the uncertain fall weather, field activities have remained at a high level. The following students have recently soloed: Paul Korzeniowski, Julius Kurfurst, Les Galko, Zig Galko and Ian Whyte.

The conditions are still conducive to good training, and we will be active as long as weather permits.

The mountains do not come to Pendleton, so perforce the soaring pilots must go to the mountains. The mountains in this case being the Green ones at Sugarbush in Vermont. Several intrepid G.G.C. pilots have ventured south to try for the Gold at the end of the rainbow, with such success that Gold C's have been falling left and right, making the wearing of hard hats all but a necessity. Those recently completing their Gold C's with the 3,000-metre climb are: Shorty Boudreault, Ed Laenen, Stan Rys, John Chesbrough and Peter Nicholls. Dave Parsey (late Southdown Gliding Club) and Peder Mortensen also made their Gold C climbs. However, Gold is where you find it and some of us are still searching.

A. B.

DENMARK

A NEW gliding centre, opened at Arnborg, has been built up exclusively with money and labour provided by the Danish gliding fraternity.

PER WEISHAUPT.

FINLAND

This, the latest Finnish 15-metre Standard Class sailplane, called "UTU", has a wing shell of FRP laminates with half its volume filled with stabilizing foam, without any ribs. Equipped weight is 190 kg. (419 lb.) and maximum all-up weight 300 kg. (661 lb.). No performance figures are yet given. The production version is expected to be ready in February.

FRANCE

THE Choucas two-seater is to be produced by the C.A.A.R.P. at Beynes, with some important modifications. The price is 40,000 F. (about £2,900), but clubs get an 80 per cent subsidy. The first production model is expected to be flying in summer 1965. *Air et Cosmos*

IRELAND (Dublin)

THE big news is that the Club has at last acquired a tug—the Beagle Terrier EI-AMB, formerly owned by the Leinster Aero Club, and now jointly owned by Michael Slazenger, one of our World Championships Pilots; Tony Moore, our ex-secretary of some few years ago; and the Club. Our current secretary, Gerry Connolly, has done the lion's share of the hard, boring paperwork associated with such a transaction, incurring thereby the sincere gratitude of all concerned.

The Terrier is three years old now, and has just completed its current C. of A. Furthermore, some involved calculations have produced a launch-price of 1s. 6d. per minute. If a 2,000-ft. launch and return can be flown in 10 minutes as predicted, then the price should compare favourably with our famous pulley-system launch at 9s. 6d.

The Club's order for a Ka-6 was changed to a Ka-8, and delivery is expected in April next, with olive-green fuselage and ivory wings.

The use of our present ground-control radio, between take-off point and tow-car, is discontinued forthwith. It seems that the frequency used was illegal, so two new radios have been ordered, to conform with the Department's wishes!

Our venerable Tutor has been presented to the Air-Scout Troop in Dun Laoghaire, to help promote an interest in gliding among the youngsters (shades of Wally Kahn!). Needless to say, it was accepted with great glee!

The possibility of holding a Rally or Competition at the Curragh next August is being investigated. With our own new tug, our new Ka-6, a Kite, and two two-seaters, the New Year should bring some interesting developments. Meantime, good luck for the New Year to all readers!

C. G.

ITALY

URIBEL C is a 15-metre type with Eppler 257 wing section, and 16.2 aspect ratio. It has a V-tail. Empty weight 205 kg. (452 lb.); all-up weight 315 kg. (694 lb.); max. wing loading 22.8 kg./sq.m. (4.67 lb./sq.ft.). Max. speed in calm air, 200 km./h. (108 kt.); in rough air and on tow, 134 km./h.

Best gliding ratio between 30 and 32 at 80-90 km./h.; sink 2 m./sec. at 100 km./h., 2 m./sec. at 130 km./h.

Volo a Vela

POLAND

THE death of Marian Gorzelak at the age of 35 is reported. Gorzelak finished third in the 1956 World Championships in France. In 1953 he became the 20th pilot in the world to earn all three Diamonds.

Aero Revue

SOUTH AFRICA

A GLIDING camp is to be organised at Odendaalsrus during January. The French journal *Aviasport* mentions the possibility of getting an Edelweiss and a Breguet 904 over there to try for national records.

SPAIN

A FLYING accident has led to the death of Julian Sevillano, who took part in the 1948 World Championships in Switzerland. There he made a spectacular safe landing in almost impossible conditions high up in the Bernina Pass.

Aero Revue

SWITZERLAND

BADGES earned in 1964 up to 11th October are: 6 Height Diamond, 20 Goal Diamond, 22 Gold C and 66 Silver C. Figures for previous year were 10 Gold and 60 Silver.

Winner of the 1964 Decentralised Contest, which closed on 30th September, was Kurt Baumgartner with 78,300 points, followed by Rudolf Seiler (75,125), and Bernhard Müller (60,420).

Swiss Aero Revue

UNITED STATES

UNLESS he is a careless smoker, the glider pilot's last worry is fire in the air. However, an unfortunate U.S. pilot set his glider on fire when it became entangled in high-voltage power lines while attempting to land. The pilot luckily slipped down a wing to safety, while hastily summoned fire department unsuccessfully tried to put out the blaze in the suspended aircraft. It was a total loss.

Many pilots in other countries envy the U.S. soaring pilots because of their relative freedom from airways and air traffic restrictions. However, these freedoms seem to be subject to a gradual erosion, and it sometimes takes a lot of effort to just stand still. The U.S. government recently proposed to lower the floor of positively controlled airspace from 24,000 down to 18,000 feet. That would mean no flights above that altitude except with radar transponders and full instrument flight capability, even in clear weather. There are lots of soaring flights made above 18,000 feet in waves and thermals, particularly in the western part of the U.S., so this proposal was fought vigorously by the S.S.A. They were joined by other private aviation groups, and such an outcry was made that the proposal was withdrawn. Among other arguments, S.S.A. pointed

out that while the proposal was made under the guise of a safety measure, it would actually decrease safety by forcing many aircraft out of the higher altitudes down to the already well-populated lower airways.

The frequency with which Odessa, Texas, has been the start of successful world records flights, I am sure, must make many soaring pilots feel that only a few days' visit there any summer, with anything better than a Primary, will produce a bag full of Diamonds, at least. But alas, in the words of the popular song, "It Ain't Necessarily So". Odessa conditions in the summer are doubtless very good by British standards, but you can't just go out and break a record any old day. I suppose the chance of having a 500-km. day in Britain must be about 1:75 in the summer, while it is probably 1:10 in Odessa. But sometimes a lot of successive tens of days pass without having the longed-for "one". As an example, I trailered out from California to the 1959 soaring camp at Odessa, needing only the Distance Diamond. Sixty-seven cross-country flights were made during the two-week period by various pilots, and the average distance was 151 miles. The only real good distance flight was one of 367 miles, made by Harland Ross, who wisely saw there was not much use starting from Odessa, and took a 100-mile tow west, to the mountains, before starting his flight. The best I could do was 160 miles to a town called Muleshoe, Texas—about the last place I wanted to see that day. It was 3,000 miles of trailering before I got home, without a glimpse of a Diamond. That year, Marfa, at the edge of the mountains, about 150 miles south-west of Odessa would have been a better starting-point. But then this year, while records were being set from Odessa, the Marfa soaring camp was having spotty, and definitely not record, conditions.

HARNER SELVIDGE

THE Soaring Society of America is being guided by a new president in 1965, John D. Ryan, who was the National Champion in 1962. He succeeds William S. Ivans who served for two terms.

The 1965 U.S. National Soaring Championships have been scheduled for 29th June to 8th July at Adrian, Michigan, 70 miles south-west of Detroit and 33 miles north-west of Toledo. The terrain, weather and a record number of entries are expected to make for a very keen competition.

No accurate figures for overall soaring activity in the U.S. have been compiled for 1964, but some statistics on the number of badges earned through 10th November will give some indication of the level of activity. Badges completed numbered 10 Diamond, 28 Gold and 125 Silver.

Wave soaring is becoming more popular as new locations for this activity are explored and developed. At least seven sites turned out over nine flights that exceeded 30,000 feet and another 25 or more that exceeded 20,000 feet. In Washington State, conical Mt. Ranier, 14,400 feet high, has produced wave flights to just over 30,000 feet.

One-design interest has been heightened by revitalisation of the 1-26 Association, which specialises in promoting activity with 40-foot span Schweizer 1-26's. Over 250 of these sailplanes have been manufactured by Schweizer, many of which were kits completed by home builders. Owners, and pilots flying them for hire, vie for a point championship and for honours at various regattas held throughout the year.

There were 30 1-26's entered at the tenth Annual 1-26 Regatta at Elmira, N.Y., and the Association has now registered 18 "Flights", groups of three or more 1-26 pilots. A growing *esprit de corps* indicates that 1-26 activity will become even more significant in the future.

LLOYD LICHER

WEST GERMANY

STATISTICS for 1964 were given at the annual conference of the Gliding Commission on 7th-8th November by Seff Kunz. There were 25,000 glider pilots with 2,500 sailplanes, and 190,000 hours were flown from 700,000 launches. Cross-country flights totalled 650,000 km. (404,000 miles). Flying instructors numbered 1,750, and workshop leaders 1,000.

In the decentralized national contest, Reinhold Stuhr, of Bissingen, won with 2,501.6 points, followed by Rudolph

Lindner, of Teck, with 2,434.2. — *Aerokurier.*

West German sailplane pilots who fly across the frontier into France must pay 100 NF (about £7 7s.) fine for "entry without customs declaration".—*Aerosport.*

FIBREGLASS SAILPLANE.—The production version of this machine (described in SAILPLANE & GLIDING for Feb., 1964, p. 25), now called Libelle, has had its first test flights. Its terminal velocity with brakes out was 235 km./h. (127 kt.). Spinning trials with c.g. at 49% chord, "o.k.". Flutter trials to 250 km./h. (135 kt.), no troubles. Brakes move easily out and in at all speeds; no vibration. Minimum sink, between 50 and 60 cm./sec. (1 ft. 8 in.—2 ft.); Dipl.-Ing. Zacher will undertake accurate measurements later. EUGEN HANLE

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