Sailplane and Gliding

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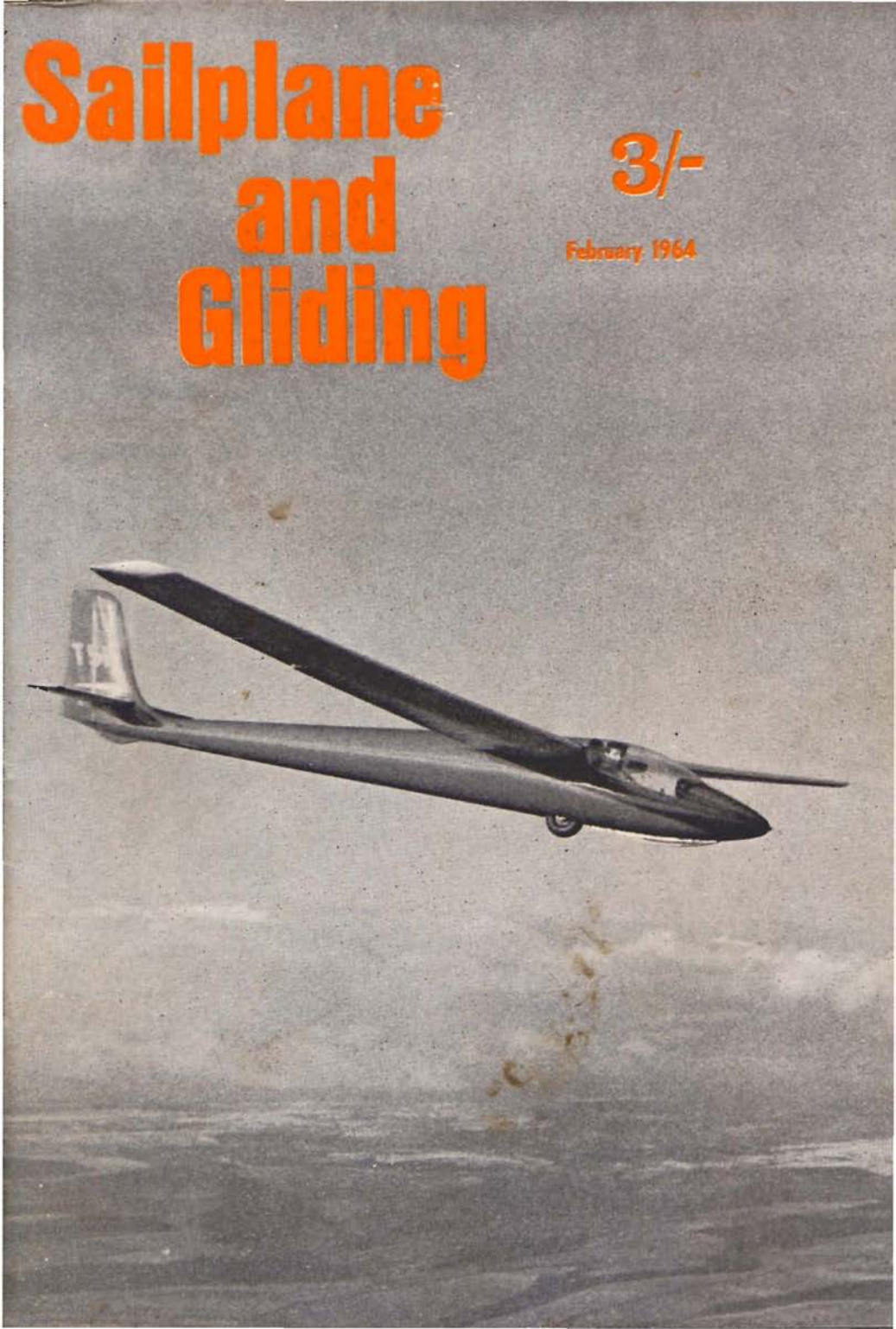
February 1964



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SAILPLANE AND GLIDING

OFFICIAL ORGAN OF THE BRITISH GLIDING ASSOCIATION

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Cover Photograph: The prototype Slingsby Dart on a test flight. Photo by J. Reussner.

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SINCE the two articles published by Philip Wills and Nicholas Goodhart in the February, 1963, issue of SAILPLANE AND GLIDING, on the campaign to introduce logic into Air Traffic Control, a great deal more work has been done to develop this approach. And in case anyone may think that bureaucrats are deaf to logic, it is only fair to say that the reverse is the case and our Ministry has in fact taken great interest in (and even action on) the logical cases presented.

This is of such primary and over-riding importance that we must shout from the roof-tops that our own Ministry of Aviation lead the world in this field, and that we, the mouse-like B.G.A., started the ball rolling. May it prove to be an ever-growing snowball. Britain has led the world to freedom in other fields before.

After which ecstatic admixture of metaphors, let us get down to a more sober presentation of the facts.

Collision Risk and Gliders

by Captain H. C. N. GOODHART

Chairman, Airways Committee, British Gliding Association

EVER since World War II there has been a tendency throughout the world to apply ever more stringent air traffic control. This process has been carried out in the name of air safety, but unfortunately no one ever seems to have taken time out to establish any logical basis for control. There has simply been a feeling that risk of collision is a bad thing and therefore every reasonable

Air Traffic Control and Gliders

step should be taken to eliminate the risk.

As far as it goes, this elementary feeling is right, but the two follow-up questions which must be answered are:

(1) How bad is the collision risk? (Here we want a statistical figure, not an emotional outburst.), and

(2) How much control is reasonable?

Unless these questions can be answered at least in some degree, it is not possible even to start on a logical control system; and if one succeeds in getting this far and inventing a particular system, the next question that has to be answered is: how effective is it in reducing collisions? Only then can a rational opinion be formed as to whether it is reasonable or not, for it must always be borne in mind that control will restrict traffic, hence an unnecessary and unreasonable degree of control will restrict the use of the air unnecessarily and unreasonably.

Logical processes such as this have hardly been used at all in introducing current systems of air traffic control. It could be that some of the present *ad hoc* air traffic regulations even contribute to collisions rather than to their elimination. The number of collisions which have occurred in controlled airspace between aircraft under control is a noteworthy percentage of all collisions.

For the non-commercial air-user such as the glider or light aircraft pilot, the outlook appears black. The octopus of controlled airspace spreads its unreasoning tentacles far and wide over the land and the space left for uncontrolled traffic shrinks alarmingly. For the glider pilot, who must go where the weather sends him rather than along man-made channels, the outlook is even worse, as the octopus stands ready to squirt the dread ink of "permanent IFR" into his path.

Clearly, therefore, if gliding is to have

a viable future, it is essential that logic be injected into official thinking and that at least some effort is made to ensure that the controls which are applied are necessary in order to achieve an adequate standard of safety without a disproportionate loss of freedom of all air-users.

One of the purposes of this article is to explain the logical method which has been used so that other countries can, if they wish, try a similar approach. That other countries should do so is of concern to us, since our own Ministry of Aviation cannot but be somewhat biased by the opinions expressed at I.C.A.O. meetings.

The method we have used is based on the random nature of cross-country glider flying. The gliders can only go where the weather permits them to go; they are not constrained to fixed heights or fixed routes. Aircraft, on the other hand, do generally fly at fixed heights and use fixed navigational facilities. There is therefore no correlation between the movements of gliders and commercial aircraft. This being so, it is reasonable to say that the movements of one are random with respect to the other.

This immediately opens up a relatively simply statistical approach to the problem of determining collision risk. The simple mathematics used have been set out in a series of papers, which have been made the basis of the general case presented to the Ministry of Aviation. A synopsis of these papers follows this article.

Having determined the risk of collision between gliders and commercial aircraft, the problem then is to relate this result to specific proposals for control. The first question that has to be answered is what is a reasonable risk of collision between a commercial aircraft and a glider.

Before answering this question, it is well to examine the present position with regard to accident rates of commercial aircraft. The current fatal accident rate for commercial aircraft is 140,000 hours per accident (7×10^{-6} accident per hour of airliner flight). This level of safety is the result of attempting to hold each major cause of accident, e.g. such things as main spar failure due

to fatigue, chance of failure of more than one engine on full-load take-off or more than two engines in flight, down to a figure of 1 in 10,000,000 hours of airliner flight (1×10^{-7} accidents per hour of flight).

On this basis it seems not unreasonable to accept a risk of collision with a glider at 1×10^{-8} accidents per hour of airliner flight. In considering this figure it should be borne in mind that due to the low density of gliders it is unlikely that a collision with a glider would in fact be fatal to the commercial aircraft. Consideration is being given to this point, but as yet no figure can be given for the probable proportion of collisions which would be fatal, because no collisions between glider and commercial aircraft have yet occurred.

Present calculations indicate that if in the U.K. all controlled airspace other than the S.E. England area was eliminated (leaving only the normal aerodrome protection "cheeses"), commercial air traffic would be subject to a risk of collision with gliders of 8.5×10^{-9} per hour of airliner flight, i.e. below the 1×10^{-8} figure. If, on the other hand, we allow for the present distribution of controlled airspace, the risk decreases to 1.5×10^{-9}. This means that a sevenfold increase in glider traffic or commercial traffic would be needed before the risk rate came up to the 1×10^{-8} figure.

In the light of this it is clear that, *provided logic prevails*, the outlook is far from black. Gliding can and should be allowed sufficient freedom to enable it to maintain the enormous attraction it currently has, and make its valuable contribution to our total air effort. There is, furthermore, another and even brighter side to the coin. The major contribution to collision risk is provided by low-level commercial aircraft. With the advent of more and more jet aircraft, the amount of low level commercial flying is rapidly decreasing. If this tendency outweighs any increase in quantity of traffic, either commercial or glider, then the trend should, as far as gliders are concerned, be towards reduction of controlled airspace rather than increase.

POSTSCRIPT.—To put these risk rates into perspective, it should be noted that 1.5×10^{-9} is one accident per 70,000 years of continuous airliner flight, and 8.5×10^{-9} is one accident per 13,400 years of continuous airliner flight.

SUMMARIES OF PAPERS

1. A statistical analysis of the heights used by gliders in the U.K.

This paper starts by describing the forms of lift used in cross-countries and deciding that "the vast majority of cross-country gliding is carried out using thermal lift and it is only necessary to consider the characteristics of this type for the purposes of this analysis." Thermal flights cannot exceed the height of the convective layer, which is generally between 3,000 and 6,000 ft. in the U.K. but can go to 30,000-40,000 ft. as shown by cumulo-nimbus clouds. "Glider cross-country flying is therefore strictly confined by height on any particular day and heights used by different glider pilots will all be similar since they will all try to keep in the top half of the effective layer."

Captain Goodhart has analysed the barograph records of 54 "randomly selected" cross-country flights representing a total of 186 hours — 23 flights by Peter Scott, 4 by himself, and 27 by members of Cambridge University Gliding Club — and added up the hours spent in each 1,000 ft. height bracket. The following table gives a summary of the results.

Height Bracket	*Time h. m.*	*% of Total*
0′-1,000′	5:10	3%
1,000′-2,000′	24:15	13%
2,000′-3,000′	54:30	29%
3,000′-4,000′	58:00	31%
4,000′-5,000′	30:50	16%
5,000′-6,000′	8:30	5%
6,000′-7,000′	2:45	
7,000′-8.000′	1:00	
8,000′-9,000′	:26	
9,000′-10,000′	:29	3%
10,000′-11,000′	:22	
11,000′-12,000′	:03	
12,000′-13,000′	:04	
	186:24	100%

According to this table, Capt. Goodhart points out, "It can be seen that about three quarters (76%) of all cross-country gliding is confined to the 0-4,000 ft. bracket. Only 8% takes place above 5,000 ft., with slightly less than 3% above 6,000 ft." But he gives an important warning, in case it should be said that, since gliders seldom exceed 5,000 ft., little harm would be done by prohibiting them from exceeding that height. The fact is, a cross-country pilot must in general use the full height of the convective layer, because as its depth increases, so does the spacing between thermals, and "the chance of reaching the next area of lift is materially reduced if the previous climb was not too near the top of the convective layer. It is this factor which has always made the British Gliding Association so emphatic that no more airspace should be controlled than is reasonably necessary."

2. Satistics of Cross-country Gliding

This paper analyses the amount of cross-country soaring done in this country by converting distances into hours on the assumption of an average ground speed of 30 m.p.h. This figure may not be quite accurate, and not all cross-countries may be recorded, but these two errors together are unlikely to produce more than 15% inaccuracy in the results given. On these assumptions the following table gives totals for the past three years:

Nat. Champs:	1960	1961	1962
Miles	none	50,033	58,971
Hours	held	1,668	1,966
Other flights			
Miles	38,237	45,333	68,477
Hours	1,275	1,511	2,282
Total hours	1,275	3,179	4,248

Capt. Goodhart points out that approximately 50% of all cross-country flying is done in the 10 days of the National Championships, and that the non-championship flying is almost entirely confined to the six months April-September. Also that the annual increase shown by these results cannot be used for predicting the amount of cross-country flying in future years, as it depends on the weather during the championships and in some degree on the type of summer experienced each year.

Another table shows the hours of cross-country flying in 1962 from each gliding centre from which more than 100 hours were done:—

Aston Down	1,966
Lasham	457
Dunstable	298
Camphill	243
Dunkeswell	205
Long Mynd	138
Swanton Morley	118
Cambridge	111
	3,536

Since many of the flights are relatively short straight-line flights or round closed circuits, the distribution of hours from the various starting points is a fair indication of the density. The table, Capt. Goodhart points out, shows that "the vast majority of cross-country gliding takes place in the southern half of the U.K. south of a line from The Wash to Liverpool. It is not unreasonable to assume that the distribution in this area is substantially uniform if Wales and the south-east part of the country covered by controlled airspace is excluded."

3. A further analysis of collision risk between a commercial airliner and a glider

This paper begins by referring to Capt. Goodhart's paper already published in SAILPLANE AND GLIDING (February, 1963, p. 4 and Correction, April, 1963, p. 96), in which the risk of collision between commercial aircraft and gliders over a defined area of Southern England was calculated to be one per 11,000 years of continuous airliner flight, assuming that 9 out of 10 incipient collisions would be avoided by "see and be seen". But no account was taken of height distribution, so further calculations have been made to allow for the fact that not only is there a strong concentration of gliding in a relatively narrow height band centred on about 3,000 ft. (No. 1, above), but that low-level commercial air traffic also has strong concentration but centred on about 7,000 ft. (R.A.E. Tech. Note Math. 80: "Analysis of air traffic controlled

by Southern Air Traffic Control Centre on four days in 1960".)

The latter analysis shows the height distribution of every 100 hours of average airliner flight to be as follows:

Flight level	*Hours*
1,000′	0
2,000′	0.8
3,000′	1.1
4,000′	1.3
5,000′	7.0
6,000′	18.0
7,000′	19.7
8,000′-12,000′	52.1
	100.0

Combining this with the height distribution of gliders (No. 1 above), Capt. Goodhart gets the following figures for collision risk per hour in each height bracket, based on 100 gliders and 100 hours of airliner flight.

Height bracket	*Risk*
0′-500′	0
500′-1,500′	0
1,500′-2,500′	205×10^{-6}
2,500′-3,500′	418×10^{-6}
3,500′-4,500′	385×10^{-6}
4,500′-5,500′	832×10^{-6}
5,500′-6,500′	520×10^{-6}
6,500′-7,500′	188×10^{-6}
7,500′-12,000′	154×10^{-6}
	$2{,}703 \times 10^{-6}$

This can now be converted back to the figure for one average glider in the box of airspace of the defined size per hour of airliner flight in that box: the figure works out at 2.7×10^{-7}, compared to the 1×10^{-6} obtained when the vertical distribution of both gliders and commercial aircraft was assumed uniform.

Thus the effect of non-random height distribution is to reduce the risk to just over a quarter of what it would otherwise be. This is on the assumption that no avoiding action of any sort is taken and that there is no segregation of the two sorts of traffic.

Statistics of cross-country gliding (No. 2 above) give 4,248 hours as the latest annual total. Dividing this by the number of hours in a year (8,760) gives 0.485 gliders as the average content of the defined box. This reduces the collision risk from 2.7×10^{-7} to 1.31×10^{-7} per hour of airliner flight in the box.

According to the R.A.E. Tech. Note above mentioned, on average about 17% of airliners over the U.K. are in the box, so the risk to an airliner flying in U.K. airspace is reduced to 17% of 1.31×10^{-7} which is

$$2.23 \times 10^{-8}$$

Capt. Goodhart then explains that gliders are specially well fitted for collision avoidance by see-and-be-seen, and suggests that at least 9 out of 10 incipient collisions *in VMC* would be avoided.

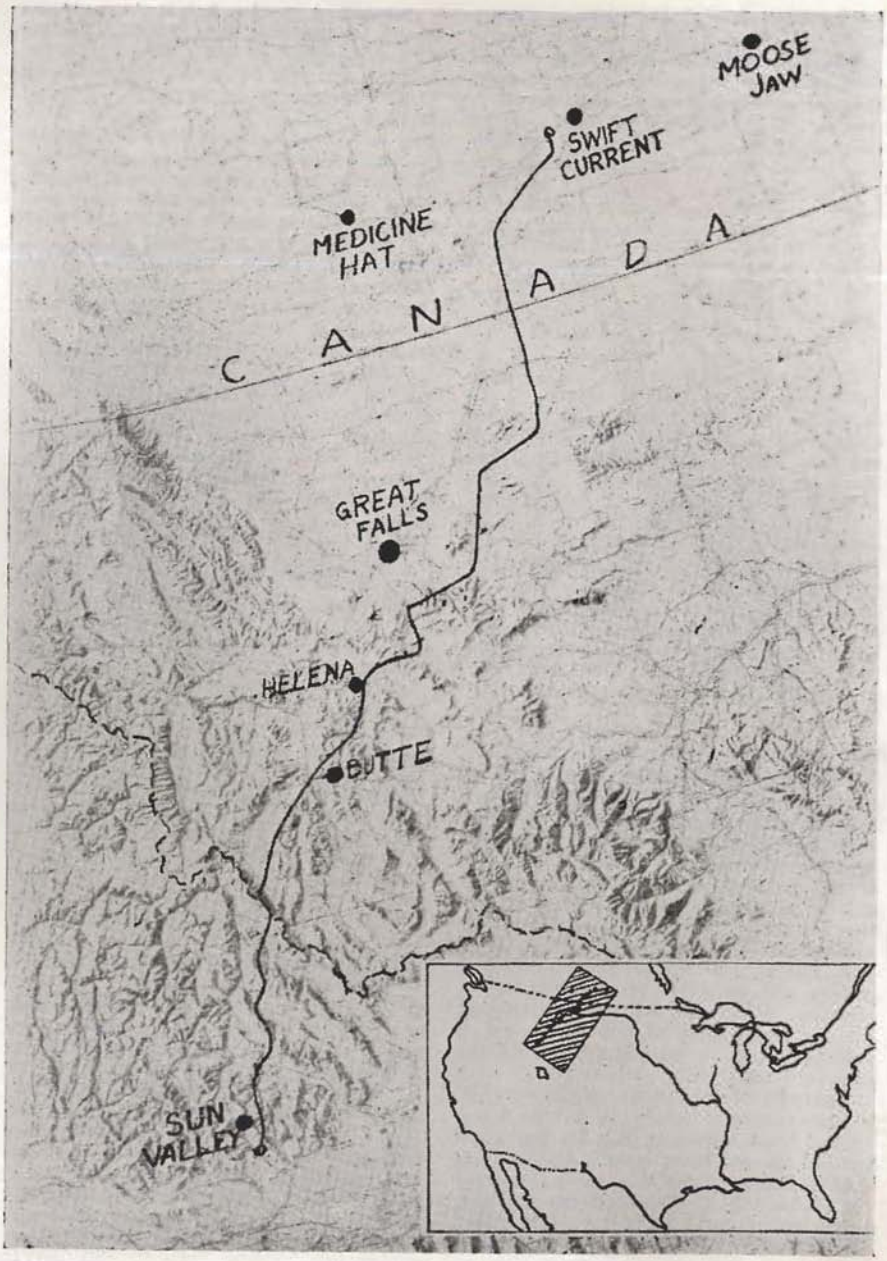
The difference between ADR's (Advisory Routes) and Airways is then discussed. In ADR's there is exposure to collision in both IMC and VMC (Instrument and Visual Meteorological Conditions), but in Airways there is only risk in VMC. No detailed statistics are available on the time spent in each type of route, so Capt. Goodhart assumes that all Airways are ADR's (i.e. cloud flying by gliders allowed) and also assumes that the average cloud base in the U.K. is at 4,500 ft. and that gliders above 4,500 ft. spend 50% of the time in cloud, since descending is done mostly outside cloud. Assuming further that the risk is reduced to a tenth by see-and-be-seen when the glider is outside cloud, he has compiled the following table:—

Height (ft.)	*VMC risk*	*IMC risk*
0′-500′	0	0
500′-1,500′	0	0
1,500′-2,500′	20.5×10^{-6}	0
2,500′-3,500′	41.8×10^{-6}	0
3,500′-4,500′	38.5×10^{-6}	0
4,500′-5,500′	41.6×10^{-6}	416×10^{-6}
5,500′-6,500′	26.0×10^{-6}	260×10^{-6}
6,500′-7,500′	9.4×10^{-6}	94×10^{-6}
7,500′-12,000′	7.7×10^{-6}	77×10^{-6}
	185.5×10^{-6}	847×10^{-6}

The conclusions of this paper are:—

"Commercial aircraft flying in U.K. airspace are currently subject to a risk of collision with gliders which lies between 1.5×10^{-9} and 8.5×10^{-9} per hour of airliner flight.

"The higher risk figures (8.5×10^{-9}) would only be reached if all controlled airspace was eliminated other than the London TMA and the Airways south and east of it. The lower figure (1.5×10^{-9}) would be reached if all commercial aircraft were confined to controlled airspace."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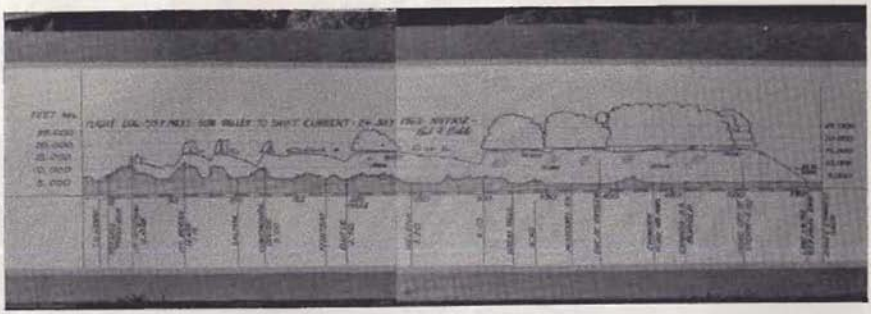

Paul Bikle Beats World Record

BY flying 556.9 miles from Sun Valley, Idaho, to Swift Current, Saskatchewan, in his Prue Standard during the Pacific North-west Regional Championships, Paul Bikle has beaten the World Distance Record of 544.3 miles set up by Karl Bezler in Europe last June. But his flight cannot be recognized as a record because he carried no barograph.

Bikle released from tow at 12.05 p.m. on 24th July, 1963. The accompanying charts show his progress. He was soon among mountains, and the photograph below was taken from 12,000 ft. when 50 miles out, south of Mt. Borah. By 2 p.m. when high over the Continental Divide, he saw a thunderstorm front to the N.E. He joined it north of Butte and flew along it at high speed. At 6 p.m., in fading light, he left it at 15,000 ft. and glided down to a landing at 6.50. He had averaged 82.5 m.p.h.

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what they said
when they tried to explain soaring flight

700 B.C. AGUR, SON OF JAKEH

"There are three things which are too wonderful for me, yea, four which I know not: The way of an eagle in the air, the way of a serpent upon a rock, the way of a ship in the midst of the sea, and the way of a man with a maid." (Proverbs, Chap. 30, verses 18-19.)

In aviation history books these words are usually attributed to Solomon, who did indeed write most of the Proverbs about 1,000 *B.C.; but Chapter* 30 *is definitely stated in the first verse to be "The words of Agur . . ." and the Authorized Version gives the date as* 700 *B.C.*

1550 A.D. LEONARDO DA VINCI

"I conclude that the mounting of the bird without the beating of wings is caused by nothing other than its circular movement which, when it starts from the arrival of the wind, sinks until it reaches the place where the reflex movement begins, after which and so circulating, it has described a semi-circle and its face turned to the wind, and follows the reflex movement on the wind still circulating until, with the help of the wind, it makes its greatest height between its lowest and the arrival of the wind and is left with the left wing to the wind; and from this greatest height again circulating, it descends to the last incident movement, being left with the right wing to the wind. As if to say, the wind goes from *a* to *c* (Fig. 1) and the bird moves from and sinks from *a b c* and in *c* it makes the reflex movement as in *c d a* and by the favour of the wind it is much higher at the end of the reflex movement, which end of the reflex movement is started perpendicularly over the said commencement of the incident movement." — Sul Volo degli Uccelli, folio 15.

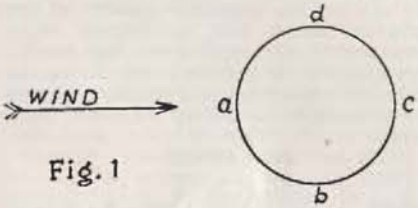


Fig. 1

This shows that although Leonardo actually observed that birds could gain height while circling, he did not know why, and thought they did so merely by turning into wind.

1809 SIR GEORGE CAYLEY

"When large birds, that have a considerable extent of wing compared with their weight, have acquired their full velocity, it may frequently be observed, that they extend their wings, and without waving them, continue to skim for some time in a horizontal path." — Nicholson's Journal of Natural Philosophy, Chemistry and the Arts, Nov., 1809 issue; reprinted in C. H. Gibbs-Smith, "Sir George Cayley's Aeronautics", p. 215-6.

This appears to be the nearest Sir George got to seeing birds soar; evidently he never watched them long enough to realize that some other explanation was needed.

1854 J. M. LE BRIS

"I took the wing of the albatross and exposed it to the breeze; and lo! in

spite of me it drew forward into the wind; notwithstanding my resistance it tended to rise. Thus I had discovered the secret of the bird! I comprehended the whole mystery of flight." (Quoted by O. Chanute in "Progress in Flying Machines", p. 105.)

This French sailor built a full-sized glider called the "Albatros"; he became airborne in it but crashed.

1882 "A. O. H."

The secret of soaring flight "lies in so altering the magnetic polarity of the physical frame that in lieu of being attracted it is repelled by the earth". This power is achieved by "living an absolutely pure life and intense religious concentration." — *Stray Feathers*, July, 1882.

You have been warned.

1883 LORD RAYLEIGH

"I premise that if we know anything about mechanics it is certain that a bird without working his wings cannot, either in still air or in a uniform horizontal wind, maintain his level indefinitely. For a short time such maintenance is possible at the expense of an initial relative velocity, but this must soon be exhausted. Whenever therefore a bird pursues his course for some time without working his wings, we must conclude either (1) that the course is not horizontal, (2) that the wind is not horizontal, or (3) that the wind is not uniform." — *Nature*, Vol. 27, p. 534-5, 5th April, 1883.

This, the first really scientific statement about soaring, came at the end of a correspondence starting on 25th Jan. in which the chief protagonists were Hubert Airy, who believed in upcurrents, and the Duke of Argyll, who did not.

1889 OTTO LILIENTHAL

"Birds of prey generally circle, but these circles are not closed, but form, in combination with the movement of the wind, cycloidical curves, and it appears as though this is the easiest method of sailing, since all birds who sail at all employ this method . . .

"That the circling motion is of secondary importance is evidenced by the fact that birds 'sail' without that motion. How can we explain the immobility in a wind of the falcon, an immobility persisted in for minutes? That this feat is particularly difficult is obvious, since there are few land birds which are capable of it . . .

"Birds inhabiting the moors and marshes appear to employ 'circling' chiefly to attain greater altitudes, in which they find the wind of such strength as to enable them to properly 'sail': 'circling', as we have seen, being easier to accomplish, and requiring therefore less wind. When arrived at a sufficiently high level, the bird often sails in a direct line towards its goal." — Der Vogelflug als Grundlage der Fliegerkunst, p. 131-2; English edition ("Bird flight as the basis of aviation"), p. 90-91.

1893 S. P. LANGLEY

"That it involves no contradiction of known principles to declare that an inclined plane or suitably curved surface, heavier than the air, freely im-

mersed in, and moving with the velocity of the mean wind, can, if the wind pulsations here described are of sufficient amplitude and frequency, be sustained or even raised indefinitely without expenditure of internal energy, other than that which is involved in changing the aspect of its inclination at each pulsation . . .

"The final application of these principles to the art of aërodromics seems then to be that, while it is not likely that the perfected aërodrome will ever be able to dispense altogether with the ability to rely at intervals on some internal source of power, it will not be indispensable that this aërodrome of the future shall, in order to go any distance — even to circumnavigate the globe without alighting — need to carry a weight of fuel which would enable it to perform this journey under conditions analogous to those of a steamship, but that the fuel and weight need only be such as to enable it to take care of itself in exceptional moments of calm." — The Internal Work of the Wind (Smithsonian Contributions to Knowledge), p. 23.

For "aërodrome" read "aircraft". The purpose of this study was to show that there is enough energy in gusts to maintain soaring flight. Hence his vision of the future aviator as preferring to be continually heaved up and down in gusts rather than waste a drop of fuel in trying to get a bit of relief by flying level, except when forced to do so when temporarily let down by the absence of gusts. Langley built a man-carrying powered tandem monoplane which broke on being launched from a houseboat on the Potomac, only ten days before the brothers Wright first flew their aeroplane in December, 1903.

1899 OCTAVE CHANUTE

"To the possible inquiry as to the probable character of a successful flying machine, the writer would answer that in his judgment two types of such machines may eventually be evolved: one, which may be termed the soaring type, and which will carry but a single operator, and another, likely to be developed somewhat later, which may be termed the journeying type, to carry several passengers, and to be provided with a motor.

"The soaring type may or may not be provided with a motor of its own. If it has one this must be a very simple machine, probably capable of exerting power for a short time only, in order to meet emergencies, particularly in starting up and in alighting. For most of the time this type will have to rely upon the power of the wind, just as the soaring birds do, and whoever has observed such birds will appreciate how continuously they can remain in the air with no visible exertion . . .

"If unprovided with a motor, an apparatus for one man need not weigh more than 40 or 50 lb., nor cost more than twice as much as a first-class bicycle. Such machines, therefore, are likely to serve for sport and for reaching otherwise inaccessible places, rather than as a means of regular travel, although it is not impossible that in trade-wind latitudes extended journeys and explorations may be accomplished with them; but if we are to judge by the performance of the soaring birds, the average speeds are not likely to be more than 20 to 30 miles per hour." — Progress in Flying Machines, p. 266.

1903 WILBUR WRIGHT

"The soaring of birds consists in gliding downwards through a rising current of air, which has a rate of ascent equal to the bird's relative rate of descent." — Address to the Society of Western Engineers of Chicago, 1st June, 1903.

No one put it so clearly, or in so few words, either before or for many years after.

1905 WILHELM KRESS

"But why does the bird make circling motions . . . ? That is because the air does not move in an upward direction over a miles-wide terrain, but there are only local circumscribed upward-pushing columns. If the air is moving upwards in one place, then it must be in downward motion in another place. Thus if the bird encounters an upward-pushing air column and wants to use it for effortless climbing, it must move in circles in order to stay in the region of

the rising air column." — Aviatik (Vienna), p. 25 (translated).

This appears to be the first published explanation of why birds soar in tight circles.

1908 SIR HIRAM MAXIM

"We shall never be able to imitate the flight of the soaring birds. We cannot hope to make a sensitive apparatus that will work quick enough to take advantage of the rising currents of air, and he who seeks to fly has this problem to deal with. A successful flying machine, moving at a high velocity, is likely at any time to encounter downward currents of air, which will greatly interfere with its action. Therefore flying machines must, in the very nature of things, be provided with sufficient power to propel them through various currents of air, after the manner of ducks, partridges, pheasants, etc." — Artificial and Natural Flight, p. 23-24.

And that is why Sir Hiram crammed on so much power in his flying machine that it broke its restraining rail and crashed. He was nevertheless well aware of how birds soar.

1908 F. W. LANCHESTER

"It is in the author's opinion comparatively rarely that in these latitudes a sufficiently powerful up-current arises from the simple heating of the air to support a bird without loss of altitude. We may take it that the velocity of the soaring bird is usually about 35 to 50 feet per second, and that its natural gliding angle is approximately 1 in 5 or 1 in 6; it may be somewhat less, but that it is greatly less is scarcely probable. Consequently the downward velocity of a bird in gliding flight relatively to the air is commonly about 7 to 8 feet a second, and it will therefore require an up-current of a velocity equal or superior to this in order that soaring should become possible." — Aerodonetics, p. 263.

1913 E. H. HANKIN

"Thus we have seen that soarability can exist under a variety of atmospheric conditions in the absence of heat eddies. Conversely heat eddies can exist in air that is completely unsoarable. No stronger proof can be required that one

phenomenon is not the cause of the other. Thus the rising masses of heated air caused by the sun's rays, whose presence is revealed by the shimmering tremulous appearance that they give to solid objects, cannot be invoked as an explanation of soarability." — Animal Flight, p. 275.

Dr. Hankin made thousands of notes of meticulous observations of soaring birds in India. He thought soaring was probably due to some sort of molecular change in the air, and could always produce something from his voluminous collection of notes to confound anyone who dared to put forward the upcurrent theory.

1922 WALTER GEORGII

"Even in our climatic region one can sometimes observe that in sunny weather the soaring birds, once they have climbed through the lowest layers, begin soaring at a height of 100 metres. The question arises whether it is actually possible also for human soarers to obtain advantage from thermal upcurrents. Similar weather conditions in the tropics, which are distinguished by weak winds and strong insolation, enable the upward streams to develop to a much greater extent than in our latitudes. With us the fluctuations of the wind, its changes in strength and direction, are so all-pervading that the perpetual turbulence will reduce substantially the utilization of upward motions. Also the vertical wind speeds will not suffice for soaring to be maintained by means of the lift in vertical airstreams alone. If we assume that a sailplane has an airspeed of 70 km./h. or 20 m/sec. and a gliding angle of 1 in 10, then an upcurrent of 2 m/sec. is necessary for the sailplane to maintain its original height. On normal days, however, these vertical speeds are relatively seldom reached. Our own researches gave at most only vertical speeds of about 1 m/sec. Furthermore the thermal upcurrents which we have seen only take sporadically the form of single chimneys or streams, which moreover are of only small extent. The skill of our aviators and the manœuvrability of our sailplanes would not suffice for holding aircraft in the restricted air-chimney for any length of time and to climb in narrow circles, as birds are obviously able to do. From these considerations it would seem that we must not expect human soaring pilots to stay up for any length of time in thermal upcurrents." — Der Segelflug und seine Kraftquellen im Luftmeer (Berlin). (Translated.)

This was the first book on soaring meteorology ever published. Dr. Georgii, a Professor of Meteorology at Darmstadt, was head of the German gliding organisation from 1924 *to* 1933. *He is still going strong.*

Finally, a warning from what is probably the first book on general aviation met.:—

1930 W. R. GREGG

"Soaring of birds is most widespread and successful in the tropics and in the warmer portions of the temperate zones, where convection is most pronounced. It is carried on at great heights. Man-made gliders also have made some very good flights by utilizing the more vigorous heat-produced rising currents in the vicinity of cumulus clouds and, in one or two cases, in a thunderstorm. Needless to say, such attempts are beset with hazard and should not be made." — Aeronautical Meteorology (New York), 2nd Edition, p. 106.

Compiled by A. E. SLATER

First New Zealand Gliding Championships

by ROSS MACINTYRE

THE first New Zealand National Gliding Championships were held at Masterton in the Wairarapa district of the North Island from the 9th to the 17th November, 1963. This followed successful provincial champs last season.

Twenty-nine high-performance gliders were entered including:

8 KA-6 Rhönseglers
3 KA-7 Rhönadlers (two seaters)
3 Skylark 2's
3 Skylark 4's
2 Skylark 3's
3 EoN Olympia 463's.

Also entered were an Olympia 2B, a Sagitta, a Standard Austria, a Bergfalke (two-seater), an L-Spatz 55, a Swallow, and Philip Wills's old Weihe ZK-GAE, now owned by Norm Murray of Tauranga.

Four aircraft were scratched before the contest began, one because it hadn't even arrived in the country in time. There were four contests running concurrently: the Open Handicap class, the Open class, the Standard class, and the Rothmans contest. This was a sponsored inter-club contest with a prize of £1,000 interest-free loan. Results given will be of the Open Handicap class.

Sunday, November 10th

WEATHER.—A "low" east of New Zealand moving away, a second "low" near south-west of South Island. A weak ridge of low pressure moving over New Zealand. Seven-eighths cumulus at 3,000 ft. a.m.; two-eights at 3,000 ft. p.m.

A task was set at 10 a.m. briefing, an 80-km. triangle to Featherston, Longbush, and return; but after a few launches it was decided to call off this task as the wind had increased. At a second briefing at 2 p.m. John Messervy of Christchurch, the task-setter, gave the pilots an out-and-return race to Lake Ferry at the southern tip of the Wairarapa Valley (78 miles). The famous Wairarapa Wave had started working and 21 out of 24 starters completed the course. (One competitor was still waiting for his KA-6 to be repaired after his trailer blew over in gale-force winds on the way to the championship on Friday.) Winner for the day was Peter Heginbotham of Wellington in a KA-6 who completed the task in 58 mins. Howard Scoffin of Auckland in the Standard Austria was second with one hour. Peter de Renzy of Tauranga flying another KA-6 was third.

It was thought that this is the first National Contest to have a task set in lee-wave conditions anywhere in the world.

Leading Results: Open Handicap

Pilot and Aircraft	*Speed m.p.h.*
P. K. Heginbotham (KA-6)	80.69
H. Scoffin (Std. Austria)	78.00
P. de Renzy (KA-6)	72.00
J. Cooper (KA-6)	67.83
A. Pearce (KA-6)	66.86

(Some aircraft are team or club entries with several pilots flying.)

Monday, November 11th, was a no-contest day; a cold front passed over in the early morning with strong south-west winds and showers.

Tuesday, November 12th

WEATHER.—Anticyclone from the Tasman Sea; extended on to the North Island. But a deep depression lay far to the south-west of the South Island. Cloud: $\frac{1}{8}/\frac{3}{8}$ cu. at 4,000 ft.; $\frac{5}{8}/\frac{7}{8}$ lenticular. Wind W.N.W., 25 knots.

The task was an out-and-return, Masterton to Gwavas Forestry Camp (near Hastings) and return to Masterton (190 miles) and from there free distance. In good but turbulent wave conditions John Cooper of Auckland in a KA-6 staggered everyone by flying a total distance of 351 miles; he landed at Wairoa in Northern Hawkes Bay, thus completing his third Diamond. Another Diamond and Gold C distance was won by Geoff White of Hawkes Bay as he completed the set portion of the task. He had declared Masterton as his landing point prior to launching. No one else completed the set portion of the task and the map showed landing pins all the way

from Masterton to Gwavas and back. It does seem tough that a Diamond flight scores less than half the points of the winner!

Cooper was surprised that no one else had done as well as he had, as he found conditions marvellous although it was quite a hard slog back to Masterton from Gwavas. There was a southerly component in the wind. Dick Georgeson, world record out-and-return holder, also commented on the marvellous conditions early in his flight, but had to land about 30 miles out on his return flight. White scored his first points in the contest as his was the Segler which had been damaged in its trailer during the previous Friday's gales. One pilot had a difficult retrieve; at one point help was only 400 yards away—across a river; his retrieve crew had to borrow a Land-Rover and drive 20 miles mainly across country to pick him up. This was after his empty trailer had blown over on the road!

Leading Results

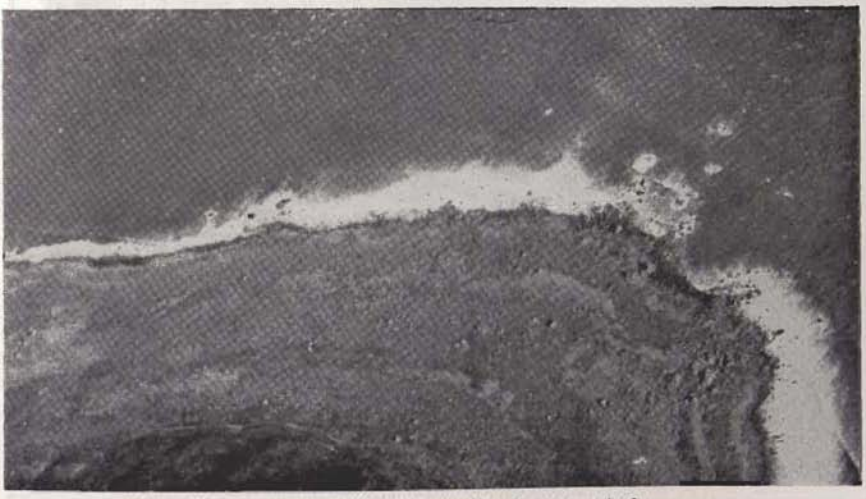
Pilot and Aircraft	*Points Day*	*Points Total*
J. Cooper (KA-6)	1000	1795
G. White (KA-6)	498	498
A. Fowke (KA-6)	411	1119
S. H. Georgeson (Sky. 4)	379	1102
K. Wakeman (KA-6)	374	1051

Fourth in total placing was 21-year-old Alan Cameron (Skylark 2) with a total of 1.066 points.

Wednesday, 13th, was another no-contest day. A cold front passed over Masterton in the morning and cloud cleared later in the day.

Thursday, November 14th

WEATHER.—A "low" was moving S.W. towards the South Island. A westerly air



Forbidding country at Turakirae Head; note wind on water.

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stream flowed over New Zealand.

More wave conditions. The task set was a tough one as it turns out, although it didn't seem too bad early in the morning. Masterton—Turakirae Head—Dannevirke—Masterton. Total distance 335 km. Turakirae Head is the western tip of Palliser Bay on the southern coast of the North Island. It is very forbidding country down there, with only one landing strip possible near the Head, and the next nearest some five miles back down the rugged coastline.

As landing reports came in, a picture was built up of extremely high winds—not very good wave conditions—and little progress to the south. Scoring distance was 30 miles and only 11 competitors managed to score. One or two went over 30 miles but failed to score as they were well off course. One actually crossed the Rimutaka Range and landed at Trentham near the famous racecourse.

Over the radio we heard a garbled report that Heginbotham and Georgeson were down, but it was over an hour later when Georgeson rang through to say that not only these two but four others as well were down at Wharekaukau. This is the landing area nearest the first turning point. Only Heginbotham (KA-6), Georgeson (Skylark 4) and John Trotter (Skylark 3F) of those who landed there had turned the first point. Keith Wakeman in the KA-6 had last been seen ridge-soaring the Orongorongo Range after turning the point. He went on to Danneverke, the second turning point where he arrived at 700 feet and had to land. He reported that he was too scared to land with the others because of the terrific wind blowing. (They were scared to ridge-soar with him because of the forbidding nature of the mountains.)

Wakeman got 680 points for this, later judged "the most meritorious flight" of the champs. The second placing went (on handicap) to Heginbotham with only 156 points.

But all the aircraft at Wharekaukau were in trouble. The fantastic winds, averaging about 60 knots, were making it impossible to retrieve them. One trailer blew over on the road (this was quite a feature of the champs.) and it was only possible to picket the gliders down in the lee of shelter belts and in one case with the derigged wings flat on the ground as it was dangerous to move them.

First five placings for the day were:

Pilot and Aircraft	*Points Day*	*Points Total*
K. Wakeman (KA-6)	680	1731
S. H. Georgeson (Skl. 4)	156	1243
P. K. Heginbotham (KA-6)	156	1156
J. Trotter (Skl. 3F)	156	922
R. Reid (KA-6)	58	1024
J. Williams (KA-6)	58	923
P. de Renzy (KA-6)	58	915

Although Cooper did not score for the day, his cumulative total of 1795 kept him in first place.

Friday, 15th, was a no-contest day as the six at Wharekaukau had not been retrieved. A huge team set off to try and do this, but after righting the overturned trailer, only two trailers were able to be taken down and that only by having two trucks driving on the windward side on the wrong side of the road, to break the wind which was still 50 to 60 knots. Stories of the previous day's landings were being told—such as "approach 100 m.p.h. and I stopped 25 yards in front of the back fence". "Even with the wheel-brake on I was being blown backwards, so I reached out with a picket, screwed it in and hung on."

Only one glider was retrieved in the morning, the 3F from Oamaru. He had landed in the lee of a hill and didn't have quite the same problems, al-

Car shields trailer: note windsock.

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Discussing ways and means of shifting wings. We left them there.

though it took two Land-Rovers to get there. Later in the day the Skylark 4 was moved about 20 miles but not without a terrible struggle. Ted Edie, the met man, forecast a lull at 4 a.m. next morning and crews set off at 3 a.m. to complete the retrieve. The lull (down to 30 m.p.h.) had arrived and only moderate difficulty was experienced.

Meanwhile back at Masterton on Friday afternoon, practice flying was going on. The wave was really copybook and four pilots gained Diamond height awards. They were:

		feet
Doug Yarrall	Olympia 463	31,500
Eric van Notten	Sagitta	30,500
Alan Cameron	Skylark 2	27,000
Dave Wright	Olympia 463	24,000

Saturday, November 16th

WEATHER.—A cold front passed over the southern North Island in the late morning. It was preceded by N.W. gales in the Cook Strait area. Wind S.W.-N.W., 10-20 knots at ground level.

More wave, although rather cloudy this time. This stopped many pilots getting away on the task, an out-and-return to Hood with pilot-selected turning point.

On their first launch most pilots declared Gwavas—well known from the second day, but found that they were a little ambitious, landed and redeclared. Their second choice generally was Lake Ferry or Pirinoa to the south. Not many actually completed their set tasks but among those that did were:

		miles
Dave Wright (Oly 463)	Lake Ferry	78
Geoff White (KA-6)	Lake Ferry	78
Ross Reid (KA-6)	Lake Ferry	78
Dick Georgeson (Skl. 4)	Pahiatua	73

and the winner for the day, John Cooper (KA6CR). John had realised that most pilots would declare Gwavas on their first launch, so he declared a point 10 miles north of Gwavas, a total distance of 210 miles. This once again was miles ahead of anyone else and put Cooper's final marks nearly 750 points ahead of the next highest place. He fully deserved the mass of cups and trophies loaded on to him that night as the winner of the Open Handicap class—Roake Cup, Open Class—Wills Cup, Standard Class—Court Trophy, and the Rothmans inter-club contest. He was the Auckland Club's entry in the last contest and thereby won the £1,000 given by Rothmans each year to the N.Z. gliding movement.

Keith Wakeman received the Hanselle cup for the most meritorious flight and Alan Cameron took the Masterton Cup on behalf of the highest scoring club team, Auckland.

A most successful competition. At the closing ceremony pilots were asked where they wanted the next year's competition and they voted overwhelmingly for Masterton in January 1965 if this was possible.

We in New Zealand claim that this championship is the first National Competition run anywhere in the world to have all its tasks set in lee wave conditions. It was only unfortunate that Friday, 15th, had to be a no-contest day, as on this day an absolutely copybook wave system was set up and world records might have been broken, had a task been set.

Final Results : Open Handicap

Pilot	*Aircraft*	*Pts.*
1. J. Cooper	KA-6	2515
2. K. Wakeman	KA-6	1771
3. S. H. Georgeson	Skylark 4	1393
4. R. Reid	KA-6	1204
5. A. Cameron	Skylark 2	1170
6. P. K. Heginbotham	KA-6	1156
7. A. Fowke	KA-6	1154
8. de Renzy & Roake	KA-6	1058
9. H. Scoffin	Std. Austria	1055

THE EDWARDS PATENT POLAR TRAP

a humble solution to Mr. Wills' problem of catching

The Elusive Polar

But I was thinking of a plan . . . .
Involving Klaxons, coloured lights,
And poles marked off with various heights

Lawrence Wright, "Alice in Bungyland"

Dear Mr. Wills,

I was sorry to read, in *The Elusive Polar* (October, 1963 issue, page 337), that you are having trouble catching polars. I agree that the original method was not very satisfactory, and only led to one or two captive specimens, but your suggestion that one polar should be set to catch another is, I submit, hardly better. We know very little about the power of differentiation of the common polar, and your trained catcher might easily return with a normal or a tangent, or even an envelope. And then there is the R.S.P.C.P. to consider.

After all, now we know what a polar looks like, it should not be too difficult to design a Polar Trap. In fact, I have designed one myself, which I intend to patent; but seeing the seriousness of your plight, I thought I would send you, in confidence, some preliminary details. I call it the Edwards Patent Polar Trap, just in case, if someone thought of it before me, his name was Edwards. It consists, very reasonably you will agree, of some poles. You should obtain eleven surveyor's poles, each ten feet high, and erect these at hundred-foot intervals in a straight line, so that the tops all lie in an exactly horizontal line. This will call for some accurate surveying, unless you can make use of a runway survey, for example. You should then keep watch during calm summer dawns, when polars tend to be at large. I recommend taking up station on the perpendicular bisector of the line of poles, some distance away, equipped with a cine-camera to photograph the polar when it comes. You should find out the number of frames the camera takes a second with great accuracy. You should also keep a record of the atmospheric conditions.

Although this is all you must do on the ground, it is a tremendous advantage to have a noiseless aeroplane to help chase the polar into the Trap. I recommend a glider. The pilot should take a winch launch or auto-tow, and then, lining himself up on the poles of the Trap, he should beat-up the Trap a few feet above the poles, taking great care not to deviate from the line, but not worrying too much about vertical movements. You should photograph each run (panning the camera if you like), and after a few runs at varying speeds you can be sure you have caught your polar. Just measure the exact height and time at which the glider passed each pole, by enlarging and measuring up the relevant frames from the cine-film, and send the results to me: after some calculations I will send you a Captive Polar Certificate, giving precise details of the polar you have caught, sex, colour, and so forth (I am afraid the polar itself would be too bulky to send from Italy).

I am loth to divulge just how the Edwards Patent Polar Trap works, but as I can hardly expect you to make one without some evidence that the theory is sound, I will give you the rough details. Consider a glider in any phase of unstalled flight. Its energy is given by the sum of its kinetic and potential energies, neglecting any rotational energy it may have. Differentiating with respect to time, and changing the sign, you will obtain the rate of dissipation of energy. Now divide by the velocity and you will have an equation for the drag. The drag in steady flight is well-known to be $mg.\sin\theta$, so if you divide the equation by mg you will have an expression for $\sin\theta$, where θ is the steady-flight gliding angle at the current velocity and wing-loading of the glider. Now look at the right-hand side of the equation: you will find that the two parts simplify, the first into the sine of the actual inclination of the current flight path to the horizontal, $\sin\emptyset$, and the second into the tangential acceleration, f, measured in units of the acceleration due to gravity. In fact,

$$\sin\theta = \sin\emptyset - f$$

This is the Fundamental Equation of the Polar Trap, and is not unreasonable, you will agree: for if the flight is steady there is no acceleration and the gliding angle — well, it is equal to the gliding angle; but if the flight path is horizontal so that $\emptyset = 0$, the sine of the gliding angle (at the wing loading appropriate to horizontal flight) is simply equal to the deceleration. This is just Newton's equation "acceleration =force/mass". If one could but fly along an exactly horizontal line, and measure the deceleration at every velocity, the polar would thus be as good as trapped. In fact one cannot fly so accurately, but not to worry, for the Fundamental Equation will allow you

to correct for serpentine tendencies in the flight path.

At any point of the flight you can measure, from your photographs, $\emptyset$, f, the velocity, and the radius of curvature of the path. You can then calculate sin θ from the Fundamental Equation, and also find the wing-loading. Thus you can reduce your actual velocity at this wing-loading to the equivalent velocity appropriate to the wing-loading when the steady-flight gliding angle is θ. Repeat the calculation for other points of the flight path, and you will end up with what you want: a curve relating θ to the steady-flight velocity. You can then transform this gliding-angle curve into a polar if you so wish. In point of fact, I think the best way is to fit, with sufficient accuracy, polynomials to the height-versus-time and distance-versus-time graphs for each flight, and thus express both sin θ and the equivalent velocity in terms of the parameter *time*. In this way each flight will give you a part of the gliding-angle curve, and several flights at varying speeds will give you the whole curve, any overlap being used to estimate the error. I have done all the algebra, and it is not difficult: as far as the arithmetic is concerned, you can borrow my computer.

I think you will agree that my Patent Polar Trap is a great advance on the old kind; the only expense of note is the camera. Aerotows, calibrated aircraft instruments and gubbins in the glider are all done away with; the pilot does not even have to look at his instruments during a run. Any departure from still-air conditions can be detected with ease. Further, time and distance can be measured with an accuracy only limited by ingenuity, so that factors such as the pilot sneezing will be the major source of error. As an alternative recording technique, it might be worth considering doing the runs in the half-light of dawn, with lights on the poles and a light on the glider flashing every second. In this way the whole flight could be recorded in one exposure of a plate camera, and the problem of measurement made correspondingly easier.

I suggest that the B.G.A. sets up a Performance Test Group whose first task will be to assess the Edwards Patent Polar Trap. If it is acceptable, a Performance Test Centre should be created, consisting of a surveyed Test Course, and the auxiliary equipment. You will have the continentals flocking over in no time. At this distance I fear that my help is limited to ideas and some computing; but there is not much else to it.

Good hunting!

ANTHONY EDWARDS

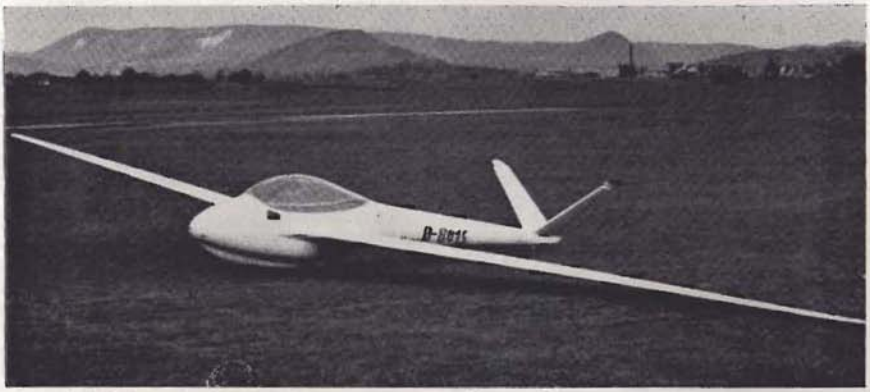
Istituto di Genetica,
Universita do Pavia, Italy.

MR. WILLS COMMENTS: $\emptyset$ Mr. Edwards, your trap has already been tried out, in a two-θ. I think by Lorne Welch and Frank Irving, using an Eagle and balloons instead of poles. But it is an excellent idea and I hope will be pursued.

A.T.C. Instructor gets B.E.M.

TWENTY-ONE years as gliding instructor in the Air Training Corps has brought Mr. Dudley S. Bradford, of Wembley, the award of the British Empire Medal. On 27th October we were invited to a ceremony at R.A.F. Halton, where the medal was presented to him on behalf of the Queen by Air Commodore J. B. Coward, A.F.C., Air Officer Commanding, Air Cadets.

Mr. Bradford has instructed throughout, and still does so, at No. 613 Air Cadet Gliding School, which in spite of its number was only the second school to be founded when gliding was introduced into the A.T.C. in 1942.



Hütter 30 GFK–A Fibreglass Sailplane

by EUGEN HÄNLE

Construction

THE WING is in two parts connected by means of spar root stubs within a wing-bridge. It is of balsa-fibreglass shell type (Nägele-Eppler system), with spar flanges of parallel-directed fibreglass rovings according to the H-H (Hütter-Hänle) method, and two balsa-fibreglass webs from the wing root to where the ailerons begin and thence continued by one web as far as the tips. The ribs are spaced at 60 cm. (1 ft. 11.6 in.) intervals and are made of balsa-fibreglass. The rear of the wing from 70 per cent chord is fabric-covered. Schempp-Hirth type dive-brakes are at 70 per cent chord. The ailerons are of balsa-fibreglass. Each wing weighs 30 kg. (66 lb.).

THE FUSELAGE is of balsa-fibreglass shell type. The "V" tail has control surfaces of wood construction, fabric-covered. A single landing wheel has a wheel brake. The fuselage with tail weighs 60 kg. (132 lb.).

Data

Span 13.6 m. (44 ft. 7½ in.)
Length 5.56 m. (18 ft. 3 in.)
Wing area 8.34 sq. m. (89.8 sq. ft.)
Aspect ratio 22.4
Empty weight 120 kg. (265 lb.)
All-up weight 200-210 kg. (441-463 lb.)
Wing loading 24-25.2 kg./sq. m. (4.92-5.16 lb.)
Max. L/D 30.4 at 80-85 km./h. (43-46 kt.)
Min. sink 0.64 m/s at 65 km./h. (2 ft. 1 in. per sec. at 35 kt.)
Breaking load factor, 8.

Max. speed	*Calculated*		*Approved for test flight*	
	km/h.	*kts.*	*km/h.*	*kts.*
Smooth air	250	135	140	76
Rough air	160	86	110	59
Aero-tow	140	76	110	59
Winch tow	120	65	90	49

History of Development

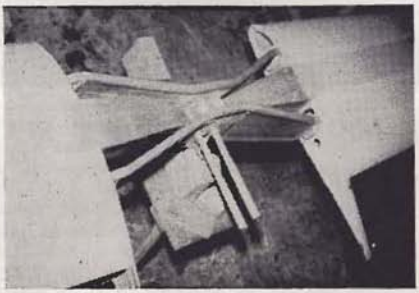
What are two glider pilots to do if they are married? Build a sailplane, of course. So we started work in the kitchen and the hall, and when our "baby" grew too big, any room which was large enough was used as a workshop. The bird was completed in 1962, with an empty weight of 118 kg., and has since been the pride of its parents.

"Hütter H-30 G.F.K.": the first name is for Dipl.-Ing. W. Hütter, designer of the Minimoa, Goevier, H-17 and H-28. [The figures denote glide ratio. — ED.] The letters G.F.K. mean Glas-Faser Kunststoff (glass-fibre artificial-material).

In designing the H-30 originally during 1948-50, Hütter decided to turn away from large spans and obtain the wing loading and performance of large-span gliders by extremely light construction.

Hütter decided on a mid-wing configuration for good visibility and to get a comfortable cockpit at a comparatively small fuselage cross-section. He preferred a V-tail for light weight and favourable spinning characteristics.

He intended to make shell-type wings of plywood and balsa to give perfect trueness of profile, and to make the fuselage of laminated poplar veneer. But we found ourselves unable to realise the projected light construction with materials available in Germany at that time.



The wing root fitting.

However, our business activities brought growing experience in the applications of fibreglass material; and the "H-H" method developed by E. Hänle and Prof. U. Hütter for fibreglass products of high loading capacity, such as rotor blades, propellors, cooling fans and springs, suggested to us its use in our sailplane. Further inducement was given by the Phoenix, the first sailplane to use fibreglass to carry air loads, which was then in an advanced state of construction, though a great deal of the load was still carried by balsa.

On the H-30, however, the spar flanges, made of fibreglass rovings, are the main load-carrying members. The wing bridge, formerly made of wood, was adapted to the H-H method too. Cone bolts are used to attach the wing roots to the wing bridge (they cannot get lost). This method saves 50 per cent of working hours and costs.

We then investigated the layout of the other fittings. Considering that fibreglass is lighter than steel, we tried to employ almost no attachment bolts or counter fittings but to bond the fittings by twines of rovings, always following the direction of stressing. The tow-coupling, the operating elements of the dive-brakes, the safety-belts, attachment bolts and release levers of the canopy, the tail-skid and landing wheel were bonded in this way. Where necessary, the attachment could be made flexible.

After this radical treatment, the rear part of the fuselage including the tail plane weighed 7.5 kg. (16.5 lb.).

Our goal now became clearer; we no longer thought only of building a sailplane for our own pleasure, but were interested in finding out how far we could carry the application of fibreglass in the construction of an aircraft. But we had no financial aid from anyone, so we concentrated our efforts on our small glider.

Replacing metal or wood by fibreglass is easy, but does not necessarily give the optimum result. A thorough study of the characteristics and factors affecting the strength of fibreglass was necessary to take full advantage of its properties. The results we obtained at first seemed to meeet the optimum, but we know that our H-30 will not represent a final result but perhaps the beginning of the all-fibreglass aircraft.

After the sacrifice of six years of spare time, our H-30 was ready at Kirchheim/Teck airfield for its first flight by Rudi Lindner. But we had to wait a year to fly it ourselves. The parachute-type dive-brakes failed several times and the H-30 needed a landing run of one kilometre;

Rear view, and H-30TS in background.

so we replaced them by Schempp-Hirth type brakes. Finally in April, 1963, our little bird took us into the air where we glider pilots feel at home. Of course, we still found scope for improvements, such as the poor ground clearance of wing-tips in thick grass and the lightly-loaded tail which does not help in preventing ground-loops. These were cured by fitting a retractable wheel.

Our efforts were greatly rewarded by the outstanding flying qualities of the H-30. Flying it, we felt really airborne, like stretching out one's arms and using one's spreading hands for control. Rolling from 45° left to 45° right bank takes 2.5 seconds. The H-30 enters a spin without difficulty and recovers after 1½ turns at a maximum airspeed of 160 km./h. (86 kts.). Stick-free and correctly trimmed, the H-30 has a normal flying speed of 70 to 80 km./h. (43½ to 50 kts.). As to high-speed performance, the profile is somewhat out of date, having been designed 12 years ago. All-round visibility is only interfered with by a small area of the narrow wings.

Please don't ask the price; six years' spare-time work cannot be reckoned in money. But many details of the H-30 are designed with a view to possible serial production.

Report on the Exide 3-MFB7

(Mentioned in our December issue, page 467)

THE tests here described were made to assess the suitability for driving the artificial horizon in a glider. The horizon used was a Bendix type J-8, driven by a Proops Bros. inverter. Since the inverter required a 12 v. supply, two accumulators were used in series.

General

The battery terminals and filler plugs were entirely suitable and convenient for glider operation. Both were provided with coin slots. It is possible and safe to charge the battery *in situ* with the plugs in place. Venting is provided for. Considered as a 12 v. supply, the battery is not of an ideal shape. Generally speaking, for glider use a pair of batteries coupled together should form roughly a square in plan. [A matter of opinion.—ED.]

Tests

Two accumulators, in the condition in which they were received from the manufacturers (they did not purport to be fully charged), were made to drive the horizon. After 4 hr. 40 min. the battery voltage had fallen to 9 v., and the horizon was beginning to slow down.

The battery was then fully charged and allowed to discharge into a resistive load. The load was set to take 1 amp. for 6 min. and thereafter to take 0.7 amp. to simulate the measured starting and running currents of the horizon.

It is concluded that this battery will run a horizon of the type used for more than 8¾ hr. The capacity is 5.95 AH. The stored energy/weight ratio is 12.2 watt-hours/lb.

(The battery has now been recharged, and will be allowed to stand for two weeks. It will then be discharged through the resistive load, to see how well the charge has been retained.)

After two months' standing, the battery retained 70 per cent of its rated charge (4 AH). One cell out of six (12 v. assembly) had electrolyte well below the filling level.

These tests with the retention test were performed by A. L. L. Alexander of the Cambridge University Gliding Club.

R. BRETT-KNOWLES,
B.G.A. Co-ordinator, Instrument Development.

B.G.A. Inspectors' Courses

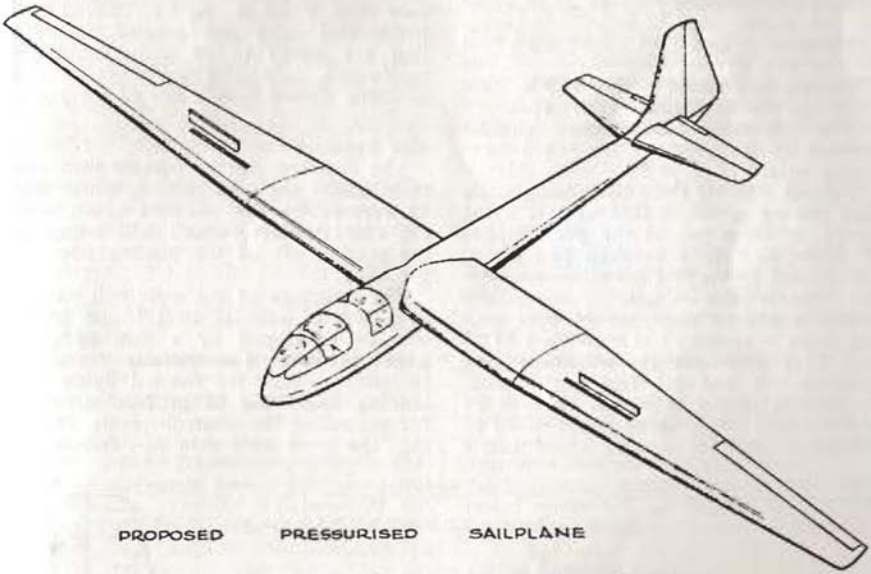
B.G.A. Inspectors' courses, organised by the Yorkshire Gliding Club in conjunction with the B.G.A. Technical Committee and Slingsby Sailplanes Ltd., will be held from 6th-8th March and 10th-12th April at £3 per course, fully inclusive. More details and application form from the B.G.A. office.

EXTRACTS FROM

Preliminary Design Study For A Pressurised Sailplane

by SLINGSBY SAILPLANES

This Design Study by Slingsby Sailplanes has been in the news recently in connection with a proposal to glide the Atlantic (described in our last issue) as a copy of it was sent to the sponsors of the proposal. The Study was made about ten years ago for the Air Research and Development Command of the United States Air Force, a pressurised sailplane being needed for the Bishop Wave Project, though in the event none was built.



PROPOSED PRESSURISED SAILPLANE

THE sailplane is intended for high altitude research into the nature of orographic lee waves, and is essentially a vehicle which is capable of carrying two pilots and a quantity of equipment to a height of around 70,000 feet, and there allowing them to perform certain predetermined tasks.

In the consideration given to this project, simplicity, in relation to the specification requirements, has been a prime consideration, and it is the belief of the designers that the machine proposed is the simplest and cheapest that will meet the requirements.

Sufficient work has been put into this design study to ensure that a machine can be developed along the lines suggested to meet the requirements of the specification and to ensure that the estimates and proposal made are reliable and practical.

General Data

Span — 80 feet
Length — 38 ft. 10 in.

Height — 7 ft. 2 in.
Gross wing area — 377 sq. ft.
Tare weight (estimated) 1,900 lb.
Max. all-up weight — 2,700 lb.
Disposable load — 800 lb.
Ultimate Factor (*g*) — 11
Aerofoil sections
Root — NACA 63_3-618
Tip — NACA 64_3-612
Incidence at root — 3°
Dihedral (on outboard wings) — 2°
Geometric washout — 2°

Pressure Cabin

Differential pressure — 3 p.s.i.
Pressure cabin volume — 120 cu. ft.

Performance

Best gliding angle — 1 in 33 to 35 at 62 m.p.h.
Minimum sink — 2.3 f.p.s. at 55 m.p.h.
Design dive speed — 200 m.p.h.
Design towing speed — 140 m.p.h.

The estimated performance characteristics of the sailplane are based on a flying weight of 2700 lb.

Figures 1 and 2 show the gliding angle and sinking speed plotted against flying speed. In these curves the performance is shown as falling between two limits, determined by varying the allowances for the interference drags. From these curves it will be seen that the best gliding angle is estimated at between 1 in 35 and 1 in 33.5 and the minimum sink between 2.3 and 2.5 feet per second. At gliding angles in excess of 1 in 25 the machine has a speed range of 50 to 90 m.p.h. and for sinking speed below 6 feet per second range of 50 to 95 m.p.h.

The Airframe

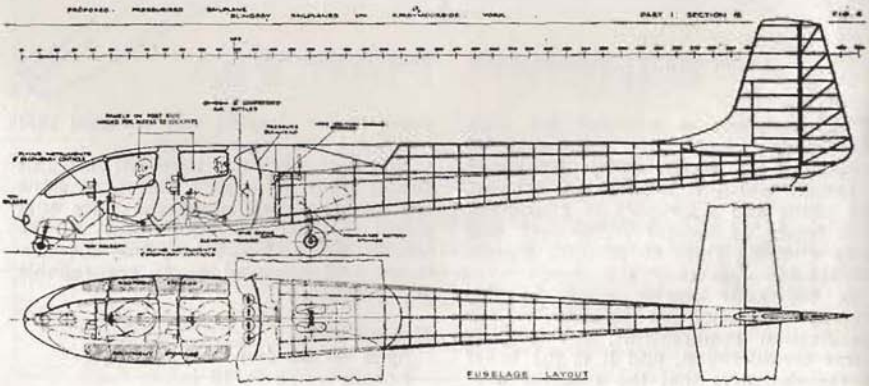
The principal materials to be used in the construction of the airframe are wood and resin-bonded plywood. The structural members will be made from Sitka Spruce to British Standard Specifications V37 and the skins, webs, etc. from plywood to B.S. Spec. V3 or V35.

An airframe of the type proposed is considerably cheaper to build in small quantities than one in metal, as the jigs and tools required for a wooden aircraft are simpler than those for a metal assembly. Another advantage of a wooden airframe for this project is the ease with which it can be repaired and maintained with the limited facilities that are likely to be available. With reasonable care and maintenance the airframe should have a life of ten years.

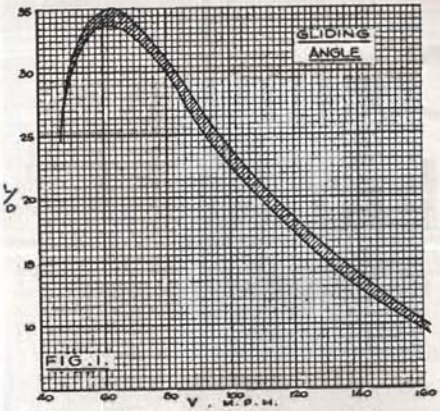
The Fuselage

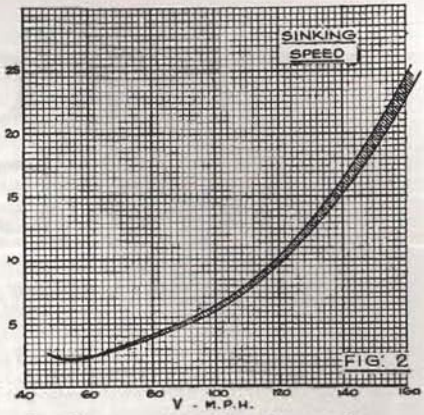
The fuselage will be divided into two main units: the nose section, which will be formed by the pressure cabin, and the rear fuselage, which will comprise the section aft of the leading edge of the wing.

The structure of the nose will consist of a welded tubular steel frame which will be enveloped by a skin of glass fibre laminate. The tubular frame is designed to take the normal flying and landing loads and to provide structure for mounting the controls, seats, floors, etc. The glass fibre skin will follow the



FUSELAGE LAYOUT





outside profile of the nose and forms the pressure cabin shell. A domed glass fibre pressure bulkhead forms the back of the cabin.

Clear vision panels will be provided round the pilot positions and these will be made from formed perspex which will be fixed and sealed to the tubular structure. Access to the cockpit will be through hinged panels on the port side at each pilot position.

The rear end of the tubular structure will be terminated at four points which will form the attachment fittings to the rear fuselage.

The rear fuselage will be of semi-monocoque construction consisting of frames, stringers and a stressed plywood skin.

The four attachments for the nose section will be located on stringers forward of the main bulkhead. The space between the pressure bulkhead in the nose and the main bulkhead will accommodate the control connections and the stowage for the stabiliser drogue for the pressure cabin.

The Wing

The 80 ft. span wing will be divided into a centre-section of 24 ft. and two outboards of 28 ft. span each. The type of construction described for the wing has previously been used by the firm for wings incorporating similar airfoil sections to those specified. It has been found to provide a profile of sufficient smoothness and accuracy to obtain the required low drag characteristics.

In the centre-section the main spar will be of box-type construction with the addition of outside flanges. The spar will have a slight sweep forward in plan view so as to maintain it at a constant percentage of the chord relative to the straight leading edge.

The rear spar will be of I section and will be swept forward to follow a line parallel to the main spar.

The main ribs will be positioned at intervals of not more than 12 inches, and in the areas covered by plywood, light intermediate ribs will be positioned between them.

The wing skin will be plywood extending from a light spar at the leading edge to the rear spar, thus providing a torsion box of ample size. The leading edge will either be a shaped wood section or a moulding in glass fibre.

The general construction for the outboard wings will be similar to that for the centre-section.

Flying Controls

It is realised that the temperature range in which the machine will operate is so wide that special arrangements will have to be made to accommodate it. This will either be done with temperature compensation devices or the use of open push-pull circuits.

Undercarriage

The main undercarriage will consist of two wheels positioned either side of a shock-absorber leg. The unit is mounted on a special frame aft of the

main bulkhead and retracts aft into a well formed by the mounting frame and the rear spar bulkhead.

It is proposed that shock absorption in the undercarriage leg shall be by means of compression rubbers. This should provide a simple and reliable unit which will be easy to service.

The nose-wheel assembly is located on an unpressurised well let into the nose of the fuselage. The shock absorption will be by means of compression rubbers. In the extended position the wheel mountings will be linked into the rudder control so that it can be steered by the rudder pedals.

The underside of the forward fuselage will be strengthened and protected by a rubber-mounted light-alloy rubbing-plate for use in emergency landings. It would seem unlikely that landings could be made on this skid on anything but the smoothest ground without some damage being sustained by the fuselage structure.

A crush pad is located at the bottom of the fin to protect the structure in the event of it touching down.

Pressurisation System

As already stated, it is proposed that the pressure cabin will be made from laminated glass fibre. It is hoped that it will be possible to make the components sufficiently airtight so that only small quantities of compressed air will be required to maintain pressure.

The breaks in the sealing of the pressure cabin will consist of the pilots' entrance doors, and the minimum number of connections for the controls and other services. The pneumatic seals are made by Dunlop Ltd., and it is proposed to try and install them so that they act as a continuous lock round the edges of the doors and so relieve the bending loads in the structure. The inflation pump and a pressure indicator will be located at the front pilot position, and relief valves will be located for operation by either pilot; a further relief valve will be operated by the emergency release handles on the entrance doors.

All control runs will pass through the pressure bulkhead, and use will be made of standard pressure seals, a wide

range of which are available.

A compressed air bottle supplies air for maintaining the cabin pressure. The air flows from the bottle through a combined reduction and shut-off valve, through a flow indicator, and then discharges into the cabin. A non-return valve allows air to flow into the cabin when the outside pressure is greater than the cabin pressure. A further valve is set to allow air to flow out of the cabin when the differential pressure is greater than 3 lb. per square inch; this discharge is through the pressurised battery housing which is separated from the main cabin by a non-return valve.

Four indicators are associated with the pressurisation system; these are the bottle contents indicator, flow indicator, differential pressure gauge and cabin altitude indicator.

Control of Moisture and Gases

With the type of oxygen system proposed, it would not seem essential to provide apparatus for the control of toxic gases, as they should not affect the breathing of the pilot. The type of pressurisation system proposed will allow the use of cabin ventilators at heights below 38,000 ft., but in practice they will probably be sealed at low altitudes when climbing, to allow a build-up of pressure in the cabin and so conserve the compressed air supply. In descending flight the ventilators can be opened to change the air in the cabin before the pilots cease the use of oxygen.

The presence of moisture in the cockpit will only be critical in relation to the misting over of clear panels in the canopy and the effect it may have on certain of the equipment carried. It is proposed to control the moisture in the cockpit by the use of silica gel, either by hanging it in bags in locations where moisture will be critical, or by suspending it close to a small circulation fan. Indicators, consisting of strips of paper impregnated with cobalt chloride, can be located near vital equipment to show if the humidity is excessive. Electric heaters will be used to de-mist or defrost local areas of the canopy required for vision.

The temperature control at high altitudes will be obtained by movable blinds which will be used to govern the amount of radiant heat admitted to the cabin. It should be possible to disperse this heat in the cabin by use of reflectors and a suitable colour scheme.

Jettisonable Nose Section

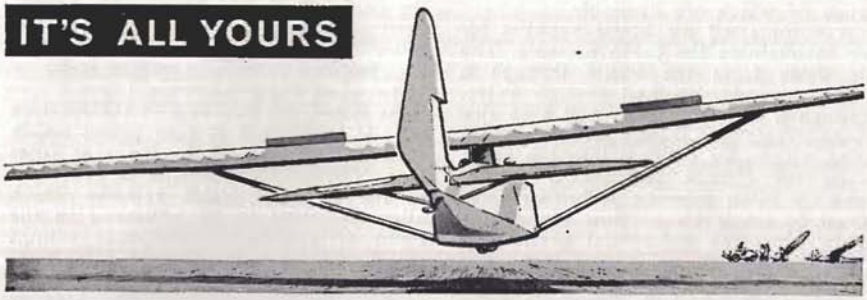
As stated, the structure of the fuselage nose is terminated at four points which form the attachment to the rear fuselage. The attachment fittings are built in the form of quick releases which allow the nose to be jettisoned in the event of emergency. The four fittings will be linked to a common cable control which will run to levers in both cockpits so that either pilot can effect the release. Micro switches incorporated in the releases will operate an indicator lamp and warning horn in the cockpit if any of the attachments are not fully locked. It is proposed that, with a view to safety, the pilots' controls should be made double acting. The release lever will be locked with a brass pin which will have to be sheared by a second lever before it can be operated. All controls and connections to the rear fuselage will be so designed that they do not obstruct the release.

A stabiliser drogue or parachute is attached to the nose section and is automatically streamed by a static line connected to the main bulkhead in the rear fuselage when the nose section is released. The purpose of this drogue is to stabilize the descent of the nose section and limit its velocity so that the pilots can leave when lower altitudes are reached.

Rigging

It is considered that with practice, and using specified equipment, 8 men could remove the machine from its two trailers and rig it in 40 minutes.

IT'S ALL YOURS



AEROBATICS

THERE is no doubt that just too often inexperienced pilots start aerobatics earlier than they should. This would not matter much if they were properly taught, but the combination of both mistakes can be lethal.

Simple aerobatics in a tough old biplane aeroplane can be done after a fashion easily, but the modern glider demands considerably more skill. The main change which has taken place in glider design in the last 20 years is an improvement in high-speed performance; this is excellent for soaring, but for aerobatics it means that the glider can be overspeeded very easily. In addition, because of the lying-back position which is becoming more popular, the pilot has much less sensation of *g* than when more upright.

It is difficult for someone who has done little aerobatics to appreciate what load he is putting on the aircraft, and he may unconsciously associate this with the force which he applies to the stick. This can easily result in the glider being overstressed through excessive *g*: for example, the pull force required to apply, say, 3 *g*, will for a particular aircraft depend on the trimmer position, and the c.g. at which it is being flown. As well, individual aircraft differ widely in the stick force per *g*, most single seaters being much lighter than two-seaters. Consequently it is asking for trouble to give a pilot a small amount of instruction on a two-seater, and then let him loose to do aerobatics by himself for the first time on an aircraft with much lower stick forces. First solo aerobatics should be done in the two-seater.

Some clubs endeavour to deal with the problem, and notes for his own club notice-board, written by Doug Bridson, who really does understand aerobatics, are reproduced here.

ANN WELCH.

NOTES ON AEROBATICS

In my experience the approach to aerobatics within the gliding movement has always been very casual. The vast open cockpit of the T-21 often seems to induce feelings of apprehension during aerobatics, and it may be for this reason that little attempt seems to be made to teach aerobatics although many instructors are not unwilling to demonstrate them.

In some cases an attempt is made to teach a pupil how to perform the two basic manoeuvres, i.e. the loop and wing-over. Unfortunately, more often than not, this kind of "check flight" is made from a winch launch with sufficient height for nothing more than a couple of rather desperate loops and a wing-over. The pupil is then cleared to perform these manoeuvres on his own, quite often in an aircraft not as heftily constructed as the T-21.

What are the pitfalls? Without entering into a lengthy dissertation upon the more obvious disadvantages of this type of aerobatic "tuition", two of the main faults to be observed when watching early attempts to perform solo aerobatic manoeuvres are:

(i) Extremely tight loops with a very high entry airspeed, and
(ii) wing-overs with near to maximum aileron deflection during the pull-up when the airspeed and *g* loading are high.

To elaborate on (i) above, rapid backward movements of the control column at high airspeed causes considerable *g* to be applied. A 3 *g* pull-up means that, to all intents and purposes, the glider, its pilot and all its equipment is three times heavier than normal. Unfortunately, the structure of the glider doesn't automatically become three times stronger, so it groans a little, accepts its sad fate and nothing breaks because sufficient strength has been designed into the structure of the glider to cope with this situation. Assuming that a particular glider has a never-exceed limitation of 4 *g*, this means that any *g* in excess of this figure could lead to structural damage. Any *g* in excess of 6 could lead to structural failure. It therefore behoves one to wag the stick with more caution than enthusiasm at high airspeeds and to ease the glider into any intended manoeuvres without recourse to excessive *g*. If, in an attempt to avoid excessive *g* during the pull-up for a loop, a zero *g* flop over the top results, the only damage resulting will be to the morale and a little practice will make perfect.

As regard (ii), let us assume that the manoeuvre, a wing-over to the right, is initiated vigorously at high airspeed and with limiting *g* applied. On the pull-up, before aileron is applied, both wings try to clap hands above the cockpit. However, they are suitably restrained although they are being "strained" to the maximum permitted by the cunning designer (who always keeps a little bit in hand for emergencies). With the downward application of aileron on the port wing, the lift over this wing is considerably increased and at the same time a considerable torsional strain is imposed through the wing on to the wing root. The end result is virtually an attempt by the pilot to twist the wing up and OFF. It follows therefore that aileron should be used sparingly while the airspeed is high and particularly when the situation is aggravated by excessive *g*.

A pilot on No. 92 Squadron (the Blue Diamonds formation aerobatic team) guilty of jerky flying because of harsh control movements was called a "Yugger". To "yug" was a great crime. Simi-

larly, don't be guilty of the same crime in a glider, particularly when flying at high speed. There is really no excuse for being a silly yugger, especially when it could result in a damaged or broken glider.

As regards the inverted flying of gliders there is nothing much to say. No club glider has a general clearance for inverted flight, and the unauthorised inverted flying of a club glider could result in the immediate suspension of the pilot's activities [or his demise—ED].

D. S. BRIDSON,
Moonrakers Gliding and Soaring Club.

* * *

DOWN WITH THE TREADMILL

Ann Welch

CLUBS do some 150,000 launches a year between them. About half of these are training launches in two-seater gliders, mainly elementary types. Approximately 20,000 are done by outside people on holiday courses, which brings in needed money to the Club and gives a lot of people a taste of gliding. This effort has its price in terms of equipment and instructors used, so it is only sensible to ask what is achieved from all these launches.

Excluding holiday courses, less than 50 per cent of the people who join clubs ever reach the solo stage. There are several reasons for this, but the main one is frustration. In terms of a club which takes 40 new members a year, 20 give up before solo; assuming that these 20 have averaged only 15 launches each, the club during the year will have done 300 wasted launches for this reason alone. Since active week-end instructors average some 150 launches a year each, these wasted launches have equalled the entire year's work of two instructors. If the club runs holiday courses for outsiders, few of whom join the club, this consumes, at least, a third instructor.

. . . consumes, at least, a third instructor

Of the pupils who start learning, not more than five per cent obtain what is today an elementary certificate, the Silver C. Some have been frustrated; some are not interested in soaring, nor become good enough; but a big proportion fail because there is insufficient opportunity, either in terms of suitable aircraft, but much more so because of the lack of the necessary training.

We have got a gliding movement at the present time which is spending an enormous amount of effort and energy in getting people to start gliding, and having got them, frustrates them, and generally fails to teach them to become effective soaring pilots, which is the object of the exercise.

This is the moment for the cry to go up that courses are needed to make money, that it is a free country, and why shouldn't anyone join a gliding club if they want to, and anyway some people don't want to soar. This may be, but do we really wish to introduce quantities of new people to gliding at the expense of the pilot who is trying to get on, and to soar, and of the voluntary instructor who gives his time and energy at the cost, all too often, of becoming a good soaring pilot himself?

One of the difficulties in answering this question exists because we are all so busy with our preoccupation to maintain, and increase, that companion to excessive basic dual the LAUNCH RATE. No one has enough time to think, to stand back and survey the current gliding scene: to peer through the shielding curtain of big Nationals, new 15-metres, finest top pilots, and try to find out where our present club activity is leading us. Whether, in fact, we are getting anywhere at all, except becoming increasingly ground flat by wasteful dead-end work.

Before attempting an answer, we should remember that in less than 20 years gliding has changed from an es-

sentially simple sport into a complex, expensive and increasingly technical one. By the word sport, I mean the sort of gliding that most people did, and not the pundit-flying of a few. Club flying was

. . . essentially a simple sport

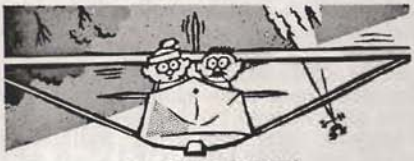
limited in scope and was almost entirely local (because the low-performance glider was not capable of wafting the unskilled pilot very far), aircraft were slow and light, clubs were small and personal. Both pilots and instructors could get by on a modicum of skill and knowledge, and a slice of common sense. There grew up a tradition that almost any keen club members became an instructor, and life went on pleasantly. Since then, clubs have grown larger and more impersonal, gliders have become heavier, faster and more complicated, inexperienced pilots range further, and everything is much more costly.

To get this expensive equipment used safely, economically, and in a satisfying way requires skilled, experienced and trained instructors. It cannot be done by club members, however enthusiastic and hard-working, if they do not have a sound or broad enough knowledge of their subject, have little or no training as an instructor, and too often have done no real soaring. But if we continue to create and consume our instructors on the launch rate treadmill, we cannot expect to have good ones, and if we do get good ones, we wear them out with endless freezing winch launches giving instruction to pupils who they may never see again.

. . . late in the evening

The launch-rate mania has an even further disadvantageous effect on club progress. It can be increased only by increasing the elementary flying; courses help it, more pupils help it, flying on windy days and too late in the evening help it, and the most satisfactory glider to do all this on is the elementary two-seater. It must be got into the air whether it is doing any good there or not. So the club's activities are ruled by the elementary equipment, often at the price of a balanced fleet and programme. The whole club continues to have an elementary outlook.

The concern with launch-rate stems, of course, from the far-off days of solo training when nearly every launch ended with the glider at the wrong end of the field, and an effective organisation had to exist to get it quickly back again. Now, although many clubs would do more effective flying, and pilot members have more fun with, say, a tug and fewer and more advanced aircraft, they are so trapped and enmeshed with trying to do too many launches with too many pupils that it does not seem possible to change.



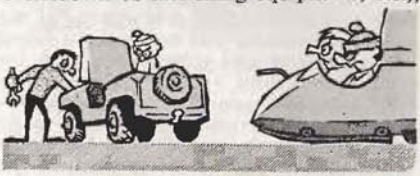
. . . lose control

Somehow this distortion of our gliding activities has got to be rectified. Club flying, equipment and instructors must be geared to the members of the club who learn to fly in order to learn to soar; much more energy and thought must be given to post-solo supervision and follow-up training; much more time must be given to the selection and training of instructors. We must concern ourselves with quality and not quantity. We are only a small movement with limited resources in skill and knowledge. If we continue growing, and continue to dilute our know-how and effectiveness with increasing numbers of half-trained pilots taught by instructors whose own knowledge and experience is in too many cases not enough, we will only have ourselves to blame if we lose control of the situation. We should be warned by the

high-performance gliders which get broken, often stupidly, by unskilled pilots, and by the accidents to two-seaters with instructors on board which show up their lack of skill and judgment. It is not that we do not want to give flying to as many people as possible; we just do not have the resources to do it.

Somehow the financial problem must be overcome, and clubs devise means of controlling or selecting their membership (some do already). Even more important, clubs must create a big and time-consuming programme of instructor training, so that these key people, whose tuition is at present given about lowest priority on the flying list, will be competent to teach members to fly, and properly use the expensive equipment that they will inevitably get their hands on somehow. That the problem exists will be shown if clubs would ask themselves the following questions. How many (or what proportion) of their club instructors can give a clear and accurate lecture on elementary theory of flight, can fly a Capstan or other performance two-seater well enough to give instruction on it, can give safe dual instruction in genuine field landings, understand enough about aerobatics to know how and when they should or should not be done, can give basic instrument or cloud flying safely and usefully, can teach cross-wind landings and steep turns really well? How many instructors, even C.F.I.s, are genuinely able to train new instructors well enough to meet today's needs?

The problem may seem insuperable, or at best one which will be difficult to overcome, but it must be faced if we are not to be overwhelmed by it in the next few years. Perhaps the first step would be to work out how many club launches are wasted considering the following—loss of members through frustration (hanging about too long before flying due to unrealistic flying lists, or breakdown of launching equipment, etc.),



. . . breakdown of launching equipment

inexperienced or poor instruction resulting in the lesson needing to be repeated, flying in unsuitable weather for giving useful instruction, trying to train pupils whom it would be kinder and more sensible to discourage from further flying. The total number of such launches related to the average amount of work done by voluntary instructors gives a measure of what spare time and energy could be available if the waste could be reduced by some method of pupil selection, and by better instruction. Without any new equipment this time could be used to improve the flying of post-solo members, and give advanced flying to existing instructors.

We must, of course, continue to teach new pilots, but the number must be related to what can be done properly. We should not start to teach more people than we can take right through to Silver C plus a calculated wastage margin. With care and intelligence this should not need to exceed 25 per cent.

. . . and the strength of their aircraft

We should tailor as far and as soon as possible flying and launching equipment to this requirement. We should fly these people when the weather is suitable, and when it is such that they will gain little from the lesson, there should be arrangements for ground school. In Britain we probably have less in the way of ground instruction than almost any other active gliding movement in the world. We must teach pupils not only to fly safely and accurately, but to soar, to understand theory of flight, and the strength of their aircraft. We must be able to give them the analytical and technical type of instruction that is needed with modern gliders.

The key lies with instructors, firstly to get rid of the treadmill, and then steadily to advance their own teaching technique, to aim for high standards both in pupil flying and in their own. An instructor who cannot soar, and who is not in-

terested in advanced flying, is not able to teach his pupils to properly and safely use soaring gliders, however good he is at tramlining round his own circuit.

Money is always a difficult problem, and disposing of the treadmill outlook may even have to result in some increase in charges, but members would be able to get real value for their money. This is often more than doubtful at the present time; just work out what it costs the average club pilot to get solo.

ANN WELCH.

. . . what it costs

POLAR POLICY

THE drive for reliable Polars gains momentum. There do exist in various obscure corners curves which have been achieved by irreproachable means, but part of the trouble is that they have not been so far clearly distinguishable from the rest. I want to suggest therefore that in future issues of SAILPLANE AND GLIDING all polars are clearly marked on the top right-hand corner.

A—will imply that the curve is the result of properly controlled performance tests carried out by an independent body.

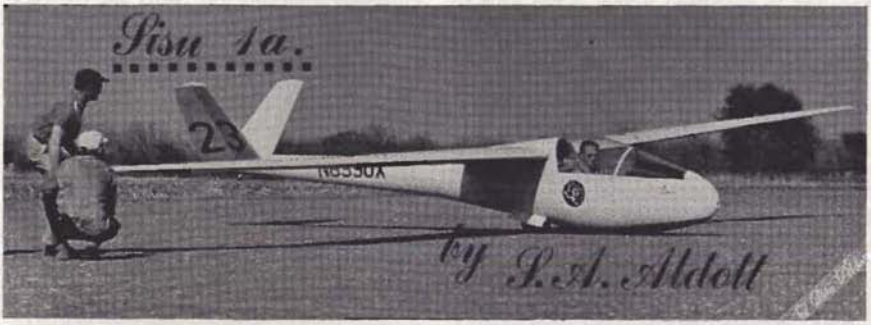
B—will cover comparison flights, made against aircraft possessing an A. curve.

C—will cover all other polars, including calculated ones.

OSTIV is about to publish a series of polars resulting from tests carried out by the F.F.M. Institut für Segelflug under the control of Dr. Hans Zacher. These will include, amongst others, the Ka-6CR and the Skylark 3F. In our Spring 1951 issue appeared some polars achieved by B.G.A. Flight Test Groups No. 1 and 3, including the Weihe. No. 3 Test Group has produced an A. class Polar for the Skylark 2. Dick Johnson in the U.S. is currently carrying out tests on the Skylark 4. My hope is that, possibly in our June issue, we may print a number of A. curves giving reliable figures for a number of sailplanes currently in common use. This will enable anyone who wants to do so to produce B. curves for his own aircraft, by comparison flying against one with an A. curve. I hope they will send us copies. As for C. curves, we will continue to print them, but ask people to realise they must, with all the good will in the world, be regarded as mainly expressions of hope and intention.

P. A. W.

Since the above was written, Mr. K.-H. Doetsch and Mr. D. Lampard, of the Aeronautics Department, Imperial College, Prince Consort Road, London, S.W.7 (Tel. KEN. 5111, Ext. 2845), have kindly undertaken to deal with all performance data sent to them, with a view to categorising the resulting polar curves, which may then be published in SAILPLANE AND GLIDING.



IN March of 1963 I had the opportunity to fly the Sisu 1A. It was a thrilling experience because very few pilots get the chance to fly a Sisu or any other high-performance sailplane of this class.

I was going to fly the first production model at the soaring site of the Texas Soaring Association, six miles south of Grand Prairie, Texas, — the sailplane that Richard H. Johnson did so well with at the world Soaring Championships in Argentina.

Dick came out to the airfield to be photographed with the Sisu. Being recently back from Argentina he talked to us enthusiastically about the superior quality of the Sisu compared to the sailplanes he saw there. After winning the Nationals at Elmira with his new Skylark 4, he still thought the Sisu was the finest of all. So did Adam Witek, of Poland; when I asked him which sailplane he would want the most, he said, "The Sisu, the Sisu," and his eyes lit up with admiration.

I saw all of the Nationals and, among other things, the most impressive sight was sailplanes crossing the starting line. With the exception of the HP-11 and HP-8, there was no other sailplane crossing it in the arrow-like way as the Sisu's did.

At first glance one may wonder and doubt the claimed performance figures. The tiny wings, the delicate fuselage keeping doubt alive, till one moves close and runs fingers over the surfaces of wings and fuselage, realizing at once that a perfectionist was at work.

If we compare wing dimensions with those of some other high-performance sailplanes our first impression seems to be justified.

	Span (ft.)	*Area (sq. ft.)*	*Aspect Ratio*
Sisu 1A	50 0	108.0	23.1
Ka-6	49.2	133.4	18.1
1-23H	50.2	160.3	15.6
Breg. 901	56.8	161.4	20.0

The cockpit has enough head and leg room to feel comfortable after a long cross-country flight. Flap and airbrake levers are situated in staggered positions on the left side of cockpit within easy reach of the pilot. No contortionism or excessive strength is required to operate them. Visibility is superior to that of any other single-seater I have ever flown, and gives distortion-free view for the pilot where it really counts, right in front.

Leonard A. Niemi, the designer, gave me a short briefing before take-off. On the second production Sisu I had seen and heard a sound system warning device which indicates if the landing wheel is not out in a locked position. Since this model had none I was concerned, but Len assured me there had been a landing made on the belly without damage before.

With half flaps in a 20 m.p.h. wind it took a run of only a few feet till we were airborne. The tow hook is located close to the centre of gravity line of the ship and for this reason the Sisu sits perfectly on the towline. The cockpit is extremely quiet. Control movements and responses are natural. Two rubber bands fixed to the floor provided adequate trim controls when manipulated over the stick. However, an aluminium rod placed over the stick

with up and down movements is in all Sisu 8's now for trim control. The wheel is retracted while on tow. After releasing from the towline, the tow-hook spoon was retracted back into the fuselage. Now only the small tail-wheel was left as a drag-producer.

In free flight, as I tried turns at different angles of bank and speeds, the wing stayed motionless, unbending, and did not develop buckles on the skin like other metal sailplanes I have flown before. Roll rate is excellent. Control forces were light on aileron and rudder, but required higher pressure fore and aft. Airspeed built up rapidly in a shallow dive as I pushed it up to 115 m.p.h. With the following wind we really moved like never before.

Landing is quite straightforward with full flaps and airbrakes open. The airbrakes are less effective than those on other sailplanes I have flown with L/D's over 30, probably because of their size and the aerodynamic cleanliness on the wings.

Sisu is a Finnish word meaning strength, integrity and stamina, but besides all these it represents beauty, gracefulness and, above all, dedicated workmanship to me. It amazed me to see how perfectly all parts fitted and clicked into position, whether put together or when slid into the snugly-designed trailer.

With the Sisu 1A designer-builder Leonard A. Niemi has created for the soaring world a sophisticated (dreamlike) and price-worthy Cadillac. This superb design of Swiss watch precision will enable Sisu owners to capture all single-seater records there are.

Wish I had a Sisu!

CORRECTION to Mr. Aldott's article "2-32" in the December issue, p. 457: the machine's take-off speed is 43 m.p.h. (63 k.p.h.), not 63 m.p.h.

Showing clean line of fuselage with wheel retracted. Dick Johnson flying.

Ireland to Scotland

FOR the first time the Irish Sea has been crossed by sailplane from west to east. During the last week-end of 1963 Flg. Off. Dmitri Zotov, a New Zealander serving with the R.A.F., took off from the Red Hand Gliding Club at Ballykelly in Northern Ireland at 11.45 a.m. in an Olympia 2B, and flew 130 miles to a landing at Crianlarich, on the Stirling-Obon road in Scotland, at 2.30 p.m. On the way he climbed to 14,000 ft., the second highest altitude in Irish gliding. He was taking part in a joint wave-soaring expedition by the Red Hand Club, the Ulster Gliding Club

The first crossing in the opposite direction was made by Charles Ross in a Skylark 3 in wave lift from the Scottish Gliding Union to Toome airfield via Portrush on 3rd February, 1963 (see SAILPLANE AND GLIDING, April, 1963, p. 76). The narrowest sea crossing is 13 miles from or to the Mull of Kintyre.

ENCOUNTERS WITH EAGLES

by MAX HOWLAND

Experiences while soaring at Cornwall Station, Quilpie, Queensland: reproduced from "Australian Gliding"

AFTER working up past 2,000 feet, down below I spied a thermalling black bird that was flapping as well—rather an unusual combination I thought at the time; and with its appearance began the most interesting—and worrying—week of flying I have done for a long time.

Philip Wills wrote of places where no birds fly. We were soon to learn that Quilpie was a place where wild birds fly. My visitor was an eagle, and he, like his mates that appeared every time we thermalled, objected very strongly to our presence in the air. Over the period, in between hold-ups due to the rain, we flew about seven hours in the Ka-6 and were subjected to so many separate attacks that I lost count.

If the same bird always keeps to the one area, at least half a dozen formed their attack group. Eagles to me had been birds that attacked sailplanes on very, very rare occasions—generally, I thought, only when they both wanted the same small section of the thermal. Marjorie Pegler had told, though, how she had had to manoeuvre violently in the Cessna to miss one that came straight at the prop, feet down in the attack configuration. She was concerned about them even before we flew. There were two of us concerned about them after I flew.

I learned a lot about eagles very quickly. The books said the wedgetail is the largest eagle in the world—and I can confirm that a six-footer passing a foot or two over the canopy after a head-on pass certainly does look big. Their method of attack is to lower their legs and strike with the two razor-sharp rear talons. The station folk say they are cowards—they fly up into the air while their nests are being robbed—they are often chased away by wagtails. That might be so, but it wasn't the eagles that were frightened this time.

In the air I soon learned that an annoyed eagle makes a loud squawk, so loud that it can be heard clearly even when the eagle is out of sight behind. In the pictures we see of the bird sitting majestically on a dead limb, the hooked beak seems to give it a rather disdainful look. In the air, when they squawk, the beak seems quite different, and it is surprising how wide it opens.

It was not a case of their attacking only when we occupied their thermal. If the sailplane was circling they would fly straight to the thermal from miles away, then climb up in it with power on. Sometimes they were satisfied if the plane left the thermal and flew away. At other times they were not. They were polite enough, that when they came in pairs, they took it in turns to attack. One at a time was bad enough, and even though I had decided to try thermalling in spite of them and to take little notice they did make my centering rather ragged.

The eagles seemed to be rather individualistic. Their method of attack varied so that there was no question of it all becoming monotonous. However, once a method was begun, it seemed to continue for all that flight. One came from behind the wing; others kept behind where they were usually out of sight. The most spectacular was a pair that positioned themselves about 30 feet up, seemed to roll, and with almost closed wings, came straight down to pull out just above the wing and disappear behind. The one attack that was consistent was when we got into such a position that we were head-on. Then the feet went down and they came dead straight. It was the sailplane that had to deviate at the last moment to avoid impact.

Of course, I wasn't foolish enough to think I could out-manoeuvre them. Any

doubts on that score were removed after seeing their skill during the vertical dives, but as we were trying everything else, I had to see what would happen. As I tightened the circle they seemed to stay with me, but every time, no matter how I handled the plane they soon got out of sight behind. They made no attempt to come straight in, but just circled with me —playing. I am satisfied they could have struck me at their leisure. The worrying question was, as their techniques were not consistent, just when they would decide to do so.

Marj (owner of the Ka-6) was negotiating to obtain a starting pistol, but in the absence of this means of making a loud frightening noise we tried the dive brakes. The noise didn't worry them. We had a good look at the nose of the Ka-6, but decided Harry Schneider had left insufficient room to mount a shotgun.

Still, if we couldn't shoot them from the air, perhaps we could from the ground. Marj had been very pleased when she picked up a thermal from 400 feet but not so pleased when the eagle joined her at 900. At 700 feet the shotgun and the 22 were ineffective, but the 222 could be a different matter. Marj was insistent that I have the rifle ready when she flew.

I wasn't so sure — stray bullets or eagles? I reckoned the marksmen and women had less chance of hitting me by accident than they did of hitting the eagle on purpose, and I didn't really give them much chance of doing that.

Although we did have a lot of fun jesting about eagles on the ground, we treated the subject seriously. However, unless their pugnacity is due to the breeding season, they are a real problem to soaring in the Quilpie area.

On my return home I wrote to a naturalist in an endeavour to get information on their flying habits. I told him the story in some detail. His reply was rather brief. The eagles had been using the air longer than I had, he said. I don't think these particular eagles had been, and I won't recognise that eagles can pass on the air as an inheritance to their descendants. He also said they were only looking at me!

I would appreciate any information from others that have been subject to eagle attack; whether contact was made, time of year, pattern of attack, action by pilot and so on. This could be sent to Max Howland, Flaxton, via Montville, Queensland.

Records broken in South Africa

FIVE world records and one British record have been broken in South Africa and now await homologation.

On 25th December E. "Boet" Dommisse in a BJ-2 went round a 500-km. triangle at 65.9 m.p.h. average, beating R. R. Clifford's official record of 44.36 m.p.h., and Anne Burns flew round the same course at 63.4 m.p.h., claiming the first women's record in this class.

The first multi-seat record for the 500-km. triangle was claimed by the brothers Helmut and Heinz Sorg, who averaged 51 m.p.h. on 7th January. Next day a pilot named Jackson (no further particulars) made a goal-and-return flight of 429 miles, beating Jan Wroblewski's world record of 421.8 miles.

Anne Burns averaged 59 m.p.h. round a 100-km. triangle, beating the women's world record of 57.85 m.p.h. by Anna Samossadova (U.S.S.R.).

Anne's husband, Denis Burns, in a Standard Austria, averaged 60 m.p.h. round a 300-km. triangle and beat Tony Goodhart's British National record of 48 m.p.h. Hans Böttcher, in a Standard Austria, beat the German national record for a 500-km. triangle.

WORLD'S RECORDS HOMOLOGATED

The F.A.I. confirms the following:—

Goal Flight: Alvin H. Parker (U.S.A.), in Sisu 1A, 487.24 miles.

Goal-and-Return: Jan Wroblewski (Poland), in Foka, 421.85 miles.

Multi-seater 100-km. Triangle: Arkady Kovchirko (U.S.S.R.) with passenger in Blanik, 62.34 m.p.h.

Women's records, all in Poland with Foka or Bocian:— Single-seater, Pelagia Majewska, Goal-and-Return, 284 miles, and 300-km. Triangle, 47.03 m.p.h.; Adela Dankowska, 300-km. Triangle (completed later same day), 51.44 m.p.h. Multi-seater, Distance 399.46 miles, Out-and-Return 260.54 miles, 300-km. Triangle 55.00 m.p.h.

The Sixth Aeronautical Art Exhibition And Competition

Judged by
Roy Nockolds
and
David Shepherd

★ ★ ★

FIVE HUNDRED people had visited the club's most successful Exhibition yet when it closed on 30th November. Thirty paintings and drawings were sold by the 37 artists who exhibited 94 oil, watercolour, goache, poster, line, pencil and crayon works.

Many V.I.P.s were at the preview, including Professor Jimmy Edwards and Air Chief-Marshal Sir Dermot Boyle.

Terence Cuneo officially opened the exhibition and presented the prizes for the competition, the judging of which was again done by Roy Nockolds and David Shepherd. As briefly mentioned in our last issue the prizes were awarded as follows:

The Challenge Trophy:
John Palmer—best over-all entry (No. 20, Ice Patrol).

Class 1: Oils
Gliders. 1st, Margaret Kahn (No. 17 Cumulus Ahead).
2nd, Ann Welch (No. 31, Two Gliders).
Powered Aircraft. 1st J. Palmer (No. 20, Ice Patrol).
2nd, R. Willbie (No. 32, The Intruder).
Highly Commended. D. Eeles (No. 10, Tiger Moth).

Class 2: Water colour, Poster, Goache
1st, A. Achard (No. 55, Whitley).
2nd, V. H. Veevers (No. 59, Coming in to land).
Highly Commended. T. Wykes (No. 90, Mischievous Pup; No. 91, The Friend in Need; No. 92, Fokker Fodder).

Class 3: Line, Ink, Pastel, Crayon, etc.
1st, N. Hoad (No. 82, Victor).
2nd, T. Shreeve (No. 87, Box Kite; No. 88, Bleriot XI; No. 89, Caudron).

Best First Entry:
R. Molesworth (No. 73, C Flight; No. 74, National High).

Roy and David have very kindly written us the report which follows.

Y. C. B.

Judges' Report

ROY and I were delighted to be asked to judge the exhibition again this year and we were most impressed by the quite remarkably high standard of the paintings—a great improvement on last year. We must congratulate the organisers on the presentation of the pictures and this was further emphasised by the all-round improvement in framing. My remark last year about the unfortunate tendency on the part of the amateur painters to go up to the attic and strip the mahogany frame off Granny's portrait seems to have had effect!

Looking at the collection of works as a whole, the outstanding failing was that old problem once again of the greens. The best advice we can give on this is never to *buy* any tube of green if one can avoid it. It is always, in our opinion, better to restrict oneself to as few colours as possible anyway and mix one's own; certainly this applies to green, which can be made far lovelier from various combinations of blue, brown, black and yellow, than any of the artificial greens out of a tube. In any case, remember what we said last year—does it *really* look green when you are flying over England?

Two paintings in this connection which spring to mind were Norman Hoad's No. 11, "Comet 4 taking off from Hong Kong", and No. 38, "An early bird", by R. G. Deane. Norman Hoad had the most terrible colour in the runway grass and this was badly applied too. The large sweeping brush marks all following in perspective the line of flight of the aircraft were crude. This was a great pity as this, together with the niggly way he painted the distant skyscrapers and shipping in the harbour, ruined an otherwise excellent painting. By "pushing" the tail of the Comet behind the wings he captured a very good feeling of three dimensions in the aircraft but this was counteracted by the background which came right forward. If only he had made it fainter by smudging his finger all along the horizon he would have pushed it away.

This point applied in so many paintings. "The Prospector" and "Final Glide", Nos. 25 and 26, by Arthur Speechley, were spoilt by the nasty hard

▲ *Matching moustaches: Professor "Jimmy" Edwards confronts John Blake.*

"Ice Patrol": the winning picture ▶ *by John Palmer*

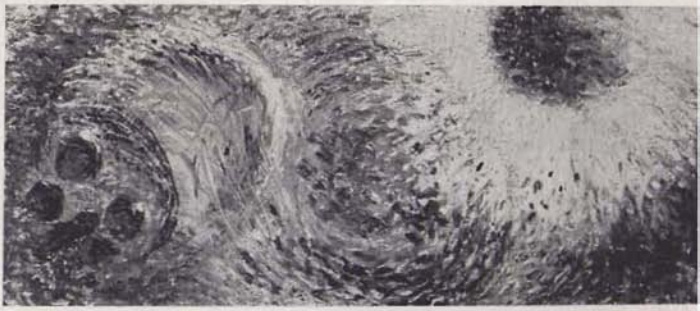
Ann Welch, Ron Wilbie and ▼ *John Palmer.*

Top right: Terence Cuneo handing the trophy to John P

Middle right: "Green Ball" by Elizabeth Hargreaves.

Bottom right: The Judges talking to Margaret Kahn and shal Sir Dermot Boyle.

All photographs by



n Palmer.

and Air Chief Mar-

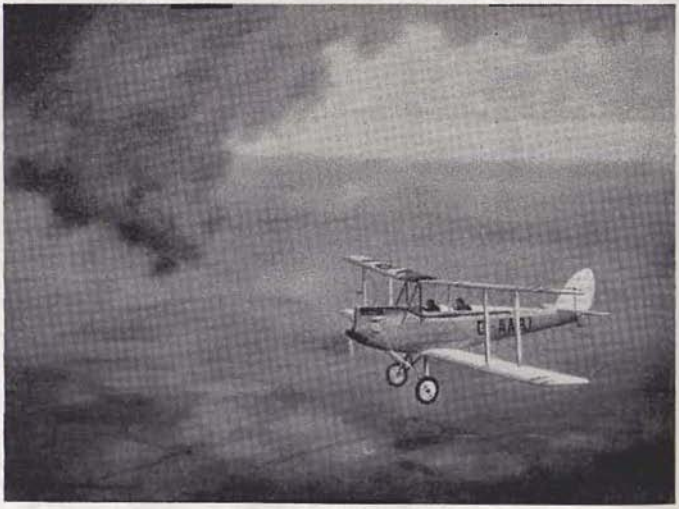
s by courtesy of Flight.

bits of black, which brought the distant landscape far too "near". Otherwise these pictures had considerable merit.

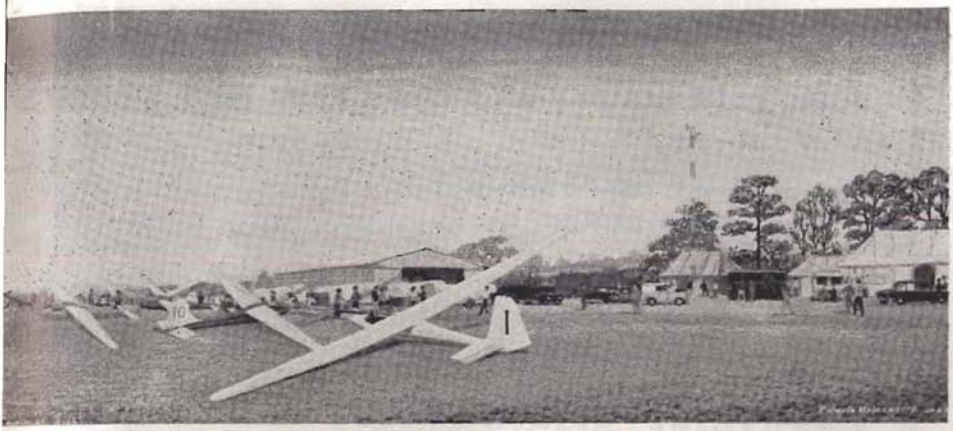
In Tom Eccles's "V.C.10", No. 9, one didn't really know if it was a painting of a V.C.10 or a patchwork of fields. This point of two centres of interest is a trap which many amateur painters fall into. Decide what you are going to paint, and then make everything else secondary to it. When we gave our informal talk on the paintings, someone said in connection with this painting—"he hasn't painted in any road". This illustrates what I mean so well. The eye should have gone to the aircraft, but instead one was worried by this frenzied background.

"Field Landing", No. 4, by Pat Armstrong, was a good first attempt and an example of the seemingly insignificant little painting catching the eye. But this was an example of lack of knowledge about texture of paint. Don't paint trees, aircraft and clouds *all* in the same degree of texture. How *can* they be, when clouds are vapour, aircraft all metal, and trees something in between? John Palmer could well note this point too in his "Escort", No. 19. This was more interesting material than his prize-winning "Catalina", but ruined by the thick over-painting. This is a very bad habit in my opinion. In "Escort" he had painted the sea, coastline, fields and clouds on top of one another and then, on top of all that paint, put a Hurricane —with a horrid result, as you could see it all under the fuselage of the aircraft in great ridges of paint. At least the aircraft were "doing something". This is another point worth mentioning, and this is why we gave a prize to Ron Willbie's "Mosquito", No. 32. A. Achard's "Mosquitos" in No. 54 were far better Mosquitos technically but they were so uninteresting. Similarly in Nos. 90, 91 and 92, Terence Wykes has a great deal to learn about drawing but we would far prefer his pictures, for *pictures* are what we are painting, than Harry Cooper's "Mosquito" and "Silver Star", Nos. 6 and 8, though these were most professionally painted.

What to say in the space available where there was so much to commend! John Palmer's 83, 84 and 85 were quite excellent—beautifully framed; he should know the value of his work better. One guinea scarcely paid for the delightful mounts and frames. Fiorello Tosoni had a nice story-telling picture in his "Take-off into sunset", No. 27. This fired the imagination as a picture should, but his "Vulcans" were even worse than last year! We wanted to give a prize to David Eeles' "Tiger Moth", No. 10. This



"Silver Star" by Harry Cooper



"National High", by R. Molesworth.

was a masterly example of boldly placing just one aircraft in an otherwise empty sky landscape and making it interesting, but he ruined it with his horrid red which would creep into the clouds.

V. H. Veevers once again displayed his skill as a watercolour painter in his "Coming into land", No. 59—clouds painted just as they should be—but his "Cross-Country", No. 60, was spoilt by the niggly chickens and superfluous detail.

A. Achard's "Whitley", No. 3, deserved a prize. He captured the cold evening feeling of a wartime bomber station.

Brian Withams has a great deal of talent, but nevertheless his "Wapiti on Patrol", No. 34, "Admiral's Barge", No. 35, and "Cosmic Wind", No. 36, just failed being excellent. His two-seater Hunter was uninteresting. Although it may sound silly, get some *interest* into a painting like this. Don't just paint it sitting on a runway. Paint one of the tyres flat, or do anything to make people look instead of pass by unmoved, however well painted it is. And yet even with the interest of his comical line of camels (he's seen the film of Lawrence too, obviously!) in "Wapiti on Patrol", the painting would have been better with just the very well painted Wapiti; or at least smudge over the line of camels to put them in the distance.

We would like to mention so much more. We seem to have been very critical, but it is said that artists are never told anything good about a picture as it is assumed they know the good points. This is definitely the way to learn and, again, we both thought it was an exhibition full of interest and good things—promise of even better next year.

LONDON'S METEOROLOGY

A COURSE of ten weekly lectures on "London's Urban Climate", by T. J. Chandler, M.Sc., is being held at University College, Gower Street, from 13th January to 16th March inclusive. The course fee is 12s. 6d., and lecture period 6.45-8.15 p.m. By the time this is published, there will still be seven lectures to attend. Readers interested in the influence of large towns on the state of the atmosphere can obtain particulars from the Department of Extra-Mural Studies, University of London, Malet Street, W.C.1.

Mr. Chandler has done original work on the subject and has coined the term "heat island" for London.

The Slingsby DART Standard Class Sailplane

THE prototype of the Slingsby T-51 made its first flight on 26th November at Wombleton Aerodrome near the manufacturers' works. In the three following weeks an intensive flight test programme was completed and the aircraft has now been submitted to the British Gliding Association for its Certification Flight Tests.

Slingsby's hope that the first of the production aircraft will be available about mid-March and that a batch of aircraft will be flying in this year's British Nationals.

The prototype in its crimson and white finish is a striking aircraft. The lines are clean and there is a marked absence of outside excrescences. The fuselage is long and thin and judged by the usual Slingsby standard, the tailunits are small. This is explained by the long rear fuselage, and by the positioning of the tailplane well aft of the fin. The general arrangement and size of the cockpit is the same as the Skylark 4 although the fuselage depth is reduced by four inches.

The layout of controls follows conventional lines. The control column is raked back so as to give plenty of clearance on the pilot's body. The rudder pedals have an improved system of quick adjustment. The trimmer control is positioned to be operated by the pilot's left hand. The instrument panel is mounted on a pedestal which comes up between the pilot's legs at the front of the seat. Sufficient room is available

for any range of instruments likely to be required.

The transparent canopy is of ample size and fits very cleanly in the lines of the fuselage, with a high standard of optical clarity. Visibility from the cockpit is excellent in all directions, and appears even to be better than the Skylark 4.

A large space aft of the cockpit is available for the stowage of equipment. Access to this area is obtained by removing the wing fairing which comes away by the release of one simple fastener. Access to the interior of the fuselage has been provided by the use of tubular steel bracings in place of the conventional plywood skin on the neck. Sufficient room should be available for the stowage of the largest oxygen bottles, radios and other equipment.

The control mechanisms are operated by open circuit push-rod systems. The aileron control is of interest in that a nobble system is used to house the control components entirely within the profile of the wings.

The all-flying tail is positioned at the base of the fin and is faired into the rear fuselage lines. Double anti-balance tabs are provided to give feel for the pilot. These can be pre-positioned by the cockpit trimmer control for speed trimming in flight.

Reports from pilots who have flown the aircraft to date are excellent. Due to the comparatively high wing-loading, its high-speed performance should show a marked advance on previous British designs.

The Slingsby Dart is intended for entry in the OSTIV standard class design competition in 1965. Some 70 orders are held, and we hope to see a number of countries flying the T-51 in the 1965 World Championships.

CHRISTMAS CROSSWORD SOLUTION

TATE GALLERY 8740

THE KRONFELD CLUB

74 BASEMENT ECCLESTON SQUARE · SW1

BY the time you read this the structural repairs to the club should be nearly complete. This includes the relaying of all the floors, putting in a new window in the lecture room, new ceilings, complete re-wiring, the building of new cloakroom facilities, etc. Frank Kinder's interior design for the lounge and new bar has been much praised. One can see that it is intended that the club be made as comfortable and luxurious as possible. Indeed all this has only been made possible by the keen support of our members and friends to the appeal launched in June last. Our target of £2,000 for the actual rebuilding and refurbishing has just been passed, but because of the huge cost of the re-wiring and the fact that we do not wish to lower our standards of comfort we do need a further £300 quickly in the form of either loans or donations. If you have not already contributed or feel you could help further we should be very pleased to hear from you.

Over the past month weekly Wednesday lectures have been continuing at No. 71 Eccleston Square, thanks to the National Playing Fields Association, but we do apologise to members for the inconvenience caused during rebuilding.

Subscriptions were all due on the 1st January and the rates are now as follows:

General Membership £2 (married couples £3).

Overseas and Country Membership £1 (married couples £1 10s.).

In the following lecture list the following are worth particular mention. Group Captain Norman Ryder, Secretary General of the Royal Aero Club, who won the London to Paris Race in 1959 will be giving a talk on it entitled "Four Fast Men".

Another very popular speaker who is coming again is Peter Brooks who will be giving another of his historical talks.

Ken Owen of *Flight*, who has recently visited the Woomera rocket ranges is coming to tell us about it on 1st April.

And don't forget the Brains Trust on Wednesday, 29th January, when Wally Kahn will be in the Chair. The "Brains" being Tony Deane-Drummond, Ann Welch and Frank Irving, who will discuss questions arising out of British Entries in World Championships. Questions on slips of paper to Wally Kahn, please.

On 5th February is another talk which should be extremely interesting entitled "Rebuilding and Flying Historic Aeroplanes". Air Commodore A. H. Wheeler, who is a founder member of the Shuttleworth Trust, will be speaking and will also show slides and a film.

Y. C. B.

Diary of Lectures and Film Shows
Wednesdays at 8 p.m.

Jan.	29.	"Brains Trust".
Feb.	5.	"Historic Aeroplanes" by Air Commodore A. H. Wheeler, C.B.E.
„	12.	"Gliding in the French Alps", talk and film by P. Hearne. (postponed from prev. date).
„	19.	The Story of the R.A.F.—Film series Period 1935-1944.
„	26.	Mediterranean diving, by chief instructor of Mediterranean Club.
Mar.	4.	Four Fast Men.
„	11.	Seaplanes and Tigers by Norman Jones.
„	18.	Motoring films presented by Bill Kronfeld.
„	25.	Rigid airships by Peter Brooks.

Upward Bound

by BRIGADIER GEORGE CHATTERTON

THE whole idea was really born in the Mansion House when Sir Frederick Hoare was Lord Mayor of London from 1961-62.

During his year of office he took as his theme "Leadership and Youth", and as his Honorary Organiser of Appeals I had the remarkably interesting job of developing his theme and of studying how best he could give support, if and where needed.

The Chairmen of every National Youth Organisation, representing between four and five million young people, were invited to the Mansion House, and asked there and then to give their views, and later, after consulting with the young people themselves, to write and inform the Lord Mayor of the views of youth itself.

To sift the data that poured in, I set up a small committee from which emerged one really clear point: the almost unanimous desire by the younger generation for older people with specialised knowledge of any kind to be prepared to pass it on through lectures or practical instruction at a price possible for the average young person to pay. This idea interested me deeply, and having been an aviator from a young age, I had for many years longed to see more young people in the air, knowing that the day one goes solo will remain unique in the memory of any man. During the war I commanded a special airborne force in which the men were all powered aviators and glider pilots, and knowing that some of them were still as keen as I to do something with our knowledge, I got together with them and suggested that we should form a gliding centre for young people between the ages of 16 and 21, with the aim of sending them solo to the standard of British Gliding Association B Certificate.

The men I approached, who had been gliding instructors since the war, showed immense enthusiasm for the idea; but enthusiasm and good ideas are not enough, and we have had immense difficulty in making the scheme a reality. After approaching several Trusts without success, I wrote to the Duke of Edinburgh, who referred me to Mr. Philip Wills, the chairman of the British Gliding Association. His interest was immediate, but for the first time I learned of his battle with the Ministry of Aviation which caused me to understand exactly how difficult my own task was likely to be. I was warned that I should never find an airfield, for land nowadays is more jealously guarded than gold. Other people warned me that perhaps young people might not be interested; and finally, how could it be run at the price we were suggesting—£7 10s.—to reach solo standard in between four and six week-ends?

This was a challenge to us all, and the more we worked on the scheme the more we became convinced that something of real value to hundreds of young people could be founded, if only we could get over the initial hurdles. The dead hand of bureaucracy lay heavily on our efforts, but the men with me are not the type to sit down and take "No" for an answer, and finally they came in contact with Messrs. Airtech, the owners of

Haddenham Airfield near Oxford, who showed enthusiasm and understanding of the whole concept and allowed us the use of their airfield. This finding of a base was the biggest problem, and our very sincere thanks go to the Chairman and Directors, without whose support Upward Bound might still be only a dream.

The next serious problem was how to obtain the necessary financial support and to buy the initial equipment. Few people will support a vision, and few visions can become a reality without hard cash. We knew that the support from young men and women would be overwhelming, for we had tested the ground by sending out a *pro forma* in the Oxfordshire district with the question "Are you willing to pay £7 10s. for a gliding course with the aim of reaching solo standard?" The reaction was startling. With the airfield promised and the young people straining to start, I decided to take a chance and to delay no longer. I sent a cheque for £500 to Arthur Proctor, the chief flying instructor, with instructions to buy a second-hand glider and winch. Shortly afterwards I took Sir Frederick Hoare, who had been from the outset a great supporter of the whole idea, down to Haddenham, where a few young people were already beginning instruction. He was so impressed that immediately, on the airfield, he wrote out a cheque for £500, and within a few days another friend of mine followed suit.

From that moment Upward Bound was a reality, and now every week-end from dawn to dusk the 12 boys and girls who are on the course are thrown into the air with highly expert instructors, who not only know the exhilaration and pleasure of flying, but have also experienced the drama and almost suicidal risks of the feats they were asked to achieve in the war. These men act in a voluntary capacity, giving their services every week-end, because they enjoy it; and for this reason the people being trained catch their enthusiasm and every course is now full until August 1964.

The idea behind the Upward Bound is to make young people air-minded and to instil into them the spirit and flexibility of an aviator. During the course they are not spared, but have to work hard, both mentally and physically in

all weathers, and to this they respond apparently with great enjoyment. The course, which is fully comprehensive, including simple aerodynamics, airfield discipline and airmanship, is the same for both boys and girls, and their enthusiasm and quick ability is inspiring. I am convinced that there can be no better training for anyone than to be forced to pull out of himself the intelligence, self-reliance, sense of judgment and courage which is required when for the first time a man finds himself alone at the top of the winch 700 to 1,000 ft. up, with the challenge of bringing the glider safely to land on the airfield. In this single action, achieved successfully for the first time, lies inclusive a change in the personality of an individual which will serve him for all time. The first solo flight is the great moment of testing, and although much lies ahead, nothing can ever be quite the same. Further courses in the finer arts of flying will be arranged. Soaring and cross-country flying and refresher courses will be held either at Haddenham or at other gliding clubs.

This is a flying age, yet never has flying for the individual been more discouraged than it is in this country at the present time. Light plane flying is prohibitively expensive and the Auxiliary Air Force squadrons are no more for the voluntary flyer. The light aircraft and glider industry are struggling to exist whilst other countries are forging ahead. Air space has become Government property and again the dead hand coming from office-chair wallahs can be seen killing incentive under the pretext of the danger of air collision.

I was recently informed by a famous newspaper that last year backing was given to a very limited extent for a light aircraft display on a certain airfield. The enthusiasm was so great that 160,000 people turned up, and as a direct result many flying companies such as B.E.A. found their passenger loads markedly increased. This year the paper will fully underwrite the display and it is estimated that about 250,000 people will attend. I mention this because it shows the deep interest shown by the public in light aircraft, if any opportunity is given, and I am convinced that very many young people are deeply interested in learning to fly.

Upward Bound is only a beginning, a tiny ripple on the pool; nevertheless, we are fulfilling our intention and even with our present equipment, by the end of one year, at least 100 boys and girls will have learnt the remarkable and shaking experience of going solo, and with a British Gliding Association B certificate in their hands can look forward with a new confidence.

Our other intention is to give every support possible to the British Gliding Association and to all gliding clubs in the British Isles. We are, of course, just young and new as a peacetime organisation, but it is my earnest wish that our "elders" will look warmly down upon us, and to help us, knowing that we are at all times deeply dedicated to the best that the air can offer.

I would like to make one final observation: I have been linked to the air as an aviator for the past 30 years, during which time we have all witnessed the most dramatic advances. During the war gliders were used to carry more than 7,000 tons of men and equipment, landing by night as well as by day in the most hazardous circumstances. Having done both, I know that the principle of flying is the same—the same judgment and the same anxiety, with the same sense of achievement after the landing. Members of the Glider Pilot Regiment who are now the instructors of the Upward Bound were ruled by a great sense of adventure and self-discipline which they wish to give to younger people in the belief that they in their turn will ensure that this country will fly forward with adventure and not stick for ever with their feet on the ground.

Information from Upward Bound, 78 Hamilton Terrace, London, N.W.8.

Pilots' Rating List 1964

A new rating list based on a revised scheme prepared by the Flying Committee is published below.

At the time of writing it is not certain whether or not it will come into force for 1964. But by the time this appears in print, a final decision will have been taken and everyone affected will have been notified.

30th December, 1963

At a Council Meeting earlier this year, it was agreed that the Flying Committee should consider the method of calculating the Pilots' Rating List. At the Council Meeting on the 13th November, it was unanimously agreed, in the light of experience, that the Scheme needed urgent revision, to take effect from the 1st January, 1964, and the following was adopted on the recommendation of the Flying Committee, who have met several times this year to consider all suggestions and criticisms received by them. Council felt that the new scheme was based more on current flying record, provided for an interchange of pilots between Leagues, allowed fresh blood into League 2 and was more equitable to Team Pilots.

1. Each competition is taken at its original value, less the usual devaluing of 10% per annum. (Except in the case of a year with no Nationals, then the previous Nationals hold their value until there has been another, whereupon the scores are devalued 10% for each year past.)

Year	*Competition*	*Code*	*Value of original score NOW*
1963	Nationals League 1	ZD	100%
1962	Nationals League 1	V	90%
1961	Nationals League 1	E	81%
1963	Nationals League 2	ZE	80%
1962	Nationals League 2	W	72%
1963	Bicester	ZB	70%
1963	Norfolk	ZF	70%
1963	London	ZH	70%
1963	Northern	ZL	70%
1959	Nationals League 1	A	65%
1961	Nationals League 2	G	65%
1962	Lasham Spring	N	63%
1962	Norfolk Easter	O	63%
1962	Bicester	P	63%
1962	Midland Easter	Q	63%
1962	Dunkeswell	T	63%
1963	Dunkeswell	ZJ	60%
1961	Bicester	M	57%
1962	Northern	S	54%
1959	Nationals League 2	B	52%
1960	Perranporth	I	51%
1960	R.A.F. Inter-Command	K	51%
1960	Inter Services	C	51%
1960	Dunstable	D	51%
1963	Midland	ZA	50%
1963	East Midlands Spring	ZC	50%
1963	Scottish Gliding Union	ZG	50%
1963	R.A.F. Venlo	ZI	50%
1963	Bicester	ZK	50%
1961	Northern	H	49%
1962	Western	R	45%
1962	Bicester August	U	45%
1962	Geilenkirchen	X	45%
1960	Coventry	L	36%

2. A pilot's rating is obtained by taking an average of ALL his scores in the highest valued competition in which he has flown providing he has five or more scores (including zeros).
3. If he has less than five he must add to these ALL his scores of the next highest competition (or competitions if of equal value) until he has a minimum of five scores including zeros —however many these are.
4. If the same or a *later year's* scores achieved in competitions of lower

value to 2 above give a better figure, they may be used providing ALL are taken.

5. Irrespective of this new system, no pilot flying in League 1 in the 1963 Championships will drop more than one League, and additional places will be available in League 2 to ensure this.

Order	*Pilot*	*Rating*	*League in 1963*
1.	Scott, P. M.	922	1
2.	Williamson, J. S.	904	1
3.	Delafield, J.	880	1
4.	Stone, A. J.	870	1
5.	Goodhart, H. C. N.	863	–
6.	Spottiswood, J. D.	825	1
7.	Strachan, I. W.	820	1
8.	Piggott, A. D.	818	1
9.	Burton, G. E.	807	1
10.	Warminger, A. H.	788	1
11.	Deane-Drummond, A. J.	750	–
12.	Gough, A. W.	749	1
13.	Ince, D. H. G.	739	1
14.	Kearon, N. W.	731	1
15.	Dunn, R. A. E.	728	1
16.	Kahn, W. A. H.	721	1
17.	Stephenson, G. H.	712	1
18.	Jeffrey, C. A. P.	706	1
19.	Fairman, M. C.	703	1
20.	Burgess, P. G.	682	1
21.	Garrod, M. P.	678	2
22.	Jones, J. D.	673	1
23.	Burns, Anne	662	1
24.	James, D. B.	658	1
25.	Wills, P. A.	654	1
26.	Jefferson, J. B.	651	1
27.	Innes, D. F.	649	2
28.	Fielden, J. S.	644	1
29.	Ellis, C. A. P.	627	1
30.	Cretney, F. D.	626	–
31.	Carr, V. C.	617	2
32.	Carrow, D. D.	613	1
33.	Bentson, C. W.	609	1
34.	Aldridge, K. R.	591	2
35.	Davey, B. J.	588	2
36.	Findon, J. A.	576	2*
37.	Fitzroy, K. C.	572	2
38.	Mackworth Young, W. C.	570	1
39.	Mann, R. A. =)	566	1
	Smith, D. A. =)	566	1
41.	Dimock, H. R.	559	1
42.	Shephard, E. G.	550	1
43.	Camp, G. W.	546	–
44.	Jerzycki, E. B.	536	2
45.	Cunningham, D. J.	533	2*
46.	Irving, F. G. =)	526	1*
	Wills, C. =)	526	–
48.	Kerridge, D. C.	525	2*
49.	Coatesworth, G. A. =)	522	–
	Bird, M. =)	522	1
51.	Pennycuick, C. J.	518	2*
52.	Hanneman, P.	516	2
53.	Dawson, P.	514	2
54.	Hunt, M. S.	502	2*
55.	Sandford, R. A.	500	–
56.	Mettam, H. S.	499	2*
57.	Bacon, G. McA.	491	–
58.	Gregg, H. M.	478	–
59.	Riddell, D. M. R.	472	–
60.	Richardson, C. G.	467	–
61.	Jeffries, J. R.	466	2
62.	Neaves, R. A.	458	2*
63.	Zealley, T. S.	453	–
64.	Sheppard, F. W. L. =)	452	2*
	Bayley, J. L. =)	452	2
66.	Corbett, D. J.	448	–
67.	Rutherford, R.	444	–
68.	Purnell, A. D.	443	2*
69.	Green, C.	433	2
70.	Sutcliffe, A. O.	431	2*
71.	Collins, G. T.	428	2
72.	Doughty, A. W.	426	2
73.	Newholme, K.	424	–
74.	Evans, J. A. =)	420	2
	Thomas, B. =)	420	–
	Minton, P. =)	420	2
77.	Daniell, J. G. B.	418	–
78.	James, P. W.	413	–
79.	Hurst, C. R.	412	2*
80.	Stark, E. =)	408	1
	Costin, J. =)	408	–
82.	Morison, S. M.	406	2*
83.	Collier, P.	400	2*
84.	Waller, R. S.	394	–
85.	Dorman, C. G. =)	390	2*
	Snodgrass, D. C. =)	390	1
87.	Loveland, A. S.	388	–
88.	Tarnow, A. F. W.	385	–
89.	Dickson, R. D.	384	2
90.	Ware, E. T.	381	–
91.	Kaye, D. M.	373	–
92.	Pozerskis, P.	370	–
93.	Tonkyn, W. N.	365	1
94.	Redman, S.	362	–
95.	Goldney, L. P.	361	–
96.	Harwood, Rika =)	360	2*
	Meddings, E. J. =)	360	–
98.	Hands, J. M. =)	353	–
	Welsh, J. H. =)	353	–

Order	Pilot		Rating	League in 1963
100.	Alexander, A. L. L.	=	352	2*
	Gaze, F. A. O.	=	352	1
	Swift, R. B.	=	352	–
103.	Pick, R. C.		350	2*
104.	Lane, P.	=	344	–
	Martin, R.	=	344	–
106.	Browning, H.		342	–
107.	Goodhart, G. A. J.		333	–
108.	Philpot, P. R.		332	2*
109.	Riddell, J. C.		331	–
110.	Scallon, D. P.		328	2
111.	Kevan, P. D.		324	2
112.	Procter, R. G.		322	1*
113.	Willbie, R. T.		321	2
114.	Midwood, H. U.		315	2*
115.	Croshaw, J. G.		314	1
116.	Blake, K. W.		313	2
117.	Tanner, L. E. M.		312	–
118.	Whitfield, G. R.		311	2*
119.	Glennie, G. A.		310	2
120.	Chandler, J. T.		304	–
121.	Welch, L.		300	–
122.	Corrick, D. W.		294	2*
123.	Perrott, R. H.		290	2*
124.	Hill,		286	–
125.	Fisher, G. F.	=	283	2*
	Smith, E. F. R.	=	283	–
127.	Mead, S. B.		280	–
128.	Marshall, R.		275	–
129.	Caiger, M. T.		272	–
130.	Stothard, R. E.	=	270	–
	Goddard, D. G.	=	270	–
132.	St. Pierre, A. H. G.	=	267	–
	Tarver, R. I.	=	267	2*
134.	Greenaway, H. J.		265	–
135.	Berriman, P. E.		263	–
136.	MacDonald, A.		262	–
137.	Zotov, D.		258	–
138.	Watson, B. B. C.		254	2
139.	Somerville, A.	=	252	–
	Stafford Allen, R. C.	=	252	2
141.	Dodd, S. R.	=	248	–
	Smoker, J.	=	248	2*
143.	Everitt, J. C.		246	2*
144.	Eldridge, M. E.		239	–
145.	Hiscox, D. G. O.		237	–
146.	Inglesby, J. T.		236	–
147.	White, J. K.		233	–
148.	Pickles, A.		230	2
149.	Grime, P. V.		226	–
150.	Redshaw, L.		225	–
151.	Lee, G. H.		223	–
152.	Blackmore, J. H.	=	222	–
	Reilly, F. B.	=	222	–
154.	Evans, T. W.	=	212	2
	McMullin, T. A.	=	212	2
156.	Austin, D. C.		203	–
157.	Tweedy,		201	2*
158.	Adam, J.	=	198	–
	Stevenson, J. N.	=	198	–
160.	Trott, R.		195	–
161.	Barrell, G.		194	–
162.	Torode, J. E.		189	–
163.	Coulson, A.		188	–
164.	Kurylowicz, L.		184	2
165.	Seth-Smith, M. P.		182	–
166.	Paul, I.		176	1
167.	Brenner, J. B.		172	–
168.	Gee, M. I.	=	170	–
	Thompson, A.	=	170	–
170.	Harwood, J. E. G.		168	–
171.	Rondel, G.		166	–
172.	Holding, D. F.	=	164	–
	Morgan, C.	=	164	–
174.	Baynes, A. H.		162	–
175.	Reeves, E. E.		160	–
176.	Prince, J. T.		158	–
177.	Docherty, T. P.		153	–
178.	Wilkin, R.		145	–
179.	Newall, R. W. B.		142	–
180.	Foot, R.	=	140	–
	Head, S. B.	=	140	–
182.	Duthy James, C. D.		134	–
183.	Tarr, J.		122	–
184.	Roberts, D. W. H.		120	–
185.	Whittingham-Jones,		118	–
186.	Mitchells,		110	–
187.	Chubb, E. B.	=	107	–
	Parkinson, R. M. F.	=	107	–
189.	Lapham, A. J.	=	104	–
	Lastowski, B.	=	104	–
191.	Brown, K. R.	=	91	–
	Alty, D. G.	=	91	–
193.	Thorburn, A. J.		87	–
194.	Wass, G.		82	–
195.	Gildea, C.	=	76	–
	Schmidt, Anita	=	76	–
197.	O'Riley, K.		73	–
198.	Glover, L.	=	60	–
	Boyce, A. C.	=	60	–
200.	Rae, J.		58	–
201.	Gunter, B.		44	–
202.	Brett, M. E.		33	–
203.	Marpole, P.		30	–

KEY. * Team entry.
– Did not fly in last Nationals.

IMPORTANT

All pilots are requested to check their name and initials and let us have any corrections for future reference. [ED.]

GLIDING CERTIFICATES

DIAMOND FOR GOAL FLIGHT

No.	*Name*	*Club*	*Date*
2/59	H. U. Midwood	Derbyshire & Lancashire G.C.	12.4.63

GOLD C CERTIFICATE

No.	*Name*	*Club*	*Completed*
111	H. U. Midwood	Derbyshire & Lancashire G.C.	12.4.63

GOLD C DISTANCE LEGS

Name	*Club*	*Date*
G. Richards	Kent Gliding Club	12.4.63
H. U. Midwood	Derbyshire & Lancashire Gliding Club	12.4.63

GOLD C HEIGHT LEGS

Name	*Club*	*Date*
T. H. F. Delap	Laarbruch R.A.F. Gliding Club	4.8.63
D. J. Marpole	Fulmar R.N. Gliding Club	27.8.63
A. H. G. St. Pierre	Geilenkirchen R.A.F. Gliding Club	9.6.63
D. G. Alty	Fulmar R.N. Gliding Club	12.10.63
J. D. Paterson	Scottish Gliding Union	30.9.63
A. Sambale	Scottish Gliding Union	30.9.63
I. Hamilton	East Midlands R.A.F. Gliding Club	17.8.63
J. Allerton	Moonrakers R.A.F. Gliding Club	8.6.63
C. C. Ross	Scottish Gliding Union	3.2.63

SILVER C CERTIFICATES

No.	*Name*	*Club or School*	1963	*No.*	*Name*	*Club or School*	1963
1364	D. J. Dawson	Midland	8.9	1375	W. T. Bailey	Doncaster	8.9
1365	C. Christianson	Derbyshire and Lancashire	14.9	1376	A. G. Moore	Clevelands	13.10
1366	E. Reed	Yorkshire	26.6	1377	P. J. Salmon	Norfolk & Norwich	29.7
1367	R. Collis	Essex	27.9	1378	A. B. Jenner	Coventry	22.6
1368	G. Richards	Kent	12.4	1379	A. Sambale	Scottish	30.9
1369	J. D. Paterson	Scottish	30.9	1380	A. T. Letts	London	29.9
1370	J. O'Donell	661 G.S.	16.6	1381	N. G. Thomas	East Midlands R.A.F.	27.7
1371	K. Targ	Yorkshire	9.10	1382	M. J. Smith	E. Midlands	13.10
1372	R. W. Pearson	Yorkshire	13.7	1383	Mrs. J. S. Williamson	Moonrakers	19.10
1373	D. J. Marpole	Fulmar	27.8	1384	C. White	Yorkshire	11.10
1374	G. G. Jones	Windrushers	27.7				

C CERTIFICATES

Name	*Gliding Club or School*	*Name*	*Gliding Club or School*	*Name*	*Gliding Club or School*
G. J. Lloyd	Cornish	P. A. Taylor	Portsmouth Naval	I. Wilson	Cambridge
A. W. Jackson	Coventry	P. S. Rayner	635 G.S.	D. F. Munday	Laarbruch R.A.F.G.S.A. Centre
D. E. Morris	Nimbus	F. S. Webb	Coventry	Marquis of Headfort	Yorkshire
W. P. Shearer	Scottish	T. C. Martin	Northumbria	T. T. Capon	Devon & Somerset
W. J. MacIver	663 G.S.	E. G. Collins	Northants	J. K. Mortimer	
R. I. Vince	Swansea	R. E. Hazlehurst	635 G.S.		
D. M. Brown	631 G.S.				

C. S. G. Stanbury	Laarbruch	J. Martin	Fulmar	D. B. Patience	662 G.S.
A. M. Raffan	Fulmar	T. J. Swack	Fenland	G. G. Horler	Cornish
R. N. Eccles	Swindon	M. Ramsey	641 G.S.	A. R. Mitchell	Yorkshire
J. Wholey	Scottish	W. E. Malpas	Bristol	T. Dent	London
D. Hudspeth	641 G.S.	R. Wood	Doncaster	S. T. J. Hampson	Laarbruch
H. Dyce	Fulmar	M. H. Hampson	Laarbruch	I. E. Pickering	Bristol
D. R. Driver	No. 2 G.C.	L. P. Smith	Bristol	H. R. Cox	E. Midlands R.A.F.
W. A. G. Mackey	663 G.S.	R. R. Pierce	Midland		
A. W. Price	E. Midlands R.A.F.	J. J. Lemanski	621 G.S.	B. Hallam	625 G.S.
		H. M. Atkinson (Miss)	E. Midlands	G. F. Rowland	London
E. Higgins	661 G.S.			D. R. E. Calf	R.A.F.G.S.A. Centre
A. Prest	645 G.S.	G. A. Anderson	Aberdeen		
S. A. J. Morrison	Four Counties	D. B. Ramsden	641 G.S.	A. G. Stevens	Laarbruch
S. W. Garner	621 G.S.	I. L. Campbell (Miss)	Phoenix	I. D. Stevens (Miss)	Laarbruch
J. G. Pilkington	Yorkshire				
B. A. Pickers	E. Midlands R.A.F.	C. J. Dart	Bristol	R. A. Cullum	Moonrakers
		J. C. L. Bennett	Bristol	M. F. Madsen	631 G.S.
W. E. Thomas	616 G.S.			D. J. Whyte	Phoenix

B.G.A. Ball

Saturday, 21st March

HAVE you booked your place at the Ball yet? If not you are advised to do so as soon as possible as tickets, price 35s. each, are limited.

The Ball is being held in the Imperial College's magnificent new hall in Prince's Gardens, S.W.7, which was recently opened by Princess Margaret. The ticket price includes a four-course Dinner of almost banquet standard. Drinks at the table and bars will be reasonably priced.

Neil Marten, M.P., Parliamentary Secretary to the Ministry of Aviation, will be our Guest of Honour.

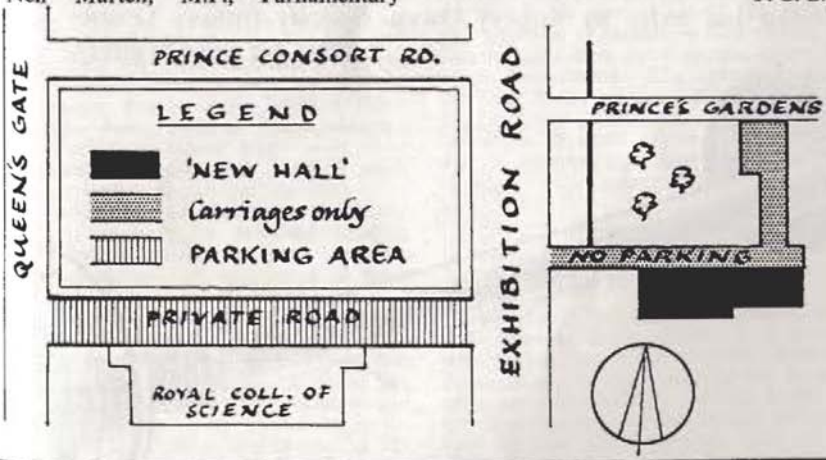
The Annual Awards will be presented.

For a complete change, music for dancing will be provided by the Russ Henderson Trio from Trinidad who will also be producing a Steel Band Cabaret.

Don't miss this annual get-together—get your ticket now from the B.G.A., Artillery Mansions, 75 Victoria Street, London, S.W.1, or from one of the ticket sellers in your club, and don't forget, cash with order please.

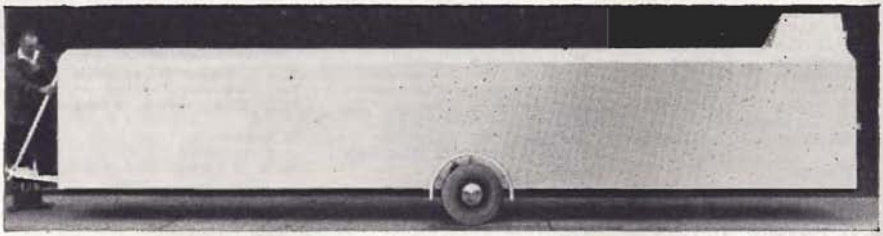
After the 16th March tickets, if still available, can only be had from Yvonne Bonham at FORest Hill 9390.

Y. C. B.



NORTHERN REGIONALS

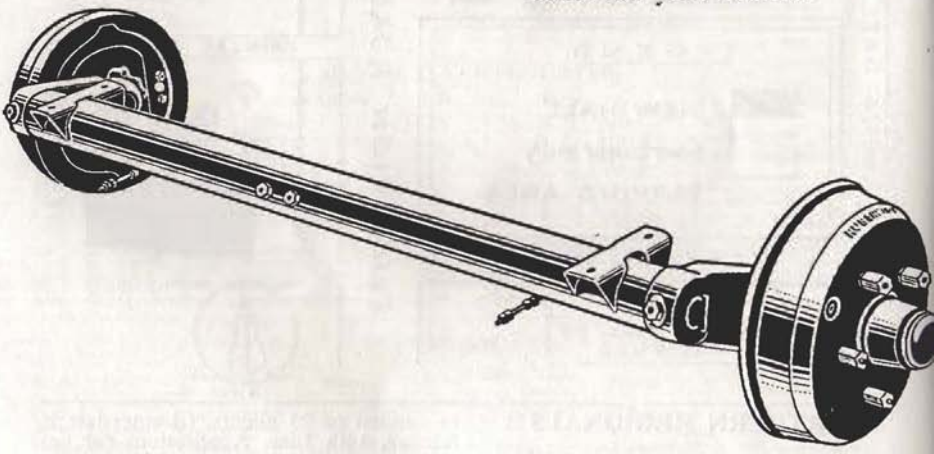
THE Northern Regional Competitions will be held at Camphill from 26th July to 3rd August inclusive. Entries will be limited to 25 gliders. Closing date is Sunday, 14th June. Applications for entry forms should be sent to Harry Midwood, Eathorpe Hall, Eathorpe, Warwickshire.



Rubery Owen Torsion bar axles were specified in the construction of the T.51 lightweight trailer

Rubery Owen would like to take this opportunity of congratulating Slingsby Sailplanes Limited on their return to the 15 metre class with this their latest sailplane.

For the new trailer specially designed to carry the T.51 Slingsby naturally choose the best suspension—independent torsion bar axles by Rubery Owen. Specify Rubery Owen axles for your trailer.



RUBERY, OWEN & CO. LTD., TRAILER EQUIPMENT DEPARTMENT, P.O. BOX 10, DARLASTON, WEDNESBURY, STAFFS.
TEL: JAMES BRIDGE 3131

"Science and Versatility"

Dr. Joachim P. Kuettner has been prominent in the realms of both gliding and meteorology ever since he reached 22,310 ft. in the "Moazagotl" wave in 1937 and in 1938 published the only pre-war meteorological thesis on soaring in lee waves. He was a test pilot during the war, and after it he emigrated to the United States, where he made some outstanding flights in the Bishop Wave in California, once reaching 43,000 ft. and once using the jet stream to cover over 600 km. across country. He also became chairman of the Scientific Section of the OSTIV. Now he has suddenly left a brilliant meterological career for a job in the American Space Administration, and the following extracts are from a speech he made to a gathering of meteorologists justifying his surprising action, published under the above title by *Astronautics and Aerospace Engineering.*

"Am I right in assuming that many of you have been struggling with the questions: 'Shall I stick to the field which is close to my heart, and which I am expert in, at the risk of falling behind? Or shall I try to keep up with the fast-moving front of research at the risk of appearing ignorant and inexperienced?' Of course, the first alternative is the more comfortable one because it does not require drastic action. But I think once you have decided that under no circumstances will you leave your snug den, you have provided yourself with the best definition of 'getting old'.

"The decision to move out is simply that of 'learning', a learning that is enormously facilitated by your accumulated knowledge and experience in your own profession . . .

"It seems to me that, in expanding one's field of endeavour, the difficulties are less and the rewards are more than expected. You may not achieve the Nobel Prize, as Crick and Wilkins did when they shifted from physics to medicine! But it is most impressive to experience how safely the laws of mathematics and physics lead you into any new field, how well the basic approach to scientific problems applies everywhere, how many misconcepts you have been living with, how gracious people are in helping you once you admit your ignorance freely, how good it feels to get slowly but surely hold of the new problems, and how enormously your horizon widens.

"I know of no better way to describe versatility than by the answer Von Braun gave when he offered me the job of getting a man into space, and I expressed doubts that I had enough experience. He said simply, 'Neither has anybody else'."

THERMAL-FINDING DEVICE

"A DEVICE developed at the Northrop Institute of Technology is intended to help the sailplane pilot by guiding him into a thermal if one is found. It consists of a bottle connected to atmosphere by way of a capillary tube, and also connected to a sensitive bellows. This assembly is fitted into the wing-tips of the glider. When the wing enters a thermal, the lower pressure in the warm air stream closes the bellows and operates a switch, which causes an automatic control to turn the glider towards the thermal. The system has not yet been tried out on a full-scale glider, but a seven-foot span model carrying miniature versions proved so successful that it disappeared from sight into the clouds."—*New Scientist.*

WHAT IS "CISAVIA"?

ALL Civil Servants are invited to a meeting from which, it is hoped, will spring the Civil Service Aviation Association, to foster and so far as possible provide facilities for all forms of sporting aviation for the benefit of members of the Civil Service, and to be affiliated to the Civil Service Sports Council. The meeting is at 5.30 p.m. on Wednesday, 5th February, 1964, in Room S.O.13, Ground Floor, 2 Sanctuary Buildings, Great Smith Street, Westminster.

New Zealand Wave Causes Aeroplane Crash

NEW ZEALAND'S worst air accident in that country's history happened on July 3rd, 1963, when a Douglas DC-3 of the National Airways Corporation crashed on the leeward (west) side of the Kaimai range at a point 20 miles west of Tauranga in North Island. This is well to the north of the Southern Alps and their geological prolongation into North Island, which produce the famous waves in a north-west wind; the Kaimai range goes up little more than 3,000 ft. at the highest, and the aeroplane is reported to have hit 1,600 ft. up the side of a 2,787-ft. mountain in a ravine.

It is of special interest to gliding people that Ralph Court, who was president of the New Zealand Gliding Association at the time, was called in to give his expert knowledge at the court of inquiry held in Wellington on October 9th, 1963, and he proved to be the chief meteorological witness. We have now received, through Philip Wills, a newspaper account of the inquiry, from which the following extracts are taken.

THE INQUIRY

"Mr. Court described strong lee air waves and wind in the Kaimai Ranges area. Even under fairly moderate conditions at some points the down-draught would be beyond the climbing capabilities of a DC-3, he said. Primary down-draughts were generally close to the mountain face. In the Thomsons Track area, near where the DC-3 crashed, air wave forms were disturbed because of the break in the range. Up-draughts and down-draughts were strongest in the Gordons quarry area.

"'For the last seven years glider pilots have been using these waves to climb to considerable altitudes in the general area between Matamata and Tauranga,' he said. 'In a west wind the maximum height reached was more than 30,000 feet and in an east wind a height of 10,000 ft. had been recorded.'

"He would expect conditions to be smooth in the down-draught close to the mountain, but extremely turbulent in the rotor area some distance from the mountain at the base of the primary wave.

"Mr. Court agreed that the likely explanation for the crash was that the DC-3 had been caught in the down-draught, which probably extended a mile out from the mountain face. The down-draught could have been smooth air, deceiving the pilot as to his rate of descent. He said he was certain a wave system and rotor were operating on the morning of the disaster.

"To Captain Allen (one of the two assessors), Mr. Court agreed that a heavily-laden aircraft could expect to be influenced by up-draughts and down-draughts up to double the height of a mountain it was flying over. He agreed it would be a useful guide to pilots to fly over mountains at twice their height.

"Captain Allen said he was once caught out while flying over Wellington at 12,000 ft. and could never find out at what height one should fly over a mountain to avoid the influence of the air currents surrounding it.

"'It is not yet known at what height a pilot should fly above mountainous country to be completely free of its air currents,' said Mr. Court.

"At the conclusion of Mr. Court's evidence, Sir Arthur Tyndall (president of the court) paid tribute to the way in which he had presented it."

EDITORIAL NOTE.—This newspaper account raises two points on which aeroplane pilots are often ill-informed through ignorance of what glider pilots have learned about air flow in mountainous districts.

Firstly is the fact that the air flow in a lee wave is often exceptionally smooth, both on the up-going and the down-going side. Yet many meteorologists persist in describing these waves as "turbulence" (which they are in a technical sense), with the result that pilots are given the impression that, so long as they don't feel any turbulence, they can't possibly be in trouble; whereas in fact they may be flying in a continuous down-current, parallel to the wave crest and to leeward of it, for miles and miles.

A particularly bad example was an Information Circular from the Ministry of Civil Aviation, No. 3 of 1953, about flying over mountains, which referred to "waves or large-scale eddies, or both, in which strong vertical currents and turbulence can occur". It said nothing about the smoothness, and although it mentioned that the effects of waves "may persist for many miles downwind", it failed to warn pilots about flying cross-wind; and instead of telling a pilot flying in such a persistent down-current to get out of it by simply changing course, the circular merely said: "it is not possible to frame precise rules for general application".

Comment on the New Zealand accident published in *The Aeroplane and Commercial Aviation News*, presumably from a correspondent in New Zealand, included the statement: "This 'roaring' wave produces extremely turbulent conditions over a wide area. These conditions were prevailing at the time of the accident and were combined with heavy continuous rain and a ceiling of 500-800 ft.." (There was no mention of rain or cloud in the newspaper report.) Extreme turbulence is characteristic of the rotor which, so far from covering "a wide area", is extremely localised; yet there was no mention of rotors in the M. of C.A. circular of 1953, though plenty was known even then about their nature and their position in relation to the mountain.

The second point is the widespread belief that there is no need to learn anything about "currents" around mountains if only some kind expert will tell the pilot how high he has to fly in order to be able to ignore them; in fact, the avowed object of the M. of C.A. circular was to warn pilots that the hitherto accepted "clearance" of 1,000 ft. above the mountain tops was now known to be inadequate.

The pilots who flew over Mount Everest in 1933 were similarly told how high above the peaks they should fly to avoid "currents", so they ruled a line on the map from their base to Everest and flew along it regardless. But, since they were unable to reach the prescribed height, they were suddenly pushed down 2,000 ft. in the lee of the South Col.

Another example is an article on "Mountain Flying" in the *Royal Aero Club Gazette* for April, 1962, where the author writes: "It is usually quite practicable to select a route between the peaks as long as you clear the ground you are near by a good margin to allow for down draughts." Nothing about keeping well away from any peaks to windward, and no indication of what is a "good margin".

Obituary

Tadeusz Proll

TEDDY, as he was affectionately known to very many gliding enthusiasts in Britain and abroad, has died at the age of 51, after a protracted illness.

Born in Poland, he achieved his ambition to become an aircraft engineer after specialising in this field at the Technical Training College of Lwow. Subsequently he joined the Polish Air Force, and in his spare time he formed the gliding club "Kruk", becoming both C.F.I. and ground engineer.

His already legendary talent was temporarily terminated with the invasion of his country, so he escaped and virtually walked across Europe wearing the black leather coat in which he has been a familiar sight on the often windswept slopes of the Long Mynd—a coat he treasured, as he reckoned it saved his life. After a sojourn in Split, where the friendly Slavs sheltered him, he made his way to France and joined their Air Force only to have to repeat the exercise. After a hair-raising episode on the Spanish frontier, as a result of which he formed a new view on neutrality, he escaped by ship to Britain and joined not only his third Air Force but what was to become a new life.

He served the Royal Air Force until 1946, and was finally stationed at Shawbury, by now in company with his wife, also Polish (and also a pilot), whom he had succeeded in extricating from the Russian zone of Berlin.

But with peace time came the urge for a return to civilian life and his pre-war profession. However, to return to Poland was not practical, so instead, in his usual resourceful manner, he armed himself with his Polish credentials, departed to the nearest gliding club and asked the first person he saw for a job.

So began the happy association with the Midland Gliding Club over a period of 17 years during which time he has kept us flying, never acknowledging defeat in spite of the inevitable surfeit of work at times, and in spite of some very rugged weather. With his cheerful disposition he refused to acknowledge "write-offs"; he merely re-built them. But he was his own greatest critic, and I remember how profoundly he was impressed by the speed with which some of his own pre-war colleagues repaired a "write-off" at Leszno, without jigs, "over-night". This was during the 1958 International competitions when, in company with Lt.-Col. Geoff Benson, he crewed for Eric Burditt, the Southern Rhodesian competitor; he also acted as interpreter.

So shall we remember him, a happy shining personality; maybe most of all when we stack the sailplanes away in the evening we shall remember his reproving "Gentlemen!" I think he sometimes swore at us in Polish.

We all extend our heartfelt sympathies to his wife and daughter.

ARTHUR SHEFFIELD.

NOTE.—The circumstances of Mr. Proll's life rendered him unable to provide adequately for his family, so his Club is appealing for funds. Donations to R. N. Thwaite, c/o Lloyds Bank, 23 The Square, Kenilworth, Warks.

Jeremy Brock

JEREMY BROCK was killed as a result of an aero-towing accident on New Year's Day, 1964. He was just 32 years of age.

Jerry had been appointed Manager and Resident Flying Instructor to the London Gliding Club at Dunstable in mid-December. On the fateful day, he had utilised his "day-off" by visiting his old club at Lasham and had immediately offered to carry out some aero-tows.

He was a wonderful character, full of life, vital, hard-working and utterly devoted to flying. From his earliest years he had wanted to join the R.A.F. as a pilot, although this was not to be, as his eyesight was slightly below the R.A.F. standard. It was on my suggestion that he took to gliding and soon proved himself a natural pilot. He gained his Silver C No. 549 in 1956 after a remarkably short time and was soon to be seen joyriding the T-21.

The day he flew his first pupil he decided that his family tobacco business would lose him to gliding and soon after he joined the staff at Lasham as an instructor. Jerry will be remembered by the many pupils he taught who found in him a sympathetic highly competent instructor for whom nothing was ever too much trouble. He will be remembered by those who took part in the National Championships as the best tug manager we have ever seen. Jerry and David Lowe ran the tugging like a circus act with split-second timing. He will be remembered by his very many friends, both in and out of gliding, as someone who was always cheerful, ever ready to lend a hand and completely dedicated to flying.

He had many skills — an expert rally driver, an underwater diver, a competent wood-worker. He is a friend who will be sadly missed. They say that it is not when you die, but what you do before you die that counts. Jeremy Brock did and gave a great deal. W. K.

Dr. G. A. M. Heydon

I HAVE just received news that on 27th April last, Doc Heydon died in Sydney, at the age of 81 years.

Doc Heydon was a very grand old man indeed—old only in body, never in spirit. I last met him in Sydney about three years ago, when he arranged a small party of gliding folk in his Club, and he was as wise, as racy, as dynamic as ever.

He served in World War I, in the Australian Army Medical Corps, and subsequently did wonderful work in New Guinea and elsewhere in the field of tropical disease and parasitology. He learnt to fly in 1935, owning a series of light aeroplanes, and in 1936 got bitten by the gliding bug—parasitology in reverse. He joined the University Gliding Club, did the first aero-tow, and in 1939 imported a Slingsby Gull, and opened the Australian skies for advanced soaring: he was founder and benefactor of the Sydney Soaring Club and of the Gliding Federation of Australia.

Only by talking to his friends could one discover his immense kindnesses and generosity. Lame ducks were especially inverted so that he could help them over stiles. Troubles taken to him were as good as ameliorated with his wise and friendly advice. To have known him was a privilege.

Occasionally one meets a man who gives one hope for the human race. Doc Heydon was one such man.

P. A. W.

BOOK REVIEW

John Goes Gliding, by MRS. ANN WELCH. Published by Jonathan Cape, London. Price 15s. (Also obtainable from B.G.A. at 15s. plus 1s. 3d.)

IN the past, when friends have asked what gliding is really like, I have given them a copy of Philip Wills's book *On Being a Bird* to read. When friends' young children asked me the same question, I found that there was no really satisfactory book for them and I had therefore to explain the sport to them myself. Now at last someone has written that book and in future I shall know what to do.

In *John Goes Gliding*, Ann Welch does manage to get across the feeling of gliding extremely well. It is in my opinion the perfect book for 9-14 year-olds and will surely inspire her readers to become the glider pilots of tomorrow.

The book tells the story of a 15-year-old schoolboy who joins a gliding club. It is a small friendly club with a very hard-working Instructor and we follow John through his training to the solo stage. There are numerous incidents on the way, a real live villain who lands a Swallow in the trees and a daring rescue which proves that every coastguard station should be equipped with at least one T.21. A short paragraph describing a rather nasty cloud made my hair stand on end but will I am sure delight her young readers. By the end of the book our hero has not only learnt to fly but has also become a very useful and willing club member.

This is really a most useful book. The author has managed to get her story across very well and will I am sure bring us many glider pilots in the future. The vital message that gliding is a team sport as well as individual is brought home to the reader. Do buy this book for your children or young friends and make certain that every children's library has a copy.

W. K.

CORRESPONDENCE

THOSE TEN FEET

Dear Sir,

In the December issue of SAILPLANE AND GLIDING (p. 429) I notice that there is an indirect reference to myself as "the famed aerodynamicist". Whilst there may be some truth in some part of that description, I think it is only fair to warn those of your readers who are not engaged in the profession of aeronautics that an aerodynamicist has been described as a man who assumes everything except responsibility. Having cleared up that point, I would like, if I may, to clarify somewhat the statement that it is possible to "improve any basic design by about 15 per cent".

Firstly, I would re-emphasise the point made in Mike Bird's report that the improvement refers to "any basic design". By this I mean that, in comparing 15-metre and 18-metre gliders, the general design standard must be equivalent for the two types. A good 15-metre is undoubtedly better than a bad 18-metre; but if one compares 15 and 18 metre gliders having the same degree of refinement and skill in design, then the 18-metre machine will prove superior to the 15-metre machine.

To try and put this numerically, I think the best criterion is the achieved average cross-country air speed.

The table given below compares these cross-country speeds for four different kinds of thermal: the thermals have maximum vertical velocities of 10 ft. per second and 5 ft. per second, and it is assumed that with each vertical velocity the radius of the thermal may be either 1,000 ft. or 500 ft. The last line in the table is the ratio of the cross-country speed of the 18-metre glider to that of the 15-metre machine.

Comparison of Cross-Country Speeds

Maximum thermal strength, f/s.	10	10	5	5
Maximum radius of thermal, ft.	1,000	500	1,000	500
15-m. Sailplane, cross-country speed, m.p.h.	39	32	18	6
18-m. Sailplane, cross-country speed, m.p.h.	44	40	24	16
Cross-Country Speed of 18-m. Sailplane divided by Cross-Country Speed of 15-m. Sailplane	1.12	1.25	1.34	2.65

The results show that for most practical types of thermal the cruising speed improvement with the larger machine is between 10 per cent and 35 per cent of that of the Standard Class sailplane. In very weak thermals the improvement due to the greater span is very much larger.

The basic reason for this improvement is that with the bigger machine the pilot and equipment, and the fuselage necessary to house him, is a smaller proportion of the total aircraft; thus with the bigger machine the penalty in weight and drag due to the useful (if one can so describe the pilot) load is relatively smaller, hence the better performance.

Harpenden, Herts. GODFREY LEE, F.A.*

* Famed Aerodynamicist (perhaps).

WHOSE SISU ? — PERFORMANCE OF BG-12

Dear Sir,

In looking through some of your back issues, I noticed a rather interesting picture on the bottom of page 51 of the February, 1962, issue. It shows a Sisu wing being subjected to the usual indignities. The line-up on the wing looks rather more like natives of Arlington, Texas, than of Northern Rhodesia. In particular the round-faced one next to the far end looks like our National Champion Practical Joker, George Coder. He flew the prototype Sisu to 7th place in the 1960 Nationals, and should be familiar to your Chairman. Suffice it to say you have been victimised (unless, of course, the Kitwie people were over-visiting).

In your October, 1963, issue is a short article by John Firth. Aside from his doubts on our ability to build a riggable sailplane (we can let the Italians fend for themselves), I enjoyed his thoughts very much. He mentions the BG-12 as being heavy, fast and flapped, and difficult to land. As I built and am part-owner of one of these very fine sailplanes, I feel that this description is a bit inaccurate.

The BG-12 is a 50 ft. span single-seater built entirely of plywood. The ribs, bulkheads and skins are all cut from sheet ply. It was designed by Gus Briegleb, one of our soaring pioneers, and is intended to combine simplicity of building with contest performance. Its performance is very good. In a recent comparison glide test it was superior to a Zugvogel 3 at all speeds (you may be receiving results of this shortly).

In an issue a few years back the BG-12 was described as looking like "a cross between a Schweizer and a Skylark". As you can see from the cover of the latest *Soaring*, this does not quite fit.

My particular ship has put in nearly 400 hours in two years, including helping Jack Arkovich become the world's youngest Three-Diamond pilot (any Three-Diamond pilots under 20?). As to being heavy and hard to land, mine flies at 5.25 lb./sq. ft. and lands quite docilely.

Glendale, California. GORDON WHEELER.

SAILPLANE FLIGHTS INTO FRANCE

Dear Sir,

I have been surprised to read in the December issue of SAILPLANE AND GLIDING that a Dutch pilot, D. W. Zondag, in a 300-km. flight, "was forced to remain within the boundaries of Belgium by some new French customs regulation, which stated that every glider pilot landing in France without prior permission would be fined

£50 for illegal frontier crossing".

I can certify that there is not any such law in our country. The case of the fine (which was only £7) happened once, three years ago, to a Dutch pilot (I have forgotten his name) who landed in the north of France without the proper aircraft documents, and was apparently unable to explain clearly his situation to the policemen and customs officers (who, unfortunately, happened to be slightly more narrow-minded and suspicious than average . . .). Incidentally, the fine was refunded later to the unlucky Dutchman by a subscription opened among French glider pilots.

Many other pilots have landed in France without prior notice in the last years, coming from Belgium, Germany—and even Holland; and I have never heard of any other "costly" misunderstanding with the Customs. The only requirement for the pilot is to hold a national identity card or passport, and the registration book of his sailplane.

May I now wish to Mr. Zondag, for the New Year, a successful 500-km. flight straight to the south?

"Air et Cosmos", Paris. MICHEL BATTAREL.

INVITATION TO FLY THE BLANIK

Dear Sir,

Whilst reading the December issue of SAILPLANE AND GLIDING we noticed a report on the International Instructors' Course at Varese, and the disappointment of being unable to fly the Blanik Sailplane owing to its non-arrival.

As we now have a demonstrator here at Oxford, we would be very happy to offer the pilots who undertook this trip the opportunity of flying this sailplane so that they may compare the Blanik with other two-seaters that were available to them.

Peter S. Clifford & Co. Ltd., D. E. HAYWARD,
Oxford Airport, Kidlington. *Director.*

DESIGN OF WORLD-BEATING GLIDERS

Dear Sir,

In your October issue, Peter Scott complains that current airworthiness certification does not distinguish between gliders flown by, in effect, very experienced and rather inexperienced pilots, and wants a pilot competence factor built into the certification procedure. He goes on to suggest that easing such things as stability and airbrake requirements would allow designers to increase wing loadings and to use flaps to improve flexibility of performance.

First, the B.G.A. Technical Committee does, when assessing handling characteristics of a new type, take into account the probable experience and competence of the pilots likely to be flying it. This affects, for example, such things as stalling and general low-speed behaviour—we try to interpret the spirit of those requirements which are expressed in qualitative terms in the light of the above factors. This process, however, cannot be taken too far without safety standards being impaired. To go appreciably further than is done at present would necessitate being able to specify in some way on the C. of A. a minimum standard of pilotage. It may be that this will have to come, but we prefer to avoid it, as effectively it means a licensing system. A further argument is that today's high-performance ship tends to become tomorrow's hack for the less experienced pilots, and undue differentiation would hinder this process—a result that is undesirable commercially quite apart from considerations of safety.

Secondly, it is in competition aircraft above all that an adequate level of stability is essential. One has only to imagine half a dozen or more sailplanes crowding into one rough old thermal—nowadays the usual rather than the unusual —to realise that good handling is second only to good look-out. However, I see no reason why a first-class performance should not be available with adequate flying qualities. Our designers are learning all the time and it is no longer necessary,

for instance, to employ large amounts of wing twist to prevent a machine from being lethal.

Thirdly, if higher wing loadings are wanted to take advantage of the stronger thermals, then why not have them, and use flaps if necessary to retain launching and landing performance? These things can be done within the existing airworthiness framework. Such aircraft will be more expensive to design, to make and to test, and pilots will have to be prepared to use any extra complication responsibly —not to loop or to go into cu-nimb with the flaps half-out unless the machine is designed for it, for instance—but so long as all this is accepted go ahead by all means.

CEDRIC VERNON,
Technical Committee, British Gliding Association.

THAT WORD

Dear Sir,

My dictionary (The Shorter Oxford) defines "Sophisticated" as "Altered from, deprived of, primitive simplicity or naturalness". This use has been current since 1603 and is, I suggest, the sense in which it has recently and correctly been applied to advanced glider designs.

Godfrey Harwood's dictionary gives another sense which is, of course, correct, but his allegation of misuse I cannot allow to pass unchallenged.

Birstall, Leicester. CHRISTOPHER SIMPSON.

Dear Sir,

I have tried applying Mr. Harwood's quoted definitions of the word "sophisticated" to the examples of current usage which I have come across since reading his letter, both in the gliding press and our more sophisticated national journals, and am prompted to suggest that he is defending the English of a Queen who has been, proverbially, a long time dead.

The flexibility of our language has admitted the word to everyday use with a sense apparently deriving more directly from the ultimate source in a Greek word for wise, with the emphasis on gain of experience rather than loss of innocence and having nothing to do with perversion by fallacious reasoning. (Were the early glider pilots sophisticated when they were misled by the meteorologists to believe that thermal soaring was impracticable?) A sophisticated design I would understand, without too much semantic stress, to be one reflecting maturity of experience in the designer: unless, of course, the writer in light-hearted anthropomorphic vein simply means that the thing has rather a naughty look.

Edinburgh. R. E. PEARS.

GLIDING SITES IN

Club	*Name of Site*	*Tel. No.*	*Position*	*Height ft. a.s.l.*	*Lat. and Long.*
ABERDEEN	North Litterty	—	4 m. N.E. of Turriff	560	57.34 N. 02.22 W.
AVRO	Woodford	Bramhall 1291	5 m. N. Macclesfield	300	53.20 N. 02.09 W.
BATH	Keevil Aerodrome	—	4 m. S.S.E. Melksham	200	51.19 N. 02.08 W.
B.E.A. SILVER WING	R.A.F. Booker	H. Wycombe 6053	3 m. S.W. High Wycombe	520	51.37 N. 00.48 W.
BLACKPOOL & FYLDE	Squires Gate	Blackpool 41526	S. boundary of Blackpool	34	53.46 N. 03.02 W.
BLACKPOOL & FYLDE	Salmesbury Aerodrome	—	Between Preston & Blackburn	250	52.45 N. 02.35 W.
BRISTOL	Nympsfield	Uley 342	3½ m. S.W. Stroud	700	51.43 N. 02.17 W.
CAMBRIDGE UNIVERSITY	Cambridge Airport	Cambridge 56291	3 m. N.E. City Centre	50	52.12 N. 00.11 E.
COLLEGE OF AERONAUTICS	Cranfield	Cranfield 212	8 m. S.W. Bedford	360	52.04 N. 00.37 W.
CORNISH	Perranporth Aerodrome	Perranporth 2124	¾ m. S.W. of Town	320	50.20 N. 05.11 W.
COVENTRY	Baginton Aerodrome	Toll Bar 3377	3 m. S.S.E. Coventry	270	52.22 N. 01.29 W.
COVENTRY	Husbands Bosworth Aerodrome	—	20 m. E. Coventry	505	52.26 N. 01.02 W.
DERBYSHIRE & LANCASHIRE	Camphill	Tideswell 207	8 m. N.E. Buxton	1,350	53.18 N. 01.43 W.
DEVON & SOMERSET	Dunkeswell Aerodrome	—	5 m. N. Honiton	800	50.52 N. 03.14 W.
DONCASTER & DISTRICT	Doncaster Aerodrome	Doncaster 56066	1½ m. S. of Town	20	53.30 N. 01.10 W.
DORSET	Gallows Hill	—	5 m. W. of Wareham	240	50.42 N. 02.13 W.
DUMFRIES & DISTRICT	Tinwald Downs Aerodrome	—	3 m. E.N.E. Dumfries	50	55.05 N. 03.03 W.
EAST MIDLANDS	Rearsby Aerodrome	Ospathorpe 260	8 m. N.E. Leicester	220	52.43 N. 01.02 W.
ESSEX	North Weald Aerodrome	North Weald 222	2½ m. N.E. Epping	329	51.44 N. 00.20 E.
GLASGOW & WEST OF SCOTLAND	Balgair Moor	—	16 m. N. Glasgow	600	56.06 N. 04.14 W.
HALIFAX	Ringstone Edge	—	5 m. S.W. Halifax	1,050	53.40 N. 01.56 W.
HANDLEY PAGE	Radlett Aerodrome	Park Street 2266	2 m. S. St. Albans	260	51.41 N. 00.11 W.
KENT	Challock	Challock 307	5 m. N.N.W. Ashford	625	51.12 N. 00.51 E.
LAKES	Tebay Ghyll	Orton 280	15 m. S. Penrith	1,000	54.27 N. 02.35 W.
LAKES	Walney Island Aerodrome	—	25 m. S.W. Kendal	10	
LASHAM GLIDING SOCIETY; ARMY; BOY SCOUTS; CROWN AGENTS; IMPERIAL COLLEGE; LEIGHTON PARK SCHOOL; POLISH A.F.A.; SURREY UNIVERSITY COLL., LONDON	Lasham Aerodrome	Herriard 270	Between Alton and Basingstoke	600	51.11 N. 01.02 W.
LONDON	Dunstable Downs	Dunstable 63419	2 m. S.W. Dunstable	500	51.52 N. 00.32 W.

THE UNITED KINGDOM

Description	*Aero-tows*	*Service or Civil*	*Days operating*	*Slopes*
2 grass runways and heather	No	Civil	Weekends	None
Used for testing	—	Civil	Weekends	None
R.A.F. satellite aerodrome runways no power flying	No	R.A.F. Satellite	Weekends	None
R.A.F. active aerodrome	Yes	Civil	Weekends & some weekdays	None
4-runway aerodrome, other aircraft	Yes	Civil	Weekends, Thursday evenings	
3-runway aerodrome	No	Civil	Sundays, also many Sats.; Spring & Summer only	
Grass strip, N.E.-S.W. on hill top, N. and W. slopes, Cotswolds	Yes	Civil	Every day	W., N.N.W.
Grass aerodrome, one runway; heavy powered traffic	Yes	Civil	Weekends, Summer weekdays	None
Runway aerodrome, training flying	Yes	Civil	Weekends	None
3 runways; plateau on top of cliffs	Yes	Civil	Winter, weekends; Summer, weekdays	W & N.N.W.
Coventry City airport	Yes	Civil	Weekends	None
Two partial concrete runways and grass	Yes	Civil	Not yet operating	None
Grass strip N.S.	No	Civil	Weekends, Summer weekdays	W. & S.
Disused aerodrome	Yes	Civil	Winter, weekends; Summer, weekdays	S., S.W. & W.
Grass aerodrome	No	Civil	Weekdays, evenings, most days summer	None
Grass and heath	No	Civil	Weekends	None
Runways	No	Civil	Weekends	
Grass	Yes	Civil	Weekends, public holidays	None
R.A.F. emergency aerodrome	No	Civil	Weekends	None
Moorland	No	Civil	Weekends	
Smooth moorland	No	Civil	Weekends	S.W. to N.W.
Firm's aerodrome, runways	No	Civil	Weekends	None
Grass	Occasional	Civil	Weekends, courses on weekdays	
Hillside Moorland	No	Civil	Weekends	S.S.W.
Aerodrome with runways	Yes	Civil	Winter only	None
3 runways, some aeroplanes, land on grass	Yes	Civil	Every day	None
Undulating grass field at foot of Downs. W. slope.	Yes	Civil	Every day	W.&S.W. N.W. to S.W.

MIDLAND	Long Mynd	Linley 206	4 m. S.W. Church Stretton	1,500	52.31 N. 02.53 W.
NEWCASTLE	Carlton Moor	—	10 m. S. Middlesborough	1,200	54.25 N. 01.12 W.
NORFOLK	Tibenham Aerodrome	Tivershall 207	15 m. S.W. Norwich	186	52.28 N. 01.05 E.
NORTHAMPTONSHIRE	Podington Aerodrome	Sharnbrook 474	5 m. S.E. Wellingborough	330	52.13 N. 00.36 W.
NORTHUMBRIA	Currock Hill	—	Nr. Hedley-on-the-Hill	800	54.56 N. 01.50 W.
OUSE	Rufforth Aerodrome	York 77133	4 m. W. York	65	53.57 N. 01.11 W.
OXFORD	Weston on the Green Aerodrome	—	7 m. N. Oxford	260	51.53 N. 01.14 W.
PERKINS SPORTS ASSOCIATION	Westwood Aerodrome	—	W. of Peterborough	34	52.35 N. 00.17 W.
ROYAL AIRCRAFT ESTABLISHMENT	R.A.E., Farnborough	Aldershot 24461	Farnborough	233	51.16 N. 00.46 W.
SCOTTISH GLIDING UNION	Portmoak	Scotlandwell 43	1 m. S.E. Loch Leven	360	56.12 N. 03.20 W.
SHORTS, N. IRELAND	Newtonards Airfield	—	3 m. W. Lisburn, Co. Antrim	330	54.31 N. 06.11 W.
SOUTHDOWN	Bo-peep, Firle	—	4 m. N.E. Newhaven	500	50.50 N. 00.07 E.
SOUTH WALES	Mynyod Mayo	—	3 m. E. Caerphilly	1,056	51.35 N. 03.15 W.
STAFFORDSHIRE	Meir Airport	—	Nr. Longton, Staffs.	620	52.58 N. 02.06 W.
SWANSEA	Fairwood Airport	Swansea 24063	Nr. Swansea	301	51.38 N. 04.05 W.
SWINDON	South Marston Aerodrome	Stratton St. Margaret 3391	Nr. Swindon	360	54.35 N. 01.45 W.
WEST WALES	Withybush Aerodrome	—	2 m. N. by E. Haverfordwest	250	51.45 N. 04.45 W.
YORKSHIRE	Sutton Bank	Sutton Thirsk 237	5 m. E. Thirsk	920	54.15 N. 01.13 W.

ROYAL NAVAL GLIDING AND SOARING ASSOCIATION CLUBS

Every one of these is based on an R.N.A. Station. All operate at weekends, and aero-tows are laid on at Fulmar and Heron.

Club	*Name of Site*	*Tel. No.*	*Position*	*Lat. and Long.*
CONDOR	R.N.A.S. Arbroath	Arbroath 2201	2 m. N.W. Arbroath	56.35 N. 02.37 W.
FULMAR	R.N.A.S. Milltown	Lossiemouth 2121 Extn. 250	3½ m. N.E. Elgin	57.41 N. 03.14 W.
HERON	R.N.A.S. Yeovilton	Ilchester 333	4½ m. N. Yeovil	51.02 N. 02.38 W.
PORTSMOUTH	Lee-on-Solent Aerodrome	Lee-on-Solent 79143, Extn. 113	3 m. Gosport	50.49 N. 01.12 W.

ROYAL AIR FORCE GLIDING & SOARING ASSOCIATION CLUBS

Every one of these is based on an R.A.F. Station. All operate at weekends, and aero-tows are laid on.

Club	*Name of Site*	*Tel. No.*	*Position*	*Lat. and Long.*
BANNERDOWN	R.A.F. Colerne	Hawthorn 283	7 m. W. Chippenham	51.26 N. 02.14 W.
CHEVIOTS	R.A.F. Acklington	Red Row 261, Extn. 118	19 m. N. Newcastle	55.19 N. 01.39 W.

UNITED KINGDOM (contd.)

Heather-covered hill top	Yes	Civil	Every day	W. & E.
Heather	No	Civil	Weekends	N.W. & N.E.
Runway aerodrome	No	Civil	Weekends	None
Grass airfield, light aircraft	No	Civil	Weekends	None
Site of old drift mine	No	Civil	Weekends	None
3 runways, grass strips each side	No	Civil	Weekends	None
Runways and grass, R.A.F. dropping zone	No	Civil	Weekends, public holidays	None
Two grass runways	No	Works	Weekends	None
Large aerodrome	Yes	Works	Weekends, summer evenings	None
2 grass strips, N.W.-S.E., W.-E.	No	Civil	Weekends, some weekdays	W., N. & S.
Active airfield	Yes	Civil	Weekends	None
Grass field on hill top, N. and N.E. slopes.	No	Civil	Weekends, public holidays	N. & N.E.
Rough mountain grass	No	Civil	Weekends	S.W., W.N.W. & E.
———	No	Civil	Weekends	None
Active airport	Yes	Civil	Weekends, Weds. evenings in summer	
Active aerodrome, test flying	Yes	Civil	Weekends	None
3 runways	Yes	Civil	Weekends and Wednesdays	
Unpaved runways on heather moor, grass strip. W. and S.	Yes	Civil	Weekends, most days in Summer	S., S.W., W. & N.W.

ROYAL AIR FORCE GLIDING & SOARING ASSOCIATION CLUBS (contd.)

CHILTERNS	R.A.F. Benson	Wallingford 2292	3 m. E.N.E. Wallingford	51.37 N. 01.05 W.
CLEVELANDS	R.A.F. Leeming	Northallerton 440	Nr. Northallerton	54.20 N. 01.30 W.
EAST ANGLIAN	R.A.F. Waterbeach	Waterbeach 301	6 m. N.E. Cambridge	52.17 N. 00.11 E.
EAST MIDLANDS	R.A.F. Swinderby	Swinderby 241	7 m. S.W. Lincoln	53.09 N. 00.41 W.
FENLAND	R.A.F. Swanton Morley	Swanton Morley 261	15 m. W. Norwich	52.43 N. 00.58 E.
FOUR COUNTIES	R.A.F. Wittering	Grantham 850	1 m. E. Grantham	52.54 N. 00.36 W.
MENDIP	R.A.F. Locking	—	1½ m. E. by S. Weston-super-Mare	51.20 N. 02.56 W.
MOONRAKERS	R.A.F. Upavon	Upavon 7	8 m. N. Amesbury	51.18 N. 01.47 W.
R.A.F. G. & S. CENTRE	R.A.F. Bicester	Bicester 501, Extn. 36	1½ m. N.N.E. Bicester	51.55 N. 01.08 W.
RED HAND	R.A.F. Ballykelly	Limavady 2201, Extn. 210	15 m. E. Londonderry	55.03 N. 07.01 W.
SUFFOLK	R.A.F. Wattisham	Needham Mkt. 234	5 m. S.W. Stowmarket	52.08 N. 01.25 E.
WHITE ROSE	R.A.F. Rufforth	York 77133	4 m. W. York	53.57 N. 01.11 W.

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PUBLICATIONS

"AUSTRALIAN GLIDING"—monthly journal of the Gliding Federation of Australia. Editor, Peter Killmier. Subscription 30 shillings Australian, 24 shillings Sterling or 3.50 dollars U.S. and Canada. Write for free sample copy, "Australian Gliding", Box 1650M, G.P.O., Adelaide.

"MODEL AIRCRAFT"—Official Journal of the Society of Model Aeronautical Engineers. Features contest-winning model designs, constructional articles, photographs and reports of international and national contests. 1/6 monthly from any newsagent. Send for specimen copy free from "Model Aircraft", 19-20 Noel Street, London, W.1.

SLOPE SOARING with a radio control model sailplane is a fascinating pastime and a typical phase of aeromodelling. Read about this and other aeromodelling subjects in *Aeromodeller*, the world's leading model magazine, published monthly, price 2/-. *Model Aeronautical Press Ltd.*, 38 Clarendon Road, Watford, Herts.

"SOARING" — Official organ of the Soaring Society of America. Edited by Lloyd M. Licher. Obtainable from Soaring Society of America, Inc., Box 66071, Los Angeles 66, California. Subscription $4.00 in North America and $5.00 elsewhere; apply to your Post Office for a form.

FOR SALE

FLYING SUITS R.A.F. Grey, Chest 33" to 36", Height 5' 4" to 5' 7", 45/-, postage extra, money back guarantee. V. G. Aircraft Ltd., Tring Road, Dunstable, Beds.

FOR gliding week-ends and trailer towing Austin A2 motor caravan will sleep two adults and two children. Smart two-tone blue white. Only 17,000 miles. Bargain £500. Rowe, Bridgetown, Stratford-on-Avon.

G.B. IIB with canopy, dive brakes, all instruments, recent 10 year inspection carried out. Aero-towed to your site (comprehensive cover until June), U.K. only. Price £325. Box No. 161.

FOR SALE (contd.)

J.S.W. CALCULATORS for SKYLARKS and OLYMPIAS at 15s. Others specially made for 25s. Orders and enquiries now, please, well before the soaring season. Box 164.

KITE 1. Excellent condition. With basic instruments and trailer. £350 o.n.o. I. R. Taylor, 17 Palmerston Ave., Newcastle-upon-Tyne, 6.

KITE 1. Rebuilt 1961, excellent condition. Full instruments, PZL, Parachute, C. of A., Trailer. £300. Knowlman, Foxdown, Wellington, Somerset.

KRANICH for sale. Has recently passed B.G.A. glued joint inspection. Fully instrumented. A very soarable 2-seater. Can be delivered to Manchester area or any point North by arrangement. Price £400. Whitehead, 136 Union Street, Aberdeen.

OLYMPIA; citron/white, upholstered cockpit, full panel. Good condition, one syndicate from new. With trailer, two-man rigging gear. £750 or offer. Midwood, Eathorpe Hall, Eathorpe, Warwicks.

OLYMPIA 2, basic instruments, trailer, current C. of A. respray, excellent condition, £775 or nearest (May, 36 Cranfield Grove, Yardley, Birmingham, STE 3956).

OLYMPIA 2 with basic instruments £575. Enclosed trailer £200. Will haggle. Box 162.

PARACHUTES. Seat or back type, complete with pack, harness and quick-release mechanism. £10 plus 5/- carr. Ex-R.A.F. surplus, sent on approval against remittance. THOS. FOULKES (SG), Lansdowne Road, London, E.11. Tel. LEYtonstone 5084.

SKYLARK TRAILER, professionally built February, 1963. Marine-grade ply, Rubery-Owen axle, fully fitted for Skylark 4 (suit other gliders) — condition as new. £275. D. C. Snodgrass, J14 Marine Gate, Brighton 7.

SKYLARK 3 in excellent condition. British built, with A.R.B. certificate. No Import Duty. £1,150 o.n.on., C.i.f. Lympne. K.N.V.v.L. Jozef Israelsplein 8, 's Gravenhage, Holland.

SKYLARK 3F, 1961, with full competition instruments except horizon. Excellent trailer with centre section trolley 1964 C. of A. renewal. £1,300. Lieut. Col. G. Benson, Marston, Pembridge, Leominster, Herefordshire. Tel. Pembridge 203.

SKYLARK 4 complete with instruments and trailer. Apply B. Keogh, 1 Lambourn Avenue, Swindon, Wilts. Phone Swindon 22685.

"TELECOMM" Portable VHF Radio-Telephone, fully transistorised, weight 4 lb. including battery, £150 complete. A.R.B. approved. Radio Communications Co., 16 Abbey Street, Crewkerne, Somerset.

THE DUNSTABLE WEIHE overhauled, modified, repainted, 10 year tested, C. of A. New instruments. Ready for new season. £650 o.n.o. Trailer if required. V. G. Aircraft Ltd., L.G.C., Dunstable 63419.

"THE" Kite IIA, built 1951, modified tips, speed-limiting brakes, basic instruments, really fine condition throughout, with current C. of A. and aluminium trailer, £500. Hawkins, 71 Maryland Way, Sunbury-on-Thames.

TRAILER. Suitable 18 m. sailplane. Unused. £100. London Gliding Club, Dunstable Downs, Beds. Tel. Dunstable 63419.

TUTOR, fully modified, fitted spoilers, rear Ottfur, windscreen. Current C. of A., £200 o.n.o. London Gliding Club.

WEIHE 1951 model, full panel, C. of A. May, 1964, total hours 950. Delivery of new aircraft forces sale at £590 including new trailer. P. R. Green, 33 Redford Road, Windsor, Berks. Tel. Windsor 63280.

1960 SKYLARK 2B, B.G.A. 923, with oxygen, parachute, full panel, superb condition. £1,000. New trailer (Universal) with independent suspension, £250. Also Kranich. Offers. Reekie, 62 Charles Close, Wroxham, Norfolk.

26 ft. TRAILER 4 mm. waterproof gaboon ply. Designed for Skylark 3, suitable any single seat glider. 2 years old, very well built, as new £130. Redman, Waresley Park, Sandy, Beds.

WANTED

Ka-2b or Ka-7. Will collect from Continent. Details to 47 Claremont Road, Whitley Bay, Northumberland.

PRESENTABLE rear-end of Sedbergh fuselage would like to meet front end in similar condition with a view to getting spliced. Mantle, School Drive, Bromsgrove.

WANTED. Flyable primary. Slight damage acceptable. J. Abbott. The "Wheatsheaf", High Street, Harlington, Middx. and Shorts Gliding Club.

PERSONAL

Crew needed for European tour May-Sept. American Schweizer 2-32. French a necessity. German a help. Also willingness to crew for Ferrari at Le Mans. George Arents, 4110 Kiaora, Miami 33, Florida, U.S.A.

YOUNG "GLIDER" begs to hire 3,463 or Ka-6 for Nationals — Gordon Camp, London G.C.

SITUATIONS VACANT

AIRCRAFT woodworker required. Capable of doing wood repairs, fitting and fabric work. V. G. Aircraft Ltd., London Gliding Club site, Tring Road, Dunstable. Tel Dunstable 63419.

C.F.I./MANAGER position London G.C. regretfully vacant. Applicant sought with high qualifications and experience in gliding and administration. Write promptly with details to Chairman, L.G.C.

CORNISH GLIDING CLUB requires B.G.A. Categorised Instructors for courses between 4th May and 14th September. 16 guineas per week. Apply J. Kenny, Secretary, 7 Duncannon Drive, Falmouth, Cornwall.

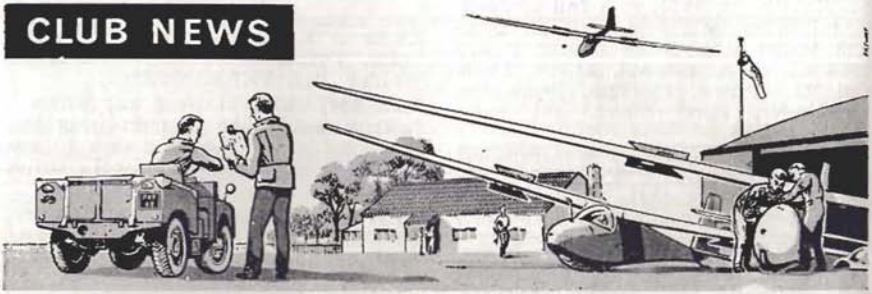
INSTRUCTOR required by London G.C., for Courses starting in March. Write to London Gliding Club, Tring Road, Dunstable, Beds.

COURSES

SPECIAL two-week courses for "B" certificate, one-week Holiday courses beginners to Gold C. Apply Course Sec., Devon and Somerset Gliding Club, "Sunnybank", Hemyock, Devon.

It will, of course, be understood that the British Gliding Association cannot accept responsibility for the claims made by advertisers in "Sailplane & Gliding".

CLUB NEWS



WE welcome to this issue the Staffordshire Gliding Club who operate from Meir Airport, and in the Service News Section the R.A.F. Club at Laarbruch, the N.A.T.O. base near Nijmegen.

The final date for copy for the April issue is Wednesday, 12th February, and please send it typed double space on foolscap, to me at 14 Little Brownings, London, S.E.23.

14th December, 1963

YVONNE BONHAM,
Club News Editor.

AVRO

THE training programme has continued to show good results, with four more pilots completing their A and B certificates by the end of '63. Congratulations to Ron Brocklehurst, John Turner, Barry McClory and also to John Nichol who converted to the Cadet on the same day as his first solo flights. The launch rate has also maintained a good level with the target of 2,000 launches for the year being passed with time to spare, the final launch total being almost 2,400.

Congratulations also to Pete Teagle on the Completion of his Silver C, the first for some considerable time.

Our thanks are extended to the Doncaster members for their hospitality and help when a number of our members visited their site with the club Skylark and gained some useful experience with aero-tows.

The repair of the club Tutor is well in hand. Something resembling a pair of wings has emerged from the wreckage thanks to lots of glue and a great effort from Bill Scull and Ron Brock. It is hoped that the Tutor will be flying again come spring. J. E.

BLACKPOOL & FYLDE

Jane Murdoch receives her A and B certificate from our President, H. J. Liver. Jack Aked, C.F.I., is standing by.

BRISTOL

MOST activity since the last notes were written has centred on the workshop, where aircraft C's of A have been taking place, and where the Scud is

now almost sprouting a tailplane and elevators. Some work has been done towards improving the present bunkhouse by tilting the floor and installing a rather better stove. The clubhouse is being repainted inside, starting with the kitchen.

On the field the heavy gang has been cutting up trees for firewood, filling up the ruts with stones and doing all the other odd jobs which have to be done. Due to legal queries, the piped water supply has not yet materialised but the airborne supply has been more than sufficient.

1963 was a bumper years for marriages and we offer our congratulations to Dave Wales and Mary Kerridge; and to Derek Stowe and Glenys Williams, who were due to take the plunge on 14th December and 28th December respectively.

A. L. S.

CAMBRIDGE UNIVERSITY

SINCE 1963 was a poor year for us, the figures of the annual review of our flying activities are a sore point. The only items which were not short of average were the eight Silver C's completed, the four Gold C heights gained and the 500 aero-tows logged. Various measures which had been taken in anticipation of a reduced income fortunately proved beneficial, so that 1963 was at least financially quite successful.

Although fog, haze, low cloud and water on the airfield took their usual toll from our flying, the last quarter of 1963 was somewhat less frustrating than the same period of the previous year, mainly due to the more efficient use of the aero-towing facilities.

Our plans for 1964 include eight Elementary Gliding Courses at Cambridge, possibly one or two Advanced Soaring Courses and two camps at the Long Mynd.

Our fleet of Club-operated sailplanes now consists of a T-21 ("Bluebell"), a Swallow, a Skylark 2, an Olympia, a Ka-7, and an Olympia 460. The last three of these are privately owned, but used by the Club. Efforts are now being made to acquire a Capstan. The syndicate that owned the Swallow "Penguin" have now sold this aircraft and bought a Ka-6 instead, and Simon Redman has replaced his Sky by a Skylark 4.

The President's Ladder was won in 1963 by Ralph Ismail with a record score of 6,300 points. Ralph thereby also qualifies for the Undergraduate Trophy and the Paget Prize. The Ladder is a scoring system in which points are awarded for cross-country flights, few for straight-out dashes and lots for triangles. The scheme was introduced seven years ago by Professor Pringle, the President of the Club, and has done much to incite pilots to do bigger, better and more interesting cross-country flights.

G. S. N.

CORNISH

WINTER'S milestones are passing in a pleasantly rapid way. The November firework party was, as always, a popular event, perhaps this is because our hangar was once one of Alfred Nobel's dynamite factories.

The gliders are looking much better for a spell in Fred Breeze's workshops but hangar space is now at a premium, as the Club has bought a very smart Olympia 2 to back up the Swallow and a streamlined trailer containing a Skylark 4 has recently appeared on the airfield. This brings the Club fleet to T-31, T-21, two Tutors, Swallow and Olympia, there are also four privately owned machines.

Your correspondent is writing these notes before the Annual Ball, as he feels that he may have a rather hazy memory of things later. This event is, of course, the premier event of our "social season" and we count ourselves most fortunate that Ann Welch can be our guest of honour this year.

The Club has at last become respectable and we have obtained the services of two Vice-Presidents, Ted Berry and Bernard Warmington, founder members and past Hon. Sec. and Chairman who have done so much to lay the foundations on which we stand.

Between these activities and hatching plots for better soaring for all, circuits are being bashed as ever, sometimes enlivened by an unseasonable thermal. The Tiger is kept busy giving tows to those Swallow pilots who regard aerobatics as winter sports.

J. E. K.

COVENTRY

THE annual Dinner Dance held at the beginning of December was as big a success as any of the previous ten. The past decade was a subject of which we were reminded in the speeches. During this time our establishment has grown from a Cadet, a Beaverette and a Wild Winch to five sailplanes with tugs and a site of our own which should be operational for the coming summer. It was a particularly happy chance that every C.F.I. we have had in our history was present on this occasion.

The club's trophies were given out at this dinner; the awards were as follows. Best progress among the ladies went to Elsie May, whilst Ray Stephens won the men's prize. Gus Cunningham won that for the longest flight in a club machine and his brother, Doug, won the Boomerang Trophy for the best closed circuit by a club member. Mike Bagnal won the Performance Pile. The Ludgate-Turner pot for the most recent flight to the Swindon Club went to Doug Sadler. The year's most outstanding flight was judged to be one on which Mike Hunt travelled a great distance without ever exceeding his launch height, this sort of thing seems to be his speciality!

At the end of 1963 we will have a change of C.F.I. Lou Glover, who has held this post for some time, has decided that it is now time that someone else should shoulder the load, so his deputy, Gus Cunningham, is stepping into his shoes. We thank Lou for his efforts. Best of luck, Gus, with this particularly important job.

C. D. D.-J.

CROWN AGENTS

SINCE the October issue we have had little activity to report. We have welcomed K. R. R. Boyce, on leave from Hong Kong, who has been flying regularly at Lasham. Charles Ogilvie has also arrived from Nyasaland and hopes to get in some flying.

As reported fully in the December issue, Bill Nicholas of the West Wales Gliding Club flew the Swallow into second place in the Aerobatic Championships at Dunstable last September. This glider has since been sold to a private owner syndicate based at Keevil, and we wish them all success and happiness with it. Thanks to the co-operation of the Surrey Gliding Club arrangements have been made for our overseas members, when qualified, to fly the Surrey Club's Swallow instead.

This club, together with the R.A.E.G.C., is playing a prominent part in promoting the Civil Service Aviation Association, the inaugural meeting of which is planned for 5th February. The Association will comprise various divisions or branches, the first of which will be formed by the amalgamation of the Crown Agents' and R.A.E. clubs mentioned in the October issue.

J. E. G. H.

DERBYSHIRE & LANCASHIRE

THE past two months have been notable for social activities rather than for epic flying. A convivial Hallowe'en party was followed a week later by the Camphill bonfire—rocket ignited in the traditional manner. At the annual Dinner and Dance held in Buxton on 6th December Philip Wills was guest of honour, accompanied this time by Kitty (and his dinner jacket). As a penalty for being allowed to go solo Alan Pring was recently persuaded to speak to us about his job in Air Traffic Control—a most interesting revelation about THEM.

The rumour that "Northerns" refers to the Scottish Country Dancing Championships is unfounded. Our team, under Chief Instructor John Riddall, is improving but is not quite ready to challenge the S.G.U. The Northerns (flying type) will be held at Camphill again from 25th July to 3rd August, when we hope to welcome friends old and new.

If, gentle reader, you wonder why no mention is made of the C. flights at 600 ft. above the windsock of Ted Twitch, F. Fumble, Syd Synk and U. T. Cobley and all, these may be found on another page of this journal. But, really, who cares?

J. N.

DEVON AND SOMERSET

WALLY WALLINGTON visited us recently and gave us a series of lectures on Meteorology which were greatly appreciated. We now know how

it rains but not how to stop it! Now that our Tiger Moth tug is permanently based here it will no doubt lead to some interesting wave flights and Swallow pilots can now look forward to flying the Skylark.

The hangar was built in a very short time, the many improvisations being a source of amazement. One wishes the Ministry of Aviation possessed some of the gusto of gliding clubs and we might even thermal in their hot air (better not, it's a control zone). The Club has been cliff soaring at Branscombe which is along the coast from Sidmouth. Bungy launches with our Swallow gave some variety of flying to our members.

We have had one film show and plan some more as we have a licensed bar and can hangar fly in comfort. Over many consecutive week-ends when weather clamped flying many members still visit the clubhouse, makes one think a Link Trainer for gliders would be an idea for English weather. Reciprocal Membership has been arranged with the Cornish Club at Perranporth which will prove more than attractive in the summer.

N. P. H.

DUMFRIES & DISTRICT

1963 was a good year for us although our total of 1,500 launches was less than the previous year. Winch launching has been slower than the tow-car but we have also found aero-tows very successful and reasonably economic apart from the 17th November when the Terrier had to scuttle back to Crosby dodging the snow showers.

The need for a higher performance club machine is becoming more pressing as the solo list grows, John Bromley being the latest to gain his A. and B.

Jack Reid provided some amusement when he got carried away by enthusiasm in the Tutor and landed in the smallest field we have ever seen.

We are pleased that Jack now has his Instructor's category and that Ian Steel, our C.F.I., has been successful in gaining a Junior Inspector's qualification.

Our Annual Dance was a great success as usual and the Club Trophy for the most progress during the year was won by George Binns. George was our first club member to go solo and is now well on the way to becoming an instructor.

FEB 1964

Campbell Boyce won the club championship.

At the time of writing we are reorganising our fleet and equipment and generally preparing for 1964.

ESSEX

SINCE the publication of our last report, much has happened in the Essex Gliding Club. The Club founders' intentions of passing full control over to the members has now been completed, and at our first meeting an Executive Committee was elected, the principal posts being filled as follows: Chairman, Bill Coyte; Secretary, John Unsworth; Treasurer, Henry Nunes.

A number of Sub-Committees have been formed and are already proving their worth. Brian Hockley, heading the M.T. Sub-Committee, has obtained for us what must be one of the most luxurious cable retrieve vehicles in any Club. To see our Ford Prefect sedately towing out the cable is a sight worth seeing.

Our main efforts throughout the winter will be directed towards increasing our membership. Our aim is 150 by the time the soaring season is with us again.

With colder days here, everyone is pleased that our mobile control hut is nearly complete. For the first time we have a list of volunteers to be Duty Pilot.

A. N.

HANDLEY PAGE

OUR Tutor flew again in December after its C. of A. overhaul and fitting of spoilers. About half a dozen members put over 400 man-hours into this effort, the majority being on weekday evenings and occasionally at weekends. This may sound a lot but we have no ground engineer, only willing but unskilled labour and no experience at all of major modifications. After those long, long retrieves the first undershoot proved that it was definitely worth it.

Since the period covered by the last news-letter Dave Harris has gone solo and Mick Goodwin is now flying the Tutor.

Visitors with or without their own gliders are always very welcome. We auto-launch off the main runway at Radlett (21-03, 7,000 ft.) and fly a T-31, Tutor and Skylark 3B.

LAKES

THE Club's Seventh Annual Dinner Dance was held at the Royal Station Hotel, Carnforth, on Friday, 15th November. Our guest of honour, Wing Commander W. S. Dodd, who commands the A.T.C. at Barrow, presented the Leighton Hall trophy to Jack Paley for the most meritorious flight of the year and the Dodd trophy to John Head for the most outstanding progress. Unfortunately, no cross-country flights had been attempted and the coveted Lonsdale trophy was not presented.

Ron Reid resumed the duties of C.F.I. in September after having relinquished them to John Young for about two years. Almost the first event in his new calendar was the Club's return to Barrow for the winter months. With the fell at Tebay turned into a quagmire by the late summer rains we welcomed the luxury of paved runways and the excellent hangar accommodation so generously placed at our disposal by Messrs. Vickers-Armstrongs at Walney. The launch rate has improved somewhat, as was to be expected, and this has induced our Chairman to produce a masterly piece of prognostication. If the present improvement is maintained, we break even. If we double it, we show a profit. A four-fold increase in the overall rate will enable the Club to pay its members for the privilege of putting them in the air! Ernie Dodd had his tongue in his cheek when he made the last statement but he has made his point. The rest is up to the members.

We congratulate John Craven in joinin the Tutor Brigade on 8th December. He had the doubtful privilege of dealing with a winch failure in masterly fashion on his first attempt. We also salute our old friend and general factotum, Mr. J. O. Parker of Tebay, who made his first flight in the Club's T-21 at the age of 80 in September.

F. S. R.

LASHAM

THE Lasham Gliding Society is made up of a number of clubs who between them have some 900 members. These notes are really a report on pro-

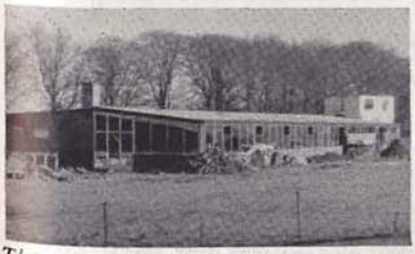
gress as far as the site is concerned rather than the happenings to club members of the ten clubs. 1963 was a year of consolidation. The Air Scouts have leased a part of the airfield from us and are busy establishing a National Air Scout Centre to which Scouts will come to glide and to learn the ways of the glider pilot.

The "digging in" programme has continued apace and 1964 will see our new clubhouse opened as well as the new electricity supply working. We were fortunate enough to have our tender accepted for some of the contents of the old B.E.A. London Air Terminal and the vital catering equipment, bar and certain other "goodies" were removed from that place in record time. These items will save us a great deal of money when it comes to equipping our new building.

The hand boring championship finished in great style when 55 feet depth was reached (though unsuccessful as chalk was not struck, we did break the U.K. local depth record). Preparations for the 1964 National Championships are well under way—volunteers are earnestly and urgently required for the Contest, apply to Lasham now!

What of the future? During 1964, we hope to rebuild our bunkhouses, the M.T. and Private Owner Workshops and generally clean up the site. With five tugs, excellent winches and reliable tow-cars we hope, weather permitting, to be able to launch our members and visitors into the Hampshire skies whenever we are called upon to do so.

What of the Commonwealth Gliding Centre? We believe that Lasham is large enough to be able to provide first-class facilities to pilots from all over the world who wish to come to fly. We hope that some will come to learn the art of instructing, to be taught by Derek Piggott and Derrick Goddard. The School offers a fleet of T-49's, a T-21 and two Swallows and providing the visitor is able to join one of the clubs based at Lasham, he will be able to fly more high-performance gliders.



The new clubhouse nearing completion.
Photo. by G. Harwood

In 1964 we will be running many more members' courses which are designed to offer concentrated flying at all levels to our members. Soaring instruction will be increased by means of the T-49's and aero-towing and the Saturday Competition for advanced pilots will be a regular feature.

We are sorry to lose Sir Charles Dorman as Vice-Chairman of the Society after five years of hard work. Charles virtually created the Society and we owe him a tremendous debt of gratitude. Pat Garnett, the Chairman of the Surrey Club has been appointed in his place and we wish him well. Administering Lasham is no small task, as besides managing the complex clutch of clubs and facilities, we have tenants ranging from an airline to farmers. However, we look forward to 1964 with enthusiasm and hope that you will visit us during the year and possibly fly (in?) there as well.

W. K.

LONDON

A CURRENT census of our membership shows there to be 405 flying members including seven per cent ladies, together with 123 associate members of whom as many as 38 per cent are female.

Our permanent staff number four.* Jeremy Brock we welcomed just before Christmas as the new manager; then we have Mike Till continuing as resident instructor and Don Gerrard as winch-driver; also we are extremely fortunate in still having attractive Betty Druce who works so hard as secretary in the club office.

Normally we expect about 14,000 launches during a year and despite the miserable 1963 weather we achieved 12,000 in the ten months available. Cross-country flying suffered though, and we flew but 6,000 km. whereas in previous recent years we have reached 13,000 kms.

Nine training courses are scheduled for this season, and they are all of a fortnight's duration, the intention being to get ab-initios solo within this period. However, not all the course members will be complete beginners, and members with limited experience from other clubs might like to join a course at Dunstable and try their hand at ridge soaring.

Prejudice against power flying is being substantially reduced at Dunstable; in December no less than five glider pilots were training for their P.P.L.s at Luton Flying Club, and this makes a total of 20 members currently flying "real" aeroplanes.

The Christmas Dance on Saturday night and Sunday morning 14th/15th December was very successful, and we are looking forward to our next official social function, which is the Annual Dinner and Dance on Friday, 28th February, at The Oldfield Hotel, Greenford. Although tickets for the dinner itself may be limited, there is no restriction on the number of people at the dance, and guests are cordially invited, especially if they can "shake" or perform a cossack dance.

G. C.

*Jeremy Brock unfortunately lost his life after this was written: see obituary, p. 69.

NEWCASTLE

IN the last issue we commented about unkind weather. Since writing those comments, the weather man has shown us just how unco-operative he can be, and the months of October and November were almost flightless at Carlton.

Almost but not quite. George Rowden was on hand on one of the very few flying days and was promptly elevated to the ranks of Tutor pilots. The only other notable flight recently was that performed by a section of Clubhouse roof in a force 10 storm. Unfortunately it chose to land in a prohibited area—the hangar roof—thereby causing some unwanted ventilation. Damage to aircraft was of a very minor nature, but the ladies' dormitory was decidedly draughty and more than a little damp!

The social side of the club has been receiving some attention recently. A party was held in the clubhouse in November, a dinner (which it is hoped will be an annual affair) was ably organised by Andy Hardie in December, and slide shows are scheduled for January and February. A pre-Christmas raffle was also held and together with the proceeds of the November party helped to boost our otherwise flagging income.

Further development of the site and the construction of much needed workshops has been brought to a halt by the weather. All we can do now is to wait for the Spring and decide on our future programme.

The M.T. department have been busy resuscitating the Austin winch which stopped short with a terrible grinding crunch when in full song, the crankshaft having had enough. We shall have to rely on the Austin again for our winter flying, since it will be impossible to move the diesel winch about the site in the worst of the weather.

Cupid has at last found our site and has been busy of late. Congratulations to Albert and Sylvia Newbury and to our chairman and C.F.I., Ian Paul, and Marjory. We wish them every happiness.

B. W. B.

NORTHAMPTONSHIRE

WITH a flat site like we have at Podington no soaring is possible in the period now under review but training flights continue whenever possible.

Three members have gone solo: D. Old, D. Robinson and D. Joyce.

We now know that the airfield has been sold but the new owner has told us that we may stay for at least two

years and possibly very much longer. At the same time we are investigating the possibilities of moving to Cranfield, which will be nearer for our Bedford members but somewhat further away for the Northampton and Kettering members.

The winch built by club members some years ago is now showing signs of old age and is being overhauled and fitted on to a new chassis.

R. N. W. K.

NORTHUMBRIA

DURING early October, the Club T-31 and the syndicate Kite were trailed to Sutton Bank for a five-day visit, enjoying the hospitality of the Yorkshire Club. Five days of excellent soaring conditions, plenty of flying time logged and a good time generally. The luckier ones spent the entire period there whilst a number only managed a day or two. Our thanks to Mrs. Ruffell for her impeccable catering organisation and congratulations to T. Martin for his C. after he just happened to be passing by and to Danny Borrits for his five hours. Our instructors temporarily relieved of their charges enjoyed sampling the capabilities of the Y.G.C. higher performance machines while some of the pupils obtained instructions in the T-21's.

Unfortunately, since then the weather at Hedley Fell has been so continuously bad that flying has only been intermittently possible.

However, the shortage of flying activities has been counter-balanced by intense constructional work. Under the leadership of Harry Anderson, the hangar-cum-workshop has been built while simultaneously our C.F.I. installed the electrical generating plant. All this being completed for the Barbecue and fireworks on 9th November, excellently arranged by our Social Secretary and his helpers on one of the rare fine evenings and well attended by members, their families and visitors.

Since then the construction of the clubhouse has started and is well under way, while the diesel winch is almost ready for commissioning.

While Hedley Fell was receiving its first dusting of snow this season, some 35 of us watched films of gliding in warmer climates and were also reminded on the screen of the Club's activities through last winter's Arctic conditions and at Portmoak in May.

Our Club Instructors have now become TV personalities after an appearance to spread the gospel of gliding. Obviously Tommy Ruffell must have enjoyed it for a little later he was presenting films and talking at one of the important local works.

As though all this wasn't enough, a small party paid a rapid private visit to the Coventry Club.

D. R. B.-W.

SCOTTISH

THE early part of the winter has passed uneventfully with little of note in flying, due mainly to the fact that this has been curtailed by a very wet November. December proved flyable but east winds limited flying to training circuits.

Considerable activity has been noted in the Christmas Tree area where the chairman and assistants have removed hundreds of trees for immediate sale. It seems likely that this operation will be spread over several years, providing healthy winter exercise and a useful injection to the bank balance.

Planning for the 1964 season is now well advanced and the ever popular series of summer courses are being expanded to meet the increase in demand, weeks have also been set aside for Instructor and Advanced Flying courses but these are restricted to Club members. In addition, a repeat of the Weekend Competitions is planned (6th-7th June and 13th-14th June) with a maximum entry of 20 aircraft and it is hoped that this event will develop into an annual event.

W. A. S.

SOUTHDOWN

BAD weather has kept us grounded for an unusually large number of weekends this winter, but several hours of aero-towing practice were put in at Redhill during October with the Club Olympia and Syndicate 463. The Tiger Club generously laid on a tug for each flying day and members were able to add to their aero-towing experience.

Back at Firle our Chairman, Les Allard, has converted to the Swallow and

Tony Bywater gained his C on a recent ridge soaring day.

Lorne Welch and John Everitt brought the T-49 to the site at the end of November but we were not able to see it in action until the following week-end due to bad weather. It was very interesting to see it flying on our site and to assess its capabilities on several of the launching runs. John, quite understandably, has not committed himself as to whether it is *the* two-seater for our site!

P. W.

STAFFORDSHIRE

AFTER nearly a year of behind the scenes activity the Staffordshire Gliding Club was formed on 19th December, 1962, with 50 founder members. Due to the fierce weather and financial problems our first aircraft, a T-31, was not available until April, 1963, and on 13th April the first flying meeting was held at Meir aerodrome near Stoke on Trent. This historic occasion was marked by a typical example of British gliding weather—cloud base 750 ft. and a steady drizzle. The first man into the air was Bertie Aranyos, who represents 50 per cent of our Hungarian membership. Bertie being quite new to the game was properly accompanied by the C.F.I. W. C. Hutchinson and survived what was indeed a baptism.

Having thus started, the Club is now approaching its first A.G.M. with quite a decent record of achievement for the year. 1,100 launches have been given and 12 pilots brought to solo standard from varying degrees of greenness. Another dozen or so are in the pipeline and a fair number of these should solo in the near future. The course method of training, known in our Club as "the art of coarse flying", is operated with several instructors under the eye of the C.F.I. The first course produced pilots on 23rd June, having started on 4th May; A. Wright, R. Kettle and W. Jeffs going solo on that day. The remainder of Course 1 went solo one on each of the four following flying days, these being W. Harvey, R. Johnson, T. Lovatt and B. Aranyos. All these have now reached A. and B. standard and this fact was duly celebrated at a gathering in a local hostelry. Pilots who have subsequently soloed at Meir are B. Gilman, B. Clare, J. Marshjones, B. Ward, N. Mackay and A. Price.

Being a new club with about 35 members quite new to gliding we have experienced a high rate of wear and tear on our ground equipment. Fortunately we have a well organised Technical Committee led by Ray Johnson, who has been the man behind many improvements to the equipment and who has overcome endless snags. The Club has a large percentage of engineers in the membership—almost every kind you can think of, from instrument and electronics to heavy electrical and mechanical types. This paid off recently when the winch required new paying-on gear. A marvellous design was soon evolved, and though it was a little expensive to produce, it will pay dividends in saved cable breaks. The Technical Committee have been well backed up by the main Committee, Chaired by Barry Gilman with John Marshjones as Secretary. These two chaps, with others, laboured mightily to get the Club started and we all hope that they still feel that it was worthwhile.

With the training courses going well and producing pilots in a steady stream, the pressure for an intermediate single-seater is now being felt, solo pilots having to fly the T-31 at present if not up to Olympia standard. The Committee have plans to buy a Tutor or like aircraft in the near future when the right one appears on the market. The Olympia is currently having a C. of A. but should be back by the time these notes appear. The additional aircraft, when we get it will make it possible for us to admit a few new members and release pressure on the waiting list.

The future activities of the Club will no doubt continue the trend to more technical improvement and innovation already established. A Club member has donated an old car for use as a retrieve vehicle, and now that the winch is off the danger list the technical committee intend to adapt this with boom and tackle for high speed retrieves.

In case anyone should think that the Club consists entirely of engineers, I am pleased to report that several literary men have come to the fore and a monthly news-letter, edited by Walter Harvey has a waiting list of material to publish. Nothing seems to escape unnoticed, and woe betide the unhappy member seen in a compromising situation, either in the air or on the ground.

Now that we are established, visitors from other clubs arriving either by surface or air transport will be made most welcome. We operate every week-end, Saturday and Sunday, all the year round and our field is easy to find being more or less at the junction of A.520 with the A.50, the entrance about 100 yards south of the roundabout on the A.50.

A. W. H. L. W.

SURREY

ALTHOUGH the 1963 season was nothing to write home about weatherwise, it does not seem to have deterred our members, and aircraft utilisation was higher than usual with a surprisingly large number of Silver C. legs flown. Trailer building, on what almost amounts to an assembly belt procedure, is now in progress under the direction of John Heeson ready for, we hope, an even bigger batch next year.

A very successful expedition to Portmoak was arranged at the end of the season and it is hoped to repeat this early next year. Given reasonable luck with the weather, a great deal can be gained by several members taking an aircraft away to a different site.

At our A.G.M., the question of changing our name was discussed but the only thing which really emerged from this was the fact that most of us are more traditional minded than we would be prepared to admit.

Ken O'Riley has resigned as Master Instructor and we would like to thank him for the tremendous amount of work which he has done during the last few years and the way in which he has improved our standards.

A. W. B.

SWINDON

THE end of 1963 saw the A.G.M. and the following have been elected to serve on the Committee for 1964: George Turner (C.F.I.), Ray Clark (Treasurer), Beryl Saunders (Secretary), Neil Eccles, Dan Ford, Stan Perry, Sam Colbourne, Peter Clifford and David Schofield.

Since our last appearance in these columns Bernard Keogh managed two legs for his Silver C. with a five-hour flight in the direction of Lasham via Southampton. Another notable flight was that of Sam Colbourne in the Oly when he reached 10,000 ft. from Nympsfield. The T-21 has been modernised by having a permanent canopy attached. This, we hope, will encourage more pupils to take advantage of training during the winter months.

Our fleet for 1964 will consist of a T-21, Swallow and an Olympia 2B with a possibility of a syndicate formation in the near future. Launching equipment comprises a two-drum winch, the Princess, a rebuilt Jenzen and, of course, Fred's never-ending support in the Terrier.

At present flying has ceased due to the arrival of the "new" clubhouse. The weekends are now producing able-bodied working parties and we hope shortly to start serving fresh beer from a new bar. Although we have no gilded plate to offer soaring arrivals, we shall nevertheless be very pleased to welcome and entertain anyone who should make South Marston their destination. By the time this is in print we should be fully self-contained and back to normal.

D. E. S.

WORCESTERSHIRE

OUR new runway at Bickmarsh is greening over nicely but it will be spring before it will stand heavy traffic. In the meantime we hope to rebuild a badly "pranged" Sedbergh which has been bought for the Club by our Chairman. The Nissen hangar is nearly complete and the drive-in and car park look the better for several loads of hardcore.

Our flying at the moment is somewhat limited as our old site, Honeybourne, has been more or less put out of action due to the local Electricity Authority deciding to erect pylons across the centre of the airfield; we are, however, investigating local hill ranges with a view to giving some of our new "soloists" a taste of hill soaring.

T. M.

SERVICE NEWS

ARMY GLIDING ASSOCIATION

FOR the past year the Association has been running two clubs and preparing to start a third. The founder club of the Association has been undergoing a slow change of rôle brought about largely by the expansion of Lasham itself. This club's name is now changed to Army Soaring Club, from Army Gliding Club, as we feel that this is more descriptive of its present status. In future it will aim to provide aircraft for soaring at Lasham whilst the other facilities provided by the Lasham Gliding Society will be available to its members.

The Southern Command Gliding Club at Netheravon has continued to grow and is now running fairly close to the capacity of its present equipment. We hope to be able to run some courses for our members at Netheravon this year.

We are forming a new club, the Aldershot District Gliding Club, flying at the R.A.F. station at Odiham. This club will fill the gap left by the changes at Lasham and provide training facilities at week-ends for our members who are stationed around Aldershot.

There is also an active Army group working with the Dorset Gliding Club which has applied for membership of this Association. When this is approved it will become our fourth club, the Bovington Garrison Gliding Club, and will, we hope, continue to operate with the Dorset Gliding Club. C. G. D.

BANNERDOWN
(R.A.F. Colerne)

IT is inevitable at this time of the year that aerial activity is reduced, although we did manage 277 launches for 32.59 hours during the period. Even at this late stage our expedition enthusiasts are still active, for Mike Channon did 4 hours at Huish and Mac Macintyre got his Silver leg with 5¼ hours on the Nympsfield ridge.

Ground work continues with a resolution of the launching policy and a full programme of vehicle and aircraft maintenance. The 403 has been cocooned until the spring and sits alongside the dismembered Grunau, which arrived ex-Germany 1st November. This will be a tough one to prepare, as neither timber nor glue are up to standard but we look forward to good service from this replacement of the Eon. The hangar appears to be littered with trailers in various stages of construction. Eric Hales and family and Hugh Bellingham are building a lightweight job for the 403. A lightweight chassis has arrived for the 2B and Grunau and a new T-21 conveyor is being carpentered and engineered by Roy Gaunt and Mac

Building a trailer for future expeditions.

Macintyre; the latter has also done a good job on the tractor and is concerned with Tug Wilson and Padre Mackenzie in a mod to the Calnan Winch.

The "sardine" farewell party to Ed Meddings and Max Bacon was on 9th November (68 bodies in the clubroom, all vertical to begin with!) and the Christmas Party was on the 14th December.

During the last few weeks we have been both instructed and entertained by Alan Yates and his colleagues on the weekly Independent T.V. programme "The Elements". In particular the speeded up films of cloud formation, and the practical demonstrations have shown the great value of visual aids and the gliding content has been most interesting. Suitably edited and condensed, this series could make a real impact on potential recruits to our sport.

Our trophies for 1963 have gone to: Officer Cadet Clive Hall (now on initial training at South Cerney). He wins the Bannerdown trophy for the novice who puts in the greatest effort into club activities both in the air AND on the ground.

Chris Gildea. He wins the Daniels Trophy for the best cross country flight from Colerne.

P. H.

MOONRAKERS (Upavon)

BECAUSE of a lengthy absence from this column it is appropriate to sum up last season's activities. On the high performance side we did well by any standard. Two Gold distances by Denis Stubbings and Jeff Chandler in Olympia 2's early in the season gave us a good start. A well-won Gold height by John Allerton turned up in June. In July C.F.I. John Williamson, second in the Nationals, "broke" the Goal and Return record with 242 miles, the day *after* the same distance was done from Lasham! A substantial claim for the Douglas Trophy can, however, be submitted.

Lower down the scale Silver badges were not very prolific, but the six or so completed did include our first by a lady member, Boel Williamson. A number of Silver distances helped swell the total cross-country miles to nearly 3,500, of which a healthy 1,200 were in the cooking Olympias.

At the end of the season we were delighted that Hon. Sec. Douglas Bridson won the National Aerobatic Championship.

Less auspicious was the record on the recruiting and training side. In a Service club these items are perhaps even more important than in a civilian because of the steady drain of top talent from the individual clubs due to postings, often abroad. There are signs, however, that the expansion of the R.A.F.G.S.A. several years ago is bearing fruit at last insofar as the flow of top talent is no longer always one way. A number of tour expired experts are showing up from overseas to carry on where they left off two or more years ago.

J. S. W.

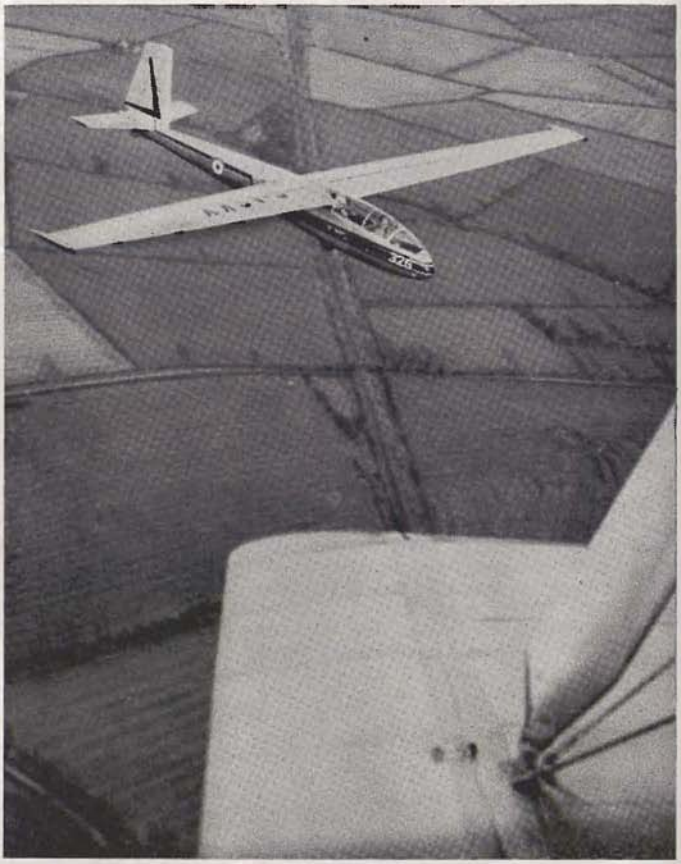
R.A.F.G.S.A. CENTRE (R.A.F. Bicester)

THE second year of the Centre has ended with an increase of both hours and launches. If we had been granted better weather we could have done very many more launches and hours but, not only were we grounded for three months in the winter, but the summer was poor. Despite this our aircraft utilisation has increased sufficiently to enable us to slightly reduce our hourly soaring charge. This year our Novice's Trophy for the novice who has achieved most in the year has been awarded to Chief Technician Tony Turner, and our hearty congratulations go to him.

One of our major successes as a Centre is illustrated by the fact that over 400 visits were made by pilots of other clubs to fly our aircraft. Chief Instructors of other clubs can well imagine what a problem of assessment and supervision this brings, but Bill Andrews, Ron Newall and Andy Gough have been tireless in their efforts.

The aircraft fleet is being modernised and we have just acquired a German SF-26. This is very similar to a Ka-6, but the structure is somewhat different, having a steel tube fuselage. It promises to be a very good club aircraft.

It is well known that glider pilots will sacrifice everything for gliding; one of our members not only planned to spend his honeymoon gliding but arrived on the airfield immediately after his



The new Blanik flying at Bicester.
Photo. by S. M. Johnson

wedding and so an impromptu reception was hurriedly organised in the club bus.

R. P. S.

PORTSMOUTH NAVAL

WE have lost our C.F.I. Jim Gunter to Lossiemouth. We wish him well in his new appointment. A general meeting of the Club was held recently at which Jim was presented with an engraved tankard in recognition of his services to the Club.

At this meeting, members learnt of the appointment of Martin Seth-Smith to Woolwich and so we lose a Chairman whom we are sorry to see go. We tried to persuade him to remain on as Chairman but he felt that he could not carry out his duties effectively from a distance and so refused.

We were pleased to have a visit from Pat Worthington, a former member, who is now working in America. From all accounts, the soaring she has there is very much better than we experience at Lee.

Our new C.F.I. is Peter Davies, who has already shown that he is going to be a good one.

John Barbeary has left us for a sea-going appointment but before he left both he and Peter Wilson were passed for passenger carrying.

A number of members visited Upavon recently with one of our gliders, and had some interesting flying. We are grateful to the Moonrakers Club for allowing us this facility. L. D. V.

EAGLE
(Detmold, Germany)

OUR first two months of operation have been most encouraging. Our best day to date was the 3rd November, with a total of 50 launches.

We now have three aircraft, a T-21, a Grunau Baby, and a Swallow. The Grunau is at present in the workshops having a major overhaul and we are extremely grateful to Harvey Barker for the tremendous amount of work that he has put into it.

The Christmas party, held on the 7th December, was a great success. The local German club was invited and in all there were about 50 people present. The party started in the Bowling Alley of the NAAFI and then retired to the clubroom, where a dance had been organised. The success of the party was largely due to the efforts of Ray Raven and we are all most grateful to him.

Here's to a successful soaring season in 1964. H. B. E. M.

LAARBRUCH
(Nr. Nijmegen, Holland)

DUE to unbearable pressure from the majority of members, "Green Ball" has been banned from taking his winter hibernation in the bar and forced to take up pen instead of glass!

The task of putting Laarbruch on the map is probably unique, suffice to say it is a N.A.T.O. base some 30 km. S.E. of Nijmegen (Holland), between the Maas and Rhine rivers.

Although we never experience the Rabelaisian conditions of our neighbouring R.A.F. clubs, soaring conditions are a little better than those in the U.K.

Good hangar, workshop and bar facilities give ample backing to ensure that our members get plenty of opportunity to sample German and Dutch thermals.

We started flying this season with very few experienced types guided by two instructors. Inevitably, several good days went by without much use being made of them, but soon our fleet of a T-21, Ka-2, 2 Grunaus, B Spatz and Ka-6 was rarely on the ground. These ranks were unfortunately seriously depleted when one of the Grunaus contacted the thermal of its life and welded itself up after hitting a high tension wire on the way into a field. The B Spatz was also seriously damaged when it was blown over after a field landing.

The four remaining aircraft were put to excellent use after this disastrous start. Our 25 A and B certificates gained this season included the Commander in Chief of R.A.F. Germany, Air Marshal Sir Ronald Lees, and six visiting U.S.A.F. Voodoo pilots, who seemed to enjoy flying without the kicks of their afterburners.

A total of 21 C certificates included our recent Station Commander, Group Captain Stanbury, our only lady member to endure our instructors' tortures, Joan Stevens, the Padre (who has a friend up there anyway) and 16 years old Martin Hampson.

On the road to punditry Harry Orme and Harry Shaw have completed all their Silver legs during the season to bring this total to 17.

The Ka-6 has been well utilised by "Trans European" pilots. It gave John Prince, our C.F.I., a Diamond goal to Hamburg and Taff Thomas, his deputy, a very near miss of 270 km. for the same award. Later in the season, knowing Diamonds are a girl's best friend, the C.F.I. tried a 500 km. attempt, but this terminated in a Cerulean French sky (so he said!) after 420 km. at the frustratingly early hour of three thirty. Tim Delap, roving in his own Weihe, threw strain gauges overboard and collected a well won Gold Height.

Although off the beaten track, we have been visited by the local Frenchen club members and their aircraft and Gordon Camp from Dunstable. Gordon attempted a Diamond goal during the weekend he was with us but ground te an early halt. Tim Delap, airtesting a Canberra later in the day, then presented him with photographs of his field landing.

Overall, although our bar takings again exceeded our flying fees, we appear to be the most successful club in

R.A.F. Germany. For the future, winter overhauls are nearing completion and the club now has a very solid committee to guide it through the coming season.

We're looking to the arrival of a promised Capstan and several members will be Diamond clutching in the Issoire waves in January. J. P.

PHOENIX

(Brüggen, Germany)

As with most "flat site" clubs at this time of year, nothing spectacular has happened at Brüggen over the last two months. Good old-fashioned circuit-bashing has carried on, though, with A and B certificates to Don Donnithorne and Tim Palmer.

Looking back on the year's achievements by club members, we feel fairly satisfied, the vital statistics being:— 22 solos, 20 C Certificates, 18 Silver C legs (5 completed Silver C's), 5 Gold C legs (2 completed Gold C's) and 4 diamond legs (2 heights, 2 goals). Total cross-country distance 4,624 km. in 51 flights, total launches just on 4,000 in 655 hrs. Now we are faced with the usual dreaded task of fettling all equipment to be ready to make next season even better.

The tin Ka-6 that C.F.I. Pete Lane bought from a little club down near Geilenkirchen somewhere has made a good start with us. Pete, Alan Sommerville and Geoff Barrell took it early in November down to Zell-am-See in Austria for the purpose of attaining Certain Altitudes in wave. There, on the 5th November, Alan took it to 24,600 ft. a.g.l. (the last 3,000 ft. of which was in the actual lenticular) for his height diamond after a tow to 7,000 ft. He tells us that he was at 15,000 ft. at 16.15 hrs. and had ½ hour before dark to climb to at least 24,000 ft. and then land back at the airfield. He did it — just!

Getting back to more mundane happenings, the club bar was re-opened on 19th October amid the usual celebrations after a month's refurnishing and streamlining — we now claim to have the highest-performance gliding bar in use anywhere. Whilst still on the subject of gliding club bars (well, who wants to read about flying anyway?) when the Geilenkirchen club opened their bar a few weeks later, we decided to raise the tone of their occasion by going down there *en masse* and showing them what a few real gliding pundits look like. Actually, it was a good party, but we have to report that, in addition to occasional gliding, they practise "ornithology" on a large scale!

On a more serious note we are regretfully saying goodbye to Geoff and Enid Barrell at the end of December on their return to the U.K. Anyway, we wish them both the best of luck in their future gliding. So, with 1964 rolling in and talk of things like T-49's and other exciting devices for the club soon, we would encourage anyone who finds themselves posted to this part of Germany to come out and visit us.

L. S. H.

OVERSEAS NEWS

AUSTRALIA

At the 14th annual general meeting of the Gliding Federation of Australia, the Design and Development Committee were given the green light to go ahead with the development of a high-performance single-seater glider. Councillors voted to guarantee a sum of at least £800 from next year's £2,000 administration and development grant to help meet the cost of design studies and production of a prototype. No detailed design specifications were set by the meeting, which commissioned Harry Schneider to begin design studies. The basis for initial study will call for a high-performance machine of 16 or 17 metres, possibly with flaps, but a machine suitable for high-performance club work rather than an exotic design for ultra-high performance which would have limited sales appeal.

At the meeting first moves were taken to investigate possible future combined Australia and New Zealand gliding competitions.

Airspace trouble was reported by the

Millicent Gliding Club, which had begun flying at a Council-owned aerodrome at a time when no powered aircraft had been operating from it. Recently, however, one light aircraft began visiting the area for training operations on Sunday of one week and Monday the alternate week, and because of this the Regional D.C.A. ruled that gliding could not be carried out at the field.—*Australian Gliding.*

POLAND

A FEW interesting statistics on gliding in Poland last year might be of general interest.

Total hours flown 59,556.

Total distance flown 386,397 km. (240,096 miles), of which 96 open cross-country flights of over 300 km., 191 goal flights of 300 km. or more, 24 cross-country flights of over 500 km.

320 Silver C.s, 40 Gold C.s and eight full Diamond badges were gained during the year; this brings the total of pilots holding three Diamonds in Poland up to 102.

T. J.

UNITED STATES

THE 31st Annual U.S. National Soaring Championships will be held at the McCook State Airport at McCook, Nebraska, from 30th June through 9th July, 1964. Sponsoring organizations will be the Nebraska Soaring Association and the McCook Chamber of Commerce. Other sites considered for 1964 were Adrian, Michigan and Hobbs, New Mexico.

McCook State Airport has three 7,500 foot concrete runways and is used exclusively by the Nebraska Soaring Association. Thermals often reach over 10,000 feet in this area during the summer, and the surrounding terrain is generally clear and smooth.

Over 50 American pilots are expected to compete.

S. S. A.

WEST GERMANY

HERREN HUTH, Grosse, Kunz and the writer have worked out a new Rating System for our national team. In future the team will always consist of 15 pilots. Within these 15 there will be as many pilots of the Standard Class as relatively participate in the Nationals. The same with the Open Class. For example: during the next Nationals 20 will participate in the Open and 40 in the Standard Class, then the national team will contain five Open Class and ten Standard Class pilots. Each class will score separately from the other and we do not want to mix them. The Rating List in each class is formed as follows: Pilots will be credited with 70 per cent for their points at the last Championship and twice 15 per cent of the two Championships before = 100 per cent. If we have three entries in a World Championship, then two pilots of the Standard Class and one of the Open Class will go.

If somebody wants to change his class, he will be integrated into the other class so that his position remains as in his old class; e.g. No. 3 of the Open Class will then be No. 6 in the Standard Class.

First we thought of giving the Standard Class pilots a bonus. But whatever percentage you add to the points of the Standard Class it always seems to be incorrect. We did calculations with electronic machines for two days and finally gave up the idea of the bonus.

Our Nationals will be at the Air Force field, Roth-Kiliansdorf, near Nürnberg, from 17th to 31st May. The week before will consist of practice days.

W. GROSS.

Statistics of German gliding for the first ten months were given by Seff Kunz to a gliding assembly at Heidelberg on 2nd November. At present not less than 2,500 sailplanes are flying in the region served by the German Aero Club. In ten post-war years there have been 5,000,000 launches and 1,000,000 flying hours. Since 1957, over 2,000,000 km. have been covered in cross-countries. At the moment the gliding groups have 25,000 members, who include 6,505 Silver C.s and 458 Gold C.s; 588 Diamonds have been acquired and 48 pilots have all three Diamonds.

First to complete a 500-km. triangle in Germany is Hans-Werner Grosse, whose course was Lübeck, Wildeshausen (to the S.W.), Braunschweig (Brunswick), Lübeck.

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