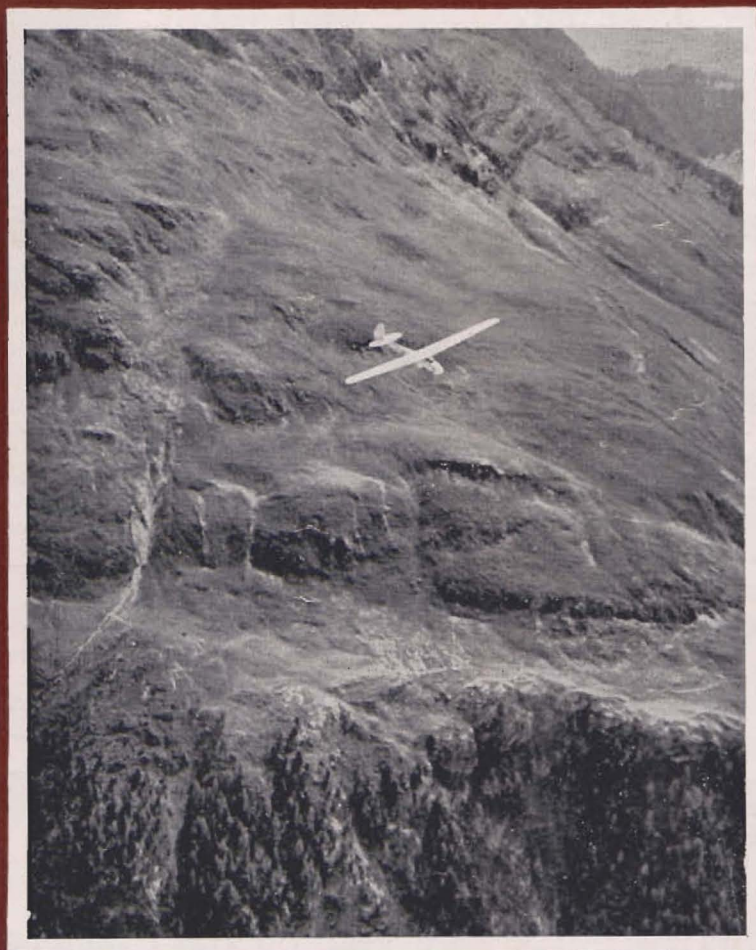


# *Sailplane and Glider*

*The First Journal devoted to Soaring and Gliding*



**FEBRUARY 1953**

**2/-**

# SCOTTISH GLIDING UNION BISHOPHILL AND BALADO AIRFIELD

Entrance Fee £1. 1s. : Subscription £3. 3s.

Write to Hon. Secretary

D. HENDRY  
THE SCOTTISH GLIDING UNION  
BALADO AIRFIELD  
MILNATHORT  
KINROSS-SHIRE

## Soaring ★

One of the few magazines in the world devoted exclusively to motorless flight.

Send 10/- for three sample copies and the booklet—

### Soaring in America

Increase your knowledge of soaring. You are invited to send £1 for membership in the Soaring Society of America, which includes a year's subscription to *Soaring*.

**SOARING SOCIETY OF AMERICA, INC.,  
3778, Marion-Ave., Memphis, Tenn., U.S.A.**

## AT LAST . . .

a Self Binding Device  
for Copies of 'Sailplane  
and Glider'

Suitable for copies published since January, 1946. Binders for copies before this can be supplied—details on request.



1. Note how flat the pages open.
2. The journals are easily inserted with steel wires (supplied with the binders), and can be removed and replaced at any time.
3. By means of a special device the binder is just as useful when only partly filled as it is when completely filled.

### ORDER YOUR EASIBINDER NOW

and bind your copies month by month

**Each Binder will hold 24 Copies—  
Two Years' Sailplanes.**

Price of complete binder, including title done in gold lettering—13/- each, postage 8d., 25/- for two, plus 1/4 postage, or 3 for 36/-, plus 2/- postage.

If years of volumes are required on binders, i.e. 1950-1951, etc., 6d. extra each binder.

**From : THE GLIDER PRESS, LTD.,  
8, LOWER BELGRAVE STREET,  
LONDON, S.W.1**

Cash with orders, please.

# Sailplane and Glider

Founded in 1930

and **ULTRA LIGHT AIRCRAFT**

**THE FIRST JOURNAL DEVOTED  
TO SOARING AND GLIDING**

FEBRUARY 1953 ★ Vol XXI No 2

Editor:

VERNON BLUNT  
MA, LLB (Cantab), FRMETS

Asst. Editor:

VERONICA PLATT

Editorial  
and

Advertisement Offices:

8, Lower Belgrave Street  
London, SW1  
PHONE: SLO 7287

The *Sailplane and Glider* is published on the 5th of every month. Price Two Shillings per copy: 25s. 6d. per year posted. Advertising Rates on application.

Published for the licencees, Glider Press Ltd., by the Rolls House Publishing Co., Ltd., and printed by The Mendip Press, Ltd., London and Bath.

## CONTENTS

	Page
Editorial	1
Australian Gold 'C' and Diamond, by Allan Ash	2
Adelaide Soaring Club Christmas Camp, by Brian P. Creer	3
Egyptian Gliding—R. Swinn	5
Progress in Two-Seater Sailplane Design	6
Simplify and Add More Lightness, by Peter Fletcher	11
The Health of Gliding Movements in Different Countries, by O. W. Neumark	12
Australian Sailplane Factory Flourishes	15
New Australian Two-seater Sailplanes being built	16
Glider Flying in Norway	18
Swedish Gliding	19
Club News	21
Correspondence	23
R.Ae.C. Certificates, etc.	24

COVER PHOTO:

Poliach, Czechoslovakia, soaring an 'Olympia' at the Engadine. By Heimgartner.

## Editorial

**A**LTHOUGH this journal has in the past depreciated the universal trend of sailplane development into highly expensive research tools and advocated the production of cheaper sailplanes in order that gliding and soaring might survive as a sport, we have never under-rated the tremendous possibilities of the sailplane as a unique tool for aerodynamic, structural and meteorological research. The cost of this development, although insignificant compared to other tools for such research, is too high for the gliding movement and it is only proper that the Scientific Organisations which would benefit most from research work with sailplanes, should contribute and assist the movement.

The joint meeting between the Royal Meteorological Society and the B.G.A. on 21.1.1953 is highly welcomed as an indication that at least one Scientific Society does appreciate that mutual benefit can accrue from closer co-operation. The gliding movement and the science of meteorology should be grateful to Sir David Brunt, Dr. A. E. Slater, Dr. Scorer, and many members of the council of the Royal Meteorological Society, who have for many years advocated the use of sailplanes for research in meteorology.

It is hoped that more frequent meetings will be arranged as the short time available precluded the development of a discussion. It is also highly desirable that the B.G.A. and the Royal Meteorological Society between them should build up a collection of time-lapse cloud development films (including atom bomb clouds) and that these should be shown at least twice during a show for proper observation. Very many sailplane pilots and meteorologists would be very glad to see the same film over and over again—new aspects and details are revealed with every showing.

Messrs. Yates, Welch, Irving, James and Ludlam together with the other contributors can be congratulated on their interesting papers (these will be published in the *Journal of the Royal Meteorological Society*). Sailplane pilots generally believed that the temperature difference between a thermal midway in its career and its environment was greater than that found by Mr. Irving's thermocouple, otherwise the papers re-stated in very lucid terms the present state of knowledge about thermals gained by sailplane pilots. Except the paper of Mr. D. J. James, who conducts his research from a high-speed, four-engined 'Hastings,' which, although it might contain the most interesting temperature and gust measuring devices yet produced, is liable by its speed, noise and prop-wash to destroy the fine texture of the thermal which was being investigated. Many people think that Mr. James would obtain far more valuable results if he would produce small self-recording versions of his millisecond-lag temperature and directional gust recorders for use in sailplanes. An even more valuable observation platform would be provided by free balloons and there would be many sailplane pilots who would only be too glad to pilot hot air free balloons equipped with appropriate research instruments if a research grant were made available for this purpose.

Mr. Welch made the very important point that thermal research should be carried out along two main lines. Firstly, by concentrating all our scientific resources for the examination of ONE individual thermal with SIMULTANEOUS penetrations by sailplanes and aircraft at different levels (and that penetrations by ONE 'Hastings', however well equipped, through innumerable thermals over a large span of time were less hopeful). Secondly, that the maximum amount of data from as many different thermals could best be obtained by loaning self-recording instruments to all high performance sailplanes in the country. He also emphasised the infinite variety of thermals and stated that there was no single standard thermal. The manufacturers of aerial cameras and photographic materials, might wish to contribute to research by loaning equipment for installation in sailplanes.

The Air Ministry could provide invaluable aid by making available smoke-producing pyrotechnic stores such as smoke canisters, smoke-puff Verey cartridges and signal rockets which would otherwise be destroyed because the percentage of miss-fires rises with age and become unacceptable for service requirements. Such stores, useless to the R.A.F., could be of invaluable use for research into thermals if widely used by sailplane pilots.

# RECORDS

## AUSTRALIAN GOLD 'C' AND DIAMOND

NEARLY 3,000 miles of cross-country flying were carried out in Australia during December and early January. Three Gold 'C' distance legs were gained, and a Diamond Goal leg. In addition, five Australian records were broken—some of them several times.

The longest flight was carried out by Bob Krick of the Hinkler Soaring Club who flew the 'Blue



*Bob Krick and Don Matts de-rigging the 'Blue Olympia' in a field near Bathurst, N.S.W.*

Olympia' 220 miles from Narromine to The Rock. He had originally nominated Wagga, 200 miles, as a goal, but having reached there by 5 p.m., he decided to go on in the hope of breaking the Australian distance record, 259 miles. The flight was made in six-and-a-half hours and gained him a Gold 'C' distance leg.

Two other N.S.W. pilots gained their Gold 'C' distance legs. On December 23, Mervyn Waghorn nominated Parkes, 63 miles, as the turning point for an out-and-return flight, but having reached there, found that the wind strength had increased so as to make the return flight difficult, if not impossible. He continued flying south and finally landed at Wagga, 200 miles. This flight completed his Gold 'C', the fifth in Australia.

On December 21, Len Schultz flew the 'Olympia' from Narromine to Walgett, 152 miles, to break his own Goal flight record. Several other Sydney Soaring Club pilots attempted to raise this figure and finally, on January 6, Sel Owen was towed from Narromine to Goonumbra Siding, 50 miles to the south, to begin a flight to Walgett in the north. He completed the flight successfully.

The distance covered was 206 miles, so on the one flight he (a) broke the Goal Record, (b) gained Gold 'C' distance, and (c) gained a Diamond leg. This is the second Diamond leg to be won in Australia. The other was awarded to Martin Warner for a flight to 24,000 feet in the 'Gull 4' in 1951.

By ALLAN ASH

Sydney Soaring Club pilots made several other long flights in attempts to better the Goal record. On January 2, Martin Warner was towed to the Bogan River to attempt a 200 mile Goal flight to Tamworth. Luck was not with him, however, and he landed after 162 miles.

Several days after Owen raised the record to 206 miles, Len Schultz was towed to Tullamore to attempt a flight to Tamworth, 220 miles. He managed to cover 196 miles before being brought down.

Other cross-country flights carried out by the Sydney Soaring Club include 135 miles to West Wyalong by Martin Warner, 96 miles out-and-return by Mervyn Waghorn, 63 miles to Parkes by Sel Owen and 60 miles to Molong by Keith Colyer.

Hinkler Soaring Club pilots Bob Krick and Ray Ash took the 'Blue Olympia' to Narromine for ten days. During this time they flew for 25 hours and made cross-country flights totalling nearly 700 miles.

Bob Krick's flight to the Rock has already been mentioned. On January 3 he made a flight of 113 miles from Narromine to Bathurst in the 'Olympia.'

On Christmas day, Ray Ash nominated West Wyalong as a goal, but in circumnavigating a rain squall he flew too far east and after a long cross-wind struggle landed at Caragabal, 115 miles.

On New Year's day, with a fresh south-east wind, he set off across wind on a Goal flight to Condobolin. He covered the 86 miles in four-and-a-half hours.

Besides these cross-country flights, both Bob and Ray did some local flying at Narromine. This 'local flying' includes a 40 mile out-and-return to Dubbo by Bob and a 15 mile jaunt by Ray.

In South Australia, nothing spectacular was achieved in the way of cross-country flying, but some good local performances were recorded. Early in



*Ray Ash, Hinkler Soaring Club, climbing for height over Narromine, N.S.W. The runways of the aerodrome can be seen on right of the main highway*

December, Jock Barratt and Lee Weste set a two-seater duration record by thermal soaring the Slingsby 'Austral' for 4 hours 13 minutes, then making a voluntary landing. A little later in the month Ted Diecmanus and B. Newman raised the two-seater height record to 6,000 feet in the 'Austral.'



The 'Blue Olympia' on the road near Greenfell, N.S.W., during a retrieve.

In Adelaide a few days later Kevin Sedgman and John Pope raised the height record to 7,000 feet in the Adelaide Soaring Club's 'Falcon,' but they were not permitted to keep it for long. Over in West Australia, Ric New was getting under way with his 'Laister Kauffman' two-seater.

On January 1, with Geoff Higginson as passenger, he raised the height record to 8,000 feet, and, at the same time, set a two-seater out-and-return record with a flight from Dowerin to the Wongan Hills and return, 65 miles.

Ric also broke the single-place out-and-return record with a flight of 144 miles from Dowerin to Dalwallinu and back. The flight lasted 5 hours 5 minutes, thus completing his Silver 'C.' On the same flight he climbed to 11,490 feet—not quite enough for his Gold 'C' height leg, as his lowest point was 2,000 feet.

He also broke the West Australian state distance record with a 134 mile flight from Dowerin to Perenjori.

Other cross-country flights in West Australia include 75 miles to Moora, Goal, by Ray Baird in the 'Grunau'; 50 miles to Balkuling by Len Anderson, also in the 'Grunau'; and 42 miles to South Tammin by Neville Wynne in the 'H.17.'

Ric New flew the 'Laister Kauffman' 34 miles to the Wongan Hills and Ray Baird, in the 'Grunau' nominated Kellerberrin as the turning point for a 93 miles out-and-return, but was let down with only 13 miles to fly to complete the trip.

On January 5 another new record was set. Though less spectacular than others already mentioned, it is still worthy of note.

Miss Irene Pumfrey set an Australian Women's distance record by taking the 'H.17' from Dowerin to Oak Park, 14 miles. This is the first time a cross-country flight has been carried out in Australia by a

(Continued on page 20)

## ADELAIDE SOARING CLUB Good Conditions for Christmas Camp By BRIAN P. CREER

THE wide bituminised strips of Gawler Air Strip, 25 miles from Adelaide, were again the scene of the A.S.C. Christmas gliding camp in December. Conditions, except for the last three days, were ideal.

The camp began, as usual, on Dec. 26 and continued until Jan. 4, and during the duration of this camp a new Australian altitude record for two-seaters was broken.

The record, however, stood for only four days when Ric New of Western Australia broke it in an 'L-K' but still it is our first Australian record and, judging by the enthusiasm it evoked, may not be our last. The flight began as a routine training effort by C.F.I. Kevin Sedgman and trainee John Pope in our Munn 'Falcon' but luckily the club's one and only barograph was aboard.

In a typical Gawler thermal they spiralled up to 7,900 ft. and stayed there for 1 hour 33 mins., before making a voluntary descent as I, flying the 'Golden Grunau' was circling too close for John's liking.

The camp was planned as an all out training effort as the trailer was not complete (putting paid to any cross-country ideas) and our Slingsby (Blue) 'Gull' was still having her face lifted. The 'Falcon' was for training and 'Grunau' pilots were told to take the barograph to Silver 'C' heights and also try for their five hours.

However, most of the flying on the 'GB' was done by aspirants for 'C's' and Duncan McCullum is now proudly talking of his. I finally got official Silver 'C' height. Quite a relief after the number of times I have had it unofficially.

The 'Falcon' upset the plan of things somewhat by consistently turning almost every circuit into a soaring flight. However I can't recall hearing any complaints about this. All 'Falcon' pupils had at least one good soaring flight and heights were varying between 2,000 and 4,000 ft.

The camp began with about 12 members and right from the jump the hourage started to mount above the expected daily totals. Peter Killmier put in 2 hrs. 3 mins., in the 'GB' and the 'Falcon' was up there with him most of the time. Charlie Bonds took the brunt of instruction for the first three days when Peter stepped in and helped out. Neither of these two were able to stay for the whole camp and had to go home on Monday so it then fell my lot to take over the dual. Having only one soaring flight in the 'GB' up until then (2 hrs. 18 mins., to 6,400 ft.), I was a little sorry that I was going to be buried in the two-seater for four days.

I under-estimated the 'Falcon's' soaring consistency. On normal dual instruction I knocked up over 5 hours in only 26 launches. This, and I stress this point, was not out-right soaring. For at least 70 per cent of the time the pupils were doing the flying—and very good soaring pilots they'll make too. Durations were varying around 30 mins., up as high as 1 hour on these flights. Throughout the

camp two-seater pilots (and the pupils as well) had it in the back of their minds that if the chance came they would have a crack at the Australian two-place duration which now stands at just over four hours. Fate, however, had decreed that as we already had busted altitude that would be quite enough for one camp.

### ROUGH AND SMALL THERMALS

Thermal soaring at Gawler when conditions are as they were this year is very similar to the famed Waikerie thermals. The lift is powerful, very small and very, very rough.

In a large, rather cumbersome, machine like the 'Falcon,' circling in such lift is extremely difficult. One very big compensation, however, is the astoundingly low rate of sink of this aircraft which makes even 6 inches a second green ball a paying proposition if you are patient enough.

During several thermal flights with pupils and once in the 'GB' I tried what to me at least, was a new type of soaring. When flying straight and level and lift was encountered I was reducing speed until the core was struck and then pulling up to just on the stall and holding the machine straight and level on the stall. It is not a procedure recommended for getting the most out of lift but it is a welcome relief from circling to just sit there in level flight and watch the altitude slowly increase. With the 'Falcon,' and also the 'Baby' the forward speed on the stall is so slow that it is almost impossible to wallow out the other side of the thermal. Two other pilots (Kev Sedgman and C. Bonds) tried this out and reached similar conclusions to myself (i.e., that it is a great relief to instructors after a bad session of turns).

The roughness of thermal activity can be evidenced by the dice which happened quite early in the morning to our new member Miss Merawyn Maloney and myself in the 'Falcon.'

We were making our final turn in at about 200 ft., with about 45 m.p.h. on the clock when a beauty struck the up wing kicking us up and over. The 'Falcon' stalled in the vertical and I let her spin until one complete turn lined us up with the approach again and we made a normal landing (rather the pupil did!). It happened just as fast as that. There was not the slightest chance of holding her.

After landing my pupil made some acrid comment about:—'Instructors are always saying not to turn away from the field during landing approaches and look what you did.' Oh Happy Innocent!

I noticed, in passing, that from then for several days afterwards all approaches were most staid.

### FUN AND GAMES.

Like all camps in the past our latest was the big chance which only comes once a year to let off steam. All the steady and highly respectable (?) workers all go a little berserk during camps.

For example:—The club has a two-wheeled dolly for trundling the aircraft sideways into our hangar. In appearance it somewhat resembles a 'Corgi' para-scooter.

For light amusement in the cool of the evening our Boffin-type Cliff Gurr decided it would prove quite a comfortable means of transport if towed behind a

motor cycle. Personally, having almost had my ear chewed off while lying prone filming his ride, I think it rather unstable and well-nigh uncontrollable.

New Year's Eve saw us piling into Alan Delaine's enormous side-box—which is rather doubtfully attached to a monstrous Indian—dressed in old straw hats, elbow length fur gloves and big game helmets and waving signal flags and anything else we could lay hold of, roaring in to wake up Gawler and surrounding districts to the fact that it was just on 1953.

Oh, it was hard to get up next morning.

### SUMMING UP.

Finally the camp drew to a close. Alan Delaine had taken the dual for the last three days with Peter and Charlie, who had now returned.

Forbes, Walker and Reg. McColl made first solos and gained 'B's' and of course there was much celebrating to be done then.

For the camp the 'Falcon' made 109 flights all of which were dual except to the first solos, and the 'Golden Grunau' made 67 flights. The flying time for the camp was 30 hours 3 mins., from 176 launches. This, added to our previous flying time for 1952, means that despite a very heavy workshop schedule for the year during which complete overhauls were given to the 'Falcon' and a re-build (still in progress) of the 'Gull' as well as the construction of a trailer, the years hourage totalled just on 106 hours from 627 launches.

In order to give some indication of the consistency of soaring at Gawler over Xmas I have listed below only the flights which were more than 11 minutes and higher than 2,000 ft.

- 'FALCON' (all dual).  
 C. Bonds—P. Killmier, 1 hr. 7 mins., 4,000 ft.  
 K. Sedgman—J. Pope, 1 hr. 33 mins., 7,900 ft. (Aust. record).  
 B. Creer—M. Maloney, 30 mins., 3,200 ft.  
 " " —R. McColl, 39 mins., 3,900 ft.  
 " " —J. Pope, 16 mins., 3,100 ft.  
 " " —J. Pope, 45 mins., 3,000 ft.  
 " " —U. Kuusik, 41 mins., 2,900 ft.  
 " " —Passenger, 13 mins., 2,900 ft.  
 C. Bonds—R. McColl, 21 mins., (Height not available)  
 " " —J. Pope, 25 mins., " " "  
 " " —Passenger, 15 mins., " " "  
 " " —J. Pope, 14 mins., " " "  
 " " —D. McCullum, 18 mins., " " "  
 " " —J. Pope, 50 mins., " " "  
 K. Sedgman—Miss B. Sullivan, 13 mins., (Height not available).  
 C. Bonds—R. McColl, 20 mins., (Height not available).  
 " " —Miss M. Maloney, 30 mins., " " "  
 " " —R. McColl, 17 mins., " " "  
 " " —M. Maloney, 50 mins., " " "  
 B. Creer—M. Maloney, 30 mins., 3,200 ft.  
 " " —R. McColl, 16 mins., 2,100 ft.  
 " " —R. McColl, 39 mins., 3,900 ft.  
 " " —J. Pope, 16 mins., 3,100 ft.  
 " " —J. Pope, 45 mins., 3,000 ft.  
 C. Bonds—R. McColl, 1 hr. 5 mins., 3,800 ft.  
 B. Creer—Passenger, 13 mins., 2,900 ft.  
 " " —U. Kuusik, 41 mins., 2,900 ft.  
 A. Delaine—R. McColl, 15 mins.  
 'GRUNAU BABY 11B'  
 Peter Killmier, 2 hrs. 3 mins., approx. height, 3,500 ft.  
 B. Creer, 2 hrs. 18 mins., 6,400 ft.

(Continued on page 5)

# EGYPTIAN GLIDING

By R. SWINN, (C.F.I.)

OPENING in October, 1951, in difficult circumstances the School has grown into a very large Institution, with a membership of over 300. So overwhelming has been the rush to join that the application list had to be closed a long time ago. All vacancies as they occur are filled from the long waiting list.

With a paid staff of 15 persons, a large, well-equipped workshop and modern clubhouse, the School must be amongst the best equipped and staffed schools in the world, and without doubt had its membership list not been closed it would have had the largest membership of any in the world.

That this tremendous expansion has taken place side-by-side with the strict School policy of SAFETY FIRST is an outstanding example of progress and safety going hand-in-hand. Throughout the entire life of the School not one single student has suffered so much as a scratched finger, although in 1952 alone over 7,000 instructional launches were made, and amongst the many certificates obtained were 4 international Silver 'C's.

The basic operational regulations of the School are those of the B.G.A. with modifications to meet local requirements. When one considers that there are ten different nationalities amongst the School

members, one realizes how carefully regulations have to be drawn up, and no little credit for success in this direction is due to the fundamental soundness of basic B.G.A. Instructions on which we have been able to model our own.

None will doubt that in the first year of the School's operation many necessary risks have had to be taken in relation to the soaring phenomena peculiar to Egypt.

The School had to face the hard reality of either avoiding the more violent soaring phenomena because of its apparent danger and so leaving it a source of danger at all time, or go ahead with the actual flying investigation of these things. The Directors wisely adopted the course that every condition likely to be met with in Gliding should be thoroughly investigated and the results made known to all by written report. The risks to be taken would be taken by the C.F.I., who is paid to take them. In this bold stroke rumours, guesses and wild speculation were replaced with a sure, clear cut knowledge, and conditions once thought dangerous used as a safe and satisfactory means of soaring. I wonder does this method of investigation and written reports commend itself to some of the hazards of U.K. sites little known to new members.

In the short life of the School, through their methods and the high standard set, they have won the confidence of the Egyptian Ministry of Civil Aviation in all matters relating to gliding. It is a comforting feeling to know that one has the confidence of this department: and mutual trust has replaced the European form filling routine. We value highly this trust and realize fully the responsibility that goes with it.

The School is rightly proud of its system of instruction which I am sure is second to none in its thoroughness. An applicant has to prove a standard of education to the minimum laid down by the School, he then has to pass a medical examination given by a Royal Egyptian Airforce Medical Officer, if he is successful he is accepted for a probationary period.

After final acceptance the student must attend a minimum 75% of the School lectures to retain his instructional rights.

A written examination must be passed before any certificate is issued, this applies from the 'A' certificate upwards. Students not measuring up to the standard are ruthlessly rejected at any stage—and in this way potential accidents are averted and discipline held at its present high level.

The School has trained four instructors up to 'B2' standard and has a further two under instruction. The instructional course lasts three months during which daily attendance is demanded.

The School has a large mixed fleet of machines from England, France, and Hungary, also four more high performance machines have been ordered and their arrival is awaited.

## CHRISTMAS CAMP—continued from page 4

P. Killmier, 30 mins.,	Height not available
C. Gurr, 30 mins.,	" " "
C. Bonds, 17 mins.,	" " "
C. Bonds, 21 mins.,	" " "
A. Killmier, 42 mins.,	" " "
H. Young, 33 mins.,	" " "
C. Gurr, 43 mins.,	" " "
D. McCullum, 20 mins.,	" " "
D. McCullum, 14 mins.,	" " "
H. Young, 15 mins.,	" " "
C. Gurr, 27 mins.,	2,900 ft.
C. Gurr, 45 mins.,	2,500 ft.
P. Killmier, 53 minutes,	2,700 ft.

## IS THIS A WORLD RECORD?

Earlier in this screed I mentioned that we broke the Australian two-place altitude record with a height of 7,900 ft., but that it only stood for four days. It was then broken by a Western Australian pilot, Ric New, flying a 'Liaster-Kauffman' when he reached 10,000 ft. On the same flight Ric did an out-and-return flight which is claimed as a W.A. record.

The following day (presumably flying solo as no two-seater record height was claimed) he took the 'L-K' up to 11,000 ft. On this flight he did an out-and-return flight of 144 miles which he is claiming as an Australian record.

We think that this may be a world record as the Americans now hold the record with a Schweizer '1-23' and a distance of about 248 miles all told. New flew 288 all told.

What do you think?

# Progress in Two-Seater Sailplane Design

## A Summary of Technical Development During the Past Thirty Years

By B. S. Shenstone, M.A.Sc., A.F.I.Ae.S., F.R.Ae.S.

### INTRODUCTION

THIS article attempts to summarize the technical development of two-seater sailplanes during the past thirty years. There is no attempt to contribute anything new to the art, but only to bring together information from various sources. It is also hoped that the data collected will be found useful to designers.

In the olden days of soaring the two-seater saw little progress, most of the effort being put into the smaller and lighter and cheaper single-seater. Hence the useful two-seat sailplane was a late development. In the early days of gliding the rather heavy weight of the two-seater made it unpopular due to its bad ground-handling qualities. Another difficulty was the manpowered shock-cord launch. It was not until aero-towing and winching were developed as normal launching methods that the two-seater became practical and popular.

### SHORT HISTORY

A rather fantastic biplane glider which Fokker flew at the Wasserkuppe in 1922 was probably the first two-seater. He made a glide of 37 minutes, but there is no record of any soaring. During the following ten years two-seater development was slow. By 1925 the best two-seater performance was a distance of 10 km. (6 miles) and an altitude of 336 metres (1,100 ft.). These earlier two-seaters were not refined sailplanes, but secondary machines of very limited capabilities. Even as late as 1929 when Gunther Groenhoff flew Lippisch's Rhoenadler (not to be confused with the later single-seater Rhoenadler) the two-seater was good only for duration. In 1932 Lippisch designed the Obs with a span of 26 metres (85 ft.) and an aspect ratio of 17.8 as a weather research machine. This was technically very interesting, but was not in the line of development.

Also in 1932 Czerwinski designed his 18-metre (59 ft.) high wing tandem CW-4 in Poland and Wolf Hirth produced his 14.5-metre (47.6 ft.) Grunau 8. These were along useful lines, but due to lack of production and the slow development of aero-towing such machines as these were not widely used. The real start was made when Hans Jacobs developed the Kranich from his single-

seater Sperber. Not only did he produce an excellent machine, but he had enough foresight to put it into production and it became generally available in Europe in about 1936. Jacobs' commercial instincts, although criticized by purists, made the two-seater widely used and enabled its advantages to be studied. The altitude of 8,200 metres (27,000 ft.) reached by a Kranich demonstrated its ability.

Shortly before the 1939 war the Hirth-Huetter Goevier (Göppingen 4) was developed and put into production. War-time design produced a series of American two-seat trainers and some German designs. Apart from some Swiss and French developments, perhaps the most interesting post-war projects were the designs put forward in response to the British Gliding Association design competition for two-seaters in 1947.

Most of the development to date has been because of the demand for two-seat trainers (advanced and *ab initio*) and it will be of interest to study this line of development and discover where it leads us.

### GENERAL DESIGN NOTES

The single-seat trainer must be a cheap machine because crashes are all too frequent. Cheapness usually means low performance. Early two-seat trainers such as Hubert's Falcon III were also of fairly low performance for the sake of cheapness. However, it soon became obvious that even trainers could have a fairly high performance if they were two-seaters because the crash rate was low and a more expensive glider could be afforded.

Actually the expense of two-seat training can be lowered if a high performance trainer is used, because for a given initial height, there is more time for instruction and the use of an intermediate type for early solo flying may be avoided. This line of thought leads to the conclusion that the operational need for two-seaters is limited to the high performance type. The only modifying factor is cost. There is, however, scope for a cheap two-seater of moderate performance such as the T-21B and SG4-2-22. The design of cheap two-seaters is not considered in this paper because the problem is very specialized.

Apart from training, the two-seater is favoured

by many because two heads are better than one. A pilot and a navigator may well be able to operate more efficiently than a pilot alone, as long as the sailplane performance is good enough.

The high performance aspects of two-seater design have not in the past received much attention, so it is worth while to discuss some of them here. The most difficult problems have been to give a good view for the second pilot and to achieve a low all-up weight. These are now discussed.

## View

The view for the second pilot is important if he is to do any piloting or navigating. Even for a passenger a good view is desirable.

The design aspect is complicated by the virtual necessity for the second pilot to be seated on or close to the centre of gravity of the sailplane. If he does not sit on this spot, the sailplane would have to be ballasted when flying solo, which is undesirable and dangerous if omitted.

The view depends mainly on wing position and seating arrangement. FIG. 1\* has been drawn to show the various layouts which have been used to date.

The side-by-side two-seaters such as Goevier (FIG. 1(a)) and Falcon II (FIG. 1(b)) have good views. The Goevier is rather cramped in beam, the fuselage width being only 36 in. (92 cm.). With two up it is not very comfortable and there is no room for any serious navigation by the second crew member. The other extreme has been achieved by the Pratt-Read TG-32 (LNE-1) which has a fuselage beam of 46 in. (117 cm.) and as a result is very bulky. There is little doubt that the large cross-sectional area of the side-by-side two-seater does increase the drag and that one can always design a tandem-seater with a better performance. To achieve a side-by-side arrangement without using ballast is not easy, since with both crew on the centre of gravity it is rather difficult to get a normal balance with ordinary tail arms and control volumes. A slightly staggered layout improves this aspect and has been used, but Huetter's scheme for adjustable sweep solves the problem completely.

Of the tandems, we may start with the low-wing type exemplified by the Short Nimbus (FIG. 1(a)). Here the view of the second pilot is excellent, except in the downward direction. The difficulty is that the low wing is likely to be damaged in anything other than an airport landing, and the avoidance of buffeting is difficult. The Schweizer TG-3A has a slightly higher wing than the Nimbus, but the designer Ernest Schweizer agrees that such a low position has undesirable features. In the Schweizer TG-2 (FIG. 1(d)) and Kranich (FIG. 1(e)) the wing is sufficiently high to clear obstacles, but the second pilot's view suffers as a result, being good only upwards and forwards. Raising the wing still further brings the second pilot under the wing as in the Briegleb BG-8 (FIG. 1(f)) and the CW-4 (FIG. 1(g)). Here the view upwards is negligible. For a dual primary (FIG. 1(h)) such an arrangement is acceptable and

it is also satisfactory for joy-riding. For serious soaring the second man would be of little help and he would probably be extremely frightened most of the time, with his lack of view. The vertical stagger used on the Yamazaki (FIG. 1(i)) and others is a development of this arrangement to give the second pilot good forward and upward view. This has many merits for training, but the severe blindness downwards limits its usefulness.

To get the view he needs, the second pilot should sit forward of the wing leading edge so that his view is blocked neither up nor down. This can be done, still keeping him on the centre of gravity, by sweeping forward the wing. The Russian solution of marked continuous sweep as on the Stakhanovitch is perhaps a little extreme. The compromise shown on the Swiss S-25, the French CM-7 and the Harbinger (FIG. 1(j)) gives the desired result also. In these types the inner portion of the wing is swept forward, the outer wings being without marked sweep. By a little juggling of the wing form, the centre of gravity can lie just ahead of the root leading edge. This wing form may cost some structural complication and this aspect is considered below.

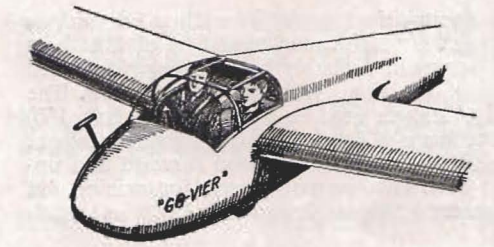
In FIG. 2 is shown a general arrangement of the Russian Stakhanovitch which shows clearly the forward sweep and the good view. In FIG. 3 are shown half wings with varying amounts and kinds of sweep forward. Crabpot has an unswept leading edge which results in a small effective sweep forward of the line joining the aerodynamic centres of the wing sections. S-25A and Harbinger show two modes of broken sweep and lastly the simply swept Stakhanovitch wing is shown.

## Weight

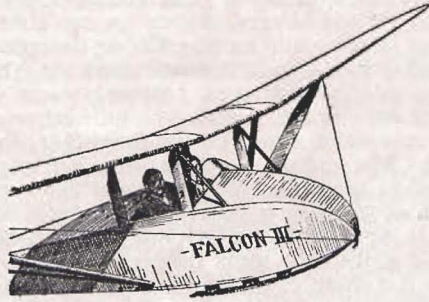
It is always a problem to keep the weight down without going to extremes of refinement which increase the cost. On the other hand, a heavy sailplane is awkward and expensive to handle. As far as sinking speed and gliding angle are concerned, weight in itself is not a critical factor, for if a heavy sailplane is large enough it can perform as well as a smaller lighter type and of course weight does not affect gliding angle. However, a large glider is not so manoeuvrable as a small one. It may therefore be stated that handling both in the air and on the ground is improved by having a light and small two-seater.

It may seem trivial to stress the importance of ground handling, but to anyone who has helped to manhandle 800 lb. (365 kg.) of empty glider in and out of hangars it is a real problem. A heavy beast of a sailplane gets a bad name. More important operationally is the effect of weight on launching. On auto-tow take-offs a heavy sailplane can wear out a motor car transmission in a short time. On aero-tow, which would now be the most normal take-off method, the heavy sailplane requires a heavier and more expensive tug, particularly if any reasonable altitude is to be attained quickly.

\* All the sketches forming FIG. 1 were drawn by W. Czerwinski.



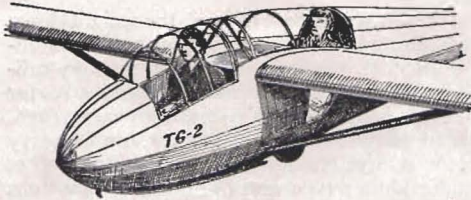
(a)



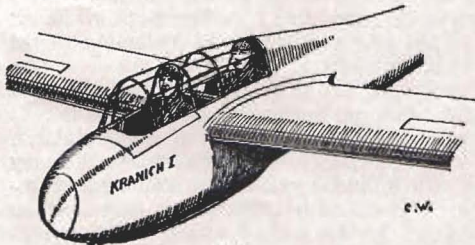
(b)



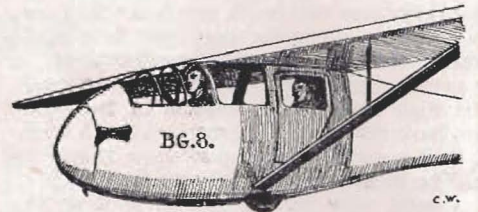
(c)



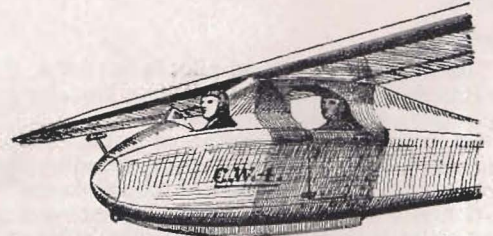
(d)



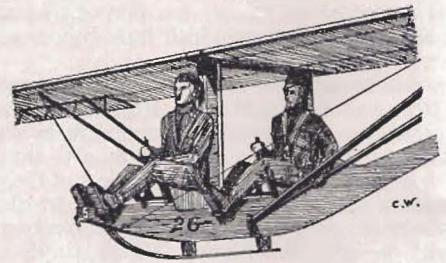
(e)



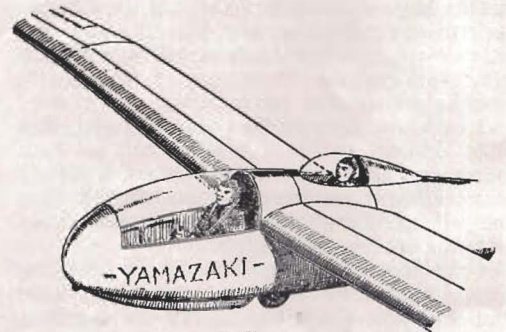
(f)



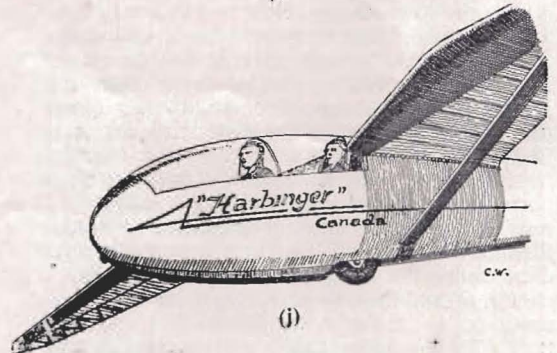
(g)



(h)



(i)



(j)

Fig. 1.—Crew arrangements for two-seaters

- |                |               |
|----------------|---------------|
| (a) Goevier    | (f) BG-8      |
| (b) Falcon III | (g) CW-4      |
| (c) Nimbus     | (h) 2G        |
| (d) TG-2       | (i) Yamazaki  |
| (e) Kranich    | (j) Harbinger |

Weight has, as stated above, no advantage. But lightness is difficult to achieve. To achieve it we should have:

Small span.

Small wing area.

Inherent light construction.

Carefully designed main fuselage frame and wing junction.

Short fuselage.

Small tail, or none at all.

Generally simple structure.

One cannot have all these features for nothing. A very light wing would be very thick or wire braced, resulting in increased drag. Too small a wing area or span results in high minimum sinking speed. The urge toward small span is a good one if tempered by a sense of proportion. How far the designer can go in this direction depends on the performance he needs. A two-seater to operate in tropical or sub-tropical continental conditions (Texas, Central Australia, etc.) will meet strong thermal conditions and good range and altitude could be obtained with a two-seater having a span as low as 15 metres (49.3 ft.). For temperate conditions (Central Europe, U.K., Canada, etc.) a normal two-seater needs a span of about 18 metres (say, 60 ft.) for reasonably good effectiveness. The problem of span is given further consideration later in this paper.

The above limits are for normally designed sailplanes. It is worth considering what means exist for reducing span without sacrificing performance. Apart from special light structure, the means are aerodynamic refinement and low drag flaps. Aerodynamic refinement would consist of reducing profile drag and could be accomplished by making the wing as thin as possible and as smooth as possible, by reducing the height, width and skin area of the fuselage, improving its shape and by paying unusual attention to sources of possible interference.

For a given span the size and weight may be reduced by increasing the wing aspect ratio (reducing wing area) and although this can result in improved penetration, it suffers at the lower speeds if overdone. The only way to improve the minimum sink is to increase the usable lift coefficient without increasing the drag too much. Leading edge slots do not help. Some form of camber increase is the most fruitful method. The nearest approach to a low drag camber increase is the use of a low-drag high-lift flap. A simple flap has often been used, but to do a proper job something better is required. Experience with the plain flap has been disappointing, the expected gain being hardly ever achieved. A flap which increases wing area as it increases camber is most likely to be effective, but is very difficult to design. Some form of Fowler or Youngman flap is suggested. At least two single-seaters, the Polish B-38 and the German AFH-4 have used such flaps, but they have proved almost impossible in detail design, due to the very small scantlings necessary. So far no flap has been found to be as good as cambering the wing in actuality. Ingenious methods for doing this have been put

forward (by Huetter for instance), but no successful schemes have been built and used.

It will now be useful to examine how weight does in fact vary with size. Span may be taken as the basis of weight variation. There are of course many other factors affecting weight such as wing area, load factor, wing thickness, structural material, designer's skill, designer's care, etc. These factors doubtless cause much of the scatter shown in FIG. 4 on which the equipped weights of forty actually built two-seaters are plotted against span. The general trend is clear, but the scatter is fairly wide. Of particular interest are the five very heavy machines from 54 to 62 ft. span. These are TG-32, TG-3A, CM-7, Nimbus and Mihm. The first two were quickly designed and quickly built sturdy trainers for the U.S. Army and Navy. There was no time for detailed refinement and their heavy weights are no surprise. In the case of TG-3A, Schweizer, who had always built metal wings, had to build a wooden wing because of shortage of light alloy. The CM-7, for reasons unknown to the writer, came out 280 lb. overweight, but it has a high ultimate load factor of 12. Nimbus was a first attempt and could no doubt be refined. Background of Mihm is unknown to the writer. In view of the above this heavy group may be ignored in the trends. Striking a line through the rest in a reasonable fashion gives the dotted line, the equation of which is:

$$We = 13b - 230 \quad (\text{lb.})(\text{ft.})$$

$$We = 19.4b - 105 \quad (\text{kg.})(\text{m.})$$

Wilkinson<sup>1</sup> uses greater refinement and takes into account one further variable, the aspect ratio. Applying this method results in the full diagonal lines on FIG. 2 for aspect ratios 10, 15 and 20. The weight equation is:

$$We = -370 + b(22.6 - 0.44A) \quad (\text{lb.})(\text{ft.})$$

$$We = -163.5 + b(31.2 - 0.44A) \quad (\text{kg.})(\text{m.})$$

The possibly surprising point that the higher the aspect ratio the lighter the weight is dealt with later in this paper. Those who disbelieve this trend may use the formula which omits aspect ratio.

There may be some who object to the assumption of a linear relation between span and weight. It can easily be shown that wing weight varies as  $b^n$  where  $n$  is greater than unity. However, if all the other weights not varying with span are taken into account, the deviation of the curve from a straight line is not great over the range of span shown. It should also be mentioned that the writer is not concerned here with what *ought* to be but only with things as they *are* in practice. The group of points cries out for a straight line. Indeed the scatter is so great that any other shape would be an unnecessary refinement. Again the designer of large-span sailplanes is always very conscious of the danger of overweight and usually makes unusual efforts to achieve a low weight. The very short fuselage of the Obs is a case in point and also the extreme wing taper of the same machine (see FIG. 5). On small-span types the designer is aware that weight may not be so critical and tends to design a little more heavily. In any such collection of data it is clear that the mean

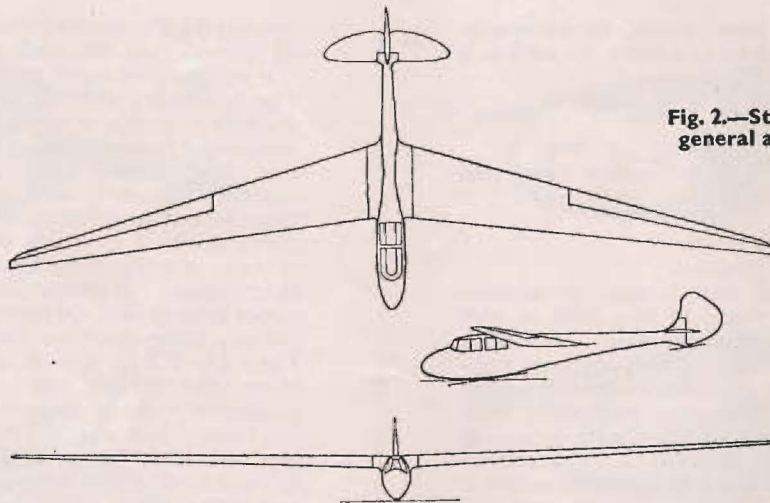


Fig. 2.—Stakhanovitch:  
general arrangement

line indicates something that any designer with reasonable skill could achieve. The most interesting points are those below the line. The little Oppenhausen is not really as good as it looks because it was an old stick-and-wire braced type which paid for its light weight by having no worth-while performance. However, the Darmstadt D-31 is quite another story. With a thin cantilever wing (Root section NACA 4415) and an ultimate load factor of 9, it is a first-class

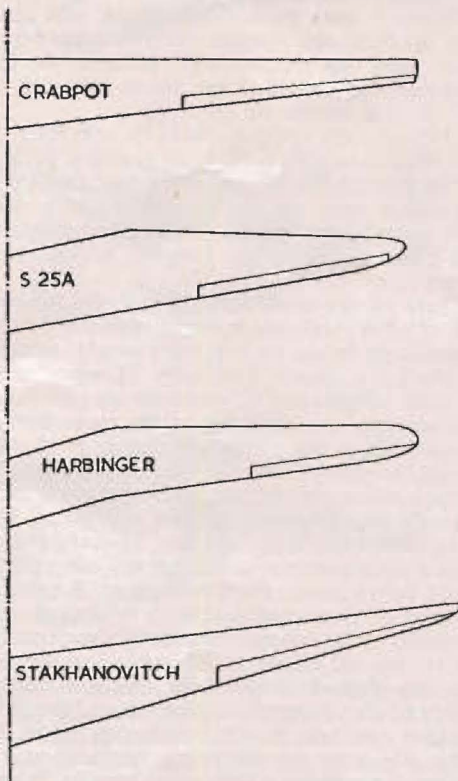


Fig. 3.—Examples of wing sweep forward

achievement. We can say with reasonable confidence that although anyone should be able to build a two-seater with an empty weight of 600 lb. with a 60-ft. span, a very brilliant designer could do it for 375 lb.

FIG. 4 probably shows more than anything else the effect of designer's care in detail design. It is there that the weight can easily be won or lost. Carelessness in detail structural design can spoil a design just as much as choosing the wrong aerodynamics.

#### PARTICULAR DESIGNS

Designs chosen for discussion have been picked out either because they have been built in large quantities or because they show interesting features or trends. Those produced in large numbers, even if inferior, are important because their use is widespread and they inevitably become standards of comparison. On the other hand, designs incorporating special features can be of more interest technically even if they have never been built.

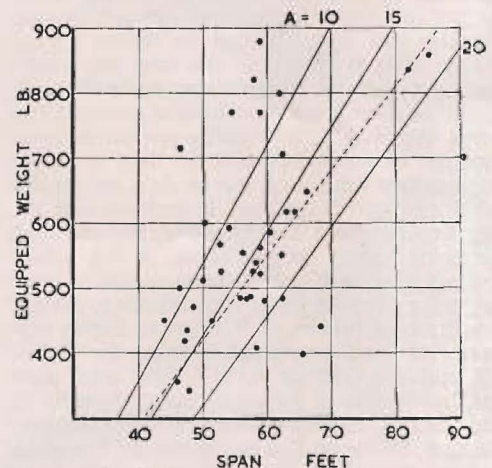


Fig. 4.—Variation of empty weight with span

(To be continued)

# SIMPLIFY AND ADD MORE LIGHTNESS

By PETER FLETCHER

I HAVE been reading Mr. Hoinville's article on costs of gliding etc., with interest, I do not agree with all his views, for instance a perfectly good two-seater is available in this country for about £500 or about £250 in kit form, this is the Slingsby 'Type 31' or 'Tandem Tutor.'

I also do not think it true to say that club pilots are mainly of the 'kindergarten stage' at any rate in this country or Europe. I know at least two British Gold 'C' holders who are ordinary week-end club members and who have never been private owners, professional or Service pilots.

I do very much agree with him when he says that single-seater high and medium performance sailplanes are too big, too expensive and generally too unwieldy for economic private owner operation, as a matter of fact several of the older hands of private owners have told me that nowadays a private sailplane is just not worthwhile because of the high cost of insurance and of running a big enough car to pull the huge trailer around, etc.

Now as to this ideal, small, cheap, easy to produce sailplane, what do we want?

Well I can tell you what I want and what I expect Mr. Hoinville has in mind, a small sailplane of reasonable performance, span not more than 40 feet, empty weight about 130 lb., suitable for winch launch or aerotow, strong, simple and reliable. Such a machine could be towed by any light car, stowed derigged in an ordinary room for annual C. of A. work instead of in some, damp freezing hangar and operated by a crew of pilot and say two partners.

This little machine would make private ownership a working proposition, as a matter of fact it already exists! It was designed and built in 1938 and in its original form flew for many years on local and cross-country soaring. I refer of course to the 'Camel' of Ivanoff and Sproule. This design which is capable of further development is the only small, practical, private owner sailplane which could possibly be produced today at a reasonable price, its slab-sided fuselage is the essence of simplicity, and the wings too are of parallel chord for over half the span, requiring a minimum of labour to build.

My guess, and it is only a guess, is that Mr. Slingsby could probably produce this sailplane even today for about £350, and in kit form for perhaps £150. A three man partnership, about the minimum satisfactory number, could have this sailplane ready-made for about £115 each, or if they put it together themselves for about £50 each.

Perhaps Mr. Ivanoff will read this and do us an authoritative article on the design, I very much hope so as I believe that it is the only one today which has real possibilities for the private owner of every-day means, for very few people today can afford a wife, family, half a dozen civil servants and a decent sailplane!

The 'Camel' has a span of 37 feet 4 inches, overall length of 17 feet 2 inches, wing area 110

square feet, aspect ratio 12.7, wing section Cött 535 M.6, rate of sink 3 feet per sec., stalling speed 35 m.p.h.

The original did not have spoilers or airbrakes but these could easily be added if the machine was produced, with them it would be ideal.

Of course whether a market exists for such a machine is another matter, it is very difficult to hazard a guess as to whether such a machine would or would not sell, since the post-war private owner market has been tiny due to the inevitable high cost of producing conventional high and medium performance sailplanes in the small numbers required. The *Sailplane* could organise a little research on this subject if it feels so inclined, by asking people to write in and say whether or not they would be seriously interested in a small sailplane if it was produced and so gauge market possibilities, but it is most important to remember that unless a manufacturer can feel confident of selling at least 60 to 75 machines the project is not worth his while.

Now my readers may say, if we have had good small sailplane designs for so long why have they never been popular? The reason is actually quite simple, the majority of these small machines have had the reputation, usually quite unfairly, of being 'tricky' to fly. This term was used to gloss over the fact that if a pilot brutally mishandled the controls the machine would spin quite firmly, in the past when sailplane pilots were solo trained and were for the most part very inexperienced, the mere fact that a machine would display any trace of character other than that of a docile cow was enough to damn it out of hand. Today no pilot goes solo until he can recover from a spin and further he can be shown recovery from unusual attitudes while flying dual, so the small machine which may be a little more difficult to handle is a perfectly safe proposition as soon as the prospective owner has had a good dual training and a little experience. However the prejudice against small sailplanes dies hard even though there have been viceless small ones built and flown safely for hundreds of hours, such as the veteran 'Scud II' and the 'Camel.'

The pre-war light aeroplane movement in its hey-day relied in the main on the 'Moth' and the 'Avian,' two delightful, and by aeroplane standards viceless machines, by old sailplane standards they might have been termed 'tricky' since they would spin firmly unless corrected and drop a wing if stalled badly, but because pilots were taught to fly properly hundreds of amateurs, both very young and very old, flew them for thousands of hours all over the world and very few came to a sticky end in them.

Glider pilots today are also taught to fly properly by dual and are very much safer particularly in the early solo stages than their elders used to be, so I feel that designers could be allowed a little more latitude in obtaining performance in the smaller aircraft without feeling that if they give a wing less than 15

(Continued on page 14)

# THE HEALTH OF GLIDING MOVEMENT

THE purpose of this examination of Statistics is not chauvinistic, there is no desire to prove that gliding in any particular country is *better* than that in another but only to gain information from the statistics of the past for use in the future. By learning from our own and other countries successes and mistakes in the past we might be enabled to enjoy more soaring and more interesting soaring in the future.

I am indebted to the Secretary of the B.G.A. for very kindly allowing me to study the F.A.I. Bulletin and Statistics which are reproduced with some corrections in Table I.

Now Statistics can be meaningless, it is said that one can prove anything with the same set of statistics depending merely on the way in which they are presented and statistics have also in some cases harmed the gliding movement. This was when the allocation of subsidies to a club, or the reputation of an ambitious instructor, depended on the number (and number alone) of certificates obtained without any distinction in value between 'A,' 'B,' 'C,' or Silver 'C' certificates. Obviously the club that concentrated on mass-producing 'A' certificates but wisely left 'B,'s' 'C's' and Silver 'C's' alone succeeded financially although the gliding movement suffered as a whole. In the future a similar harmful use of statistics might recur, some country's gliding movement might make it a point of honour to mass-produce Silver 'C' certificates in numbers exceeding all other countries but at the expense of those pilots, who, having once obtained their certificates, would no longer be afforded opportunities for soaring.

It is extraordinary difficult to compare the gliding movement in one country with that of another on any basis. The first and obvious basis is that of size and on this count alone France stands out as a Colossus dwarfing pigmies. France shows more hours

of soaring, more 'A,' 'B,' 'C,' Silver 'C,' Gold 'C,' Diamond 'C's' being produced every year than all others combined. But other countries' figures are far more inconsistent, some produce 'A' and 'B's' in profusion but no Silver 'C's,' others no 'A' and 'B's' but a fair number of Silver 'C's' (and better), others possess a vast number of sailplanes but keep them in hangars, others very few sailplanes but really use them for soaring.

Bearing in mind the evils which a fascination for gliding statistics can lead to, I have attempted to evolve two formulae for examining such statistics, which even if they are taken too seriously, will do the gliding movement the minimum of harm and the maximum of good. I did suggest them in the January issue of this journal before I examined the statistics and before I had any idea of the results which such formulae would reveal.

They were based on these questions :

A. Is a gliding movement really utilising its equipment for *Soaring in the Air* or for *Hangarage on the Ground*? Has it too great a proportion of elementary training gliders to medium or high performance sailplanes?

$$\text{A. Formula-criterion} = \frac{\text{Total Hours Soaring}}{\text{Total number of Gliders and Sailplanes, all types}} \\ = \text{average Utilisation in hours per plane.}$$

Number of launches do not figure in this. The object is to *Soar*, not to spend one's time trying to do as many winch launches followed by immediate landings. Obviously clubs with hill slope soaring sites have advantages over those operating from flat sites. But let the latter so improve their launching organisation and techniques that they can compete with topographically more favoured clubs on a basis

	FRANCE				GREAT BRITAIN			SWEDEN				SWITZERLAND		
	1949	1950	1951	1952	1949	1950	1951	1949	1950	1951	1952	1949	1950	1951
Hours .. .. .	83200	79613	54299	25252	7134	7560	7736	3394	3942	3585	3893	5825	5524	3893
Club A/C .. .. .	1400?	1379	1050	1000?	113	129	139	239	230	214	214	196	192	171
Private A/C .. .. .	—	—	—	—	48	48	50	—	—	—	—	—	—	—
B .. .. .	1286	1320	1125	?	493	644	836	273?	306?	245?	299?	?	?	?
C .. .. .	899	916	735	?	331	242	240	198?	205?	202?	219?	?	?	?
Silver 'C' .. .. .	368	265	131	119	67	47	63	?	27	26	17	?	28	?
Gold 'C' .. .. .	27	14	11	20	3	2	—	?	5	2	5	—	2	—
Diamond 'C' .. .. .	30	—	1	48	—	—	—	—	—	—	—	—	—	—
Criterion A Hours ÷ A/C .. .. .	60	58	54	25	44	42	41	14	17	16	—	29	28	22
Criterion B Hours ÷ New Silver 'C' ..	223	300	415	211	106	160	122	—	145	137	229	?	200	?

TABLE I. CRITERION A=average utilisation in hours per aircraft.

# MENTS IN DIFFERENT COUNTRIES

By O. W. NEUMARK

of *Soaring Hours*.

Maximum utilisation of sailplanes has never been attained by any club in the world. There are always sailplanes on the ground or in the hangar, when they could, but for a thousand and one omissions or mistakes, be in the air (e.g. winch has run out of petrol, cable break, too many landing at the same time for lunch and tea etc., etc., minor repairs not carried out in the evening but left to spoil the next soaring day).

One factor which unnecessarily reduces the utilisation figures is when flying time is rationed to 15-20 minutes soaring per member when there are too many members and too few sailplanes. The Surrey Gliding Club were the first, to the best of my belief, to overcome this evil by agreeing that there should be no limitation or rationing of soaring time when an individual was actually airborne—that he was to exploit meteorological conditions to make the best possible flight—usually a cross-country, regardless of the others who were waiting to fly that sailplane. Each would have his turn on other days. Each member got more soaring hours and cross-country mileage per year than he could possibly have done under any short 'time' rationing system.

On very few occasions the weather becomes so bad that it is unsafe to continue soaring, or, too many sailplanes might be congesting on too short a beat and under these conditions too great regard for maximum utilisation might do some harm.

The average utilisation figures are shown per year at the bottom of Table I and again the average utilisation figure for several years in Table II with the best figure obtained in brackets.

The second criteria or formula is based on this question:—

B. In which country are new pilots enabled to join those who already enjoy the beauties of cloud

and cross-country flying?

$$B. \text{ Formula-criterion} = \frac{\text{Total Hours Soaring}}{\text{New Silver 'C's'}} \\ = \text{One New Silver 'C' produced for every } \dots \text{ hours soared.}$$

Many will disagree with this second criteria. 'Why choose Silver 'C' certificates? It is no real test of airmanship, skill, soaring meteorology, etc. Some excellent pilots simply cannot afford the expense of a cross-country flight but they are much better pilots than many holders of Silver 'C's' and enjoy themselves on the slope or in local thermals just as much, if not more, than the latter.' or 'No thermals are encountered at my cliff-soaring site and members must obtain their Silver 'C's' elsewhere at great expense, while at one well-known alpine site it is easy for a 'B' certificate pilot to obtain his 'C' and Silver 'C' cross-country in one flight of uninterrupted slope-soaring in an area of slope lift 8,000 ft. high, over 1,000 yards wide and conveniently 45 miles long—therefore the Silver 'C' is a most unfair test.'

There is reason in all these objections but what simple or better alternative is there? Examinations or tests whether for Silver or Diamond 'C's' or matriculation or degrees all have their limitations and even drawbacks. It is permissible to obtain Silver 'C's' on closed circuits which partly demolishes the argument about costly retrieves but we are at this stage not examining costs but results.

The 'B' criteria should be read in conjunction with the 'A' criteria. The 'B' criteria should be large if the country possesses a very great number of Silver 'C' pilots already, as these should be allowed to continue soaring and should not be grounded in favour of mass-production of new Silver 'C's'.

Thus the high 'B' criteria figures for France are

U.S.A.			FINLAND			NETHERLANDS			SPAIN			YUGOSLAVIA		BELGIUM			DENMARK			AUSTRIA	
1949	1950	1951	1949	1950	1951	1949	1950	1951	1949	1950	1951	1949	1950	1949	1950	1951	1949	1950	1951	1950	1951
5000	4000	5500	2326	920	1000	2029	2750	2550	2798	2801	2452	6750	7227	600	962	1565	1031	1125	1150	725	1137
50	50	45	94	94	109	85	66	83	2107	201	180	252	276	29	20	21	75	75	75	72	121
433	419	400	1	1	1	—	—	—	—	—	—	—	—	—	1	2	—	3	?	—	3
—	—	—	83	48	94	55	112	175	1262?	349	231	—	—	15	40	46	72	30	77	30	202
119	64	66	62	50	46	48	35	45	?	324	252	1914 { 1836		12	15	21	58	51	75	12	112
12	19	18	8	7	6	9	14	8	4	4	3	17	30	1	2	8	9	4	7	21	21
—	6	5	1	—	—	—	—	—	—	—	—	—	6	—	—	—	—	—	—	1	1
—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10	8	12	24	9	10	23	41	30	13	14	13	27	26	20	48	68	13	14	15	10	9
415	210	305	290	131	166	229	196	318	890	900	800	390	240	600	481	195	114	281	164	34	50

CRITERION B. = Total hours flown divided by number of new Silver 'C' certificates obtained and shows rate in hours at which new Silver 'C's' emerge.

Average Utilisation Criterion A.				Average New Silver 'C' Criterion B.				Combined A and B criteria (averages).			
				<i>Hours</i>				<i>Points.</i>			
France .. .. .			49 (80—1949)	Austria .. .. .			42 (34—1950)	Great Britain .. .. .			21
Belgium .. .. .			45 (68—1951)	Great Britain .. .. .			124 (106—1949)	France .. .. .			20
Great Britain .. .. .			42 (44—1949)	Sweden .. .. .			170 (137—1951)	Sweden .. .. .			16
Netherlands .. .. .			31 (41—1950)	Denmark .. .. .			186 (114—1949)	Netherlands .. .. .			15
Switzerland .. .. .			26 (29—1949)	Finland .. .. .			195 (131—1950)	Switzerland .. .. .			14
Yugoslavia .. .. .			26 (27—1949)	Switzerland .. .. .			200	Belgium .. .. .			13
Sweden .. .. .			15 (17—1950)	Netherlands .. .. .			271 (196—1950)	Denmark .. .. .			13
Finland .. .. .			14 (24—1949)	France .. .. .			287 (223—1949)	Austria .. .. .			13
Denmark .. .. .			14 (15—1951)	Yugoslavia .. .. .			310 (240—1950)	Finland .. .. .			12
Spain .. .. .			13 (14—1950)	U.S.A. .. .. .			310 (210—1950)	Yugoslavia .. .. .			10
U.S.A. .. .. .			10 (12—1951)	Belgium .. .. .			425 (195—1951)	U.S.A. .. .. .			5
Austria .. .. .			9 (10—1950)	Spain .. .. .			863 (800—1951)	Spain .. .. .			4

TABLE II.

satisfactory and well balanced for a country with so many Silver 'C' pilots.

The excellent 'B' figures for Austria in spite of the very poor utilisation 'A' figures is mainly due to the fact that very many pilots who were well above Silver 'C' standards but unable to qualify due to the wartime prohibition of cross-country soaring, are now taking their opportunity.

The figures for Germany are not yet available but they will also show similar distortions. This should by no means be taken as a criticism of the policy of encouraging old pilots at the expense of new entrants as a first and only temporary stage in the rapid renewal of the sport. The second stage must of course follow.

The figures for the U.S.A. are rather disappointing in view of the great number of high performance sailplanes and two-seaters and the practical absence of elementary trainers in that country.

Countries where the two-seater training method has replaced solo training will show more favourable

'A' figures but the proof between the two systems can be obtained from the 'B' criterion.

The criteria reveal that the most notable progress has been achieved by Belgium—utilisation rising from 20 in 1949, 48 in 1950 to 68 in 1951 and the Silver 'C' 'B' criterion dropping from 600 in 1949, 481 in 1950 to 195 in 1951. It will be most interesting to see how long this progressive trend can be maintained.

No country or club can harm itself by aspiring to reach the Belgian utilisation figure.

It would be useful if the F.A.I. could publish the 'A' and 'B' criteria together with Statistics in future bulletins. It would be interesting to compare activities of clubs in Great Britain on this basis. It would also be interesting to conduct a similar investigation giving the total cost per soaring hour and the total cost per new Silver 'C' but all the relevant data would be impossible to obtain on an international basis and nearly impossible on a national basis.

## SIMPLIFY AND ADD MORE LIGHTNESS

(Continued from page 11)

degrees of washout at the tip, little Willie will kill himself if he stalls the thing, he knows what to do if he has been well trained, and he will crash anything however much built-in safety you provide if he has been badly trained anyway!

I do not believe the next decade will see any further expansion of gliding unless we can standardise our two-seater and single-seater gliders and so get the costs down and encourage group and private ownership at reasonable outlays. The 'Type 31' is a step in the right direction, something like the 'Camel' for solo soaring should be the next.

I do not of course advocate no more large high performance sailplanes, but these have now reached a price where they can really only be termed

'instruments of research' and as such are rapidly moving out of the realm of pure sporting gliding, for these that can afford them they are no doubt just what they want, but for the majority who fly at week-ends just for the fun of it the best advice is the oldest in aviation 'simplify and add more lightness.'

## FOR SALE

KITE II A. with Bubble Hood, 12 months C. of A. A. J. Fyfe, Ianlea, Kinross.

## WANTED

ONE complete set 'Olympia' metal fittings. Reasonable condition and price. Answers to G. R. Higginson, 61 Birkett Street, Bedford Park, Perth, West Australia.

# AUSTRALIAN SAILPLANE FACTORY FLOURISHING

## HIGH PERFORMANCE TWO-SEATER TO FLY SOON

From **BRIAN P. CREER**

**E**DMUND SCHNIEDER, famed designer of the 'Grunau Baby' the 'Falcon' and many other machines so dear to the hearts of enthusiasts, has established Australia's only sailplane factory at Rosewater in South Australia.

Rosewater, a suburb of Adelaide, is only a few miles from the heart of the city and although the present factory is not as large as the old-established pre-war one at Grunau in Germany, it is well-equipped and will no doubt shortly grow considerably.

Edmund and his son Harry have been in Australia for about two years now and have been living in S.A., for about half of that time. They were assisted greatly in establishing both themselves and their factory here by the enthusiastic John Wotherspoon. Credit must also go to the firm orders placed by several Australian clubs for machines from the Schnieder range.

Work is well under way and new projects taking shape both on the design board and in the workshop. A 'Grunau Baby' has been delivered after being constructed in six weeks. John Wotherspoon has persuaded Edmund to design him a high-performance two-seater strictly for Australian conditions.

This has been named the 'ES-49B' 'Kangaroo' and is to be test flown at the end of January or early February.

The 'Kangaroo' has a span of 18 metres, seats two in tandem under a one-piece blown canopy, weighs 540 lb., a gliding angle of 1:26 and sinks at 0.7 m/s (2' 4").

It is a shoulder high wing monoplane with highly tapered wings plying back to the single spar. The fuselage is ply covered and all controls are push-rod operated to obviate heat and cold variation. There

is also a 16 metre version known as the 'ES-49' which is an advanced club machine. The sink is 2' 6" and the stall of 28 m.p.h. glide:—1:24. This aircraft, however, varies quite a good deal from the 'Kangaroo' to the extent that it is almost another type.

### 'CAST IRON' TRAINERS.

Also in the range are two 'Club' machines designed to be 'cast iron trainers.'

They are the 'Club' two-seater and 'Club' single-seater. Both are very similar in appearance and construction.

They have been designed with the view to cost, ease of replacement of broken parts, ease of construction in kit form, whilst at the same time giving a reasonable performance in the air with rugged construction for club use and ground handling.

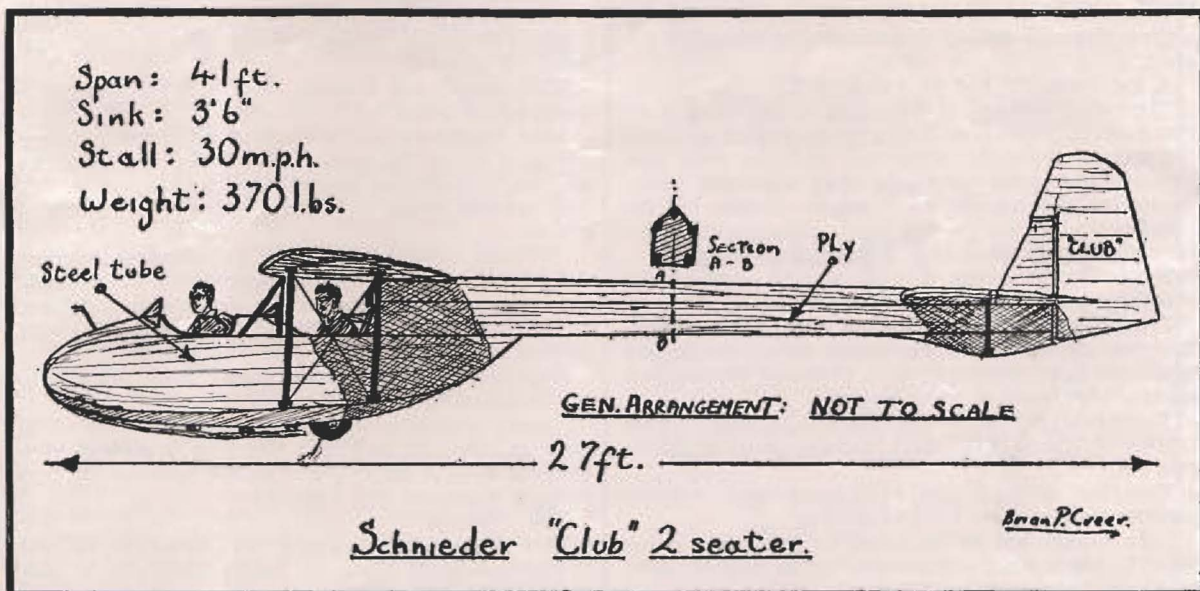
Both machines have two-spar, parallel chord wings, welded tube fuselage with ply covered boom (the fuselage of both machines is semi-pod and boom) a single air wheel without brakes and are supplied with any of three colours.

The only difference in construction features for the two-seater is the inclusion of spoilers.

One of these machines has been ordered by a newly-formed South Australian club at Nuriootpa and one of their members has also ordered a 'GB11B.' Three 'Club' two-seaters are on order from interstate and there is a possibility of more to come as the machine becomes better known.

Schnieder has carried his wonderful 'Grunau Baby' two stages further now with the advent of the 'GB3B' which is equipped with dive brakes, perspex canopy, wheel, a thickened neck and more squat fuselage.

(Continued on page 23)



# NEW AUSTRALIAN TWO-SEATER SAILPLANES BEING BUILT

## Details of Four New Designs

UNDER construction in Australia at present are no less than ten two-seater sailplanes, varying from elementary trainers to super high performance machines. Among these are many wholly designed and stressed locally.

Australian designers have turned out a number of first class sailplanes in the past, and the two-seaters now coming up will certainly carry on the traditions set by machines like the 'Golden Eagle,' 'Kite,' 'Falcon,' 'Coogee,' and others. *Australian Gliding* presents here first published details of four of the new designs.

Several years ago, Douglas Lyons of the Beaufort Gliding Club, in Melbourne, began the design of a single-seat intermediate sailplane called 'Aeolus.'

When the club's 'Phoenix' two-seater was crashed early last year it was decided to shelve the 'Aeolus' design and bring out a two-seater instead.

The new two-seater was to be called 'Zephyrus.' (According to Greek mythology, Aeolus was the ruler of the winds and Zephyrus, the west wind, was his brother).

The design and layout of the 'Zephyrus' was done by Lyons, and the stress analysis by John Baldwin.

Design work commenced in May, 1951, although much of the work done on the 'Aeolus' in the previous two years was of great value to the two-seater design.

Details of the machine are: Span 56 ft. 4 in., length 27 ft., wing area 236 sq. ft., aspect ratio 13.2, maximum all up weight 1,080 lb., empty weight 600 lb., airfoil section NACA 4415, and the wing has a three degree washout commencing outboard of the strut.

A maximum L/D of 22 is expected.

The sweep forward in the centre of the wings is for two reasons. Firstly, to obtain the maximum practical distance between the main spar and the drag spar (while maintaining a straight spar) since this determines the spacing of the fuselage frames for the attachment of the wings, and consequently this affects the space available for the second pilot.

Secondly, the sweep forward should improve the visibility from the rear cockpit.

The 'Zephyrus' is a tandem seat, dual control, intermediate sailplane. The wings have a single box spar and light stiffening spar, plywood torsion box leading edge, and are strut braced.

The fuselage is of welded steel tube construction fabricated from T45 steel tubing, and is fabric covered.

Tailplane surfaces are of conventional wooden construction, and are fully cantilever.

Dive brakes are to be fitted to limit the diving speed to 120 m.p.h. but the machine has been designed for a safe diving speed of 137 m.p.h.

The brakes are of the hinged panel type, the top panel being hinged at the forward edge, and the lower panel hinged at the rear edge. When the brakes are open they leave a slot through the wing.

It is likely that the canopy will be made up of single curved panels, as a moulded canopy would probably be too costly and would prove too difficult to construct.

Conventional skid and landing wheel undercarriage is to be fitted, and the wheel will have a brake.

Construction is well under way. The rudder is complete except for trailing edge and fittings, the tailplane spars and ribs are complete, main spars are 90 per cent finished, and wing nose ribs are complete, and a start has been made on the trailing section.

Steel tubing has been purchased and construction will commence on the fuselage very soon.

The 'Kangaroo' two-seater sailplane designed and now being built by Edmund Schneider Ltd., of Adelaide, is an 18 metre development of the 16 metre 'E.S.49.'

Specifically designed to give a high performance machine suitable for club operation, the 'Kangaroo' dispenses with the expensive cantilever wing and monocoque construction so prevalent with modern designs of sailplanes.

However, even with its strut braced wing and hexagonal fuselage, it has a performance equal to our best single-seaters.

Estimated performance is given as: Max. gliding angle, 1:26; min. sinking speed solo, 2.5 fps., and dual, 2.8 fps.

The cockpit has tandem seats and the canopy is made in one piece.

Dive brakes similar to those of a 'Grunau Baby' are fitted to the 'Kangaroo,' and both nose and centre of gravity hooks are incorporated for launching.

A landing wheel is located behind the centre of gravity.

Although designed as a high performance machine the 'Kangaroo' retains the ruggedness which made the 'Grunau Baby' such a successful club sailplane.

The front end of the fuselage is strongly built to give pilot protection in case of crash.

Handling characteristics of the 'E.S.49' are said to be 'outstandingly good.'

Roomy cockpits, with pleasant and safe stalling features, and the fact that the trim is altered very little by light or heavy pilots makes it one of the best training machines ever designed.

The 'Pelican 2':

This two-seater designed by members of the Waikerie Gliding Club, in South Australia, is now very close to completion.

# AUSTRALIAN DESIGNED BAROGRAPHS ARE SUCCESSFUL

Offer to Manufacture Instruments for Sale

MR. LES ANDERSON, President of the Gliding Club of West Australia, has designed and built two barographs which are suitable for use by Australian gliding clubs. He has offered to manufacture similar barographs for clubs if they are required.

The barographs are known as Omikron 1, which reads to 28,000 feet, and Omikron 2, which reads to 40,000 feet. Mr. Anderson gives the following details of them:—

OMIKRON 1. The Kelvin sensitive altimeter was used for the main actuating gear. As there are many extra wheels and accessories, it was decided to remove the synchronising gears permanently.

The centrifugal balance and hair spring were retained in order to smooth out any rough movements.

A suitable length for the pen arm from the altimetric apparatus to the drum was calculated from a test arm running on a smoked plate.

The gear was tested in a decompression chamber. In this case the length of arm to point of recording pen was about 3½-in., giving an altitude reading of 28,000 ft. over a 4-in. drum.

The arm was connected to capsules at the end of a toothed quadrant where there was a small counter-balancing weight.

A counter-balance for the arm was built into the quadrant with lead.

Shim steel was used for pen arm, stiffening being obtained by a small turned up edge on both sides of the tapered arm.

The pen was a normal barograph one, clipped or soft soldered to the end.

Tension on the arm was obtained by riveting on a piece of steel from a razor blade (Thin Gillette).

The clockwork mechanism was a Junghans alarm, with the alarm removed. The minute hand spindle drives the drum.

The 3-in. diam. fibre drum is fitted with plugs top and bottom, in which spigots are set.

One of these moves in a jewelled bearing, and the other is tapped to fit the clock spindle.

The altimeter was mounted so that the point where the arm was pivoted was in line with the centre of the drum.

Lever arms were connected both to lift the pen and stop the clockwork.

A case measuring 8½-in. by 7¼-in. by 5 in. was built around the base which is 1½-in. deep and hinged at one edge.

## New Australian Two-Seater Sailplanes being Built—continued

The cockpit, which has side-by-side seats, is enclosed with a bubble type canopy.

It has a three piece wing of 54 feet span. The length is 24 feet, and the empty weight 500 lb.

The fuselage is of the pod and boom type, and the wing is cantilever.

Estimated performance figures are given as:

Best gliding angle 1:22.

Minimum sink 2.75 fps.

In Queensland, members of the Brisbane Gliding Club are working on a two-seater of local design, and construction is about 80 per cent complete.

The machine has a strut braced wing of 53 ft. span, which tapers from 6 ft. at the root to 3 ft. at the wingtip.

Airfoil section is the 'Gottingen 535.'

The fuselage construction is similar to that of the 'Grunau Baby.'

Tandem seats are arranged under an enclosed canopy.

The original stress and design details were laid down many years ago, but construction did not start until recently.

The fuselage, empennage and one wing is completed, and construction has started on the other wing. It will probably fly early in 1953.

—*Australian Gliding.*

## FAMOUS SAILPLANE FOR SALE

W. S. SHACKLETON LTD., 175 Piccadilly, London, W.1., Europe's largest aeroplane dealers (21 years at this address and 124 distinct types of aircraft sold) have the honour to offer for sale a truly outstanding sailplane, all British and World-famous.

£1,295

## SLINGSBY 'SKY'

This is the actual 'Sky' which, flown by Philip Wills, won first place in the 1952 International Gliding Championships in Madrid. It has a gliding angle of 1 in 29 at 46 m.p.h. Offered with new Certificate of Airworthiness by the makers, finished in high-gloss blue and cream cellulose enamel and equipped with full instrument panel. Stowage for oxygen and radio equipment.

W. S. SHACKLETON LTD.,  
175, Piccadilly, London, W.1.

Tel.: Regent 2448/9. Cables: Shacklud, London.

A perspex viewing window was also built into the front of the case.

The price of the instrument is approximately £15, but may vary slightly.

OMIKRON 2. This barograph is of a different principle in both actuating and recording apparatus. Overall dimensions are 6½-in. by 5-in. by 3-in.

Capsules are coupled to drive a continuous brass band in a vertical motion as against an arc in the Omikron 1.

The recording paper is on a continuous roll moving at 4-in. an hour.

The marking gear is of two types :

(a) Inking pen,

(b) Steel point coupled to a cam from the clock, punching the paper every 5 secs.

The case is a crinkle finish aluminium with a perspex viewing window.

A vertical scale is set beside the pen.

This instrument will read to 40,000 feet, over a four inch scale, or, if required, can be made for lower altitudes.

Price of the Omikron 2 is approximately £25.

The actual price of the instruments will depend on the ruling price of sensitive altimeters.

However, the overall variation should be small.

—from *Australian Gliding*.

## GLIDER FLYING IN NORWAY

By H. MOTZFELDT

THE administration of glider flying in Norway is formed by a Committee subsidiary to the Norwegian Aeroclub.

The Committee has appointed one executive, whose name is Mr. Hakon Martinsen.

There are in all twenty gliding clubs in Norway with in all thirty gliders. (See below).

The glider committee (or rather Mr. Hakon Martinsen) is formally doing the liaison between the various local glider clubs on one side, and the Directorate of Civil Aviation and the Norwegian Aeroclub on the other.

Mr. Martinsen at the age of thirty started in aviation as a mechanic in S.A.S. in Oslo. He did his first flying four years ago with an 'SG-38,' thereafter with a 'Grunau Baby 2 A' (which came to Norway in 1936 and is still in use). After that he trained on an 'Olympia' which brought him as far as the 'S' certificate. In recognition of his services to the Aeroclub for his work on gliders, he was given free training on a 'Piper-Cub NKZ,' and is now a second pilot in S.A.S.

Martinsen's deputy is a Mr. Hayden, whose job it is to train instructors. These ultimately are approved as such by the Directorate of Civil Aviation at the recommendation of the Glider Committee.

The glider organization tries to follow the Swedish pattern as far as their very limited means allow them.

### PRESENT AIRCRAFT

#### Primary trainers :

13 'SG-38.'

9 'Grunau.'

#### 2-seaters for instruction with dual control :

1 'TG-2.'

1 'TG-3.'

#### Intermediate trainers :

2 'EON Baby.'

1 'Baby 2 A.'

3 'Baby 2 B.'

One of the senior members, Mr. Gunnar Bakke, is now trying to get hold of the drawings of a 'Weihe' from the Focke Wulf in Germany, and will build this one himself, which may take a year-and-a-half.

We also have 3 'H-17' ('Hütter') which are crashed, but are being rebuilt.

The Norwegian gliders took part in the World Championship in Sweden in 1950 and in Spain last year, with the sole object of acquiring experience. In Sweden they were represented by Mr. Hayden who flew an 'Olympia' (which has since been grounded because it has been too much exposed to the weather due to lack of hangar space).

In Spain they sent a team of 5 men and the leader, where they flew a 'Kranich' which had been placed at their disposal by the Spanish Aeroclub.

In Madrid, although Norway came in last, two new Norwegian records were made :

Height flying : 6,000 metres, with a gain of altitude of 5,150 metres.

Distance flying : (2-seater) : 220 km.

The following performances have been made in Norway :

Distance flying (single seater) : 236 km.

Goal flight : 152 "

Duration : 10 hours.

In Norway over 500 diplomas have been issued, and there are some 200 flyers. In all 6 Silver 'C' diplomas have been awarded, and 25 'S's'. There has been no attempt to make any records in height, distance or duration flying in this country, mainly because of lack of planes, as they dare not take any chances with the limited number of planes at their disposal. In consequence there have never been any Norwegian championships.

### NORWAY'S NATURAL CONDITIONS FOR GLIDER FLYING.

The country consists mainly of woods and mountains, and thus offers very few chances of

emergency landings during long distance flying. On the other hand it has been stated by the German Professor Georgi that he considers Norway to be one of the best countries in the world for wave soaring, although very little has been done due to the limited number of gliders. Some research flying on the wave soaring was actually done here by the Swede, Karl Erik Ovgard, who recently crashed his plane in Bishop Valley, California. A couple of years ago B.E.A. carried on research on the airwave in Norway with a 'Mosquito,' and further research is for the moment not being made.

It has been mentioned as a particular feature for Norway that the 50 km. distance flying can be done here as slope soaring, starting at a lake called Stensfjord, north of Oslo, and from there northwards, in a height varying from 1,800 to 2,000 metres.

Because of the geographical conditions as mentioned, it has been very difficult to find a suitable field from which to carry on glider flying in the summer time, and up to quite recently all glider flying has taken place on frozen lakes in the winter time, where often the main job has been to clear away the snow for auto-towing. However, thanks to some awakening interest on the part of the authorities, an abandoned airfield was this summer placed at the disposal of the gliders, and it is hoped that these facilities will be extended in the years to come.

The present plans and hopes are to establish a training centre under the Norwegian Aeroclub where all the initial training is to be done, and then it will be up to the local glider-clubs to carry on the further training. Before such a training centre can be started, a suitable field must be purchased. The money is available (in the 'Ole Reistad Foundation'), and a committee is now working on the job of finding a suitable field.

It is further hoped that the Government will grant money so that they can institute 2 new *paid* jobs: One man to look after all the planes, and one man to look after all instruction.

I may conclude by saying that it is generally hoped and expected that the glider flying in Norway will gradually increase.

## SWEDISH GLIDING IN 1952

### Air Forces Help

THE annual report on gliding of the Royal Swedish Aero Club has recently been issued. It covers the period October, 1951—October, 1952, but it should be borne in mind that gliding in Sweden is almost exclusively executed during the summer half of the year.

To give some figures, 37,100 launches were made as compared to 33,700 in the year before. This includes both primary glider launches and sailplane launches, of which there were about 20,000 in 1952. Time spent in the air has increased from 3,600 to 3,900 hours. The increase is also noticeable in regard to

the number of diplomas taken. 440 'A' diplomas (345 in 1952), 299 'B' (245), 219 'C' (202), 17 Silver 'C's' (26) and 5 Gold 'C's' (3). The number of 'C' diplomas, Silver 'C's' and Gold 'C's' which have been issued in Sweden up till now, totals 2,405 'C's,' 292 Silver 'C's' and 28 Gold 'C's.' A large number of different Diamond legs have been taken. In 1952 the Trollhättan Gliding Club put up a very good show indeed, with 3 of the 5 Gold 'C's' in Sweden being acquired by members of this club (Larsson, Pedersen and Stahl). The other two Gold 'C's' were taken by members of the Stockholm and the Karlstad Gliding Clubs. Sven Jonsson of the latter club made his Gold 'C' distance from Karlstad to a little island in the Baltic—210 miles (340 km.), no mean feat, considering he flew a 'Grunau Baby.'

Some of the clubs have been very active indeed. The Eskilstuna Club produced 21 new 'C's', Lidköping 17, Stockholm 15, not to mention the Central School of Alleberg, which, all in all, produced 130 diplomas, 28 of which were 'C's.'

1953 seems to be a prospective gliding year. The general interest for gliding seems to be gradually getting back to what it was in 1945 and 1946. No doubt, one of the reasons for this is the aid being given from the Air Force. As it will be giving up gliding in 1953, the gliding equipment will be given away to civil gliding clubs, many of which are badly needing gliders and tug planes. Though these planes are old and in need of a thorough overhaul, they are a very welcome help to us. 15 'Kranichs,' 13 'Babies,' 5 'Weihs,' 27 'S.G.-38's' and 11 Focke-Wulf 'Stieglitz' tug planes will be distributed in January and February.

B. MICRANDER.

#### STATISTICS OF GLIDING AND SOARING IN SWEDEN 1/10/51—30/9/52

	Starts	Duration
Training Glider ..	17,512	252 Hrs. 20 Min.
Sailplane ..	19,614	3,645 Hrs. 55 Min.
Total ..	37,126	3,898 Hrs. 15 Min.

#### Gliding and Soaring Certificates issued by Kungl. Svenska Aeroklubben

'A' Certificates ..	440
'B' " " ..	299
'C' " " ..	219
'S' " " ..	91
Silver 'C' " " ..	17
Gold 'C' " " ..	5
Total ..	1,071

#### Total Certificates from Beginning of Gliding and Soaring in Sweden.

'A' Certificates ..	6,409
'B' " " ..	3,862
'C' " " ..	2,405
'S' " " ..	1,094
Silver 'C' " " ..	292
Gold 'C' " " ..	28
Total ..	14,090

#### Staff-Instructors.

Soaring Instructors ..	108
Gliding " " ..	47
Rebuilding " " ..	91

### Planes, Auto-Cars and Auto-Winches.

High Performance Sailplanes	..	28
Training Sailplanes	..	93
Training Gliders	..	93
Auto-Cars	..	51
Auto-Winches	..	56
Trailers	..	39

In the year 1953, the Swedish Royal Air Force will present the following machines to gliding clubs in Sweden :—

'Weihe'	..	..	..	7
'Kranich'	..	..	..	15
'Grunau Baby'	..	..	..	13
'S.G.-38'	..	..	..	27
Towplanes :				
'Focke-Wulf, Stieglitz'	..	..	..	11

### SWEDISH SOARING RECORDS, 1/12/52.

#### Single-place Records.

Distance in a straight line:	Alf Hedman	520.0 km.	'Weihe'	5/7/51
Distance with return to point of departure:	Laroy Mansson	390.0 km.	'Weihe'	7/7/50
Distance to a predetermined destination:	Alf Hedman	520.0 km.	'Weihe'	5/7/51
Duration:	K. E. Ovgård	21 h. 46 m.	'Olympia'	13/6/44
Altitude gained:	P. A. Persson	8,050 m.	'Weihe'	12/7/47
Speed for 100 km. triangular Course:	Billy Nilsson	52.2 km./h.	'Weihe'	16/7/51

#### Feminine Single-place Record.

Distance in a straight line:	Gunbritt Floden	157 km.	'Gr. Baby'	23/6/48
------------------------------	-----------------	---------	------------	---------

#### Multi-place Records.

Distance in a straight line:	H. Kipp, J. Blomberg	209.0 km.	'Kranich'	30/6/43
Duration:	K. E. Ovgård, R. Widmark	17 h. 01 m.	'Kranich'	2/7/46
Speed for 100 km. triangular Course:	H. Westrin, T. Hakanson	45.7 km./h.	'Kranich'	31/7/51

#### Feminine Multi-place Records.

None

## GLIDING ON SHOW

THE Dublin Gliding Club created much interest and comment with their exhibit of a full-size Kirby 'Cadet' glider at the recent Model Aeronautics Council of Ireland Show in the Mansion House, Dublin.

The Show, opened by Mr. Sean Lemass, the Minister of Commerce, has received a good deal of encouragement from the government who loaned an electrical control panel from a 'Hurricane' Fighter and a number of Blind Flying Instruments.

Among the models there were many beautifully built gliders including one with a 9 ft. wing span. Unlike many of the model power aeroplanes, if an actual glider is reduced to model size the ability to fly is affected and therefore although there were many 'Stukas', and modern jet-aircraft—there were no familiar 'Olympias,' or 'Grunaus' in miniature, just gliders.—M. L. Duck.

## Public School Masters to be Gliding Instructors

MASTERS from 19 public schools and grammar schools attended two gliding courses at the R.A.F. Home Command Gliding Instructors' School at Detling, near Maidstone, last month.

The courses opened on January 2 and January 12 and instructed schoolmasters in charge of Combined Cadet Force air sections in the operations of the primary glider fitted with a 'shock cord' launching device for use on school playing fields. The following schools sent masters :—

Course January 2-11 : Langley School, Norwich ; Highgate School ; Westminster School ; Brighton Grammar School ; Eastbourne College ; St. Bartholomew's, Newbury ; Victoria College, Jersey ; Peter Symond's School ; Stowe School ; Priory School, Shrewsbury ; King Edward VI, Stratford-on-Avon ; Monmouth School ; Rugby School ; Denstone College, Staffs ; Trinity College, Glenalmond.

Course January 12-18 : Watford Grammar School ; Brighton College ; Eastbourne College ; Lancing College ; Woodbridge School, Suffolk ; St. Bartholomew's, Newbury.

### RECORDS—continued from page 3

woman pilot. It is even more worthy because Miss Pumfrey had only taken her 'C' six days earlier.

The last two years have seen a marked change in the outlook of most Australian clubs. For ten years Australian pilots have been content to be local flyers, climbing to astounding heights in good conditions and then calmly returning to the aerodrome. Cross-country soaring was seldom indulged in.

The Sydney Soaring Club was the only club in Australia who made a habit of cross-country flying with the result that, for a long time, they were the acknowledged leaders in high performance soaring. Four of their seven members have Gold 'C's' and two others have one leg of the Gold 'C.' The remaining one has only been soaring for a little over a year.

Now, however, there are many other pilots who have ventured away from their home aerodrome and are collecting Silver and Gold legs.

Soaring conditions in the inland of Australia are comparatively untried. Every year new routes are flown and more good country is opened up. Pilots are adapting overseas techniques to local conditions and are growing bolder in their ventures. There is a growing realisation that we in Australia have some of the best soaring conditions in the world. Our big lack is the sailplanes to take advantage of the conditions we find.

The highest performance sailplanes in Australia at the moment are 'Olympias,' and there are only three of these. The majority of Australian pilots do their flying in 'Grunaus' and similar machines, yet their performances are remarkable.

We are still years behind the rest of the world in experience but we are catching up rapidly. It would pay to keep an eye on activities in Australia.

## SURREY GLIDING CLUB

WITH the coming of the soaring season, we would like to tell you a little about the Surrey Gliding Club which is now numerically the third largest in this country.

The Club was formed by Mrs. Ann Douglas, M.B.E., in 1938. We moved from Redhill, Surrey, in August, 1951, to Lasham Aerodrome which lies between Alton and Basingstoke in Hampshire. In the past, we have been noted for our cross-country flying, the most notable flight being by our former Chief Flying Instructor, Mr. Lorne Welch, who flew from Redhill across the Channel to Brussels. The year 1949 produced more cross-country miles flown by the Surrey Gliding Club and the Imperial College Gliding Club which is associated with us, than any other club in the country.

In 1947 and 1948 the Club was awarded the Du Garde Peach trophy for the best Club team in the National Championships. The Club members have gained over 50 Silver 'C' Badges (approx. 400 in U.K.) and 4 Gold 'C' (11 in U.K.).

Since moving to Lasham, our membership has risen. The site has proved to be superlative as regards warm air currents which we use for soaring. Our Instructors, who are mostly ex-R.A.F. pilots, are highly qualified and the two-seater training system has been most successful. Training has continued at a very high rate and over 5,000 launches were carried out by club members. Hours flown were nearly 500.

The Club facilities include sleeping accommodation for both sexes, a bar, a lounge and very fine workshops. All maintenance is carried out by the members themselves on both the glider fleet and the motor cars and winches.

At Easter, 1952, we held a practice camp for the British team. Pilots from all clubs in the country came here and nearly 1,000 miles cross-country were flown. In Spain, a club member, Mr. Philip Wills, won the World Championships and brought home that title to Britain for the first time. Mr. Lorne Welch, who was our former C.F.I., came 7th in the final placing. Mrs. Ann Douglas, our Club Chairman was the team Manager and was honoured with the M.B.E. for her splendid work.

Lasham being situated on a high plateau 600 feet above sea-level is ideal as a starting point for cross-country flights and the existing British Distance and Goal Records as well as Height were set up starting from this locality. One of our Club Instructors, Walter Kahn, was recently awarded the British Gliding Association Wakefield Trophy for the longest flight carried out in Britain during 1952. This was from Lasham to Coningsby in Lincoln.

We are shortly adding to our fleet by buying another two-seater to be used for training and will then have two two-seaters. We also have five High performance soaring sailplanes.

# SLINGSBY SAILPLANES LTD.

KIRBYMOORSIDE • YORK

*Designers and Builders*

*of*

**“SKY” SAILPLANES**

**1st PLACE and 7 PLACES IN FIRST 14  
IN WORLD CHAMPIONSHIPS**

**MADRID 1952**

## Central African Gliding

### THE RHODES CENTENARY GLIDING RALLY

THE Central African Gliding Association is organizing a Gliding Rally as part of the festivities connected with the 1953 Rhodes Centenary. The Rally is to take place at Salisbury, Southern Rhodesia, during the third week of September.

The Rally will consist of five competition days, culminating in a public day, when it is intended to concentrate the flying in the vicinity of the airfield in order to entertain the crowd. A number of trophies will be given.

It is anticipated that most of the sailplanes taking part will be of the intermediate class, but a system of handicapping will be used to encourage as many entries as possible, including two-seater types. Launching will be by winch and aero-tow.

As many entrants from outside the Rhodesias as possible will be welcomed, accommodation for visitors will be found, but it is regretted that no financial travel assistance can be given. There will be no entrance fee or condition or qualifications for entry. All entrants will have to provide their own sailplanes, though it is possible that two intermediate types will be available to qualified pilots on some of the competition days.

The Central African Gliding Association would appreciate being informed at the earliest possible opportunity of the number of people interested, and the number of teams likely to participate, in order that accommodation and other details can be arranged. The number of persons in each team will not be limited, and individual entries will be equally welcome. Retrieving teams can be provided for individual entrants.

September has been chosen as it should provide reliable, rather than spectacular, weather. The soarable layer is usually 6,000 and 7,000 feet deep at this time of year, with occasional days of cloud development beyond this. Visibility is sometimes limited as a result of smoke haze.

Further information and details will be circulated as arrangements are finalized.

ROBERT MITCHELL,  
Hon. Secretary,  
Central African Gliding Association.

## The Popular Flying Association

### The Ultra Light and Group Aircraft Movement

AT a recent Extraordinary General Meeting of the Ultra Light Aircraft Association it was decided to change the name of the Association to 'THE POPULAR FLYING ASSOCIATION' and to broaden the aims of the organisation so as to give more active support to the 'Co-ownership Groups' which operate light as opposed to ultra light aircraft.

A 'Co-ownership Group' is broadly defined as a group of not less than five persons who associate for the purpose of operating a jointly owned light or ultra light aircraft for sporting and recreational flying. Several affiliated Groups of the Association

have, over the past four years, proved the practicability of the 'Co-ownership Group' scheme and enjoy their flying at rates below £2 per hour.

In view of the Association's main objective of bringing the cost of flying down to a level where it can be enjoyed by the man in the street, this facet of the Association's activities will be more vigorously encouraged. The new policy will in no way lessen the Association's ultra light aircraft activities and the development of ultra light aircraft will be pursued as before.

The 'Dart Kitten' single seat ultra light project, sponsored by the Association is now near fruition and the flight trials for the Type Certificate of Airworthiness are almost completed. Successful completion of the trials is expected within the next few weeks and means that a long cherished ambition, to provide kits of parts or sets of working drawings for the amateur constructor, will have been achieved.

Mr. Maurice O. Imray, a Founder Member of U.L.A.A., has been appointed full time Secretary and all enquiries may be addressed to him at:

The Royal Aero Club Aviation Centre,  
Londonderry House,  
19, Park Lane,  
London, W.1.

## Austere Gliding at Poona

WE publish the following extract from *Indian Skyways* which might be of interest to the House Committees of several clubs:

We are wondering when the Gliding Association of India will wake up to the realisation that the main handicap to progress in gliding, at their Fursingi Gliderdrome, Poona, is the lack of domestic facilities.

So far as we are aware no water is held on to the site not even a convenient well. There is no canteen to supply even picnic meals, tea and cold drinks. No club house comforts, or place to sit round and chat about the oversized bump or the super-duper-thermal we got into in the early days of gliding at Aundh.

How can the Committee expect public support when they offer gliding in the most austere form ever attempted. It is a sport people like to enjoy over week-ends or holidays, they are not doing a penance, they expect simple amenities.

Those who wish to glide seriously, like to be on the spot during their available time for gliding, week-enders expect to do the whole show as economically as possible, and hotels in town are expensive. Poona is a long way off, 6 miles. Why have not the Committee set up a few hutments with furnished rooms for those on long courses, and dormitories for week-enders? They would pay for themselves in no time. It seems the Gliding Association of India is doomed to suffer an unimaginative Committee which virtually does nothing to further gliding in India. The whole show would have packed up years ago, had it not been for the efforts of Mr. F. H. Irani. When will the D.G.C.A.'s appreciate the work of this super enthusiast, and give him some support to get on with the job, and scrap the I.G.A.'s as such.

## CORRESPONDENCE

SIR,

Before dealing with the objections raised to my sketch of some features of the big subject of the use of aero-towing for launching dual training gliders, I would like to point out that the use of aero-towing is envisaged as an extra method in conjunction with winching.

Firstly I assure Mr. Blanchard that the figures quoted in connection with solo training are factual: if they seem unfamiliar it is because they are seen from a fresh angle. In view of the now widespread adoption of two-seaters I agree with him that it is better to compare the costs of this with those for aero-towing—not that this does away with the case for aero-towing. The acceptance by some of the greater cost of towing is implicit in the article, which accepted that, for those with the time to give to it, winchery is cheapest. But very many people who cannot devote large slices of time eventually give it up, which is a pity, if for no other reason than that clubs thereby lose much potential revenue. However, I feel that some of these folk would cheerfully pay more if by doing so they could speed up their training; swifter training being for them obviously cheapest because it would enable them to complete their training. Fred Hoinville, in January *Sailplane*, pungently expounds this paradox.

Mr. Fletcher's point about regular attendance I readily concede!

Messrs. Blanchard and Fletcher are unanimous on (a) instruction in stalls and incipient spins and (b) more landings for pupils. Regarding the first, if 1,000 ft. launches are generally the order of the day then indeed a happy state of affairs does already exist. In passing, however, it is interesting to remember that the B.G.A., state that 'the instruction in stalls and incipient spins can be given on powered aircraft if no other method is available.' About landings, Mr. Fletcher says that in his view my conclusions are 'manifestly absurd' and 'exactly the same as saying, because a pupil car driver has smashes on corners let us teach him to drive only on straight roads!' No, I didn't even try to advocate the abolition of landings. The idea I endeavoured to put over was that pupils would acquire greater proficiency in handling the machine in the air so that they would be much better able to deal with the landings they actually do. A more apt analogy would be, I think, the practice of the driving instructor who lets his pupil get the hang of things on little-frequented roads before gradually introducing him to congested conditions demanding better judgement and quicker reaction.

Of course, the whole question of aero-towing for training does entail formidable difficulties; for instance, as regards safety of operations. How many clubs would think it judicious to hitch their training systems to a single hard-worked aero-engine? But it would be interesting to know whether the idea ever has been tried.—**J. R. C. Walshaw, Thurleston Rd., London, S.E.27.**

\**Gliding*, Autumn, 1952.

SIR,

I have just received my copy of *Sailplane and Glider*, and think that 'Bird Flight' and 'Human Powered Flight' contain very informative 'gen'; as I have pondered long and deeply on both subjects.

But being a farmer's son and naturally saving for when I am on my own (which means no flying), what gets me, is the fact that for the last 2 weeks, I have been raving to all and sundry (which caused most sceptical remarks) on the delights of Hot Air Ballooning, with its simplicity and its pecuniary attractions, with its self-contained thermal, and the means of gaining altitude, and sinking, without loss of ballast or gas.

I am prepared to build one and wondered if you would mention it in *Sailplane and Glider* with a view to forming a Club. Yours enthusiastically.—**A. J. Brown, Home Farm, Ravensden, Bedford.**

SIR,

The instructions to beginners contributed by 'Airflow' in the December *Sailplane* call, I feel, for some comment.

There has in the past been some controversy amongst instructors about the way in which a pupil should be taught to *think* of the use of the controls. This has been thoroughly thrashed out however, and the method now taught by the R.A.F. and adopted by the B.G.A. is to think of each control as having one function during the turn, the ailerons controlling bank, the elevator the position of the nose, and the rudder controlling slip.

Steep turns are *not* an entirely different matter and the pupil should still think of the controls as having the same functions.

It is not true to say that, if an aircraft is slipping in during a turn, bottom rudder will not stop the slip. It *will* stop the slip but *also* may cause the nose to drop, which in turn is corrected by using back pressure on the stick. In fact it is necessary to use both rudder and elevators to make the complete correction.

Although an experienced pilot will use his controls in the same way to make corrections, no matter how he has been taught to think of them, it has been found that the above method makes it easier for a pupil to correct faults.

'Airflow's' method of applying bottom rudder to bring the nose down can of course lead to a spin if the aircraft is nearly stalled, and this fact alone is enough to condemn it.—**H. U. Midwood, Highbury Grove, Clapham, Bedford.**

### AUSTRALIAN SAILPLANE FACTORY FLOURISHING—continued from page 15

A projected further development of the '3B' will be identical but for the substitution of 'Gull 549' profile wings.

Schnieder's will sell any of their range on a hire-purchase basis but all prices are given ex-works and do not include instruments or Sales Tax (if any).

Enquiries for further information on any of these machines would be promptly dealt with if addressed to:—Edmund Schnieder Ltd., Blakeney Road, Rosewater, South Australia.

## ROYAL AERO CLUB CERTIFICATES

(Issued under delegation by the B.G.A.)

DECEMBER, 1952

CERTIFICATES 'A'	70 (15795-15864)
'B'	70
'C'	11
Silver 'C'	2
Gold 'C'	-

### 'B' CERTIFICATES

No.	Name	A.T.C. School or Gliding Club.	Date taken.
3528	M. G. Weller	Cxford G.C.	31. 4.52
3893	D. J. Lawrence	No. 123 G.C.	23.11.52
7869	R. E. Smith	Moonrakers G.C.	22.11.52
9888	G. D. Durrant	No. 104 G.S.	14.12.52
12999	K. J. Britten	No. 123 G.S.	9.11.52
13104	D. E. Miller	R.A.F. G.S.A. W. Area	30.11.52
13529	F. J. Clack	R.A.F. G.S.A. W. Area	30.11.52
13714	D. Campbell	No. 31 G.S.	6. 9.52
14276	D. A. Moffat	No. 1 G.S.	17. 8.52
14286	W. A. E. Creed	No. 186 G.S.	24. 2.52
14409	M. D. Tannian	No. 92 G.S.	23.11.52
15795	J. W. Carter	No. 44 G.S.	28.10.51
15796	C. A. Jonas	No. 42 G.S.	4. 8.52
15898	C. C. Howell	No. 125 G.S.	23.11.52
15799	C. B. Ward	No. 123 G.S.	23.11.52
15800	W. B. Budge	No. 2 G.S.	16.11.52
15801	P. A. Crabtree	Southdown G.C.	19.10.52
15802	D. S. Ford	No. 89 G.S.	16.11.52
15803	A. P. Hilton	Cranwell G.C.	23.11.52
15804	R. H. Beer	No. 166 G.S.	23.11.52
15805	I. E. A. Palmer	No. 2 G.S.	23.11.52
15806	C. F. Harrison	No. 42 G.S.	30.11.52
15807	R. J. Turner	No. 168 G.S.	30.11.52
15809	J. E. Sykes	No. 23 G.S.	30.11.52
15810	T. C. Dickson	No. 1 G.S.	23.11.52
15811	S. R. Stringer	Scharfolfendorf G.C.	10. 7.52
15812	E. C. Smith	H.C.G.I.S.	16. 5.52
15813	J. L. Brimfield	No. 143 G.S.	7.12.52
15815	M. C. Lay	No. 104 G.S.	7.12.52
15816	G. J. Miller	No. 104 G.S.	7.12.52
17817	R. Thompson	No. 92 G.S.	23.11.52
15818	K. W. Davies	Laneburg G.C.	7. 5.52
15819	A. L. Willings	Cranwell G.C.	23.11.52
15824	F. Hargreaves	Army G.C.	6.12.52
15825	G. Simpson	No. 2 G.S.	9.11.52
15826	R. J. Bond	R.A.E. Tech. G. Flight	12. 7.52
15828	D. R. D. Potts	R.A.F. G.S.A. W. Area	30.11.52
15829	F. Rowley	Hameln G.C.	12.10.52
15830	M. Bingham	No. 22 G.S.	20. 4.52
15831	D. H. Crowley	No. 126 G.S.	15.12.52
15832	P. Husain	Central G.S., Karachi	30. 8.51
15833	L. R. G. Mason	No. 104 G.S.	14.12.52
15834	A. B. Phillips	No. 143 G.S.	14.12.52
15835	M. J. Smith	No. 104 G.S.	14.12.52
15836	W. J. Rule	No. 82 G.S.	28. 9.52
15837	S. J. Adlam	No. 126 G.S.	14.12.52
15838	R. A. Fresson	No. 7 G.S.	7. 9.52
15840	J. Westcott	No. 68 G.S.	23.11.52
15841	J. H. Goodwill	No. 141 G.S.	14.12.52
15842	S. J. Yendall	No. 125 G.S.	21.12.52
15843	H. E. Rose	No. 125 G.S.	21.12.52
15844	G. A. Northwood	No. 42 G.S.	30.10.52
15846	C. A. R. Ferguson	No. 2 G.S.	14.12.52
15847	K. R. Durrant	No. 136 G.S.	26.10.52
15848	W. G. White	No. 68 G.S.	7.12.52
15849	J. Sheppard	No. 49 G.S.	16.11.52
15851	G. Cook	No. 102 G.S.	7.12.52
15852	J. D. Hayhoe	No. 146 G.S.	28.12.52
15853	J. J. Carroll	No. 168 G.S.	14.12.52
15854	G. A. Hingley	No. 102 G.S.	27.12.52
15855	P. J. Meloy	No. 104 G.S.	14.12.52
15856	G. B. Smith	No. 68 G.S.	21.12.52
15857	B. L. R. Pocock	No. 166 G.S.	26.10.52
15858	D. E. Parslow	No. 130 G.S.	12.10.52
15859	A. G. Hutt	No. 141 G.S.	21.12.52
15860	F. M. Conway	No. 203 G.S.	30.11.52
15861	R. O. Aitken	No. 2 G.S.	21.12.52
15862	T. N. Huntley	No. 105 G.S.	30. 8.52
15863	W. A. Bosanko	No. 82 G.S.	21.12.52
15864	A. E. Morphett	Newcastle G.C.	19.10.52

### 'C' CERTIFICATES

2152	E. J. Chipps	No. 126 G.S.	29. 6.52
6057	C. Walsh	R.A.F. Thornhill S.R.	22. 9.52
10365	H. M. Gass	France	30.10.52
13834	P. W. Loeke	R.N.G. and S.A.	30. 7.52
14466	D. B. Kirkpatrick	No. 203 G.S.	30.11.52
14520	D. Adams	R.A.F. Thornhill S.R.	22. 9.52
15070	E. W. Harvey	No. 48 G.S.	26. 8.52
15090	D. W. Hills	R.A.F. Thornhill S.R.	28. 7.52
15092	F. P. Jukes	R.A.F. Thornhill S.R.	20. 7.52

### SILVER 'C'

405	H. M. Gass	France	8.11.52
406	J. B. Cookson	R.A.F. Gutersloh	5.11.52

## THE MIDLAND GLIDING CLUB LIMITED

The Long Mynd, Church Stretton, Shropshire. Telephone: Linley 206.

New members welcome. Ab-initio training by two-seaters. Slope, thermal and wave soaring. Resident engineer. Dormitory. Catering at week-ends.

Secretary: S. H. Jones,

82, Ravenhurst Road,  
Harborne, Birmingham, 17.

## THE DERBYSHIRE AND LANCASHIRE GLIDING CLUB

Camphill, Great Hucklow,  
Derbyshire.

2-seater ab initio instruction, intermediate and high performance flying.

Dormitory and Canteen facilities. Apply to the Secretary for details of Membership.

## THE LONDON GLIDING CLUB LTD.

Dunstable Downs, Beds.  
Tel.: Dunstable 419.

**Flying Membership:**  
Entrance Fee £5. 5s. 0d.  
Annual Sub. £6. 6s. 0d.  
(or 11/6 monthly)

**Non-Flying Membership:**  
Entrance Fee Nil  
Annual Sub. £2. 2s. 0d.

Flying Instruction: Wednesdays, Thursdays, Saturdays and Sundays.

Twelve Club aircraft, including 'Olympias' and 'Sky' Sailplanes.

Holiday Courses are open to non-members:

9—16 May  
6—18 July  
10—22 August  
31 August—21 September

## THE YORKSHIRE GLIDING CLUB,

SUTTON BANK, YORKSHIRE.

Ab-initio Training. Full Flying Facilities for all Pilots. New Members Welcome.

For full particulars apply to:—  
Miss Sue Parke, 'Norlands', Middlecave Road, Malton.—Hon. Secretary, Yorkshire Gliding Club.

# Sailplane and Glider

8, LOWER BELGRAVE STREET  
LONDON, S.W.1  
SLO 7287

# Sailplane and Glider

## Suggested Gifts for Your Friends

### Subscription to 'SAILPLANE'

INLAND

25/6 PER YEAR 12/9 6 MONTHS

OVERSEAS

25/6 PER YEAR 12/9 6 MONTHS

### BOUND VOLUMES

Attractively bound volumes of 'SAILPLANE & GLIDER' for 1952 are now being prepared. Supplies are, we regret, limited—make sure of yours by ordering now and avoid disappointment. Price Two Guineas. A few vols. available for 1948 and 1950.

### SPECIAL OFFER

A complete set of 'SAILPLANE'S' for 1952 in the EASIBINDER, leaving room to contain all this year's issues, is offered at the specially reduced price of 35/-.

### 'Soaring Flight'

by Terence Horsley  
(EYRE & SPOTTISWOODE)

16/6

The classic English book on the subject.

### 'Gliding and Power Flying'

by 'Stringbag.'

(OXFORD UNIVERSITY PRESS)

Drawings by Stanley Sproule.

*A delightful little handbook.*

6/4

### 'Weather Forecasting'

(LONGMANS)

S.W.C. Pack.

25/9

'Invaluable'—*Royal Aero Society.*

### 'Gliding and Advanced Soaring'

by A. C. Douglas.  
(JOHN MURRAY)

16/6

★ All PRICES include Postage and Packing to any part of the World.

AND—

### BACK NUMBERS

We possess a small selection of back numbers dating from 1934 onwards. If readers desirous of obtaining copies will state their precise requirements we shall endeavour to accommodate them.

Price: 2/- per copy, January, 1950 onwards; 2/6d. for all preceding issues.

To THE GLIDER PRESS, LTD.,  
8, LOWER BELGRAVE STREET,  
LONDON, S.W.1

Please send to the address below the following:—

.....  
.....  
.....

Name.....

Address.....  
.....

CHEQUE/POSTAL ORDER for  enclosed herewith.

## The aeroplane

The Blackburn "Universal" Freighter.

This versatile, box-like aircraft carries charabanes,

tractors, Army Tanks,

even mechanical

excavators up to

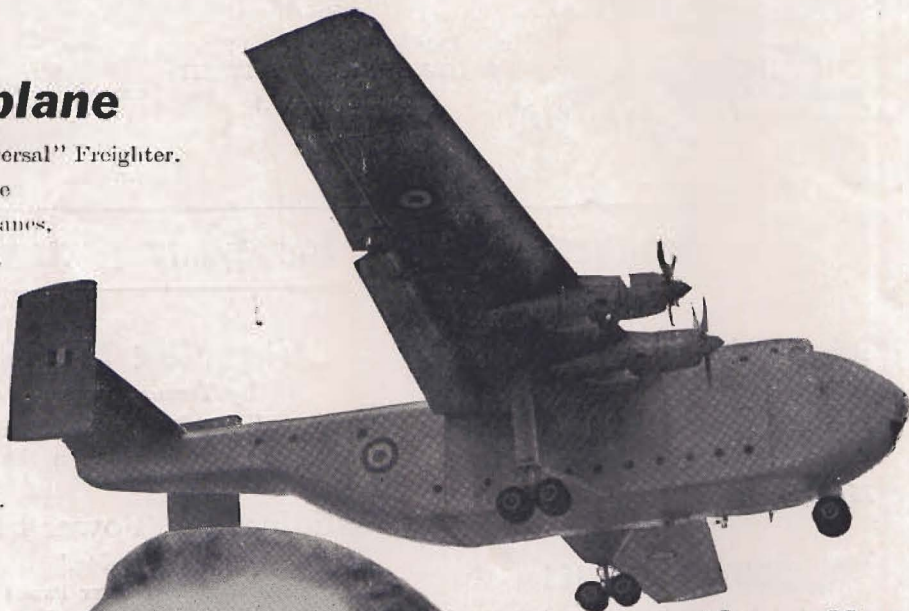
22 short tons.

Span : 162',

length : 99' 2".

Four Bristol

Centaurus 171 engines.



## the pilot

Flight-Lieutenant Harold ("Tim")

Wood has been with Blackburn and General Aircraft for eleven years. Has been flying since 1925.

Before the war he had an adventurous time flying to Australia in a Monospar, with a forced landing on a barren coral reef in the Timor Sea. Chief pilot of British-American Air Services until 1939, then R.A.F. until 1941. Says "Shell and BP Aviation Service has kept me airborne all these years."



## SHELL and BP Aviation Service

In the days of goggles and open cockpits, pilots would point and shout "There's the Shell and BP fueller" to

the passenger behind. Nowadays a polite note

"We are landing for a refuelling stop" is passed round a pressurised cabin.

But it's the same Shell and BP Aviation Service : smart, efficient, always ready, always on the spot at all Britain's major airfields

SHELL-MEX AND B.P. LTD., Shell-Mex House, Strand, London, W.C.2.

Distributors in the U.K. for the Shell and Anglo-Iranian Oil Groups.

