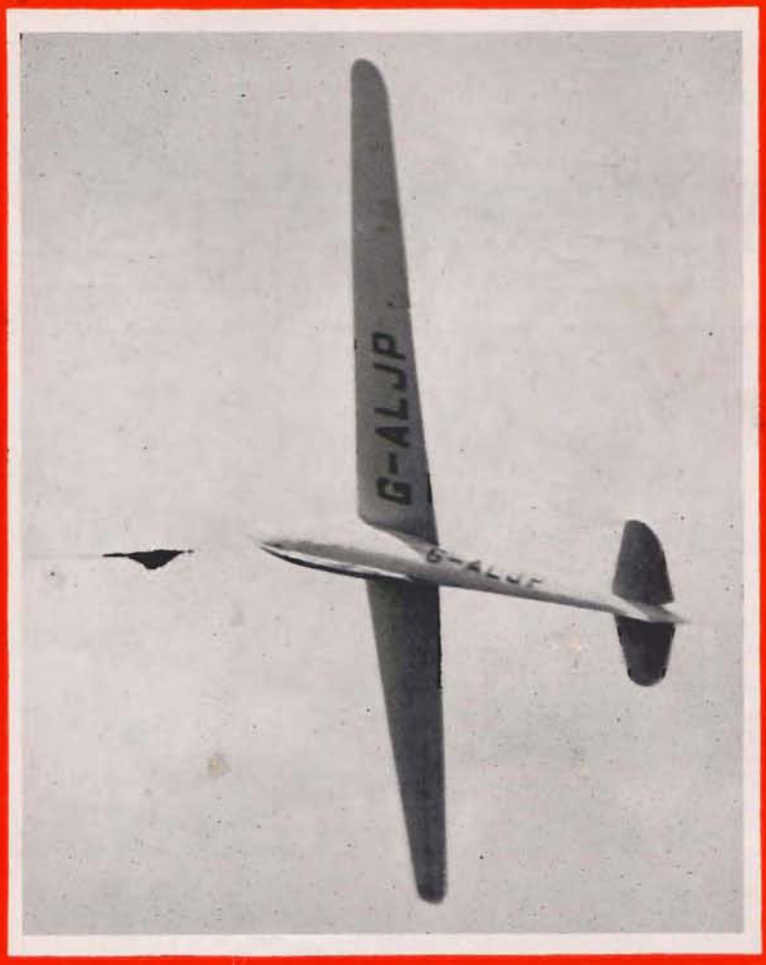
Sailplane and Glider

The First Journal devoted to Soaring and Gliding



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THE FIRST JOURNAL DEVOTED TO SOARING AND GLIDING

APRIL 1952 ★ Vol XX No 4

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CONTENTS

COVER PHOTO :
Gt. HUCKLOW.
'G-ALJP' being launched

Editorial

THE news that Robert Kronfeld's 'Horten IV' all wing sailplane, now owned by Hollis Button of U.S.A., is to be flown in the forthcoming American Gliding Competitions, will focus a great deal of attention on them, because it is the first time that this machine has been flown in any Competitions, so far as we are aware. It was built during the war, and acquired by Kronfeld afterwards from the British Ministry of Supply, for an attempt on the world's distance record, which was to be made in S. America in a flight along the mountains which run from North to South of that great continent. Kronfeld once told the Editor how he proposed to do this but that is another story.

The U.S. competitions which are taking place in this year's American Competitions will be doubly interesting, because as far as is known, the 'Horten IV', which is being flown by Rudolph Opitz, who helped to build it and flew some hours in it in Germany, is the most efficient sailplane in the world with a gliding angle of one in 37 (*Sailplane*, Jan., 1946, pp. 11-14). Sinking speed 19½ins. per second (*Sailplane*, Oct., 1944, pp. 10-11).

Competing against it will be Richard Johnson in his 'RJ-5', of conventional design, but hotted up with every refinement of polish and the removal of all parasitic drag, and with laminar flow airfoil. The original concept when this machine was designed was to provide a gliding angle of 1 in 30, but there seems to be little doubt, from Richard Johnson's modest account in our issue of July, 1951, that the achievement is better than the prospect. He speaks of a two mile flight and landing from a height of 250 ft. If this is true there is little between the 'Horten IV' and the 'RJ-5'.

We have had little news of the 'Horten' two-seater XIV (or I Ae 34) which Dr. Horten designed for the Argentine and which first flew there in 1950, and was reported in our issue of May, 1950, but the first accounts were lyrical reports by pilots who had flown it, not all of them with much experience, which is surprising as Jock Forbes reported the 'Horten IV' which was at Oerlinghausen, as being somewhat unstable and difficult to fly.

The affairs of the Ultra Light Aircraft Movement in this country, since Group Captain Edward Mole became the Director of Civil Aviation in the Bahamas, have come to a sorry plight. They may be revived to some extent, as may those of Private and Light Aircraft flying in general, by the Kemsley Trust's offer of a prize of £100 for a new design of light aircraft.

This is very commendable of course, but we wish someone would offer a prize of say £10,000 for a new design of aero engine, delivering 90-130 h.p. but, costing less than £200 and weight per horse-power of one pound or thereabouts. There have been several small aero engines built in the past few years by enterprising manufacturers, but there has been no incentive to them to go on to develop a really efficient engine around which new aircraft can be built.

There is a great field for such an engine, and we have not heard of one which remotely realises the ideal which, because of modern developments in design, alloys, fuels, etc., is now within reach.

The news that there are to be no British National Contests this year will be a disappointment to many, who look forward to these annual gatherings as a period of hard work but with a certain primeval joy. Instead there is to be a competition and points system, as devised by the Swiss, for flights from home airfields within certain objectives and limits.

It had been hoped to have the contests in Scotland, but the lack of a suitable road system and local amenities militated against this, and so Scotland will have to wait until another year.

There may be those, however, who in the absence of a British gathering, might wish to go to Madrid for the International Contests. We regret to say, however, that it appears that it will be expensive. The Excursion Air Fare return is £50, a hired Dakota would cost £32 each for 4 days, Friday to Monday, and there is living on top of that. The latter might be reduced considerably by arrangement with the Competition authorities, and we are attempting to fix this. We have also another plan for cheap transport. Would anyone who would be interested therefore in a trip to Huesca for either 10 days or 4 days please communicate with us. The overseas expenditure must of course be limited to £25 including pleasure, sight-seeing, etc.

Flight and Natation

(Concluded)

By Denys Jones

Fig. 11

FIG. 11 is an end-on view from ahead of a fish's tail in the normal at rest position. The fish's body has been omitted; the central eliptical section represents a 'cut' across the rear end of the body at the base of the tail.

Fig. 12a shows this same tail when it has been flipped over first to our right and then to our left.

If we turn these two diagrams sideways and compare them with the bird's wings in Fig. 10 we find both pairs of pictures to be strangely similar.

STRIKING RESEMBLANCE.

Turned this way too, diagram A now represents the horizontal tail of a porpoise or a whale, so that the resemblance to the bird's wings is even more striking, since now the direction in which they flap or flip is the same in both cases.

In case we should feel that diagrams A of Fig. 12 do not illustrate a typical fish tail—A being in fact a portrait of a tunny's tail—diagram B gives the tail of a trout in similar positions. This latter diagram turned sideways would pass almost anywhere as a drawing of the outstretched wings of a small bird such as a starling.

There are of course numerous fish, for example rays and eels, whose tail structure resembles neither A nor B and certainly does not resemble the wings of any known species of bird, and who indeed must use almost any part of their anatomies other than their tails for propulsion. But such exceptions, together with certain exceptions we could encounter in the world of flapping flight, are by no means exceptions to the principle we are investigating.

MUSCULAR COLUMN.

Now from a study of Fig. 12 we soon see that unlike the bird's wing-strokes, these tail flips must be executed by means of a muscular column which runs at an approximate right-angle to the vertical plane of the tail, so that the central part between the two forks (the part which is equivalent to the bird's body between its two wings) has first to move sideways in an arc in the required direction, and so 'drag' the rest of the tail after it.

The bending or flapping action is the same, except that this central part and the parts immediately on each side of it (which are the equivalents to the lifting shoulder-parts of the bird's wings) all move just as well as, although always a little in advance of, the outer parts. This more or less equal distribution of movement is due to the fish-tail, whether vertical or horizontal, having no lifting duties to perform, so that its entire span from one tip through the centre to the other tip may be employed solely for propulsion.

The leading edge, or edges, of the tail are the first to be dragged through the water immediately after the muscular central part; and these leading edges are followed by the trailing edges, the surface between them being bent in a convex curve, usually a parabola, which causes the actual thrust against the water.

Again, we have not only this sectional curve from leading edge to trailing edge, but also the curvature of the span—caused by the centre preceding the inner parts, and these inner parts preceding the extremities, in that order. This resultant end-on curve, being exactly comparable with the shoulder-to-tip pliability curve of the bird's wings, will be considered with the latter in the same subsequent paper.

There is little more relating to the movements of a fish-tail that has not been previously dealt with in the section on the propeller-blade and the bird-wing. Just as the propeller-blade, whether rotated or flapped, produces a similar effect in either air or water, so the bird-wing and fish-tail both produce the same effect by means of the same movements in either fluid.

This similarity of movement and effect is further illustrated in Fig. 13 which in part consists of a series of reproductions of the *right-hand trailing parts* of the various diagrams in Figs. 7 and 8. The dual footnotes to Fig. 13 may be of special interest and significance.

CAUSE OF THRUST.

The time has now come to consider in final detail the effect that these movements have on the fluids in which they move. In other words, how it is that the convex bending of the wing and tail surfaces

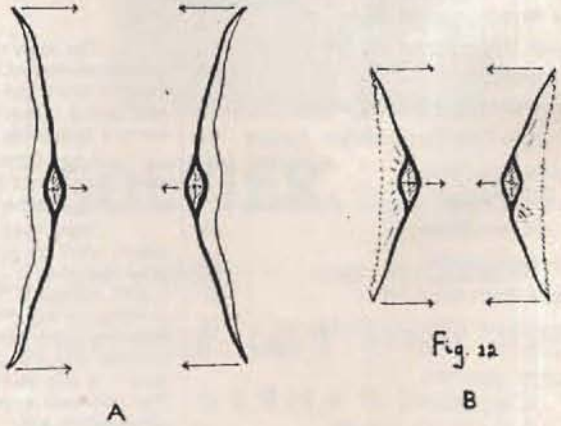


Fig. 12

Footnotes Fig. 13

1.

Here are sixteen vertical views of vertical fish-tail in action, or horizontal views of cetacean's tail. Shaded wedge-shaped portion is rear end of fish which supplies the muscular sweeping action necessary to operate the tail itself. Arrowed arc across this shaded part indicates the direction of stroke or ' flip.' Zeros at i, v, vi, xiv, and xv indicate that the sweeping movement of the rear end has ceased.

Amount of curvature greatly exaggerated in diagrams.

Diagrams do not present an unbroken picture of the action like a continuous reel of ciné frames. Although in order of occurrence, many intermediate stages have been omitted.

2.

Also shown are sixteen horizontal views of the rear or flapping section of a bird's wing.

The shaded wedge-shaped portion indicates the thickening area of the wing merging into the semi-rigid leading part, this thickening being mainly made up of increasing layers of feathers and remaining after a preceding stroke and constituting a favourable grip or leverage for the present thrust.

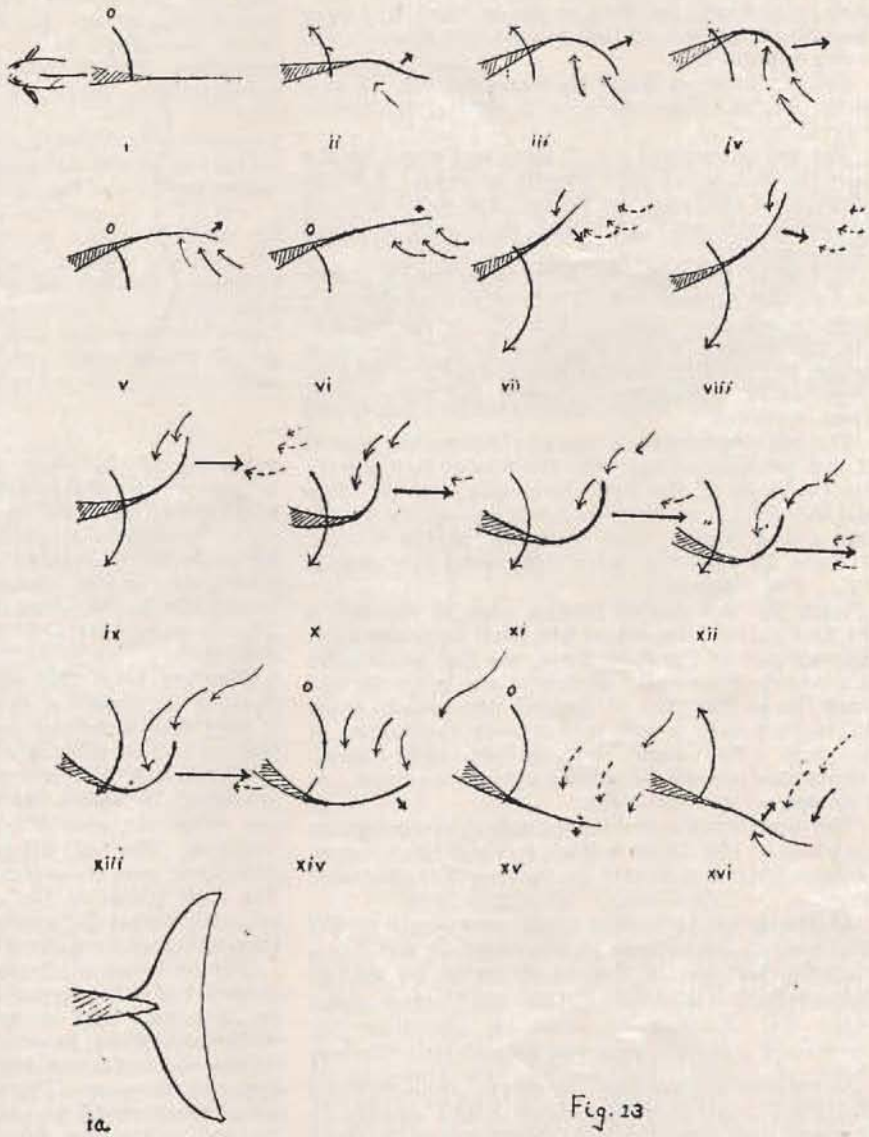


Fig. 13

The rigid and semi-rigid leading part itself is not illustrated here, as it has already been illustrated in Figs. 7 and 8 with which compare above.

Zeros at i indicate at rest position such as would be adopted by bird when gliding. At v, vi, xiv and xv they indicate upper and lower limits respectively of wing-beat, when wing changes its direction rather than pauses at rest.

Amount of curvature greatly exaggerated in diagrams. Many intermediate stages omitted as with Footnote 1.

Arrowed arc indicates direction of sweeping or flapping movement.

Thick straight arrows indicate direction and force of thrust.

Thin curved arrows indicate direction and amount of slip or eddy.

Broken curved arrows indicate this slip set up by

Diagram 1*a* : Side view of fish-tail or plan of cetacean-tail showing difference of surface or thrusting area between rear end of body and tail itself.

Continued from opposite page

causes thrust, and also what happens to the resultant eddies, the slip, which in the case of the rotating propeller we know goes to waste.

For this investigation we will remain to start with in the water, since we can more easily discern currents and eddies of water, and therefore may feel more justified in illustrating diagramatically the slip set up by the fish-tail moving in this fluid.

Such diagrams are already included in Fig. 13, so

that in fact we are able to study from the same diagrams the effects of both wing and tail in air and water respectively.

Let us, however, begin by regarding Fig. 13 as a series of bird's-eye views of a vertical fish-tail in action.

The tail is enclosed on all sides and edges by the buoyant and viscid fluid known as water. For the purposes of this work we assume the water to have no movement, such as would be caused by tidal stream or surge.

In Fig. 13 the tail itself, being in section, is shown as a slightly tapered line. The rear part of the fish's body (which must also move) is shown shaded, and the arc through which this rear part moves as it carries the tail from side to side is drawn in with an arrow at its extremity indicating the direction in which it moves.

The tail commences its first stroke from the normal at rest position in line with the fore-and-aft line or the backbone of the fish's body (diagram i). This first movement, which is really only going to develop into a half stroke since it begins in the middle, is made towards the fish's right side (upwards in Fig.) as diagram ii.

Since the less pliable leading edge of the tail is the first part of the actual tail itself to follow after the rear part of the fish's body, the first small bend or convex surface to be formed in the tail is formed along the leading part of the tail, (diagram ii) while the trailing edge is still in line with the former at rest line. This small, and as yet undeveloped, convex face thrusts or pushes against the water as it sweeps across to its right.

The direction of this thrust is indicated throughout the whole of Fig. 13 by a thick straight black arrow, while its force is indicated by the length of this same arrow.

At the same time, this initial movement of the tail causes a disturbance in the water on the other, concave, side of the tail—a dragging or suction eddy, indicated by a thin curved arrow.

COUNTER THRUST.

As we may perhaps begin to suspect from studying diagram ii that a counter-thrust might equally be obtained from the right-hand movement of the fish's rear end, the additional diagram *ia* has been included at the foot of the Fig. We are reminded by this diagram of the vast differences in surface area presented by the rear-end of the body and by the tail itself. Clearly then, during any of the positions shown in Fig. 13 this comparatively tiny convex surface will no more cause counter-thrust sufficient to effect the proportionately huge thrust of the wide expanse of tail, than the convex non-pliable surface across the shoulder-end and along the leading-edge of the bird's wing will cause ' counter-lift ' during an up-stroke and so tend to force the bird down towards earth again.

In diagram iii we see the tail having been moved a little further to the fish's right. The section has now become a complete curve, the direction of thrust a little more to the rear, and a little stronger owing to the tail being bent a little more acutely and

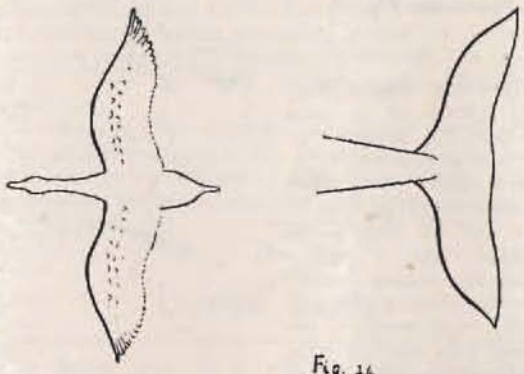


Fig. 14

sweeping all the time ' up ' to the right, and yet because of its natural resilience tending to straighten itself out if only the movement would cease.

On its suction or concave side we naturally find an increased indraught caused by this continued movement, and a greater eddy of water is rushing to displace the theoretical vacuum of the indraught. This increased eddy is shown by two thin curved arrows.

Diagram iv : The tail has almost reached the limit of its stroke in this direction. The tail itself is bent into a sharper curve ; the thrust is greater than ever ; so are the eddies on its concave side—now increased to three thin curved arrows.

Diagram v shows the tail at its limit. The fish can move the rear of its body no further in this direction. The tail, left to its own devices, begins to straighten, and consequently the thrust is negligible. The little eddies on the concave side however come on, and in fact help to push the tail straight, and then to force it over the other way !—as in diagram vi.

The zero sign at diagrams v and vi indicate that the limit of movement along the caudal arc has been reached, and that in both diagrams the sweeping movement or flip has ceased.

Now diagram vii shows the first movement in the opposite direction. The tail-end has begun to move down the arrowed arc, and the tail itself has begun to bend in the new direction, the reverse of that in diagram ii.

Note now the new direction of thrust, and most important the still extant eddies of the previous stroke which, although the entire tail and fish have been moving forward through the water, have none the less been ' keeping up ' with the tail in the form of a little following slip-stream whorl, much as the rubbish and paper on a railway line flies in the wake of an express train.

This new thrust then, exerted now by the new convex surface of the tail, does not act or impinge against a mere motionless mass of water any longer, *but against eddies going against the direction of this thrust* in the same direction as the direction in which the fish is propelling itself, and actually diverging from this direction only at an angle most favourable to the formation of a direct ' head on ' resistance to the thrust from the convex tail surface.

The eddies set up by the previous flip are thus utilized by this subsequent flip, and supply a considerable boost to the power of the thrust itself. For the thrust is now working against a pushing force almost equivalent in effect to the pushing power of a following current.

These previous eddies are shown in the ensuing diagrams in broken lines, while the new eddies set up by the new ' left hand ' flip are shown by more thin curved arrows.

By diagram xiii we find the effect of these old eddies beginning to wear off, mainly because the forward distance covered by the fish has tended to outstrip its pursuing currents before the completion of this left-hand stroke. But immense additional thrust has been obtained from these eddies during the middle part of the stroke, i.e., in diagrams ix to xii.

EXPLANATION.

The three remaining diagrams need little explanation. xiv and xv show the end of the left-hand flip, and xvi the beginning of the next right-hand one, which this time will be through a complete caudal arc ; with, in diagrams xv and xvi, the old eddies of the foregoing stroke still pouring in ready to add their weight to the forthcoming thrust.

We may now regard Fig. 13 from the beginning once more, this time with the eyes of someone viewing the tail movements of a porpoise or a whale, and therefore seeing them from the side instead of from overhead. Right and left-hand flips therefore become up and down flips respectively ; otherwise there is no difference, except that the eddies go also in an upward and downward direction.

And now, still with Fig. 13 before us, we return to contemplation of a bird's wing during flapping flight.

Here, if we refer to the second of the two footnotes, which emphasizes that Fig. 13 is also a repetition of Figs. 7 and 8 *without the inclusion of the fixed leading-part of the aerofoil*, we find, if we compare the sixteen diagrams with the flapping trailing-parts of the various diagrams in Figs. 7 and 8, that they are very similar if not exactly alike.

And since air is only a thinner and less buoyant fluid than water, the thrust and the eddies already shown in Fig. 13 must be just as true for the wing flapped in air as for the fish-tail flipped in water.

IDENTICAL CONFIRMATIONS.

Of course, Figs. 7 and 8 show only the aerofoil sections of *one* wing, and therefore our present view of Fig. 13 may be suspected of also showing sections of only one single wing, whereas we have made use of it to show sections of an entire fish-tail, and not merely one of its limbs or forks. However, as both bird's wings move in unison, it is clear that both will adopt identical conformations at the same instant, given ideal conditions of theory such as constant course and speed etc. Therefore a section through both wings will be exactly the same, indiscernable from a section through one wing only, so that Fig. 13 may safely be regarded as faithfully illustrating the action of a complete fish-tail and of a complete *pair* of bird's wings.

We come now, in conclusion, to a final comparison of fish-tail and bird-wing, which may or may not throw further light on the subject in the future, and help to explain for instance *why* these tails and wings are shaped as they are, and whether these shapes contribute in any way to ease of movement or to speed or to manoeuvrability.

The common reptilian ancestry of both birds and fish have been recognised for a long time. Now it almost appears that both ' descendants ' possess additional mutual characteristics.

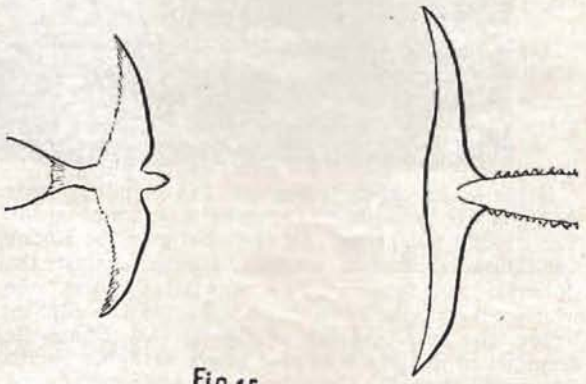


Fig 15

SURPRISING SIMILARITY.

Figs. 14 and 15 show the surprising similarity of outline of certain fish-tails and corresponding bird-wings. The only differences lie in their relative sizes. Innumerable such pairs of similarly shaped wings and tails can of course be instanced. It seems probable that this affinity of outline may have much to do, firstly with the identical forms of movement and effort we have already investigated, and secondly with other, as yet mysterious matters in the realms of Flight and Natation which have yet to be explained.

INSTRUCTOR'S BADGES

THE Council has inaugurated a new type of badge, to be known as the Instructor's Badge. Minimum qualifications are :—

(a) Applicants should have held an A.T.C. or B.G.A. Instructor's B.1 or B.2 category licence for at least 12 months.

(b) Applicants should have made a minimum of 500 glider launches or, for B.1 holders—20 hours, or for B.2 holders—50 hours, in each case as pilot in charge.

(c) Applicants should have qualified for and been awarded the ' C ' Gliding Certificate.

SOARING IN FRANCE

World Duration Record

53 Hours 4 minutes

By GUY BORGÉ

A SPLENDID duration record for two-seaters has just been broken at Les Alpilles with a flight of 53 hours 4 minutes in a ' C.M.7 ' sailplane by Messrs. Carraz and Brunswyck. They took off at 1.40 p.m. on Monday, February 4, and landed on Wednesday, February 6, at 6.44 p.m.

Their flight took place between the heights of 1,300 feet and 8,200 feet over a distance of 9 miles. The previous record was held by Messrs. Bodecker and Zander with a duration of 50 hours 26 minutes in a ' Kranich ' at Rossiten. Any duration record is held at the Centre of Les Alpilles to-day, and the next project will be to improve the one-seater record of Guy Marchand ; I hope that a friend of mine, Atger, will succeed in this direction soon.

TRAINING ON PLOUGH

Atger has had an extraordinary training at Les Alpilles consisting of some hundreds of hours along the slope, several night tailwind landings in 60 m.p.h. gales, and a few performances of 10 and 15 hours or so. He is a farmer, and as training has already sat through 52 consecutive hours on his plough.

Situation of the Centre of Les Alpilles, near Avignon, is unequalled anywhere in the world. The Alpilles hills, 1,000 feet high, between the Rhône and Durance valleys, create a barrier against the powerful and frequent mistral wind. Thoret, the whirlwind specialist, founded a school at Les Alpilles before the war and as at Challes les Eaux, he accustomed his pupils to soar heavy aeroplanes with the engine shut off. Once he stayed aloft for 9 hours without an engine in a ' Morane 315.'

The soaring Centre was founded in 1947 and became associated with many duration records and also with the great difficulties of instructing pupils—the airfield is situated close to the hill, and it appears impossible to execute normal landings in front of the wind because of the powerful lift and the height of the steep hill. Therefore, even by the fastest gale, and at night, the sailplanes must land tailwind, sometimes at 125 m.p.h. in relation to the ground.

There are beacons installed for the night flights, and radio for insuring constant communication with the pilots. A very interesting book, written by Guy Marchand and entitled ' Mon record du monde de Vol à Voile ' (' my world record in soaring ') gives many details about the site and tells how he was able, in 1948, to break the world record, his visits to foreign soaring centres in Germany, Italia, India, and the story of a future distance flight at 65,000 feet from Paris to Rome in a sailplane by waves.

The same mistral wind which permitted the 53 hours' record flight, has blown at Saint Auban and Fayence, where several Diamond and Golden ' C ' climbs have been made. At Saint Auban, Max Gasnier attained the height of 28,000 feet in the ' Arsenal 4111,' breaking the French record on this day. On another occasion, Veyrac climbed to 25,000 feet in an ' Air 100 ' ; Heaven knows how many times Veyrac has achieved a Diamond ' C ' gain at Saint Auban !

CLOSED TO GLIDING

Last year, the soaring centre of Challes les Eaux closed its doors to sailplanes and has done only power-plane instruction. A curious decision indeed, because the mountains make this type of instruction difficult and it would have seemed more logical to send the aeroplanes to some flat airfields and to reserve Challes for sailplanes. Ten miles from Challes, the military Centre of Le Bourget du Lac practises extensive soaring on an airfield where constant downcurrents exist, asking for thirty minutes' aerotows to the favourable slopes. But logic has won for a part—the Challes Centres reopens in 1952 for soaring.

The four soaring Centres will receive some pupils with the following programme of courses :—

Challes les Eaux—June 2—28, July 2—31, August 5—30, September 1—27.

Pont Saint Vincent—March 3—29, April 1—26, May 5—31, June 2—28, July 2—31, August 5—30, September 1—27, October 1—31.

Saint Auban—March 3—29, April 1—26, May 5—29, July 2—31, August 5—30, September 1—27, October 1—31, November 3—29, December 1—22, January, 1953, 5—31, February, 1953, 3—28.

La Montagne Noire—July 7—31, August 5—30, September 1—27.

For foreign pilots the prices are fixed at 3,000 francs an hour in two-seater by aero-tow, 2,000 francs in one-seater.

Special conditions exist for stays of several days :

2 days, at least one hour of soaring, 2,800 francs.
5 days, at least three hours of soaring, 8,400 francs.
8 days, at least five hours of soaring, 14,000 francs.
15 days, at least ten hours of soaring 28,000 francs.

Candidates who wish for these Courses must write to :

' Service de l'Aviation Legere et Sportive '
S.A.L.S.,
22 Boulevard Victor, Paris (15).

The S.A.L.S. has just announced the sorry figures for 1951 : 54,229 hours' soaring (79,673 in 1950) and 279,505 launches (400,975 launches in 1950). The strong decrease of these numbers in relation to 1950 is due to the bad weather.

Members of the Southdown Gliding Club being bungy-launched after the Club's annual dinner on February 2. *' Eastbourne Gazette and Herald.'*

BELGIAN ENTHUSIASM ON NEW GERMAN SAILPLANES

Hubert Zuerl
Editor ' Aero '

WILLY GRANDJEAN, President of the Belgian Gliding Movement, together with Marcel Cartigny and Francois de Savage, best known national soaring experts, paid a visit to the newly established Scheibe Sailplane Factory, nr. Munich on March 28 upon the invitation of Ing. A. Vogt. After a close inspection of the workshops and the excellent craftsmanship performed in the production of the ' Mü-13 E ' planes by Ing. Scheibe's gang of old-timers, the Belgian experts had some test hops in spite of bad rain and snowfall.

To the editor of the *Aero* magazine, Hubert Zuerl, who did the interpreting job, the Belgians expressed their high admiration on the excellent characteristics of the ' Bergfalke ' two-seater, which inspired them to give Dipl.-Ing. Egon Scheibe his first foreign order on the spot. The first ' Bergfalke ' going abroad is to be delivered by mid-June and will first be seen in the big public during the Belgian National Championships on July 20th.

In addition, the Belgian pilots showed a keen interest in the prototype of the bantam performance sailplane ' Spatz ' (' Sparrow ') of only 13 m. span, which will be available from July on for DM 6,000 only and a 10 m.—midget acrobatic sailplane of Ing. A. Vogt, which is still in the drawing board stage at his Peissenberg, Bavaria, works, but, according to its designer, will be ready in time to be shown during the Madrid World Championships and, upon the invitation of the Belgian sportsmen, during the Belgian Nationals.

From previous page.

To January 1, this year, France holds :

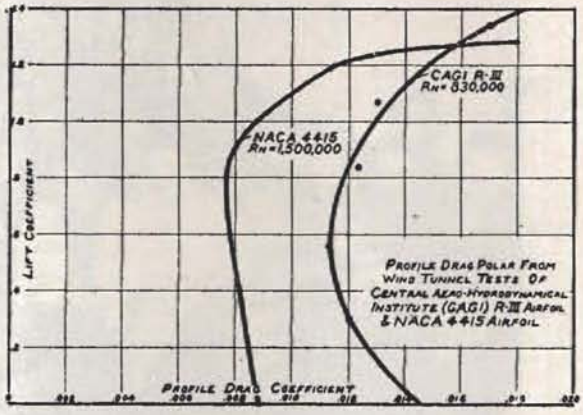
9,093	'B' badge	holders.
5,499	'C' ,,	,,
1,275	Silver 'C'	,,
71	Golden 'C'	,,
1	Diamond 'C'	,,

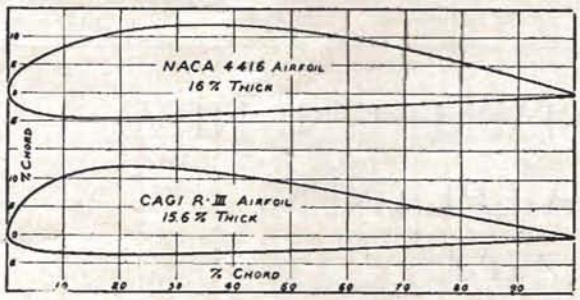
An interesting detail is the fact that M. and Mrs. Mattern are probably the only couple in the world to both hold the Gold ' C '.

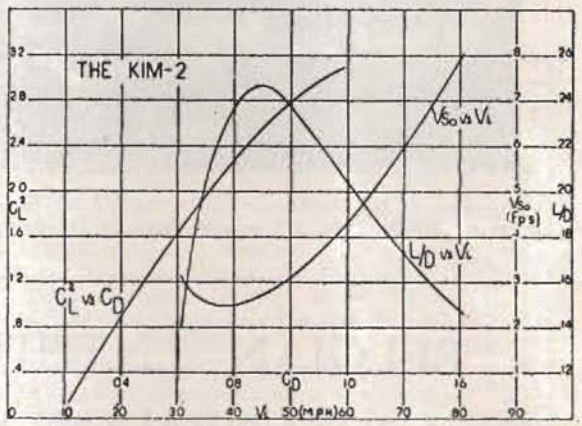
' KIM - 2 STAHANOVEC '

A Sailplane Catalogue Item

THE Russian ' Stahanovec KIM-2 ' is evidently the second sailplane of the ' KIM-series '. A later modification featured droop-tips on the wing. There is no doubt that this was an outstanding design in its time. Proof of this lies in the fact that this ship holds all three international two-place distance records. Examination of the statistical data shows that the Russians appreciated the benefits of forward sweep. Here is a wing with high taper ratio, of uniform section and built with no twist. It is evident that the designer, Jemieljanov, knew how to achieve lateral stability, avoiding tip stall by using forward sweep. The Russians were aware of the detrimental effects of hinges and protruberances but were not aware of the magnitude of these effects since they mounted a pilot mast directly in the high velocity flow on the fuselage nose. But we must remember our state 15 years ago was not as advanced as the ' Stahanovec ' indicates the Russians were. Inspection of the characteristics of the R-III airfoil shows it to be a forward camber airfoil. Since its properties are not exceptional one questions its extensive use on Russian sailplanes.







The performance of this sailplane in its day was excellent. However the relatively poor efficiency factor shows that much could be gained by treating the wing root more elegantly.

Measurements in Feet

Span	64.0′
Length (Overall)	26.7′
Height (Overall)	7.05′
Fuselage Width (Overall)	2.14′

Areas in Square Feet

Fuselage Cross-Sectional Area	6.3′
Wing Area (with Aileron)	240′
Aileron (Total)	21.5′
Flaps (Total)	None
Spoilers (Total)	None
Stabilizer	0
Elevator	23.7′
Horizontal Area	23.7′
Fin	None
Rudder	12.28′
Vertical Area	12.28′

Weights

Empty	695 lbs.
Pilot	345
Extra Equipment	0
Total	1,030 lbs.
Pilot/Empty	0.496

Wing

Wing Platform	Taper
Sweep forward at 25% c	9°
Dihedral	2.5°
Gull	None
Root Chord	6.40′
Half Span Chord	3.77′
Tip Chord	1.15′
Aspect Ratio	17
Taper Ratio	56
Load Factor	10

Airfoil Sections

Wing Root	R-III-17%
Wing Half Span	15%
Wing Tip	13%
Horizontal Tail	Symmetrical
Vertical Tail	Symmetrical
Angle of Incidence to Fuselage	7°
Washout	0°
Winch Tow	Yes
Auto Tow	Yes
Airplane Tow	to 113 mph
Aerobatics	Yes

Performance

Glide Angle (Maximum)	24.6
Minimum Sink	2.4 f/s
Airspeed at Best Glide Angle	45 mph
Airspeed at Best Sink	38 mph
Maximum Design Speed	113 mph
Wing Loading (Test Flight)	4.3 psf
Span Loading (Test Flight)	0.250 psf

Construction and Materials

Wing—Wooden Structure, etc.	
Fuselage	Wood
Horizontal Tail	Wood
Vertical Tail	Wood
Landing Gear	Skid

Aerodynamic Characteristics

C Dmin	0.0164
Efficiency Factor	72%

(By courtesy of ' Soaring ')

An Introduction to Aero Tow

By R. T. Baird *(From Glidabout)*

AFTER several years of waiting, a towing attachment for a ' Tiger Moth ' was finally procured and the wheels were set in motion to complete arrangements for W.A.'s initial aero-tow.

The procuring or making of the necessary equipment went ahead smoothly, thanks to Geoff Higginson and Len Anderson. The Hon. Sec. was also negotiating with D.C.A. and the Aero Club; the latter for the loan of one ' Tiger Moth.'

' Blue ' Farmer came up with the plans of weak links for the tow rope and Geoff smartly made up a pack.

We only wanted D.C.A.'s sanction and the Aero Club to shoot over a ' Tiger ' and we would be all set.

After several week-ends of ' It's on ! ', ' It's off ! ', we began to wonder just when or if we would ever get around to aero-towing our sailplanes.

However, one day I received a 'phone call from Geoff Higginson. ' Everything's set for Saturday, September 1st, at 14.30 hours,' says Geoff. ' Can you make it O.K. ? '

Replying in the affirmative I ' snuck ' back into my workshop and proceeded to fly again in aero-tow.

During the next two days I went over all the notes I had and re-read every article I had been able to come by on the subject. An article by Fred Hoinville in *Sailplane*, and a chapter on ' Flight Without Power ' proved good matter. Also, the notes on Aero-Towing sent by Lauri Sadesky from Tasmania shortly before his untimely death were most enlightening.

It was also my good fortune to have a long talk on aero-towing with perhaps the best tutor one could wish for—George Ozsdolay. George gave me countless pointers and indeed a great deal of confidence.

The big day arrived and running late, we streaked out to Caversham and set to and rigged the ' G.B.' in record time. In fact, I remember helping to take a wing out of the trailer, turning away to get something or other, turning back and ' Huh ! ', there was the ' G.B.' completely rigged.

Jim Pekin, the pilot of the ' Tiger Moth,' strode up and we had a talk on procedure and signals. Then with a cheery ' See you when we get down, Ray,' he walked over to the ' Tiger,' VH-BEK. I scrambled into the ' G.B.' and adjusted my straps, and 300 feet away at the other end of our green tow rope Jim Pekin was doing likewise in the ' Tiger.'

The line was hooked up and I called for one bat; gradually the tug took up the slack on the rope; the tension taken, the all-out signal was given and we rolled forward; the speed increased, the ground slipped away and the ' G.B.' was just skimming above the macadam.

As the speed built up I had to hold the ' G.B.' down, while keeping one eye on the ground and one on the ' Tiger.' The tug shed surface friction and started to climb and I eased up with him.

During the climb to 300 feet I had little trouble with the tow and was beginning to think it a piece of cake when ' whoops ! ' I rocketed up high above the tow plane and the surge that took place—' heck ! ', I thought that the ' Tiger ' was going to whip back right under me.

Things quietened down and I dropped a bit of height. Jim signalled a turn and I tried to follow him; boy! what a time. I bobbed around like a cork in a sea—up! down! out! in!, all over the place. I just couldn't keep that ' Tiger ' in the one place.

Later I found out that I was too high above the tug. This caused a fair bit of trouble; accounted for the surges anyway.

However, we ironed things out and kept going around and up—now we had Caversham on our left, the river up ahead, as we flew straight towards the ranges; over the river we turned again and I found this one easier by not steering so sharply towards the outside of the turn.

We flew along inside the ranges until we reached 1,500 feet. At this altitude we were off the end of the runway from which we had taken off a few minutes previous. Jim turned to line up on the strip and ' heck ! ', up went the airspeed and I swung wide out in the turn. After a bit of a battle I lined up again and soon we were over the strip, 2,000 feet. I reached for the release ring and pulled, away sprang the rope and I peeled off to port as prearranged and then straightened up, eased the speed off and just floated along, whilst watching the ' Tiger ' going down with the tow rope.

A few minutes later the ' Tiger ' landed and so I proceeded to do the same, losing a bit of height in a couple of loops, etc. I was soon down low, a turn over the boundary fence, a slip, and we were on the deck.

Subsequently, all agreed that I looked to be too high above the tug and should try a lower station on later tows. Also, by steering too sharply towards the outside of the turn I had been whipped around similar to an aquaplane.

Lin Ericcson was to fly the ' Tiger ' the next trip, so after clearing up a few points we were all set and a few minutes later were airborne again.

The ground organisation was superbly handled by ' Blue ' Farmer, and with several enthusiastic Club members assisting him things moved like well-oiled clockwork.

A grand effort by all this day, and truly the gliding spirit.

South-West Africa Soaring Expedition

By E. DOMMISSE

Brooklyn Road,
Menlo Park,
Pretoria, S.Africa.
29.3.52.

EDITOR,
Sailplane and Glider.

SIR,

Herewith an article on flying in South Africa, or the South-West part thereof. We have high hopes of what we will yet achieve there. We made more notable flights than those described in this one article, but it is for the pilots who did them to write it up and send it in with the very interesting barographs.

About myself : I have at various times held, sometimes for only a year, almost every S.A. gliding record. Duration of 9.20 hours is still held by me, but only because no one is interested to exceed it! I still have no Gold ' C ', only Silver.

I have been more active in building, and have done major repairs and rebuilds, also built completely one ' Grunau Baby,' one ' H-17 ' and now a ' Kranich.'

The wings of the ' Kranich ' are now ready for covering. They were rebuilt from a total wreck which was brought to S.A. by Hans Würth from Switzerland. The fuselage bulkheads and plans are arriving shortly and I hope to complete this with the empenage sometime for more South-West Soaring this year. René Compte, who went to 36,000 with 30,000 ft. climb in his ' Moswey 4,' at Johannesburg, hopes to go to S.W. this year and if the weather treats him kindly then records are certainly going skyhigh.

Yours faithfully,
E. DOMMISSE.

P.S.—The papers of the flight were submitted to the F.A.I., but naturally they cannot accept it without the barograph record. It merely means that we go and do the flight again.

WE in South Africa have known for years that there is phenomenal soaring weather in S.W.A., but owing to circumstances and lack of equipment we could never get together to go there and try it out. Hans Würth went there early in 1951 to repair a ' Grunau Baby ' for Herman Winter. After finishing the ' Baby ' he did a flight in it of 169 miles in 3 hours. Conditions caught him entirely by surprise. Flying with insufficient clothing at 12,000 feet above ground in the open cockpit soon set him to freezing so badly that he had to abandon the flight just after 3 p.m.

On his return to Johannesburg he made the following statement : To create new world distance records three things are necessary, and must be better than in 1939, when most of the world records, that still stand to-day, were set up :

1. The pilot must fly better—be better trained and have more experience.
2. The machine must be better.
3. A place must be found where the weather is better.

We here can certainly fly better today than in 1939. Better machines however have been built but we have no hope of possessing any for years to come. By flying one of these new high performance machines and in the hands of a pilot such as Richard Johnson, the world's single-seater distance record has now been pushed to 445 miles. So we have to be satisfied with a reasonably good machine such as Hans' ' Kranich ' and must find better weather conditions than Johnson had. *This we have in South West.*

We organized an expedition and went there from January 12th to the end of February, 1952, taking the ' Kranich,' and telling everybody that we were out to break world records, single as well as two-seater.

It took four days to get to our base, which had to be Keetmanshoop, not because this was the best place to go, but because of the good aerodrome with hangarage, and a towing plane on the drome.

South West Africa is a semi-desert, very thinly populated and with bad roads and communications. The pilot must therefore be good on his navigation and always carry water. This water story is very serious !

The best season is from October to December when the temperature rises at times to 118° F. in the

shade. Owing to circumstances we, knowingly, went at the wrong time, but there was nothing to do about it. As it turned out there were only a few days in which good flights could be made. Usually soaring conditions started too late. Warm air was coming in with an unwanted south wind. During the night cold air would move in with a west wind on the ground while the upper airstream remained south. This caused an invariable inversion at 4,000 ft. above ground, which only lifted occasionally in the late afternoon. It is also impossible to make long flights with a south wind. Conditions are very different during the summer months of October to December when persistent N.W. to N. winds bring in very unstable warm air.

We made frequent flights which started at 4 p.m., just to test conditions. Invariably we would go to cloudbase which was from 10,000 to 14,000 ft. above ground. Thermal strength varied between 800 and 1,800 ft. per minute.

We were flying the ' Kranich ' and the ' Grunau Baby ' belonging to Herman Winter. Conditions were so good that we would release from aero tow at 500 ft., go rapidly to cloudbase at about 12,000 ft., and find ourselves flying around Brukaros mountain, a prominent extinct volcano which is 40 miles away, with the aerodrome still within sight and gliding distance. From here we would wander for miles to the east, going from cloud to cloud and staying high, then fly against the south wind to a point 25 miles south of the aerodrome and come back again. The last thermal could still be used at sundown, which was at 7.45 p.m., and a landing made at 8 p.m., when it started to get rather dark. It would have been possible to attack the world 100 k.m. triangular speed record but we could not get it organized and find the necessary observers for the turning points.

On Saturday, 9th February, I flew with Sam Barker as co-pilot on a record out-and-return attempt. All papers were filled in and witnessed, a barograph was placed in the ' Tiger.' The observers at Marienthal, 135 miles away, our turning point, were notified. The ' Kranich,' before taking off, was equipped with two barographs under the seat of the co-pilot. When I arrived Sam was already strapped in and he assured me that Hans, who had already left, had switched the barographs on. As it turned out they had not been switched on. This lamentable fact happily does not detract from our achievement of successfully completing the flight and exceeding the world record with a flight of 270 miles out-and-return.

The only grievance is that I now cannot officially claim a record or analyse the flight. However, conditions are so good that I am determined to go back and push the record up to 300 miles, and on this occasion I shall personally sit on the barographs.

We released from tow at 10.49 hours at 2,000 ft. (All heights are above ground, Keetmanshoop aerodrome is 3,600 ft. above sea level). The point of release was 1 mile south of the aerodrome, while Marienthal, the declared turning point, is 135 miles due north of the aerodrome. It was still too early for active lift and we came slowly down to about 1,500 ft. drifting west in a light east wind. At 11.30 the lift got better and the first cumulus appeared far to the N.E. We gained height at 2 to 3 metres per second, until we were 2,000 metres up directly over the aerodrome. It was 11.45 a.m. when we set off, going east of our direct course in order to get under the clouds. 15 miles out we circled up to cloudbase at a steady 5 metres per second. Cloud base was 3,000 metres. From here we got going at 150 kilometres per hour. Sam got airsick and begged me to turn back. I assured him that he would get over it and also stated that I knew very definitely that we were going to achieve our goal and that I would rather take his dead body on the trip than turn back. Sam carried on very gamely but suffered badly from time to time. This put a restriction on flying tactics. I had to make wide circles in lift and failed thereby to get the best rate of climb. After a while I also stopped making sweeps or pulling up when going through lift. Despite this we flew 25 to 30 miles between thermals at 150 k.m. per hour and lost only 1,400 metres height. Cloud base rapidly went to 3,400 metres and the lift increased to 9 metres per second which is 1,800 ft. per minute. Most thermals started at 5 metres per second at 2,000 metres, which was mostly the lowest point we went to before looking for more lift, and rapidly rose to 6, then 7 metres per second, ending up usually at 8 metres per second under cloud base. We were 30 miles to the east of the direct course to Marienthal for the first 75 miles of the outward leg. After this, cumulus filled the whole sky and we edged in on to a direct route. We arrived over Marienthal at 2 p.m., with 2,000 metres. We flew around going well past the town, coming down to 1,400 metres taking photos and firing Verey signals. We were observed by many people before gaining height directly over the town and starting back at 2.45 p.m.

The wind was now south at about 5 miles per hour on the ground. Large dust devils could be seen everywhere. The lift was so good that I increased

speed to 160 kilometres per hour. Far ahead large thunder storms had developed out of the cumulus and rain storms were blocking our way... We had some slight worry because of this but actually negotiated the storms by flying straight along the western edge of these clouds, on the sun's side, gaining height until we reached cloud base. Rain was falling from the same cloud on our left. There were some good clouds within reach further west which we could have used if necessary. I estimate that we covered 15 miles under this same enormous cloud in straight flight, gaining height from 1,500 metres back to 3,400 metres at an average rate of climb of about 5 metres per second. We were now past Brukaros and one further totally unnecessary climb saw us back to base with height to spare. We circled the town and the aerodrome before landing at 5.45 p.m.

The total time for actually covering distance was just 5 hours which makes our average speed 54 m.p.h. Imagine such conditions with a tailwind !

Herman Winter on this same day flew 233 miles to Rehoboth in his ' Grunau Baby ,' which is the finest achievement anywhere in the world with such a machine.

There is not the slightest doubt in my mind that 100 kilometre triangular course can be flown here in record time and that distances of 600 miles are fairly easy just to start off with. Windhoek to De Aar lies within the bounds of the weather conditions described here and the distance between these two places is 720 miles.

A last word about the dust devils cannot be omitted. Standing on the aerodrome at Keetmanshoop under a cumulus covered sky, we would see more dust devils around than we could count. They would stand straight up in the sky from ground to cloud, wavering and wandering around in one small space and persisting for as long as 20 minutes. Collars of dust would form in two or three places around the central column. Each one is good for 7 m./sec. lift from base to top. Once I took off on aero-tow from the bottom of the runway and the pilot went straight for a dust devil at the top end. Rough lift started when we were still 50 yards from the dust centre. I cast off at 300 ft. and circled around the outer edges going up at 5 m./sec. Higher up the circle was tightened up, but at no time was it necessary to fly too close to the dusty core. The going was not too rough. The lift increased to 7 m./sec. and the thermal took me to cloud base at 3,100 metres.

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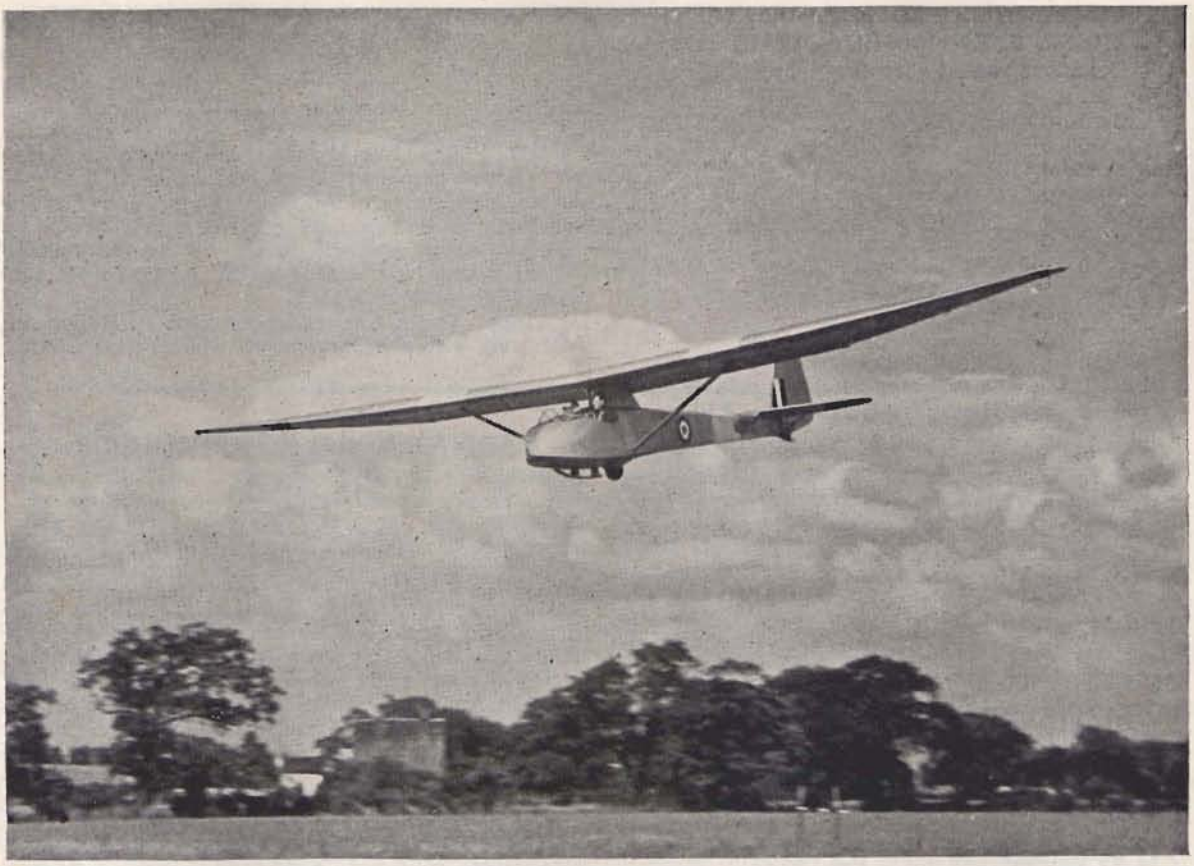


"Sedberg" approaching to land at 183 Gliding School, Woodford, Cheshire.
1/100 F8, 2x Yellow Filter. By R. Schofield.

CENTRAL AFRICAN GLIDING NEWS

Bulawayo

The club has been forced to vacate its hangarage at Kumalo Airport, and to bring its equipment into the City. The use of a field has been arranged, and primary flying should commence there in the near future.

Gwelo, I

The R.A.F. Gliding Club has not yet received delivery of its 'Tutor' and 'Primary,' so no further news is available.

Gwelo II

Work is proceeding on the construction of a privately-designed intermediate sailplane for the proposed civilian club.

Salisbury

The quarter started well, over two hours' flying being recorded for the two-seater ('T-31') every Sunday, the maximum flying time being regulated at 30 minutes per launch.

Although the 'Cadet' has been grounded awaiting the delivery of new wings, the 'H-17' has been flying regularly and well, the best flight to date being by Jimmy Harrold who managed a 3¼-hour flight, in thermals.

10,000 FLIGHTS IN 'T-31' EVERY WEEK

Flights to 10,000 in 'T-31' were achieved without fail every week-end, the most unusual flight being by Instructor Eric Bone who climbed from 1,500 to 2,000 feet by a series of six stalls in a storm front! No flying, however, took place in the last month, the doldrums having hit the committee who were unable to repair the winch drum any more quickly.

In spite of all, many new members have enrolled and we have had a visitor from the Cambridge Club.

The C.F.I., Captain Derek Lane, has been transferred for three months to Nyassaland, but he and Jack Fennis have purchased the 'Kite' from the Umtali Gliding Club and will spend the next six months on repairs. It is hoped that Jack Fennis will acquire a 'Tiger' for aero-tows. Eric Bone is now on holiday in England where he hopes to purchase a sailplane for Jack Wall. Soon five machines should be in our hangar. Jimmy Harrold and Douglas Elliott both acquired their 'C's' during the quarter.

Eric Burditt, recently returned from a refresher course at the Lindin Club, has returned and joined the Bluebird syndicate, and has been flying 'H-17.'

THE BRITISH GLIDING ASSOCIATION.
WORLD CHAMPIONSHIPS—SPAIN 1952
Donations received for the Appeal Fund :

£	s.	d.	
2	2	0	S. G. Stevens
1	0	0	J. J. Cresswell
2	2	0	R. Clough
1	1	0	G. Bacon
1	0	0	J. Moore
2	2	0	D. H. G. Ince
5	0	0	Royal Naval Gliding & Soaring Association
31	10	0	P. A. Wills
3	3	0	Docker Brothers
10	0	0	British Ropes Ltd.
100	0	0	The de Havilland Aircraft Co., Ltd.
50	0	0	The Fairey Aviation Co., Ltd.
15	15	0	R. B. Pullin & Co., Ltd.
5	5	0	Cellon Ltd.
10	10	0	British Aviation Insurance Co., Ltd.
50	0	0	Royal Aero Club
10	0	0	Sperry Gyroscope Co., Ltd.
50	0	0	Sir Francis McClean
1,000	0	0	The Society of British Aircraft Constructors
£1,351	0	0	TOTAL to the 31st January, 1952

The Loan of the following Equipment has also been promised for the period of the Championships :

5 Sky Sailplanes	Slingsby Sailplanes Ltd.
5 Estate Cars	Standard Motor Co. Ltd.
1 Saloon Car	Standard Motor Co. Ltd.
5 Air to Ground and Ground to Air Wireless Sets ..	Pye Ltd.
5 Turn & Slip Indicators ..	R. B. Pullin & Co. Ltd.

Central African Gliding News—*contd. from previous page.*

Umtali

The only serviceable aircraft having been a ' Dagling,' no activity has been recorded. Delivery of the new ' T-31 ' is long overdue, but it was known to be at Beira early in December. Assembly of the fuselage should be well under way by the time this reaches print. The ' Kite ' has been sold to members of the Salisbury Gliding Club, and the ' Dagling ' is for sale.

The Municipality is understood to be building a new municipal airfield, primarily for the use of the gliding club. The new airfield built by the Government for commercial flying at Grand Reef, although suitable, due to the surrounding hills, is considered to be too far distant for satisfactory gliding.

Umvukwes

A successful inaugural meeting was held on the farm of Jim Harrison, who was elected Secretary. A ' T-31 ' in kit form has been ordered, but it will be at least six months before delivery is made and assembly completed. Messrs. Harrison and Darby have had construction and flying experience at the Salisbury Gliding Club and will constitute, initially, at least, the backbone of the Club. We all wish them luck in this latest Rhodesian Club.

World's Two-Seater Height Record

46,000 ft. (approx.)

THE F.A.I. has received application for the homologation of a new height record for two-seater gliders made by Larry Edgar and Harold Klieforth, at Bishop, California, on March 29.

They claim absolute height of 14,436 metres (about 46,000 ft.) and a height gained of 11,155 metres (about 36,000 ft.).

' Hope ' Platts account of her visit to Bishop on March 28, with photographs, will appear next month.

International Competitions in Spain

THE Swiss are sending three pilots to fly single seaters, ' Pirat ' Gehriger, Max Schachenmann and one of the brothers Fahrlander. These were among the outstanding pilots in the Swiss home points competitions last year. The Swiss are also sending a two-seater team, Kuhn and Nietelspach.

The German team is not yet chosen, but we hear that an American Team, originating from the U.S. Forces in Europe with Paul MacCready, Emile Lehecka, William Beuby and R. Scott Royce will also take part.

The Swedes are expected to send their usual strong contingent and so are the French.

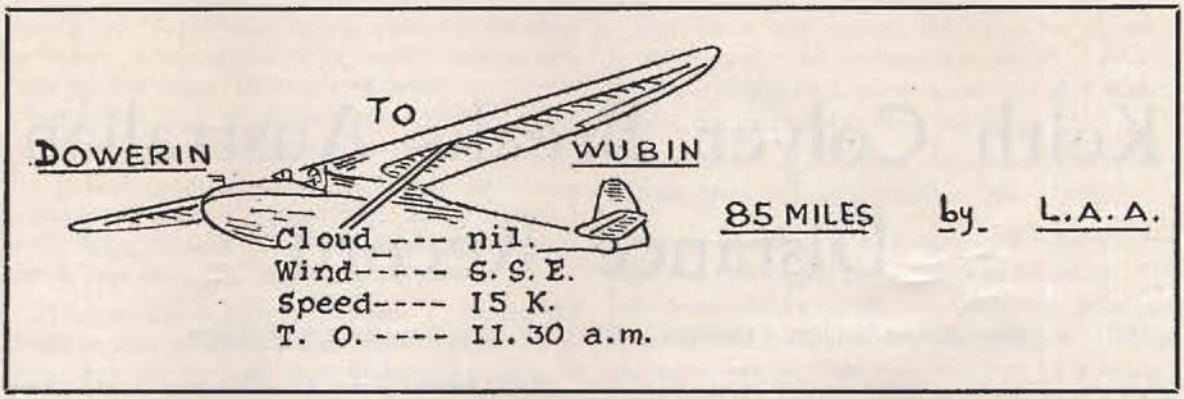
It does not seem to have been decided if there is to be either Italian or Jugo Slav teams, or whether there are any other entrants. It appears likely that the British Team may be more limited than was at first expected, if the response to the Appeal by Lord Kemsley for funds does not reach the anticipated figure of £4,500. So far it is about £1,500.

Portsmouth Naval Gliding Club

THE ways of their Lordships of the Admiralty are shrouded in mystery, and often hard to fathom. The latest example is the unexpected demise of the Portsmouth Naval Gliding Club following the posting of Lt. Cdr. Tony Goodhart to a post in Scotland, and the departure of the only regular instructor, L. Coulshaw, to a post 300 miles away.

No one can be found to take their places and so the Navy loses the club around which most of the fame the R.N.G. and S. Society has gained since the war has aureated.

This has also happened to several R.A.F. Gliding and Soaring Clubs, and several times the joint civil and military gliding clubs in Germany have suffered the same fate, only to rise again when some new enthusiast came along who was prepared to do the donkey work necessary to lay on gliding for somebody else.



THE take-off behind Tiger Moth ' VH-ABC,' with Cyril Flood at the controls was without incident, the air being only a delicate shade of green. The drift carried the ' G.B.' in a 330 deg. direction. The height, however, was falling off the further the airstrip was moved from. After 20 mins. of alternating between 2,000 and 1,100, a course was steered to move upwind to a large dried up salt lake. This proved more difficult than it had first appeared as the red ball kept screaming for recognition. In looking for more lift areas the plane drifted back to the original position. After much scrambling the edge of the lake was finally reached and lift encountered at 5 f/s. This proved good for 2,700, so a resolution was formed ; if the 3,000 came up a start would be made in a northerly direction. With the altitude gained over the lake it was possible to search a wider area. The results were rather poor on flying out to the centre of the lake, no thermal activity being found. On turning and flying downwind to the edge of the lake a thermal was discovered. the reason being that the air blowing across the surface of the lake needed something to knock the bubble off, with the difference in the two temperatures of the lake and the land doing this. At 12.30, 3,000 ft. was reached . . . a triangular course flown to check thermal activity and a course steered at 330 deg. Airspeed 40 m.p.h.

The country was set out like a checker board and as far as possible a course was plotted to have bush country anywhere but directly underneath. The lift was good, averaging 8 f/s., but the rate of sink between thermals was very high, at 40 m.p.h. 5 f/s. The 30 miles to Wongan Hills was covered very slowly as the air between thermals was not condusive to building up high speeds. Wongan Hills came up on port of course. The lift on the lee side of the hills was very strong and there may have been a slight wave effect. At times the lift was up to 15-20 f/s., and 6,000 ft. was reached very quickly. Time however was not spent riding to the top. The buoyant air was utilised in building up airspeed to 60 m.p.h. without any appreciable sink. After Wongan the course was changed to 360 deg., and the railway line crossed at Kondut. The temperature at 6,000 was 42 deg. F. Further north of Kondut the thermals were not ridden to the top, as they could be more profitably used in speed flying without much red. After losing 2,000 ft. in travelling 16 miles, strong air was found west of Ballidu which enabled 65 m.p.h. to come up with the green bobbing at 5 f/s. To completely ignore this seemed wasteful, so a few circles were indulged in, bringing the height up to 6,000 again.

The chains of salt lakes were excellent landmarks, but the lift directly over them was very disappointing. In fact, lift was hard to find over unbroken wheatfields or any field of even colours. Light sandy patches on the edge of wheat, or the difference between trees and sand seemed to be necessary for the sending off of thermals.

Below 3,000 ft. the ground looked too close for comfort and anything that showed the faintest tinge of green was worked up until a safe height was reached again. Dalwallinu appeared to starboard approx. 12 miles away. Height had been dropping slowly after the last thermal to 1,700 ft., at which altitude the air was very dead, so a farmhouse was picked out and preparations were made to land. Luckily, weak lift was encountered, making it possible to go to 4,000 ft. in 15 mins., but from then on, for some unknown reason, the lift was nowhere to be found. At this stage the wind was strong and although dynamic lift was encountered each circle took the ' G.B.' over an unhospitable section of salt lakes. Possibly by using the dynamic lift the lakes could have been covered, but the thought of a salty ending did not seem like a happy climax. A farm house, two Nissen Huts and a field for an aero-tow were picked out. On approach, the ' G.B.' seemed almost reluctant to come down, and it was only with a lot of coaxing and a lot of side slip that a landing was made at approx. 3.15 p.m.

The property landed on at Mia Moon, 11 miles from Wubin was owned by Mr. M. Sanders. The hospitality of Mr. and Mrs. Sanders was much warmer than the 101 deg. outside. It is people like them who make cross-country flying possible and to whom the Gliding Movement will always be grateful.

By permission of ' Glidabout ' and the Gliding Club of Western Australia (inc.)

Keith Colyer Breaks Australian Distance Record

Flies Raspet-Modified ' Olympia ' 259 miles from Narromine to Jerilderie.

ON Christmas Day, Keith Colyer, of the Sydney Soaring Club, broke the Australian distance record with a flight of 259 miles from Narromine to Jerilderie, reaching a maximum of 15,700 ft. in an eight-hour flight.

He flew the club's ' Olympia,' which Mervyn Waghorn had ' cleaned up ' on advice of Dr. Raspet, of Mississippi State College. Here is his description of the flight.

As small cu. started to form over Narromine about 10 a.m., I was aero-towed by Len Schultz, and released at 10.20, 1,500 ft. over the hangar. There was reasonable lift about, but I could not climb higher than 4,000 ft. for some time. By 10.45 I decided conditions would improve enough to warrant leaving the aerodrome.

As the wind was from the N. East, about 5 knots, I set course 240 deg. for Tullamore. I reached this town in an hour, mainly by circling in clear air, but also using lift under cloud, the base of which was now about 5,000 ft.

Over Tullamore I met up with the first cloud with good lift inside, and climbed to 7,000 ft. with the rate of climb indicating about 6 f.p.s. I had by then decided to make Narrandera, which is a little over Gold ' C ' distance.

It was obvious that my track would lie near Lake Cowal, and I wanted to make sure that I gave this a wide berth. It is about 15 miles long and 5 miles wide, and a couple of years ago I flew too close to it and was let down by stable air.

I set course for Condoblin, and by this time there was good lift under three eighths cloud, so I decided to hop from one to the other and not go inside, as I did not want to waste time instrument flying, which in my case, is somewhat erratic.

Soon after mid-day I flew over the Fifefield mines, which are very interesting from the air.

Radio reception was becoming poor on the 3 meg. band, and by pulling a length of fishing line we had rigged up from the set to the cockpit, I switched to 6 megs., and was able to hear Narromine without difficulty. It is our practice to contact base every half hour, our ground station being installed in Len Schultz's car. Radio contact is extremely useful, not only for letting the rest of the team know one's position, but in organising a retrieve even before one lands, and thus saving time.

Near Condoblin I met up with much larger cloud than I had previously seen and decided to see how high I could go inside. I was able to reach 10,000 ft. and came out near the top without having spun or had the airspeed too high or low. However, for the next 30 miles I used lift under clouds almost exclusively, and occasionally used clear air thermals. Sometimes these would develop into clouds above me as I was circling—a most satisfactory feeling.

Knowing the importance of keeping one's ground-speed up I did not waste time getting speed after leaving thermals. I remembered reading how Paul McCready, the American pilot, maintained very high speeds in Sweden by diving steeply at the beginning of each dash between thermals.

HIGH SPEED TECHNIQUE USED ON RECORD FLIGHT.

I followed McCready's high-speed technique, and found it to be well worth-while. My average height after 1 o'clock was between 7,000 and 8,000 ft , but occasionally I would make a high climb in cloud if I thought the lift was strong enough inside, and on one occasion decided to try for Gold ' C ' height.

I started circling at 5,700 ft. and entered base at 8,000 ft. It was a little turbulent below base, but quite smooth inside, with a rate of climb between 10-15 ft. a sec., slackening off near the top. It

became quite rough near the top, where I broke clear at 12,500. I was shaken to notice the canopy and both leading edges were covered with ice. I was grateful for a clear vision panel which enabled me to see where I was going until the ice melted.

I pressed on at 55 to 60 I.A.S., and flew for a considerable time without circling. Every now and again, flying through lift I would reduce the speed to a little over 40 m.p.h., to prolong the descent.

About 50 miles from Narrandera I noticed the clouds in that direction did not appear as active as those more to the east, and I changed course to

Narrandera was reached at 4.40 p.m., at about 10,000 ft., and Gold ' C ' distance gained. I decided to try for Jerilderie, to the south-west, with a straight railway line and road to show the way.

I had been in touch with Narromine all this time, and the Moth had left to retrieve me.

Thirty miles west of Narrandera I decided to enter what was the biggest cloud so far encountered. This time I climbed to 15,700, but found the turbulence so great that I did not feel like going any higher, and came out on what was meant to be a straight

(From ' Sailplane and Glider,' April 17, 1931).

Mr. Marcus Manton soaring The London Club ' Professor ' at Tottenhoe.

180 deg. I had one gap of about 30 miles to cross where there was practically no cloud, but was still able to find good lift in clear air. Once again back in cloud lift I was able to identify Grong Grong.

Here I set about the business of entering cloud, which I was able to do at 9,500 breaking through at 12,000 feet. It was even more turbulent near the top than before, and the build-up of ice even greater. The ice was not clear, but rough, rather like gravel, and about quarter of an inch thick.

course. I am sure it varied about 45 deg. on each side.

I have used oxygen many times in service aircraft, and am a great believer in using it early rather than late, and at 13,000 ft. I put on the mask and found everything working well. It so turned out that I did not need it, but it was comforting to know that if I had gone higher everything would have been fine.

From this cloud I had a run of about 40 miles to

Jerilderie, and don't believe I circled once. This was the last cloud encountered on this route, but I could have still obtained cloud lift if I had turned west, where the country was very uninviting. Anyway, I was ready to relieve a badly aching back.

I flew the last 20 miles at 70 miles an hour, and arrived over Jerilderie with 4,000 feet, and landed in a field one mile north-east of the town at 6.20 p.m.

After landing I noted that the clouds which I had previously left had developed into cumulo nimbus, and occasionally could hear thunder.

Club of Victoria pilots improved the distance and 'out-and-return' records, and Ron Roberts of the Victorian Motorless Flight Group, set a new goal flight record.

The two clubs flew a total of 600 cross country miles in competition and in non-competition flights.

The G.C.V. record breakers are Dave Darbyshire and Ted Desmond. Members of this club flew a total of 70 hours and 399 miles cross country.

Eighteen members attended the camp with the

(*From 'Sailplane and Glider,' May* 1, 1931).

A photograph taken from a camera strapped to the wing. A member of the 'Engineers' Gliding Club' takes a picture of himself above the airport.

My actual groundspeed, counting the time en route, was about 33 miles an hour, and the distance covered was just 259 miles (exceeding the existing record by 38 miles—Ed.).

VICTORIAN CLUBS BREAK THREE STATE RECORDS

FLYING from Berwick and Benalla during the Christmas period, members of the two Victorian gliding clubs broke three State records. Gliding

Blue and Grey 'Grunaus,' the 'Kadet' and 'Utility, made 132 winch and 51 aero-tow launches.

One of the best flights was from Benalla to Seymour and return by Ted Desmond—distance, 61 miles, The maximum height was 11,100 ft., which gains Ted his Gold 'C' height leg. Lin Beck, during a 92-mile flight in the Grey 'GB' climbed 10,000 ft., which will probably give him a Gold 'C' height—the barograph has not yet been checked.

Dave Darbyshire took the distance record with a flight of 105 miles in the Grey ' Grunau,' made in the record time of 4 hrs. 05 min.

Less spectacular, but worthy of note was a flight by Owen Lewis, who gained his ' C ' by taking the ' Utility ' to 5,000 ft. ; and a climb to 7,500 feet by Ted Desmond in the ' Kadet.'

Non-competition distance flights were 43 miles to Rutherglen by P. Bourke in the Blue ' G.B.', 25 miles to Tarrawingee by R. McAliece, and 10 miles to Goorambat by Gordon Isaac.

Four G.C.V. pilots gained Silver ' C ' legs : Lin Beck (distance and time) ; Dave Darbyshire (distance and height) ; R. McAliece (height) and Gordon Isaac (height).

Two ' A,' two ' B,' and three ' C's ' were also gained by trainee members.

G.C.V.'s Blue ' Grunau ' was damaged and disqualified under the competition damage rule, losing a total of 192 pts. for the pilots who flew it.

At Berwick, members of the V.M.F.G. were making good flights. Cross country flights were made from this field for the first time.

Best performance was put up by Ron Roberts who flew the ' Golden Eagle ' on a goal flight of 98 miles to East Sale. He made the flight in 2 hrs. 50 minutes.

Jack Day flew the ' Eagle ' 47 miles to Trafalgar in 1 hr. 37 min., and Derek Reid flew 36 miles to Narbethong in 2 hr. 40 min., having flown across the Dandenong Ranges. Bill Iggulden set off in ' Kestrel ' but was let down after 12 miles.

V.M.F.G. had ' Coogee ' put out of action early by a hard landing which broke a strut, thus disqualifying it from competitions. The damage was not severe and ' Coogee ' is flying again.

BRISTOL CLUB'S SUCCESSFUL YEAR

A successful year's working was reported at the Annual Meeting of the Bristol Gliding Club recently.

The number of launches, 5,615, exceeded that of any other club in Britain, and a high number of certificates have been gained. Financially it has been the best year since the formation of the club. There was a profit of £511.

RENE COMTE 9,600 metres a.s.l.

DEAR OLD PIRATE,

I'm writing to you in haste. The day before yesterday, December 1st, I climbed in the ' Moswey 4 ' to 9,600 metres after a gain of height of about 7,500 metres. It was the last day of the South African Championships and about 11 o'clock the weather looked good. On the other hand when I started around twelve, nine-tenths of the sky was covered with cloud and twenty km. south of our starting point, Baragwanath (Johannesburg) it was raining. I took off last and released at 350 above ground level or about 2,000 metres a.s.l.

In a few bounds I reached the rain front and climbed up immediately into the cloud where there was lightning and heavy rain. At first I climbed at 3 metres per second and the air was fairly steady, but at 5,000 metres the rain changed into hail and pounded violently on to my Plexiglass cockpit. At 5,500 metres I was using my oxygen breathing apparatus. The hail grew more violent and the drumming was so strong that I could not hear the slipstream noise. I was glad that I had the Artificial Horizon and not only a turn and bank indicator so that though I could hear nothing, I could easily keep the aircraft on a level keel (the air speed indicator had been iced up a long time).

When the pounding grew even more violent I opened a window to find out the size of the hail stones with my hand. They were tiny, possibly about the size of a pea, so that I had nothing to fear. The icing on the wing was also slight—about 2 cm. at the tips. The steering of the ' Moswey ' functioned without wobbling and in a few minutes I was over 9,000 metres up and climbing rapidly. The clouds were already clearing when a flash of lighting leapt up and I was conscious of a discharge through my hands and head.

I pulled in my head and immediately steered on a direct course for Bloemfontein which I had declared would be my goal.

In two minutes I came out of the cloud but only for a few seconds while in front of me the entire sky was thick with fog and dark clouds. I flew by compass for about 20 minutes like an airline pilot until I came out under the cloud base at 2,000 metres above ground level and about 200 km. further on. It was raining around here and despite more than an hours' trouble negotiating the showers I had to land somewhere.

Unfortunately I hadn't my own barograph with me and had The Hill's Peravia which only goes up to 8,000 metres so that I could not have the excess height homologated. On the other hand with a registered height of 8,000m. for the Dramond Mountain I could make an official announcement. The documents and the barogram will be sent through the S.A. Aeroclub.

Furthermore I am announcing the flight as the Swiss record for absolute height in that the barograph shows 8,000 metres a.s.l. It is a pity that the barometer did not record everything but I shall have another opportunity to attempt heights.

CORRESPONDENCE

'DAKOTA' TO SPAIN

The List Lengthens

Your Last Opportunity

SIR,

I am a prospective newcomer to the sport of gliding and am very keen to start. However, despite searching enquiries I failed to discover any Club in this vicinity, which rather surprised me considering that Maidstone is ringed with airfields and seems good gliding country to me.

I was overjoyed therefore to see the February edition of *Sailplane and Glider* on a bookstall which I found most interesting and the article for beginners by Godfrey Lee was much appreciated.

I see too that it has been suggested chartering a 'Dakota' to go to Huesca. If this proposed trip materialises I would like to put my name down for it if I am not too late. Could you please send me details.—**W. G. S. Meredith, Holland Road, Maidstone, Kent.**

SIR,

With reference to the 'Dakota' to Huesca idea originated by F/O L. Bond in last month's *Sailplane* dated Feb., 1952, provided the cost is appreciably below scheduled Airlines, I shall consider booking for the return journey.—**A. Pratt, c/o Mr. Hammond, Tunley Garth, Kirbymoorside, Yorks.**

SIR,

'Dakota' Trip to Spain.

With reference to one of your reader's suggestion that a 'Dakota' be chartered to Huesca for the Gliding Contests I am interested in same and would like to have any further information if a sufficient number of people can be found.—**Miss A. M. Gray, Grosvenor Place, Jesmond, Newcastle-on-Tyne, 2.**

SIR,

What has happened to " News from the Clubs." ?

Our American friends write to know what has happened to Ulster Club news. We also like to get news of other Clubs rather than reprints of 1930!—**William Liddell, Upper Queen Street, Belfast.**

(*What has happened indeed is what we would like to know. Perhaps Press Secretaries of Clubs would say and we would all be the wiser—or have Clubs ceased to appoint persons to this office, which in our opinion is as important as the C.F.I.?*)

SIR,

I read with great enthusiasm, the suggestion made by F/O L. Bond in *Sailplane and Glider*, that a Dakota be chartered to fly to Huesca for the Gliding contest.

If it is not too late, perhaps you would add my name to the list of supporters and oblige.—**John Butler, Wallasey Road, Wallasey, Cheshire.**

All names must be in by April 20, when a decision will be taken.

SIR,

In reply to your answer to my contribution to your Suggestion Competition, you ask who is interested in home or group building?

My answer is the Portsmouth Gliding Club.

Not only are its members interested but are actively engaged in both building and re-building of Gliders.

Although this Club is a very old one, it is also very small but that does not stop it from being both progressive and ambitious.

Funds have never allowed it to buy complete Gliders but by the skill of its members it survives by building its own gliders and also re-building written-off jobs acquired at low cost.

Can the Club come under the heading of Too Lazy? I think not.

You may never hear of this Club or its members breaking records or doing outstanding flights but it is very much alive and its members are as happy a bunch as can be found in any gliding club.

While I agree the high cost of materials put paid to most individuals' desire to build their own Gliders, would it not pay the Clubs to supply the materials and let its members construct club machines? Then maybe we would see a greater variety of designs on the flying field.—**Peter Shaw, Portsmouth Gliding Club.**

Hanna Reitsch Flies Again

FRAU HANNA REITSCH, brilliant German airwoman who flew in the prototype 'V1's' and shared Hitler's last days in the Berlin bunker, is in the air again.

Now 40, she is to captain the German team competing in the International Gliding Contests in Spain.

It was as a glider pilot that she used to come to England in the '30's. During the war she was a captain in the Luftwaffe and was twice awarded the Iron Cross.

German experts say of Hanna Reitsch: 'In every thousand prospective pilots you get 100 who will never be able to fly, the majority who are just average, and one who was born to live in aeroplanes. Hanna is that one.'

'DIE WITH ME'

She showed her devotion to Hitler by hedge-hopping into Berlin during the last days in a 'Fieseler Storch' training plane which she landed in the Brandenburger Tor. 'Hanna,' said Hitler, 'you belong to those who will die with me.' But at the end she got away.

NEWS FROM THE CLUBS

LONDON GLIDING CLUB

HOLIDAY INSTRUCTIONAL COURSES FOR NON-MEMBERS.

THE Club will run four holiday courses during 1952 primarily for the benefit of non-members and beginners. Tuition by qualified instructors will be given in dual control two-seaters. In the interest of efficiency no more than 12 pupils will be accepted for each course.

The dates are :—April 15—25; June 9—20; July 14—25; September 1—12.

With the exception of the first, courses start on a Monday morning and conclude on the following Saturday week after breakfast. Trainees will be given priority over regular club members except on the Saturdays and Sundays, when the reverse will be the case.

The inclusive charge for accommodation, dormitory style, meals, and gliding instruction on club aircraft (of which there are 12) is £21. Non-flying friends or relations of course-members can be accommodated for the 12 days for £10.

SOUTHDOWN MEMBERS LAY-IN ON SUNDAYS

SOUTHDOWN GLIDING CLUB are losing flying time because members are not turning up early enough at Friston on Sunday mornings. Last year the machines were out of the Hangar at 9 o'clock, but on the last two or three Sundays, many members have not appeared on the field until mid-day. It is early in the season, but members are being urged to be on the field as early as possible now that flying is in full swing. Last Sunday it was soarable all day, 23 hours were flown, but even so there was still a waiting list when dusk made further flying impossible.

Peter Healey has searched Eastbourne for chairs for the clubroom—he still wants some more so if you have any disused chairs in the loft bring them along, the visiting pundits do hate sitting on the floor. The club could also do with any worn-out car or motor-cycle batteries that members may have.

THE NEWCASTLE GLIDING CLUB

THIS Club was founded in February, 1930, and has had an uphill path during all of its 22 years. Interest, duty and responsibility having urged different stalwarts to pilot their club over crisis after crisis, with only a few wishing to surrender and fall by the way.

Since the end of hostilities the frustration of effort has been greater than ever, and the outlook has never seemed more hopeless. This has been fanned by a lack of genuine enthusiasm to apply effort, or take active part, by the bulk of post-war members.

Our principal post-war trouble has been associated with Flying Sites, and these notes are a brief history, written from memory, of our trials in this direction only.

1. CRAMLINGTON AERODROME.

This was a 1914-1918 war aerodrome, later used by Newcastle Aero Club, and taken over by Newcastle Gliding Club in 1936. The hangar was purchased with subsidy and the club house and land were leased to us. It was our pre-war headquarters and training site until requisitioned by the Admiralty (three days before the declaration of the last war) and held by

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them until after the ban on civil gliding was lifted. A goodly portion of the aerodrome was built up and a high barbed wire fence enclosed a compound. We were given a sort of unofficial permission to restart our activities, with the use of a wooden shed. About six months' restricted operations took place while we were fighting for the de-requisitioning of the property. However, it soon became apparent that once in the clutches of a government department, it was like shaking off a money lender. The site was taken over by the Ministry of Works, who used it as Headquarters for open cast coal operations. We eventually found the shed we used demolished and some of our equipment thrown out.

Fortunately, we had just acquired city headquarters and were able to store part of our equipment there. The remainder was put in the Clubhouse on the aerodrome which was not taken by the Ministry of Works.

Then began two years of negotiations for a new site, during which there was no flying by our members other than a few who went to help the A.T.C. Officials of the club started parallel negotiations for both Morpeth Aerodrome and Woolsington Airport tenancies.

2. MORPETH AERODROME.

This aerodrome was occupied by a small R.A.F. caretaker staff, pending the sale and removal of equipment therein.

After a long period of negotiations we entered the aerodrome and put some equipment in an open blister, with the approval of the C.O. only. On the principle that possession is nine parts of the law, we eventually succeeded in obtaining permission to use the run-ways only; a closed blister hangar, and a five roomed building as a Clubhouse. All other buildings excepting Bellman Hangars were demolished while a large area was used by the Board of Trade for storing munition boxes.

After twelve months' tenancy the site and remaining buildings were taken over by the Ministry of Agriculture, and an offer we had made to purchase our hangar was not accepted.

Our system of launching was altered to solid wire auto towing behind a 49 horse power Rolls Royce, to overcome cable costs due to wear on the runways, and we acquired a ' T21B.' It was learnt during the period of our tenancy that a site 2½ miles from the main bus route and one mile from an auxiliary bus route, was too much for many post-war youths who depended upon Shank's Pony. Attendances dropped and operating costs soared to 7/- per launch, but we struggled on hopefully, as the most uneconomically operated club in the country, until we received notice to quit on the 31st March, 1951.

We still continued operating intermittently as required for another six months, until the Ministry of Agriculture erected fences in positions which definitely hindered our operations.

It had become known to us at the time the Notice was served, that the site was to be divided into holdings for local farmers, and our contact with these farmers gave us the assurance that they would permit our tenancy to continue. However, the Ministry of Agriculture never relinquished their hold, or advised the farmers which three were going to get holdings on the site, until they had got the fences almost completed.

The aerodrome could very easily have been divided into three parts without the fences affecting our operations, but it would have been contra-ministry principles to have asked us if this was possible. The placing of these fences is undoubtedly a blunder which officialdom will not admit, and therefore at a time when the country's finances are not good, the Ministry of Agriculture have prevented the country from receiving the £78 p.a., which we would have contributed to the other incomes obtained from this site.

The local Members of Parliament were brought into the negotiations and asked to place the facts before the Minister of Agriculture. After much correspondence an under-secretary's letter accused us wrongly of not paying our rent, and proof was sent that this had always been paid within a few days of receiving notice. This proved to us that an excuse was being sought for giving us Notice to Quit, and after this nail was knocked on the head we were told that the farmers desired to enjoy their tenancy unmolested. They did not know that one of the farmers was a member of this Club and the others were also in complete agreement with the continuance of our tenancy. It was becoming more and more apparent that the life of this old established organisation was being made precarious by the blundering of some official—paid out of our taxes—who lacked sense of co-operation from which the country would have benefitted. Imagine our surprise after all of these years to be told that gliding and cattle grazing cannot go together.

If the farmers had been given their land back (which is only suitable for grazing) and were free to enjoy their tenancies, we would be operating on this site without hinderance.

The only success of the M.P's. endeavours was to obtain temporary permission to store our equipment in the now derelict and broken hangar, until we obtained alternative accommodation.

Recently a local Land Agent of the Ministry of Agriculture discovered that we were still using the hangar, and that this decrepit building must therefore be urgently needed by them. This was strange

MIDLAND GLIDING CLUB, LTD., Long Mynd, Shropshire

★ Summer Camps will be held as follows :—
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to us who were responsible for the prevention of its demolition two years earlier.

We have emptied the Clubhouse building to save the rates, and moved much equipment from the hangar. The ' T21B ' is still there with the ' Tutor,' and some launching equipment which could be moved to our City Headquarters. The Rolls Royce's are being sold, but the ' Beaverette ' and Winch will be retained if possible.

3. WOOLSINGTON AIRPORT.

During the above negotiations for the continued use of Morpeth Aerodrome, we were also in contact with the local Airport Committee, and a fairly bulky folio entitled ' Woolsington Correspondence ' gives one enlightenment on how Councillors can frustrate the development of initiative. One wonders why persons with no interest in flying serve on committees such as this. I understand Newcastle Airport Committee has about 40 members, and I am inclined to the thought that ' yes ' could be obtained more easily from Mr. Vishinsky.

However, our present negotiations brought us nearer to permission than any other time. We were asked if we would operate in conjunction with the A.T.C. (who were also applying for permission) and of course we agreed. Nothing transpired at our end for several months and after writing for the cause of delay we were invited to call on the Deputy Town Clerk. At this interview we were informed that agreement had been reached for this Club and the A.T.C. to use the Airport, and arrangements had been made for us to share accommodation. The delay was caused because the A.T.C. had not confirmed their agreement to the terms. We were asked to submit an offer of rental and if approved we could move in without waiting for the A.T.C. That would be over three months ago and many letters have passed since, but we do not know to this day if our offer was acceptable.

After continually pressing for permission to move in, and learning that the A.T.C. did not now intend to use the site, we were informed that the Airport Committee could not see their way clear to grant permission. We are still trying to learn why this Committee altered their decision.

This Airport is on a bus route only seven miles from the City, and the most mollycoddled gliding aspirant could reach it without physical effort, so a simple ' yes ' from the Airport Committee would mean the rebirth of the gliding side of this Club.

I should add that the Airport Committee has kindly agreed to allow us to store the ' T.21 ' in the roof trusses of a hangar, but we are having difficulty in getting to know the terms of the rent.

4. SUTTON BANK.

To keep real gliding enthusiasm alive at this end of the country we negotiated an agreement with the Yorkshire Gliding Club whereby we shared costs of their site in proportion to the ratio of flying done on their site by our Members and their Members. This agreement gave the Members of each Club the right to use the facilities of both Clubs. This arrangement was not attractive to beginner members, and those without their own transport failed to make use of it, although the total flying done by our advanced members in relation to that done by our neighbours, will make our share of these costs much higher than our capital returns. The principle is ideal and commendable, but we must have a training site to bolster it up.

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5. CITY HEADQUARTERS.

The acquisition several years ago of an eleven-roomed house in the heart of the City has been the salvation of this Club during the years of post-war frustration. It has kept the Members together, provided facilities for office and repair work, and enabled income to be derived from supporter Members (Non-fliers).

Unfortunately the financial assistance which the flying side received from this social venture is at present dwindling due to the universal shortage of money for these attractions, and at present it is barely paying its own expenses.

Although there are Members in this Club who will never give up the fight for its continuance, they realise that they are lined up against big odds by tackling ' monopolies ' with a civil service complex, but they also have the foresight to see that unless they persevere, a large populated area of this country would be robbed of a flying amenity which should rightly be available.

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(Issued under delegation by the B.G.A.) FEBRUARY, 1952

CERTIFICATES 'A' .. 63 (14318-14380)
'B' .. 50
'C' .. 10
Silver 'C' —
Gold 'C' —

'B' CERTIFICATES

No.	Name.	A.T.C. School or Gliding Club.	Date taken.
2546	Ronald R. Page	B.142 G.S.	25. 2.52
10878	Anthony G. Marks	No. 89 G.S.	10. 2.52
12673	Ronald H. Moore	No. 48 G.S.	17.10.51
12682	Robert S. Lowrie	No. 48 G.S.	7.10.51
12710	John S. Pickup	No. 48 G.S.	7.10.51
13285	Peter E. Murray	No. 84 G.S.	7.10.51
13439	Douglas S. Jones	No. 48 G.S.	10. 2.52
13535	Maurice C. Bass	No. 105 G.S.	3. 2.52
13620	Richard Quartermaine	No. 105 G.S.	24. 2.52
13879	Peter B. Gildersleeves	No. 104 G.S.	24. 2.52
13913	Peter G. Brown	No. 146 G.S	9. 2.52
13919	David F. P. Sharrock	Oxford	3.11.51
13975	Kenneth Marshall	No. 6 G.S.	16.12.51
14155	James R. Bowman	. o. 130 G.S.	16. 2.52
14318	Joseph R. Pendle	. o. 122 G.S.	3. 2.52
14319	Alain A. Decavel	Cambridge	8. 7.51
14320	John I. Barrow	No. 122 G.S.	3. 2.52
14321	Charles Smith	No. 166 G.S.	15. 8.51
14326	Michael Beaman	No. 125 G.S.	27. 1.52
14327	Terence L. Kelly	No. 161 G.S.	2.12.51
14330	Margaret Williams	No. 166 G.S.	3. 2.52
14331	Bryan A. H. Hitchings	Scharfold B.A.F.O.	4. 8.51
14332	Phyllis T. Hitchings	Scharfold B.A.F.O.	17.10.51
14333	Cyril A. McMillan	Dumfries	14. 6.51
14334	Trevor H. Wilden	No. 43 G.S.	7.10.51
14336	Brian E. Drake	No. 83 G.S.	13. 1.52
14337	Frederick W. Christie	Aberdeen G.S.	26. 8.51
14338	Mervyn G. Thomas	No. 87 G.S.	2. 9.51
14339	James A. Sharman	No. 49 G.S.	16.12.51
14340	Roger F. Pritchard	No. 125 G.S.	27. 1.51
14344	Roger C. Grannum	No. 123 G.S.	2. 3.52
14345	John H. Welch	Hamein	23. 7.51
14350	Peter F. Jowitt	R.A.E. G.F.	28.10.51
14351	Clifford P. Ward	No. 168 G.S.	10. 2.52
14353	Donald W. Gale	Gutersloh	3. 2.52
14355	John Condon	Beynes France	26. 9.51
14359	Robert W. W. Smith	R.E. G.C.	3. 2.52
14361	Terence E. Betts	No. 22 G.S.	6. 1.51
14362	Leslie Dandy	No. 23 G.S.	14.10.51
14365	Robert Tringham	Midland G.C.	24. 2.52
14366	Arthur J. Baxter	No. 104 G.S.	24. 2.52
14369	Norman O. Preston	London G.S.	13. 1.52
14370	Malcolm O. Bennett	No. 168 G.S.	24. 2.52
14371	Royston Saunders	R.A.F. Kabrit G.S.	4. 8.51
14372	Syed A. Rashid	R.E.F.C.	20. 2.52
14373	Charles Waller	London G.C.	26.12.51
14375	Harry A. Lake	R.A.F. Wahn G.C.	16. 2.52
14376	Alexander Brown	R.A.F. Bridgnorth	12. 9.51
14378	Rene J. G. Delhaye	R.A.F. Wahn G.C.	21.10.51
14379	Brian Stocks	No. 22 G.S.	2. 9.51

'C' CERTIFICATES

12209	Joseph D. Parker	Wahnerheide	1. 5.51
12611	Richard Etherington	Surrey	23. 2.52
12654	Stanley W. Skelton	Fassburg	26.11.51
13084	Brian S. Townsend	No. 126 G.C.	21. 2.52
13658	Hendrika J. Harwood	Wahn	1. 2.52
14331	Bryan A. H. Hitchings	Scharfold B.A.F.O.	18. 8.51
14345	John H. Welch	Hamein	26. 9.51
14355	John Condon	Beynes France	29. 9.51
14369	Norman O. Preston	London G.S.	10. 2.52
14373	Charles Waller	London G.S.	27. 1.52

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