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JULY 1953

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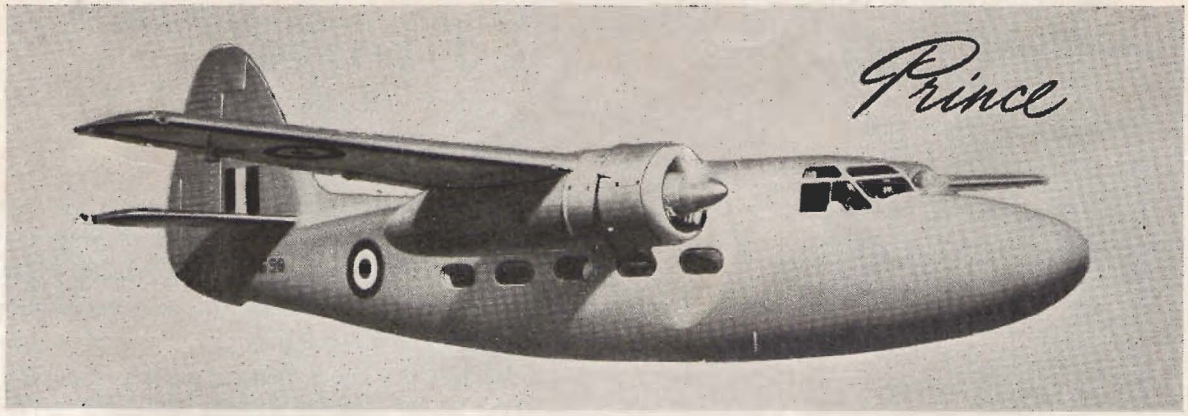
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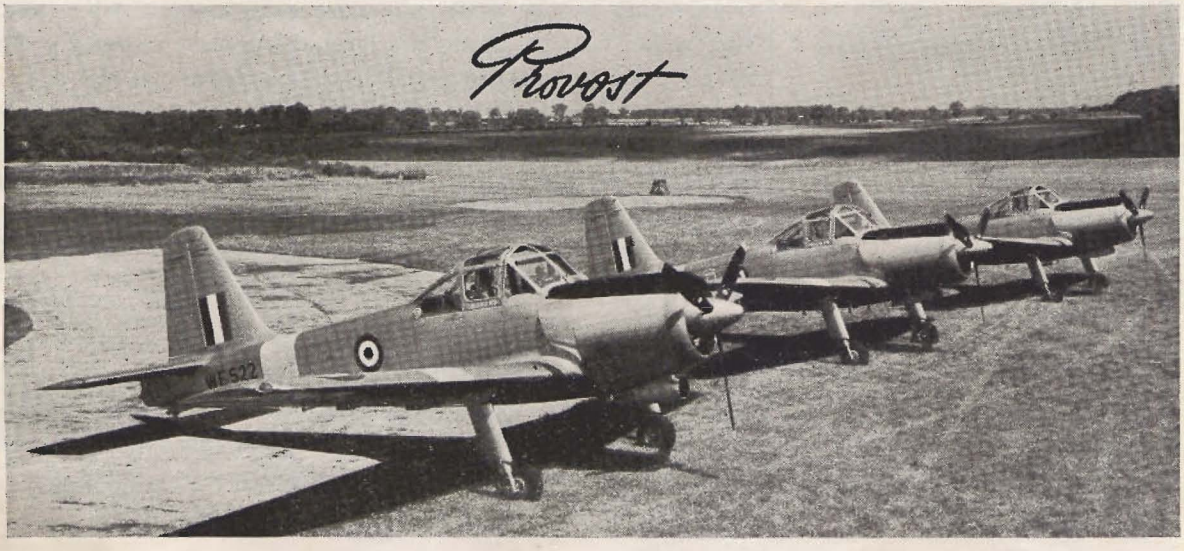
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THE FIRST JOURNAL DEVOTED TO SOARING AND GLIDING

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Editor :
VERONICA PLATT

Asst. Editor :
RONALD BISHOP

Editorial and Advertisement Offices :
8, Lower Belgrave Street
London, SW1
PHONE: SLO 7287

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Cover Photo:
The Swiss 'WLM Type' flying at Samedan (Engadin). By Heimgartner.

Editorial

WE give this month details of the forthcoming National Competitions. In the belief that it may be of some help to others who are contemplating similar contests, we are giving the full text of the system of marks as well as some extracts from the Regulations. These competitions vary a little from country to country and we learn from each other's experiments. For instance, we believe that our system of allowing individual entries gives a fairer over-all picture of a pilot's capabilities than if we were tied to one entry per Club, as in the last Argentine Contests. On the other hand, the hosts, the Derby and Lancs. Club, are again penalised because they will be so occupied with the details of the Contest that most of them will have no time to compete themselves. And as one tends to think of National winners as probable International winners also, it is sad that they should be inadvertently left out of the picture just because they were on the organising side rather than the flying side.

Competition practice is a great help to a pilot. Some people can never do their best in direct competition—their nerves will always betray them—whereas others seem to be spurred on in a remarkable way and put up a performance that they would find it hard to equal on an ordinary Sunday flight. That is where constant practice, especially under contest conditions, is of enormous benefit. Like public speaking—the more one does, the easier it gets. It might be a good idea if more inter-Club competitions could be arranged, to be run under the same rules as National contests. That would help to loosen the inevitable tension experienced by the pilot who has not previously flown in a big competition, besides getting him accustomed to flying from other airfields than his own. One gets to know the likely places for thermals so well on one's own field ; strange ones can seem very inhospitable from a height of anything under a thousand feet, especially when time is of the essence. The accustomed competitor can assess his chances much more tranquilly and it is a great advantage to him.

This Contest will see the debut of the 'Skylark,' the new Slingsby sailplane. We would like to wish it a most successful meeting, and hope that it will conquer the skies of England in the same way as its predecessor the 'Sky' triumphed in Spain. The World Championships will be held on this same site next year, so this year's contest will serve as a grand rehearsal.

NATIONAL GLIDING CHAMPIONSHIPS

Great Hucklow, Derbyshire :: July 25—August 3

THE period of the Contests will be from 0900 hours B.S.T. on July 26th to 1800 hours B.S.T. on August 3rd. Practice flying will be permitted on July 25th, and while no marks will be awarded for flights on this day, a Daily Prize will be given.

No pilot may be nominated unless he or she :—

(a) Holds a ' C ' Gliding Certificate.
(b) Holds a Silver Badge, or has had at least 20 hours' solo flying, of which 5 hours must have been hill-soaring, in gliders up to 1,250 lb. all-up weight.
(c) Has completed a cross-country soaring flight of at least 50 km. distance.
(d) Has done at least 10 winch launches.
(e) Holds a valid F.A.I. Competitor's Licence.
(f) Has satisfied the Organisers that he or she is in current flying practice, for which purpose pilots should have their personal log-books available.

HANDICAPPING.

The Championships are open to all types of gliders. Entries will be handicapped into three categories, based on Aspect Ratio. Category 1, with aspect ratios of 17.0 and above, will be Scratch ; Category 11 with aspect ratios between 17.0 and 14.0 will receive a bonus of 10 per cent. of all marks earned ; and Category III, with aspect ratios of 14.0 and below, will receive a bonus of 33⅓ per cent. of all marks earned. ' Aspect Ratio ' will be defined as :

$$\frac{\text{Span}^2}{\text{Gross Area}}$$

(Ref. A.P.970. AL 40. Appendix I and 3.

In the case of two-seater gliders, if necessary, the weight of the air-crew complete with flying clothes and parachutes will be made up by the addition of fixed ballast to an average weight of 170 lb. per crew member.

CHAMPIONSHIP CLASSES.

The Championships will be divided into two classes :—

(1) The Team Class, in which two or more pilots must be nominated.
(2) The Individual Class, in which one pilot only may be nominated.

No glider may be entered in both classes, and no pilot may be nominated in more than one glider.

Marks will be awarded to gliders, not to pilots.

Only the best flight of the day, by each glider, will score marks.

To qualify for the Team Prize, a glider must score marks when flown by at least two pilots of its team ; while in the case of a two-seater, no individual pilot must be on board the aircraft during all its mark-scoring flights.

A passenger, other than a nominated pilot, in a competing two-seater glider, must not be in possession of any higher gliding qualification than a ' C ' Gliding Certificate.

NATURE OF THE CONTESTS.

One of the following Tasks will be set by the Organisers before each day's flying :—

(1) Flight to a Goal predetermined by the Organisers. (This may be a straight flight, an Out-and-Return or a flight round a triangular course).
(2) Flight to a Goal predetermined by the pilot. (Out-and-Return declarations will be accepted, but written evidence of having been over the turning point must be received by Midnight the same day, from an Official B.G.A. observer or a recognised airfield controller).
(3) Straight distance flight in a direction predetermined by the Organisers.

MARKING.

1. GENERAL.—Marks will be awarded for distance, and in some cases for speed ; while in other cases marks will be awarded for reaching a predetermined goal. All these will be called ' Basic Marks.'

The Basic Marks earned by every flight will then be adjusted for the Handicap Category concerned.

The ' Adjusted Marks ' thus obtained will then be subjected to a ' Daily Factor,' by which the flight with the greatest number of Adjusted Marks, each day, will receive 100 ' Points ' ; all other Adjusted Marks being reduced to Points in the same proportion, thus :—

$$P = 100 \times \frac{b}{a}$$

where P = Points for the flight concerned.
a = Highest Adjusted Marks for the day.
b = Adjusted Marks for the flight concerned.

2. DISTANCE MARKING.

(a) All distances for the purpose of marking (' d ' in the subsequent formulae) will be measured along the line of the route being attempted ; and will be taken as the distance in miles from the Take-off point to the projection on that line of the landing point.

In Tasks (1) and (2), ' d ' will never be considered as greater than the full distance, ' D,' from the Take-off point to the declared goal, i.e., no extra marks will be gained by flying on beyond a goal.

The following symbols will be used in the subsequent distance marking formulae :—

N = Basic distance marks.
d = Distance in miles of the flight concerned (as defined above).
D = Distance in miles from the Take-off point to the ultimate declared goal (i.e., the *full* distance of an Out-and-Return, if applicable).

(b) Tasks (1) and (3) Distance marking will be given by the formula N=d.

(c) Task (2) Distance marking will be given by the formula $N=\frac{d^2}{D}$

(d) No distance marks will be awarded for flights of less than 15 miles.

3. GOAL MARKING (Additional to the Distance marks described above).

(a) A successful goal flight is made by landing within 1,000 yards of a declared point; or within the perimeter if the destination is an airfield.

At the destination, normal circuit and approach rules **must** be observed. Any complaint by airfield authorities, if found to be reasonable, will result in loss of all marks gained by the flight; or, in a serious case, disqualification from the Championships as a whole.

(b) In Task (1), a successful flight to the declared goal will earn Basic Goal Marks, dependent upon the ground speed at which the course was covered, in accordance with the following formula :—

$$S=5(V-T)\times\frac{D}{100}$$

where S=Basic Goal marks for speed.
V=Ground speed in miles per hour of the flight concerned (See details below).
T=' Target Speed ' in miles per hour for the Handicap Category concerned (See details below).
D=Distance in miles from the Take-off point to the declared goal, as in Section C.2(a) above.

The times that will be used for calculating ground speeds will be the time at which a glider carries out a predetermined manoeuvre for observation purposes and the time of touch down as recorded by an Observer at the destination.

The basic Target Speed of the day will be determined by the slowest aircraft to complete the course, and will be taken as 5 miles per hour less than the speed of the slowest aircraft.

Whatever Handicap Category the slowest aircraft is in, the Target speeds for the three categories will always be in the ratio of 7 : 6 : 4 for Categories I, II and III.

Thus, if an ' Olympia ' (Category II) is the slowest aircraft at 25 m.p.h. then the basic Target speed is 20 m.p.h. for Category II, and the respective speeds for Categories I, II and III would therefore be 23.3, 20 and 13.3 m.p.h. If, however, a ' Prefect ' (Category III) is the slowest aircraft, still at 25 m.p.h., then the basic Target speed is 20 m.p.h. for Category III, and the respective speeds for Categories I, II and III would be 35, 30 and 20 m.p.h.

Note.—It will be seen that this formula always gives the slowest aircraft to complete the course a bonus of 25 per cent. of his distance marking; while an aircraft (in the same Handicap Category) 5 m.p.h. faster will receive a similar bonus of 50 per cent., etc.

(c) In Task (2) speed will not be taken into account, but a successful flight to the declared goal will earn Basic Goal Marks in accordance with the following formula :—

$$G=\frac{N}{3}$$

where G=Basic Goal Marks.
N=Basic Distance Marks for the flight concerned (See Section C.2.(a).)

In the case of an Out-and-Return, the completion of each leg will earn Basic Goal Marks, and in this case ' N ' will be taken as the Basic Distance marks for the leg concerned.

NATIONAL GLIDING CHAMPIONSHIP ANNUAL AWARDS.

THE KEMSLEY CUP
To the Gliding Club whose glider earns the greatest number of Points in the Team Championship.

THE LONDONDERRY CUP
To the winner of the Individual Championship.

THE L. DU GARDE PEACH TROPHY
To the winner of the Team Championship.

THE FIRTH VICKERS TROPHY
Best performance by a British pilot in a British designed and built glider.

THE EON CUP
For competition among entrants of whichever type of British-built glider is numerically the strongest in the Contests, awarded to the entrant of the glider of that type which earns the greatest number of Points in the Contests.

THE FURLONG TROPHY
To the entrant of the two-seater glider earning the greatest number of Points in the Contests.

THE SLINGSBY TROPHY
To the pilot making the most meritorious flight in a ' Sedburgh ' two-seater glider.

YEARLY AWARDS.

The following Cups and Trophies are also open to Competition by British nationals for the year ending 31st December :—

DE HAVILLAND CUP
Greatest height during the year.

MANIO CUP
Best goal flight during the year.

WAKEFIELD TROPHY
Longest distance during the year.

VOLK CUP
Best Out-and-Return flight during the year.

SEAGER CUP
Best two-seater performance during the year.

There is a total of 37 entries—the highest ever received.

No.	*Aircraft*	*Name of Entrant.*	*Names of Pilots (Captain of team bold type)*
INDIVIDUAL CLASS.			
1.	' Sky '	P. A. Wills	**P. A. Wills**
2.	' Sky '	London G.C.	**G. H. Stephenson**
3.	' Olympia '	Frank Foster	**Frank Foster**
4.	' Mu 13a '	Royal Naval Gliding & Soaring Assoc.	**Lt. Cdr. G. A. J. Goodhart**
5.	' Skylark '	F. N. Slingsby	**Lt. Col. A. J. Deane-Drummond**
6.	' Olympia '	D. A. Smith	**D. A. Smith**
7.	' Olympia '	Surrey G.C.	**C. W. Dowdall**
8.	' Weihe '	Surrey G.C.	**W. A. H. Kahn**
9.	' Kite II '	Andrew Coulson	**Andrew Coulson**

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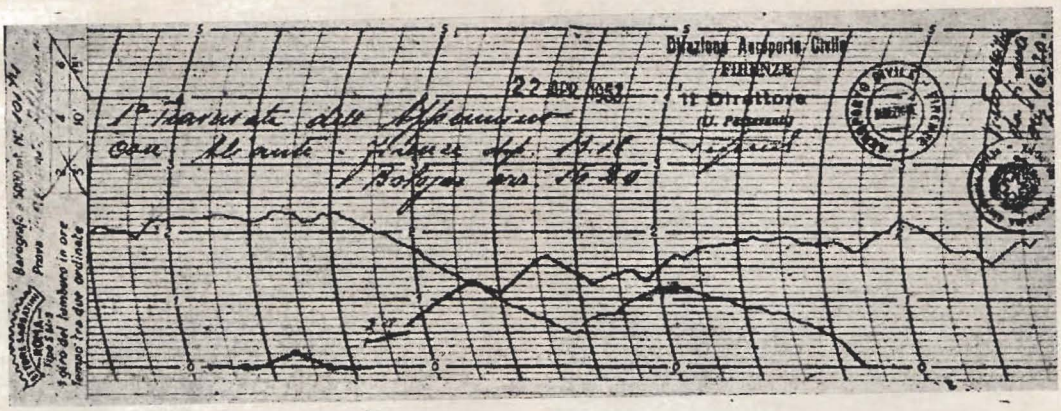
ITALY

Appenines Crossed by Sailplane

MAJOR MANTELLI in the course of a normal training flight in a 'Canguro' sailplane succeeded in crossing the Appenines on the 22nd April.

He took off at 1 p.m., from the aerodrome of Peretola (Firenze), towed by a 'Piper Cub' piloted by Commandante Magrini. At 400 metres he released and finding the atmospheric conditions favourable he decided to make the crossing.

No other glider pilot has ever attempted this flight but Major Mantelli—director of the Military Gliding School—succeeded brilliantly, landing two hours later at the aerodrome of Bologna. We reproduce his barograph below.



NATIONAL GLIDING CHAMPIONSHIPS—

continued from previous page.

No.	Aircraft	Name of Entrant	Names of Pilots (Captain of team bold type)
10.	'Sedbergh T21B'	R.A.F.G.S.A. No. 7 Area Gliding Club, Middleton St. George	**Cpl. L. Simpson**
TEAM CLASS.			
11.	'Olympia'	Army G.C.	**D. L. Martlew** J. S. Williamson P. Wenham
12.	'Olympia'	Bristol G.C.	**J. D. Jones** M. J. Hodgson G. E. Miller J. M. Hahn
13.	'Olympia'	Cambridge University G.C.	**G. R. Whitfield** J. Grantham A. R. I. Austin
14.	'Prefect'	Cambridge University G.C.	**A. B. Adams** J. P. W. Gaskell
15.	'Olympia'	Imperial College G.C.	**W. N. Tonkyn** A. G. Oram
16.	'Olympia'	London G.C.	**C. A. P. Ellis** G. H. Lee
17.	'Olympia'	Southdown G.C.	**W. F. Jordan** J. F. Godley D. C. Snodgrass
18.	'Gull IV'	R.A.F.G.S.A. Western Area G.C., Cosford	**S/Ldr R. H. Pelling** F/Lt T. Page
19.	'Weihe'	Association of 2nd Tactical Air Force Gliding Clubs	**Cpl. McKercher** Cpl. Brennan
20.	'Sky'	Empire Test Pilots School, Farnborough	**P. L. Bisgood** A. D. Dick
21.	'Olympia'	Empire Test Pilots School, Farnborough	**E. C. Rigg** C. H. Macfie J. D. Price
22.	'Olympia'	Major C. G. Dorman	**Major C. G. Dorman** S. Morison
23.	'Olympia'	R. G. Frecheville	**R. D. Dickson** R G Frecheville W. A. S. Murray
24.	'Olympia'	Hickling/Cotton	**J. H. Hickling** J. L. Cotton
25.	'Kite IIa'	F. G. Irving	**F. G. Irving** L. J. W. Hall
26.	'Olympia'	M. V. Laurie	**J. C. Neilan** M. V. Laurie
27.	'Olympia'	Prof. G. C. Varley	**Professor G. C. Varley** R. C. Stafford-Allen R. M. H. Goodhall
28.	'Olympia'	A. H. Warminger	**A. H. Warminger** B. Gould
29.	'Olympia'	A. H. Yates	**A. H. Yates** G. Nixon
30.	'Petrel'	Yorkshire Soaring Syndicate	**R. C. Pick** S. C. O'Grady A. de Redder
31.	'Sedbergh T21B'	A.T.C. Home Command Gliding Instructors School	**F/Lt A. D. Piggott** F/O E. J. Meddings
32.	'Sedbergh T21B'	A.T.C. No. 168 Gliding School, Detling	**K. W. O'Riley** H. G. How
33.	'Sedbergh T21B'	A.T.C. No. 106 Gliding School, Henlow, Beds.	**S. R. Dodd** F. E. Allen
34.	'Sedbergh T21B'	A.T.C. No. 89 Gliding School, Christchurch	**S/Ldr F. R. E. Hayte** P/O J. C. Allan
35.	'Sedbergh T21B'	A.T.C. No. 49 Gliding School, Newton, Notts.	**W. D. Campion** B. Longstaff
36.	'Sedbergh T21B'	Cambridge University G.C.	**A. L. L. Alexander** G. S. Neumann
37.	'Sedbergh T21B'	Imperial College G.C.	**R. A. B. Macfie** P. Murden

CLOUD FORMS OF THE JET STREAM

The study of upper air winds has become increasingly important with the higher cruising altitude of civil aircraft. The jet streams, great fast-flowing rivers of air at or near the cruising altitude of jet airliners, present particular problems of navigation and turbulence when encountered. They are difficult to detect and forecast, and this article describes what may prove to be a valuable means of visual identification.

WITH aircraft flying at higher altitudes where winds of great velocity are encountered, wind has maintained, if not actually increased, its importance as a factor to be reckoned with in any air operation. This is especially true where wind, by extending or limiting aircraft range, can determine the feasibility, physical and economic, of an operation, and it is perhaps overworking the issue to point out that if the ultimate effectiveness of increased speed is to be realized, range should be increased somewhat proportionately.

The phenomenon of jet streams has posed particularly great problems and possibilities in this respect. Jet streams present certain problems of turbulence and navigation when encountered, but they present especially great problems of detection and prognostication if they are to be effectively utilized when possible and avoided when necessary.

That jet streams can be effectively utilized for transport operations seems to be proven by the fact that Pan American World Airways is presently flying passenger-carrying 'Boeing Stratocruisers' (377s) non-stop from Tokyo to Honolulu on a regularly scheduled basis. Three flights per week are flown on this 3,900-mile route, the longest non-stop scheduled flight in the world, by using the prevailing winds of the jet stream that blows along the Tokyo-Honolulu route during winter months at average speeds of 70 to 80 miles per hour, at flight levels of around 23,000 feet. Prior to a series of Pan American test flights over the route in late December and January that proved the practicality of the non-stop operation, Tokyo-Honolulu flights stopped at Wake Island for refuelling. Non-stop flights take 11 hours for the route instead of 18 via Wake, with the aircraft averaging 355 miles per hour. Sidney M. Serebreny, P.A.A. meteorologist, who was aboard the proving flights, said the jet stream should permit non-stop service from 15th November to 15th April.

Investigations on prognostication and detection of jet streams have been going on in many quarters.[2] In 1951, J. S. Sawyer and B. Ilett undertook an investigation at the Central Forecasting Office, Dunstable, England, in order to ascertain whether the distribution of medium and high level clouds near the jet stream followed a recognisable pattern. The value of such a method of detection was expressed by Sawyer and Ilett who said 'If such a pattern existed, it would be of value in the analysis of high level charts when fewer upper air soundings were available; it might also permit the navigator of an aircraft to recognise his position with respect to the jet stream from the state of the sky.'[3] Using a statistical approach, Sawyer and Ilett developed evidence that there is a relationship between cloud and jet stream, but they were not able to place the centre of a jet stream within 200 miles.

During the summer of 1952, Dr. Vincent J. Schaefer, working on the possibility suggested by Sawyer and Ilett, made a series of observations which indicated the probability that jet streams may often be located from the ground by visual observation of cloud formations. For nearly ten years, Dr. Schaefer, a General Electric scientist, observed and sometimes photographed a spectacular pattern of clouds in the vicinity of Schenectady, New York. When high altitude isotach charts, prepared by WBAN Analysis Centre in Washington, were added to the facsimile network in the spring of 1952, the opportunity arose for correlating field observations of cloud forms with the observed location of jet streams. The following is based on a paper read by Dr. Schaefer before a meeting of the American Meteorological Society last January. The paper reports the preliminary results of a phase of field research conducted during the summer of 1952 by the Atmospheric Research Project of the Munitalp Foundation, an organisation fostering pure research in the field of meteorology.

Within a few weeks of observation, it was discovered that a combination of specific and rather spectacular cloud types invariably coincided with the close proximity of the jet stream. The diagram below illustrates the position of the jet stream as shown by the WBAN charts during several different field observation periods during the spring and summer of 1952. Observations made on these days and more than 20 other periods when the reported position of the jet stream coincided with the site of field observations have established the following cloud types as forms which may be utilized to establish the location of the jet stream.

1. High Clouds (H_4 and H_5)—Cirrus streamers of great complexity moving at high velocity and showing long tufted streamers, complex shear lines and massive whorls. Fig. 1.

2. High Clouds (H_9)—Cirrocumulus in blanket-like masses scattered in a random fashion although sometimes in a line showing evidence of being at the crests of undulations in the stream. Clouds sometimes changing in character, shifting rapidly to cirrus streamers or showing fine structured waves at very high altitude. Some blankets show high order Tyndall spectra in green, red and other colours when near the sun. Fig. 2.

3. Middle Clouds (M_4 and M_7)—Altocumulus lenticular wave clouds sometimes in great profusion with large lateral dimensions in the direction of flow of the stream. Often with considerable vertical depth and piling up in many layers. Such clouds show little apparent relationship to ground topography, although they are basically 'standing clouds' and, therefore, do not exhibit rapid movement except when snow is shed from them. When this occurs, long streamers may extend downwind for many miles to emphasise the high velocity nature of the air.

When near the sun, high order Tyndall spectra colours are commonplace. Fig. 3.

4. Middle Clouds (M_3 and M_5)—Altocumulus. A billow-type cloud which may extend from horizon to horizon with the waves in parallel bands at right angles to the air flow. At times the cloud sheet may appear as a relatively thin layer with the units more cellular in form. Fig. 4.

In addition to the four basic cloud types which seem to be closely related to the main axis of the jet stream, the following three other characteristics have been noted.

HIGH VELOCITY

In all instances the clouds show evidence of the high velocity characteristic of the jet stream. This is most easily seen by using as a reference point some distant object. No trouble is experienced in observing the high velocity, except with the lenticular forms which do not move rapidly. Extremely rapid cloud changes may occur with the cloud cover shifting from 1/10 to 9/10 and back to 1/10 in less than an hour. In several instances, Dr. Schaefer has watched a storm form along the apparent axis of the jet. The storm development proceeded rapidly and suggested frontogenesis. In most cases observed, precipitation under the axis of the jet stream has been limited to sporadic sprinkles of rain or snow. As a rule, the weather under the major axis and to the north has been typified by cool crisp air, unlimited visibility, mostly blue skies, and persistently fine weather.



FIG. 1

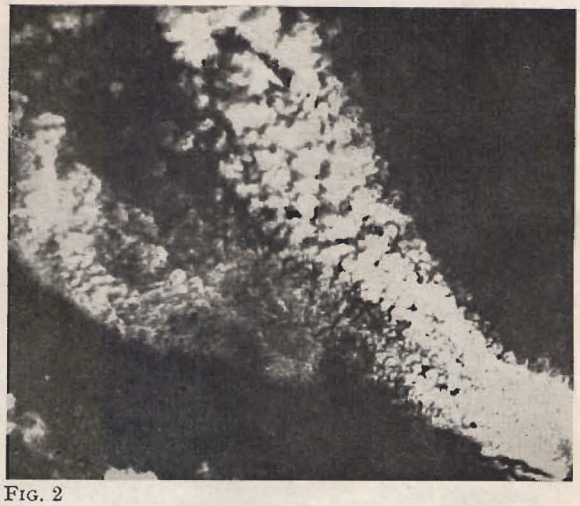


FIG. 2



FIG. 3

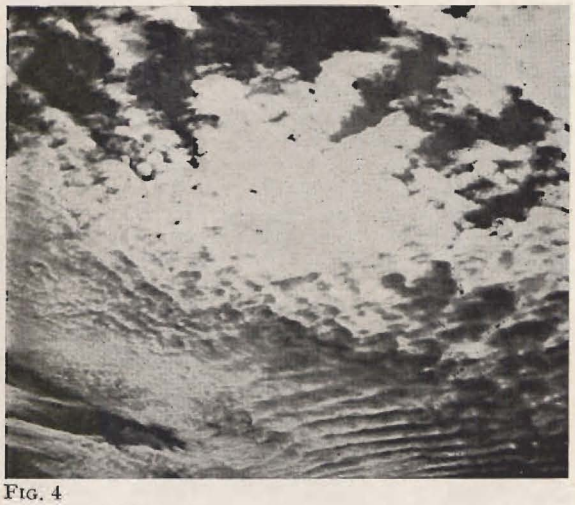


FIG. 4

A combination of cloud types which Dr. Schaefer has shown to coincide with the proximity of the Jet stream. FIG. 1. *Cirrus streamers seen moving at high speeds and high altitude.* FIG. 2. *Cirro-cumulus which sometimes shift rapidly to cirrus streamers and often take on tints of green and red near the sun.* FIG. 3. *Altocumulus piled layer on layer at altitudes of about* 20,000 *feet.* FIG. 4. *Billowing altocumulus which often extend from horizon to horizon, with parallel waves running at right angles to the direction of the air flow*

(*Continued at foot of next page*)

INDIAN GLIDING

Altitude Soaring Record

BARON A. H. DE ROSEE, a member of the Delhi Gliding Club set up an altitude record in soaring, in an ' Olympia ' sailplane belonging to the club. He took off at 14.22 hours and landed at 16.30 hours having attained an altitude of 14,504 feet.

He released himself from the tug aircraft at 1,200 feet above aerodrome level which is 695 feet above mean sea level. This is claimed to be the highest altitude attained in soaring flight so far in India. The height was recorded in a Peravia type of barograph.

The Baron commented very favourably about the weather conditions for soaring in India.

INDIAN GLIDER AIRBORNE FOR FIVE HOURS.

Baron A. H. de Rosee remained airborne in an Indian Built Intermediary glider of ' Grunau ' baby type, for five hours, nineteen minutes. The glider took off at 12.15 hours and landed at 17.34 hours. The pilot, it is said, could have remained much longer had it not been for hunger and fatigue.

The glider was manufactured by the Technical Centre of the Civil Aviation Department, who are now developing two-seaters and high performance planes.

DELHI GLIDING CLUB FIRST ANNUAL GENERAL MEETING.

The first Annual General Meeting of the Delhi Gliding Club was held recently at Delhi when certain amendments regarding the managing committee were carried out.

CLOUD FORMS OF THE JET STREAM—*continued from previous page.*

COHERENCY

In every instance when cloud forms have been related to the jet stream, they have occurred in a coherent pattern often extending from horizon to horizon.

GUSTINESS

In about half of the cases observed to date, a peculiar persistent gustiness in the air at ground level has been noted. Although this feature has not yet been studied in detail, such winds seem to be most common under conditions having a dry adiabatic lapse rate. The gustiness at ground level which seems to be related to the effect of the jet stream may be related to the instability of the air. In a number of cases, small stratocumulus clouds with tops less than 8,000 feet above the ground have displayed profound modification due to the jet.

A preliminary check of the incidence of high winds at the summit of Mt. Washington, New Hampshire, made by Mr. Raymond Falconer of the General Electric laboratory, shows a high correlation between such high winds and the close proximity of the main axis of the jet stream to the mountain. It is quite likely that the world record in recorded wind velocity at a ground station measured at Mt. Washington of 231 m.p.h. and similar excessive winds of the past will show a high correlation with the presence of the jet stream.

In this respect, Dr. Schaefer recommended to the U.S. Forest Service that anomalies in forest fire behaviour may have a similar relationship.

DETECTION OF THE JET STREAM

A preliminary ' rule of thumb ' method for using the foregoing cloud types and related characteristics in establishing the near proximity to the observer of the jet stream requires the appearance of at least three of the cloud types described, along with evidence of high velocity movement and coherency. If all four cloud types occur, the evidence may be considered complete.

Since 1st May, 1952, Dr. Schaefer has been accumulating photographic evidence of cloud types related to the jet stream. Nearly 500 feet of time lapse motion pictures have been secured thus far in eastern and central New York, western Minnesota, western Montana, northern Idaho, western Wyoming, and southern Colorado. The general characteristics of the type clouds in the various regions are identical, although local variations may be noted.

The use of clouds to establish the location of the main axis of the jet stream is limited, of course, to those periods when lower clouds do not obscure the sky or when enough moisture is in the jet to permit cloud formation. It has been noted that the hour after sunrise and before sunset is most favourable for revealing high thin clouds related to the jet at times when very little moisture is in the air.

An hour by hour study of the cloud forms related to the jet stream illustrates many interesting features of its high velocity, meandering nature, and ' micro ' structure. This is particularly interesting when the jet is relatively narrow in width. By employing a visual method supplemented by time lapse motion pictures over an extensive network, it is quite possible that a much better understanding of the basic dynamic properties of the jet stream may be obtained.

Dr. Schaefer suggests that the relatively dense network of meteorological stations throughout the world could be easily utilized for pinpointing the location of the jet stream on an hourly basis following the cloud identification procedure described in his paper. This type of data, he says, supplemented by aircraft pilot reports, should lead to a better concept of the physical nature of the jet stream.

2. P. D. Taggart—Cowan's Presidential Address to the Canadian Branch of the Royal Meteorological Society presents a resume of the scientific papers published on the jet stream and related phenomena up to March, 1949.

3. Sawyer, J. S., and Ilett, B., ' The Distribution of Medium and High Clouds near the Jet Streams,' *The Meteorological Magazine*, Vol. 80, No. 952, October, 1951, p. 277.

Our grateful acknowledgments to ' Shell Aviation News '

UNPLANNED RETRIEVE

By E. W. CLARKE

THOSE of us who were left on the ground after Leith's launch (Unplanned Silver ' C '—May issue) on his ' unplanned cross-country ' were lost in thought as we watched him soar the locality at 4,000 ft. plus until finally he disappeared into cloud and was not seen again. Our thoughts turned at once to retrieving and we hastily called a sub-committee meeting of the mechanical sub-committee to discuss how to bring the fellow back. Taking stock we found :—

(a) The sadly battered old ' Beaverette ' was running on two pots, four wheels and one brake.

(b) The Chevrolet was totally unserviceable.

(c) ' Doc ' Cotton, who was with us, possessed a gleaming new Standard Vanguard fitted with a towbar.

We decided to battle with the unknown rather than allow ' Doc ' to return home, nearly a day late, to an anxious wife who was waiting 80 miles away. After all, time and discomfort meant nothing to us, for were we not enthusiasts ? The decision was made : Leith would be retrieved by the ' Beaverette ' if an aero-tow could not be arranged.

The ' fettling up ' of the ' Beaverette ' took nearly two hours but as someone put it at the time : ' It takes a good retrieve to get all the lights and things back on the vehicles and in working order once more.'

The 'phone rang. Leith had landed the ' Olympia ' at Southend and although an aircraft was available there was no tow rope. At our end we had an aircraft and rope but no pilot. There was no choice ; it had to be the ' Beaverette.'

After a hasty check to ensure we had everything for the journey on board we piled on the rugs and flying suits and set course for Southend Airport at six o'clock. About five miles along the road the silencer box fell off, and, coupled with the two cylinders which were not firing, produced a difficult situation, for the ' Beaverette ' sounded rather like a 20 mm. cannon towing a 30′ trailer. We ought to have turned back but instead we accepted the challenge of the ferociously bellowing ' Beaverette ' and ' pressed on.' The technique evolved of running into a town at high speed and then releasing the accelerator pedal thus causing the noise to diminish considerably. The vehicle was allowed to coast through as far as possible, then foot down hard and we were away ; before the Law located the noise. About nine o'clock we were entering the outskirts of Chelmsford when I remembered that this was the county town and usually it was swarming with policemen on foot, on bicycles and in cars ; remembering also the duff brakes, and being only too painfully aware of the deafening exhaust, I felt suddenly tired and suggested that perhaps someone else might like to drive in order that I could conserve my energy for the long trip home. Tommy, from Deeside, was either intoxicated by the exhaust fumes or did not weigh up the situation because he leaped delightedly into the driving seat and recklessly thundered down upon the entire Essex constabulary who emerged from their hideouts to watch us pass through the almost deserted streets.

We were given many doubtful gestures on our way through but it seemed politic to ignore them : in any case we were much too scared and were greatly relieved to be out in the dark but friendly country lanes once more on the final stage of our outward journey.

Leith, who had been ejected from the Airport bar hours previously, heard us coming when still about two miles away, walked to meet us as we turned into the Airport gateway. Fifty-five miles in five hours.

The ' Olympia ' was just inside the hangar, already derigged (all a part of the service at Southend it seems) and nestling down beside Dr. James' minute ' Chilton.' Stowage, with the aid of torches, took only a few minutes and was considerably less than the time taken to stow the bottled fluid found reposing in the ' Olympia ' cockpit.

On the journey home power began to fade after a time and Tommy kept us amused by leaping madly out of the ' Beaverette ' when going up any slight incline and walking on ahead to the crest ready to jump on again when we drew level for the ensuing rush down the other side. We were not a little worried about the showers of sparks which were from time to time being hurled back from the engine, and probably this influenced us when Tommy suggested that it might be a good thing to have the plugs cleaned. Foolishly we allowed him to try. His final exasperating effort was to pour a pint of petrol on the roadside and then ignite same ; its purpose being ' to remove the excess oil ' when the plugs were held in the flames. The two car drivers who that night saw a weird figure chasing a ball of fire down a hill whilst waving his arms and shouting like a witch doctor may rest assured that it was only Tommy as he juggled with the hot plugs. The plugs were cleaned and replaced ; Tommy was cleaned and replaced ; the engine started and we carried on at exactly the same speed as before.

Eventually at four-thirty that morning, very cold, tired and hungry, in the grey dawn we crawled back into our own airfield. It is doubtful whether or not we should have begun the journey, and certain that we should have returned when the silencer fell off, but *we* had to go on because retrieving crews, like the Mounties, always get their man.

We all learn from experience and when those experiences are pitiable and painful we seem to enjoy learning all the more, viewed in retrospect.

Editor's Note.—The writer has since qualified as a tug pilot to carry out aero-tow retrieves.



1. The Why and How of Gliding

This article first appeared in ' The Sailplane ' during 1947 *and we are reprinting it as we feel it will be of interest to new readers.*

A SERIES of articles for the beginner, Mr. Editor? That is rather a tall order, for a glider pilot is always a beginner in the sense that he still goes on learning; and each new discovery we make or each fresh flight we take only serves to emphasise how little we knew before and how much there is still unknown. But I will assume you mean someone who has never left the ground, never felt that sensation that on good days combines something of sailing and ski-ing and dancing and skating and surf-riding, yet can make one feel helpless as a leaf in a whirlwind on bad ones. . . . Still, for all its excitement and thrills gliding remains one of the safest of all sports, safer far than crossing a traffic-heavy street or even than riding a bicycle. Boys and girls of fourteen can fly just as well as grandparents in their fifties, and provided they are reasonably fit and healthy there is no reason why they shouldn't. But I stress the fitness because gliding is strenuous, far more strenuous than flying an aeroplane or driving a car; and your motive power lies almost as much in your brain as in the weather. If conditions are right and you do not know how to make the best of them you will get nowhere.

I would like here to quote something I read the other day. It comes from Arnold Haskell's ' Balletmania.' Put gliding in the place of ballet and it is very apt. ' This is a chronicle of hard work. The dancer will never cut her rehearsals, but clamour for more; and when she is not herself dancing she watches others, in acute discomfort, for she will make every movement inwardly and suffer with every fault. She has never finished learning. At the height of her triumph she must submit herself to the discipline and often to the abuse of her instructor. To him she is never ' Madame ' but always the small girl whose arabesque lacks perfection or whose elevation is weak. What a mental and physical training, this daily class. . . . I have yet to meet the truly conceited dancer—that is, the dancer who really believes her own pathetic little attempt at bluff. There is always something new to be learned, something that X excels in and that she herself lacks.' And there you have the secret of success, or at least of proficiency. There are plenty of proficient glider pilots in the world, but the really outstanding ones are almost as rare as the really outstanding ballerina. Therein lies its fascination. A first-class sailplane pilot is a joy to watch. He flies with a calculated perfection of movement, never hurried, never jerky, yet always in the right place at the right time—which may be due to some sixth sense we others haven't got but is more probably the result of long and careful training and a quick and keen intelligence, allied to a sense of rhythm. It is not necessarily the pupil who learns fastest who advances furthest. One of the best of the pre-war German soaring pilots had such a record of crashery and hamhandedness that he was twice turned out of the school as useless, not worth the trouble of training. Yet he persevered and became brilliant. If you find it difficult don't despair. Gliding can be as exasperating as golf, and one has off-days for just as little apparent reason.

That brings us to the question of patience. Elementary training can be carried on in almost any kind of weather except with a strong gusty wind, but you are quite likely to turn up at the field and find no flying. Why? Oh, because the towing winch or car is out of order, or the skid wants fixing, or the ground is too wet, or any one of a hundred other things. This is where the Club discovers the true worth of its members, for the ones that are any good will roll up their sleeves and work till it is dark—and even then sit on discussing gliding theories till they have to make a dash for the last train. There used to be a notice hanging in the bar of the London Gliding Club to the effect that there are thirteen things to be done before you can glide and that unless you have done one thing thirteen times or each of them once, you are not pulling your weight. I forget exactly what the thirteen were, but they must have included opening up the hangars, getting out and cleaning the machines, filling up the cars and winches with petrol and oil and water, laying out the cables, collecting signal flags and landing marks and tools, towing the gliders out on to the field, checking all controls carefully, rounding up the time sheet and stopwatch. . . . That is nine,

anyway. And to this you might add cutting the grass, levelling the runways, painting and repairing and bricklaying around the hangars and club, and a dozen more. Where I learnt, we used to have to put in an hour in the carpenter's shop for every flight we made. There was always something to be done in the way of repairing or rebuilding the Club machines and a careless landing by somebody may mean several weeks' work before the primary can be used again. We built all our own machines, both elementary and advanced types, and that gave us a personal interest in their well-being that went a long way towards preventing casual crashery.

A primary glider is a very simple affair, strongly built and *almost foolproof*. It has no pretence to beauty of line or anything but fitness of purpose. The wings are square-ended, the tail ungraceful, the fuselage simply a couple of crossbars and some wires. There is no cabin. The pilot sits out on the nose with nothing between him and the earth but a couple of webbing straps. There is a joystick that gives him fore and aft and lateral control and a rudder bar for his feet that will turn him to left or right. The movements are simple. Stick forward, nose down ; back, nose up ; to the right, bank right ; to the left, bank left. Push with your left foot, the nose turns left. Push with your right foot, the nose turns right. And that is all. To these add one rule—when in doubt push the nose down and you will come to no harm. Put unscientifically, what holds you up is your speed through the air. In the next article I will explain how and why. But for the time being it is enough to remember that in speed lies safety. Hold your nose up, the speed drops, the air can no longer support you, and you stall. Dip your nose, the speed rises, and you have control again. But you will lose a lot of height in a stall, so avoid them like the plague unless you want to bore a hole in the landing field. You will be taught to judge your speed by the feel of the wind in your face and the sound of it in your ears. If ever there is a calm space and a silence, drop your nose quick. It is not the air that has stopped moving, but you. Figure out why afterwards. What you have to do immediately is get up speed and regain control of your machine, and that can only be done by diving. When you can hear and feel the wind again pull your stick back gently and regain the horizontal. Time enough then to wonder what you did wrong and decide never to do it again !

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2. *Training and Technique*

IN Part 1, I gave you the elementary rules of flying, or rather, of gliding. Stick forward, nose down ; stick back, nose up. Stick right, right bank ; stick left, left bank. Left rudder, nose left ; right rudder, nose right. And when in doubt, stick forward and feet straight ahead. There you have the five-finger exercises of gliding, and indeed of all flying. From there it is up to you whether you are keen to go on or not. You may stay in the stage of being able to pick out a tune with one finger, but there is no real reason why you should not practise hard and perfect your technique till you can play really well, though—to continue the simile—unless you have the divine spark you may never be a Paderewski or a Kreisler. It is just the same with gliding. Given enough enthusiasm and the right kind of encouragement and instruction it is easy to become a crack pilot even if you have no natural gift for it, simply by being expert technically. But you must be keen and you must work hard.

Study the records of any Gliding Club and you will see that far more people begin to fly than ever keep it up. They drop off for various reasons—expense, illness, a disapproving parent, lack of time. Then since most clubs can only function at week-ends the weather is a great deterrent ; rain and hail and fog and snow can all make gliding most uncomfortable. But if you can be one of the ten per cent. tough enough to follow right through the course you will have won your entry into a select band. In odd places all over the world you will bump into someone who recognises your badge and from then on you will be among friends, even though you can't understand a word of each other's language.

The gliding badges are three—or five, if you aspire to be one of the aces. They are International, varying only in the letters at their head, each letter representing the country of origin. The badge itself is a blue enamel button worn in the lapel. The A has one white seagull, the B two, and the C three (as on page 23). Then there is a Silver C and a Golden C, but these are relatively rare and it may be a long while before you see one. The minimum requirements are these :—

A.—30 seconds free flight in a straight line.
B.—45 seconds flight making an S curve.
C.—A flight if 5 minutes *above* the release point.



Veronica Platt

You will see that the first two are easy—just a matter of controlling the machine well enough to bring it down straight and level again a few seconds later (though it is quite astonishing how long thirty seconds in the air can seem . . . .). For the C you have to be capable of soaring—that is, of finding and using an up-current. These exist in various places. The easiest to find are those caused by the wind sweeping up over the face of a hill. Unless it is a very exceptional wind or a very exceptional hill you will not get very high or very far, but with the wind in the right direction you can be sure of lift. So most elementary gliding clubs are situated on one of these hills. Primary training is carried out at the foot of the hill, and later on the pilots are launched from the top, there to beat up and down from one end of the slope to the other as long as they please. This is not very exciting but it is a good way to pile up time in the air and concentrate on technique. Much more skill is needed when flying from flat country. There the up-currents are due either to cloud lift or to bubbles of hot air breaking away through some irregularity in the ground. It takes knowledge to find these and experience to stay in them, so I am going to leave that till a more advanced lesson.

Your first day at the club will be spent learning the uses of the ailerons. These control the lateral balance of the machine, and the movements become instinctive almost immediately. Sit in the seat with your feet up on the rudder bars, hold the stick gently with one hand, look ahead to the horizon and relax. One of the members will then rock the wings and it will be your job to try and keep them level by balancing movements of the ailerons. As the right wing drops bring the stick over to the left to counteract it. The right wing will lift; but if you have over-corrected, the left wing will drop instead. This is why I said 'Relax.' Make all movements smoothly and gently and the glider will respond. Remember, too, that all machines are naturally stable. Later on you will be able to prove this by flying hands and feet off, when the primary will probably fly better than with you guiding it! But don't try this till you are expert. Just remember that it can be done and give her her head.

After a few minutes you will be responding instinctively as soon as the machine is rocked, and when the instructor thinks you have the hang of it he will give you a 'ground slide.' Strapped in the primary you will be towed behind a car, pulled along by the winch cable, or just dragged by your fellow pupils from one side of the field to the other. The idea is to keep straight and not let either wing drop. If it does (and it will) correct it by opposite movement of the stick.

When you can do this effectively the speed of the tow will be slightly increased and for one ecstatic moment the glider will be airborne. It will seem enormously high at first and you will be amazed and incredulous to find you were never more than eighteen inches off the ground . . . . But with each successive tow from now on you will be taken higher and higher, always on the end of the tow rope. When you can fly straight and level right across the field at a height of about fifteen feet the instructor will give the signal for you to release the cable and come down alone. (These signals are given by flags, but as they unfortunately vary from club to club I will not specify any for fear of muddling you. The instructor will explain and all you have to do is to obey implicitly. He knows how to fly and he knows how to make *you* fly, so ignore anything said to you by your fellow learners and concentrate on believing faithfully everything the instructor tells you. That is why he is there).

At the Club where I learnt, it was the custom to stand a round of beer after the first free flight; on others nothing is celebrated till you have your A. This is just a matter of going on as you have begun till you are making tows of about 100 feet in height, releasing the cable, and gliding straight ahead in free flight. When you can stay thirty seconds in the air you will be given the A—but not if you slow your airspeed to stalling point in the effort to make the glide last longer. The machine has a 'best angle of glide' which you will discover from experience. Learn to keep your eyes on the horizon and you will soon get the idea of where it should be. If it disappears and you see only blue sky, the nose is far too high and you are about to stall—dive her at once. If the amount of ground is too large in relation to the amount of sky you are flying with the nose too far down. Lift it a very little till the horizon is in the normal place. But make all movements gently and smoothly. Keep your muscles and nerves relaxed and you will fly well.

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3. *From the 'A' to the 'B'*

IN Part 2, I took you as far as the 'A' Certificate, and up till now it has been immaterial whether you are learning on a level aerodrome or a hill site. I have also assumed you will be learning, not in a two-seater with an Instructor, but alone in a primary. There is some divergence of opinion here and you will find the experts arguing fiercely. On the whole people prefer the method they use themselves. You will find I have a bias in favour of flat country and primary training, simply because I learnt that way myself. But I will try to give you both sides of the picture.

One reason for the primary is that it is very cheap. Its construction is so simple that any Club can make one, and in case of minor crashery it is easy to repair. Then, too, you have none of the awful sensation of being left alone on your first solo. You are alone from the very first moment you sit in the machine, and you will find, surprisingly enough, that a flight in a two-seater with an Instructor makes you less confident rather than more so. But I do think that two-seater instruction later on is a great help. When you come to thermal flying there are so many short cuts to knowledge that can be better explained at

the time than after you come down, and the Instructor has a chance to correct any small faults that may have crept into your handling of the machine. This can equally well be done by wireless—the only snag about that being that it sometimes fails to work and leaves you literally hanging in mid-sentence. . . . But it is again a much cheaper method than the two-seater, which unfortunately becomes increasingly expensive.



Relax !

My bias in favour of flat country comes from there being much more of it. There are so very few slopes that face in the right direction for our prevailing wind, whereas the war has left us with a great number of good airfields not too far from towns. I would like to see every reasonably sized community with its own Gliding Club, and there is no chance of that if we have to depend on hills and their owners. With a rope and an old car a glider can be got into the air ; with a winch it is even easier. And from there to aerotow is but a step. Once you get on to aerotow you can continue to have fun perfecting your aerobatics even when the conditions are hopeless for either time or distance. But we are going ahead too fast—back to the ' B.'

There is so little difference between the conditions required for the ' A ' and the ' B ' that it has been possible in England to get them both on the same day. I think this is wrong, as it may depend entirely on luck and nothing at all on your capacity to fly correctly. I prefer the method of giving the ' B ' at the end of a specified course in which you have covered certain ground. In the Argentine, where soaring flight has reached a very high standard, the period of training includes about fifty launches during which you learn tail wind landings (in case of emergency—or forgetfulness !), 360° turns, the difference between the reactions of stick and rudder in shallow and steep turns, spot landings, and the S-approach to an aerodrome. That to me makes the ' B ' certificate very much more worth the winning than if it merely means you have stayed up fifteen seconds more than the next man. But again, that is a personal bias. The fact remains that these things have to be learnt if you are ever to fly properly and safely, and it is quite immaterial whether you learn them now or later. That must depend on your Instructor.

If you are flying from a hill site you will now be able to be launched from the hill. Later a small cabin will be fitted over the nose of your primary to give you a little more streamlining, or perhaps you will miss out this step and go straight on to a slightly more advanced type of trainer known as a secondary. If flying from flat ground you will be promoted to a longer cable. In any case your launches will now be considerably higher above the ground and you will have more time to think before you land. Now is the moment to try a slight turn—first a deviation from the straight by pressing the foot only, then a return to the original line with the aid of the stick as well. You will see that if you only press your right foot forward the machine's nose will turn rather heavily and clumsily towards the right, whereas if at the same time you push your stick a little over to the right the machine will incline slightly and the turning movement will be much easier and smoother. Look at any bird turning and you will see that they bank quite steeply towards the inside of the turn. If they did not they would skid outwards. And the tighter the turn they wish to make, the steeper the inclination.

So it is with aeroplanes and gliders. A shallow inclination will give you a wide slow turn, a steep inclination a tight fast turn. But in these turns different forces begin to act on the wing surfaces. The air becomes a brake and you must fly with a little more speed. Get in the way of dropping your nose slightly before you start a turn. More accidents have been caused by failure to keep up speed in a turn than from any other reason. That is why the power pilot who stalls his engine after taking off should never in any circumstances attempt to turn back into the aerodrome ; he cannot get up speed fast enough to counteract the braking effect of the turn and so loses all the buoyancy that speed would give him. So you can see that it is important to master turns till you can make them perfectly, accurately, and instinctively. You will need them

(*Continued at foot of page* 15)



Beating up and down the slope.

SOUTH AFRICA

SEVEN HOURS AND A SORE TAIL

By E. B. V. Tolliss in a ' Bowlus Albatross '

ON Saturday, 6th December, during the 1952 Gliding Championships at Bloemspruit, I decided to have a crack at the elusive five hours for the last leg of my Silver C. The weather did not look as promising as it had done for the past few days, but I made up my mind to find a good spot—if there was one handy—and stay there. I took off at 11 o'clock and released at about 1,500 ft. in a thermal which took me to 7,500 ft. Scanning the sky it seemed that the clouds were less scraggy towards Basutoland. Some clouds offered no lift so I had to make my choice with caution. Cloud base was about 8,000 ft. above ground ; I peeped into one or two but the roughness caused a quick exit to smoother air.

After a couple of hours, conditions seemed to improve a little in the West, so I flew towards Bloemfontein again and at 2 o'clock I saw the hangars of Bloemspruit and wondered what had been on the menu. I ate a couple of biscuits—they were dry, I was dry and my water bottle was dry, having sprung a leak.

At this point I turned eastwards again and near Ladybrand ran into conditions which rather puzzled me ; fierce ups and downs in narrow widths. ' Being over broken ground ' went through my mind, but there were no indications of high ground winds. To the south the sky was clouding over. The clouds nearby were growing heavy bellies and linking up with one another. To the north the sky was clear except for a few scraggy looking clouds. (It was at this stage that I realised my tail was beginning to ache, though I could not understand why).

Tiring of my ' boiling pot area,' and thinking of saving a retrieve, I headed home again. This was nearly my downfall for at a quarter to four I was coming down like a bomb, cursing the red ball. I spotted a farmhouse where earlier I had received some lift and flew in its direction with a silent prayer. Gradually the red gave way to the green ; forgotten were my sore tail and dryness ! My one thought was to get the most out of that thermal.

Back I went to my ' boiling pot ' with a joyful heart, knowing that five hours were ' in the bag.' Now my thoughts turned to home, but Thor, the thunder god, had different ideas, having no sympathy for my ' Thor tail ' and providing a drum symphony to liven things up.

What gives now ? I thought as the ' Toffee Apple ' gave a shiver. Opening the window I found that the air was horribly cold ; another rumble and the storm started in earnest. As it was moving in a northerly direction I flew eastwards, slightly below the cloud front. Edging into the rain I found that there was still lift there, although it was slightly rougher, then I edged away again to smooth 10 ft. a second lift. Each time I reached 9,000 ft. I turned away from the storm until I had lost a thousand feet then moved back again into the path of the smooth lift. I continued this until about 5 o'clock, haunted all the while by the thought of how to land ; I had had one experience of landing in a rain squall which cost four days' repair work !

At about 5.15 I sighted the dorp of Excelsior around which were many ploughed fields. With the idea of getting well ahead of the storm before landing I pushed the speed up to 55-60 m.p.h. and hastened northwards. At 6,000 ft. I ran into the biggest dust devil I have ever encountered so I sat on top of it and marvelled at the beautiful panoramic view I had of the storm. To the left was a curtain of rain about 15 miles long. To the right, for approximately the same distance, a curtain of sand rising like inverted sea waves ; dark at ground level but fading to a lighter hue as it reached the clouds above. (Farmers' top soil disappearing into the blue ! !).

There were several gaps in the sand curtain caused by grassed areas, some with the sunshine piercing through. The advancing curtain moved on, Excelsior was there one moment and gone the next.

Now I made up my mind to attempt to reach the end of the sand curtain before landing, so I waited on my dust devil until the storm caught up then I flew along the edge of it towards the Bloemfontein-Johannesburg road. Before getting there I sighted Winburg so once more left the storm and headed in the direction of that town. As the country just around Winburg is rather broken I used a very smooth thermal to gain a little extra height. I put the old ' Toffee Apple ' into a turn, and believe it or not, she carried on with my hands and feet off the controls for three minutes !

As a result of all this dilly-dallying the storm was catching me up, so seeing a native in a ploughed field I decided to land near him, and after circling the farmhouse touched down in the field to find that it was freshly ploughed and not so smooth, and the ' Toffee Apple ' ended up in a contour furrow. The time was 6 o'clock, exactly 7 hours after take-off. Tenderly feeling my sore tail I discovered the reason for my discomfort ; I had been sitting on my pen knife !

My Zulu meant nothing to the native nor his Xhosa to me, but I managed to make him understand that I wanted him to hang on to the nose. A lorry approached with two farmers and a load of natives, and as I turned to greet them my native shouted ; the dust storm was upon us ! I dived for the wing-tip and for a moment bedlam was let loose with everyone grabbing the nearest part of the machine. When the first onslaught had died away I introduced myself and the boys then dragged the ' Toffee Apple ' into a courtyard of the farm buildings.

After a very welcome cup of tea we dismantled the machine and put it into a new wool store. No sooner was the machine safely housed than down came the rain and I was paddling about with bare feet. (During the excitement my sandals had got lost but were produced later by two piccanins).

Over a whisky and soda I was introduced to the rest of the family. Then followed a hot bath, a 'phone message to my team mates, and a hot dinner. You can't beat the Afrikaans people for hospitality !

Incidentally, the natives reckoned the ' Toffee Apple ' was a jet plane and swore that smoke came from the boom !

' WINGSPAN.'

SWITZERLAND

DURING May some very successful flights were made all over Switzerland. Here are the best of the results :

HEIGHT :

	Pilot	*Sailplane*
5,496 m.	Schachenmann	' Air 100.'
4,915 m.	Kuhn	' Meise.'
4,869 m.	Nietlispach	' Kranich.'

DISTANCE :

	Pilot	*Course*	*Sailplane*
341 km.	Kuhn	From Courtelary to Wolfertshausen	
204 km.	Hächler	From Birrfield to Vireloup.	' S22.'
179 km.	Hösli	From Birrfield to Gland.	' Moswey.'

GOAL :

308 km.	Nietlispach	From Biel to Valence.	' Meise.'
212 km.	Hächler	From Birrfield to Genf.	' S22.'
66 km.	Schmid	From Zwingen to La Chaux De Fonds.	' Spyr.'

OUT-AND-RETURN :

193 km.	Pelzer	From Birrfield to Chasseral.	' S22.'
182 km.	Hächler	From Birrfield to Courtelary.	' S22.'
136 km.	Witschi	From Olten to Chasseral.	' S25.'
136 km.	Otth	From Olten to Chasseral.	' Spyr.'

SAILPLANE CAMP IN DALLIKON.

From the 10th to the 25th May a meeting was held by the Zurich Gliding Club at Dällikon—29 pilots took part. There were 146 flights totalling 70 hours, 27 minutes.

Breitenstein flew to Bellach (75 km.), and to Oetschwil (46 km.), Glutz to St. Gallen (72 km.), Störchli to Oberbüren (60 km.), Ruckstuhl to Titisee (56 km.), and Steinacher to Lachen (45 km. goal flight).

The 3rd International Gliding Contest at Bodensee will be held from the 13th to the 17th August.

BREVITIES

WOMEN IN GLIDING.

SWITZERLAND.—Jolantha Tschudi, Gold ' C ' has now gained her first diamond. She flies at Berne.

GERMANY.—Hanna Reitsch, famous German pre-war glider pilot, held a special gliding course for women at Klippeneck. There were 37 pupils.

FRANCE.—Marcelle Choisnet has gained her diamond ' C ' with a distance flight of 505 km. from Beynes to Mareillac in an ' Air 100.' This makes her the first feminine holder of a diamond ' C ' and also gives her the French record.

Jacqueline Leroy has gained the feminine world record for a goal flight from Chavenay to Angoulême, 405 km., in an ' Air 102.'

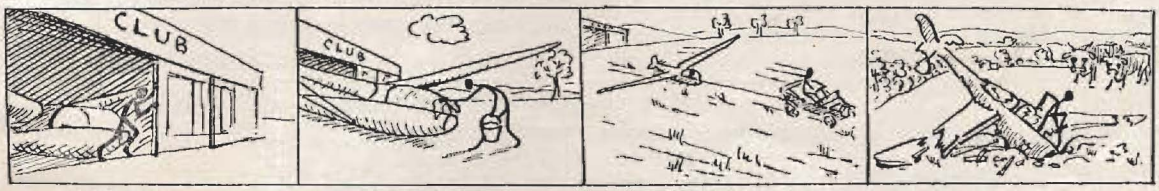
FRANCE

On the 9th May, Lepanse and Roboan gained the French two-seater goal flight record with a flight of 370 km. from La Ferte-Allan to Cognac.

BEGINNERS' PAGE—*continued from page* 13

all the time. In slope soaring you will be making 180° turns along the side of the hill over and over again ; in thermal soaring you may want to make as many as two or three hundred consecutive perfect 360° turns without ever coming out into the straight. Practise them in both directions assiduously. Most people prefer a left turn to a right one, but you need both and both should be equally good.

It is easier to keep a steady bank in an aeroplane than in a glider because there are usually struts or the engine frame or cowling in front of you. Keeping this at an unchanging angle with the horizon is simple. In a primary you have to judge the angle of bank by your own inclination from the vertical. Keep your eyes on the horizon. If you look along the downward wing you will think the turn is much steeper than it really is. And let your body go with the turn. If you try to hold back, your upper shoulder will begin to ache and you will have a sensation of falling that is quite unpleasant. As in your beginning days, relax. Let yourself lean into the turn, make the movements of stick and rudder as lightly and gently as possible, and you will feel as if the wings really grow on your own body and you are making the turn with a lift of the eyebrow. When hands and feet are perfectly co-ordinated there will be no sensation of either slipping in or sliding out. The wind will blow steadily from directly in front of you. Should it press on the upper side of your face you are sliding out and need a trifle more bank. Should it blow on the lower side you are slipping in and should take the bank off a little. It is not because either way is particularly dangerous—it isn't. But it is sloppy flying and should be corrected till your instinct will not allow you to make any but perfect turns every time. And when you can do that you are well on the way to being a pilot !



Anticipation . . . . *Preparation . . . .* *Realisation . . . .* *Frustration . . . .*

NEW ZEALAND

SAILPLANE FLIES 190 MILES

Extract from ' The Herald,' April 9th, 1953.

" Wellington (N.Z.), Thurs.—A flight of 190 miles, from Oxford, Canterbury, to Taieri aerodrome, Dunedin, has been made by Mr. S. G. Georgeson, of Christchurch, in a sailplane.

" This beat his earlier New Zealand record for a 90-mile flight, with a gain of 12,000 feet.

" In his record flight he reached 22,000 feet—a gain of 14,000 feet. He did the journey of 190 miles in three hours."

As can be seen by Georgeson's flight to Taieri Aerodrome from Oxford near Christchurch, a distance of 190 miles, with maximum altitude of 22,000 ft., and net gain of 14,000 ft., I assume he was aero-towed to approximately 8,000 ft. in order to contact the standing wave lift of the giant lenticular cloud, the North West Arch, which lies parallel with the Southern Alps and varies according to wind velocities and may be 25 miles from the Alps, or directly over Christchurch, which is just over 40 miles from the Alps. Position of the cloud is governed by the Tasman Sea winds over the Southern Alps and respective velocities plus condensation levels. I gave a brief description of the possibilities of this cloud in my article, December - January issues 1949-50. The potentials of the North West Arch I ventured to say were almost of the category of the Bishop Wave, acknowledging the fact that the Californian Sierras were perhaps 5,000 ft. overall height in excess of the Southern Alps, and therefore would inevitably be proportionately more effective than the South Island Alps.

On a rough estimate with the Air Force pilots at Wigram, Christchurch, the Wave would be effective up to 27,000 ft. and possibly 30,000 ft., always remembering that these figures could be improved upon by survey aircraft under all conditions carrying out tests as with the Bishop Wave, to determine peak areas of effective lift. Exceptionally strong and smooth lift is indicated in this cloud plus relative wind component to enable a climb to 22,000 ft. by Georgeson and to average 63.333 miles per hour over the 190 miles' flight. These figures speak for themselves of the possibilities of a high speed record goal flight by a high penetration sailplane. I think an average of 100 miles per hour could be achieved with very little effort. When a ' Harvard ' trainer could soar from 7,000 ft. to 16,000 ft., and a ' Tiger Moth ' from 6,000 ft. to 17,000 ft. throttled back, one can rightly assume that a high efficiency sailplane of 4 to 5 lb. per sq. ft. of wing loading would go up like a rocket, and therefore with such a rapid altitude gain, the distance along the 100 to 200 mile cloud would be an absolute cinch, especially considering the penetration of a ' Prefect ' is moderate compared to a high efficiency machine.

Even if the North West Arch was not visible, due to barometric phenomena, the strong wave lift would still be there, due to the sharp deflection of the steep slopes of the Alps. My own aim was to have a crack at the Arch, (Hardinge demonstrated in his own ' Olympia ' all over N.Z. as our readers will remember), but arrived just too late, for the cloud disappeared same day of arrival and did not reappear during my 6½ weeks down South.

This flight of Georgeson's could be bettered, by a take-off several miles north of Christchurch, but the Dunedin end of the flight is made hazardous by strict limitations of landing regions, the mountains and broken terrain are liberal at the bottom of the South Island, and not very nice country to fly over. The Wave would terminate around about Dunedin and another 30 miles in the direction of Invercargill would be about the greatest possible estimate and 250 miles the absolute limit.

I think a slope soaring flight of 400 miles is possible on the Tasman Sea coast of the Alps, involving many risks of enforced descents. It would need light plane survey along the Alps at the most effective heights under strong wind conditions, then someone with much courage, a machine of high glide ratio and penetration values. The wind is the least worry for the North Westerly can blow unchecked for many days with very high velocities. I hope to see more flights of great distance by Georgeson, other flights of his have escaped world attention such as a 3½ hr. flight and altitude of 10,200 ft. at Tekapo near Mt. Cook, a desolate region but abounding with natural barriers to give high altitude slope flights. Another flight as indicated by the press cutting, states he has flown 90 miles with altitude of 12,000 ft. prior to the 190 miles' flight. I am greatly surprised that these flights have not received international recognition, for the reason that these accomplishments have been kept virtually secret from the outside world, although of relative importance to Gliding in New Zealand.

It is up to the New Zealand Gliding Association, if same still exists to give this news, for progress only comes from making known the achievements of their fellow countrymen, who must have earned praise by the amount of effort required to work for and plan such meritorious flights. I sincerely hope Georgeson will write his stories for *Sailplane* as the many readers of *Sailplane* will wish to read a detailed account of riding the Wave. As well as the tangible efforts of the flight makers, what about the constructional teams going in other cities, what about their progress, gliding types always like to hear the progress of another new machine, regardless of how fast or slow the assembly. All this detail is news and it spurs the builders to greater efforts to find that their machine is noted amongst the latest to reach the jig stage and final assembly.

ARTHUR D. HARDINGE.

SOUTHDOWN CLUB COURSES

★ Southdown Gliding Club are holding a Soaring Course, open to non-members, at FRISTON from AUGUST 15 to 22.

The course will be limited to pilots of ' B ' standard and above. Cost £12.

Write—Course Sec.: A. R. C. LENNARD, 48, Arthurdon Road, London, S.E.4

New Sailplanes being Built in West Australia

By Neville Wynne

A SYNDICATE of members of the Gliding Club of West Australia is constructing two ' Olympia' sailplanes. Another member of the club is building a Munn ' Falcon ' two-seater.

The ' Olympia ' project was originally started by Geoff Higginson and Harold Luckly who, together, bought the plans from Chiltons of England, in 1948, for £21.

So far only 1,100 hours have been put into the two machines and items finished are bulkheads (2 sets), tailplane, elevator and rudder (2 sets) and some metal fittings.

Very little work has been carried out on the jobs over the last two years, the reason being that Harold Luckly (having taken up farming) is now a very busy man, and Geoff Higginson has been severely handicapped by two things—namely, lack of a suitable workshop and the fact that he is the secretary of the G.C.W.A.

The first of these handicaps is now practically overcome as Geoff has built a 30 ft. by 20 ft. 'Sailplane Garage ' in his backyard, after many troubles.

A syndicate of three has now been formed to complete one of the machines. It comprises Ray Baird, Max Johnson and Geoff Higginson.

Another 3,000 hours are forecast to complete the ' H.B.J.' syndicate machine, but no information is available on the other job.

Materials (spruce, ply and some metal) were obtained via Disposals from the R.A.A.F. To date despite much enquiry, no supplies of the specified steel tubing have been located.

The fuselage will be built on a very rigid type of jig, now under construction, consisting of 22 feet of 6 in. by 3 in. R.S.J., with uprights and braces of angle iron.

The parachute from the ' Yellow Witch '—bought some time ago—has been put aside for use in this machine. A Raspet nose pitot and retractable landing skid are listed among certain ideas which will be incorporated.

It is also planned to equip the machine with radio and oxygen.

The ' Falcon ' two-seater is being built by Reg Currell. He bought the plans recently from Mrs. Munn, via Nial Hart, of Toowoomba.

He states that all materials are on hand (except some tubing, including struts). He has just received two sets of sutton harness which he bought from Nial Hart.

Construction started in September. All work so far has been carried out on the kitchen table and floor. Finished articles include a full set of bulkheads, six mainplane ribs and some tailplane ribs. Reg intends to manufacture small parts (like ribs) in his Ford Custom as he travels around the countryside.

The fuselage will have a full canopy, and will be ply covered with a slight building up of the bulkheads to obtain a more symmetrical section throughout.

The metal fittings are being made by Aero Services Pty. Ltd., of Maylands Aerodrome, West Australia.

Thirty-five pounds have so far been spent on templates for the fittings. If anyone else is interested in metal fittings for the ' Falcon ' it might be advantageous for them to contact Aero Services or Reg Currell, as two or three sets would certainly be turned out at a cheaper rate than one set.

In addition to these three sailplanes, two members are working on a ' Rhon Ranger ' primary glider. They are Frank Hawkes and Ross Mill, of Gnowangerup.

Good progress is reported; the fuselage being almost complete. It is hoped to have it flying sometime this year.

NEW ZEALAND CLUBS BECOME ACTIVE

By Ralph Court.

AFTER many years of hard work the gliding movement in New Zealand has begun to get under way.

The Auckland Gliding Club ' T.31 ' two-seater was duly tested late in June and went straight to work on circuits at a local ex-fighter 'drome, ' Ardmore.'

The Air Force is renting the club a hangar, so our worries are few. The strips are 4,600 feet long with grass each side and at the ends.

Auto tows with a special Chev. chassis give launches to 800 feet with 1,200 feet as the best to date. A winch is being built, but auto tow is cheap to operate.

So far we have completed more than 750 flights since early July, and the average flight has been about four minutes. Although early in the season we have had many soaring flights already—the best being 32 minutes (with myself in the back seat shouting, ' Tighter ! Tighter ! ').

Quite a number of the boys are ready to solo, but as a matter of policy we are doing all flights dual until we get a second machine.

MIDLAND GLIDING CLUB, LTD., Long Mynd, Church Stretton, Shropshire.

★ Summer Gliding Courses will be held as follows :—

June 20th—28th, July 4th—12th, August 15th—23rd, August 29th—September 6th.

Inclusive fee for each course of 9 days with accommodation, 4 meals per day and all flying, £15.

Full particulars from :—S. H. JONES, 82 Ravenhurst Road, Harborne, Birmingham, 17.

Cost of the ' T.31 ' was about £NZ470 ready to fly. It is working out very well as a trainer, being easy to build, maintain and fly.

We have bought an ' Eon Baby ' sailplane from the Midland Gliding Club in England and this is being air freighted out for us by the Air Force at a reasonable charge.

It should be here very soon now and we hope to have it flying in December. Our ' Olympia ' is being flown more regularly now with Gordon Hookings turning in some excellent local flights—best lately, 3 hours 15 mins.

Dick Georgeson has sold his Slingsby ' Prefect ' to Peter Renshaw—ex-Dunstable—now a doctor at Dunedin.

Dick bought Philip Wills' ' Weihe ' and will have it here shortly.

Here is a brief summary of our gliding movement. No mention is made of clubs just being formed.

Auckland Gliding Club. 30 members with a ' T.31 ' two-seater and a privately owned ' Olympia.' In transit is an ' Eon Baby.'

Christchurch Gliding Club. Members have just completed assembly of a ' T.31.' In transit is a privately owned ' Weihe.'

At Dunedin. A privately owned ' Prefect ' operated by Peter Renshaw.

' Kangaroo ' Passes Test Flights

JOHN WOTHERSPOON'S new 18-metre span ' Kangaroo ' two-seater was test flown at Gawler, near Adelaide, on Saturday, February 7. First handling tests indicated that the machine would have a performance even better than that calculated for it.

The ' Kangaroo ' was designed and built in Australia by Edmund Schneider Ltd. It has an estimated gliding angle of one in 27.5.

Test flights were carried out by Mr. Schneider and his son, Harry. The first hops showed that the machine needed no adjustments at all before being given a full launch.

The ' Kangaroo ' is fitted with shoulder release hooks, and on the first full launch—on the Adelaide Soaring Club's Ford V8 winch—it reached a height of 1,500 feet even though it was climbed slowly at first.

The dive brakes opened during stall tests on this flight, indicating the need for an easily fitted over-ride lock.

The second full launch produced a soaring flight of 15 minutes with stalls, loops and steep turns.

Test pilot Harry Schneider reported that the machine flew beautifully, with fast, positive reaction from all controls and a gentle stall at 22 knots indicated on the A.S.I.—not calibrated.

He said the shoulder releases gave it pleasant flying characteristics on tow, the machine responding to the controls just the same as in free flight.

After a short flight in the machine, owner John Wotherspoon said : ' It is a thoroughbred. It seems to handle better than my ' Olympia ' did, and has a better performance.'

' Selling at £1,550, I think this new machine will prove popular overseas, and we will explore its possibilities as a dollar earner.'

News from Canadian Clubs

CALGARY

WE hear that Keith MacDonald and Adam Hamilton are now co-owners of a ' TG-3,' CF-ZBM, acquired from Vancouver. They're working on its main spar and intend to do a spot of Raspet-izing on it.

Keith's ' BG6 ' is nearing completion also, and he hopes to test-fly it in June. He also has a ' Dagling ' (the plutocrat !) in which he expects to be airborne again shortly.

Adam is working on ideas, for a power take-off from a Ford truck to drive a self-propelled winch. With three gliders and a winch, these two should be a going concern, and we hope to hear more of their doings in the near future.

CU NIM GLIDING CLUB

The club has taken delivery of a ' Cinema II,' their first two-seater. This machine will fill a long-felt need for dual instruction, and will be winch launched for this purpose. Some repair work is necessary before the ' Cinema ' can be flown however.

The long winter evenings were well spent in re-finishing the ' 1-19 ' and thanks are extended to Foothills Aviation Ltd., whose dope room and equipment were at the club's disposal. Work is also well under way on a trailer for this aircraft. A new winch engine has also been acquired and put in shape, thanks largely to the efforts of Norm Scott.

SOARING NEWS FROM MONTREAL

Activities are well under way at St. Eugene. On the week-end of May 2-3 about 30 people were at the field and all four gliders (' 1-23,' ' Mu 13,' ' Pratt-Read ' and ' 1-19 ') were up at the same time on several occasions. About 100 flights have been put in so far this year for a total (up to May 5) of around 2,060 minutes.

Probably the most interesting news from Montreal is not really from Montreal at all, but from California, where Gordie Hicks was given a warm welcome by Paul Bickle (U.S.A. Diamond ' C ' No. 4). Here are some excerpts from a letter Gordie wrote to John Agnew, which sound exciting enough to boost California's tourist trade : ". . . had dinner at Chuck Yaeger's (the XS-1 man) . . . found that Paul Bickle was in charge of the instrumentation branch at Edward field. I went to his home, saw all his soaring pictures, his cups (19 in all—won at western and mid-western meets since 1948 approx.).

Paul asked me to El Mirage . . . over the week-end. He owns a ' 1-23 ' equipped with oxygen, radio, insulation, flush rivetting etc. I found El Mirage to be comprised of a fair airport—3 runways 2,500-3,000 ft. long—alongside of which was a dry lake, three miles by one mile. Two or three miles from the lake were two or three good hills for slope soaring.

The Sierras in the distance made possible, by their location relative to the desert, a phenomena known here as shear wind. Hot air passing over the desert is deflected upwards over colder air approaching from a different direction. In a shear wind I am told soaring is possible to 15-18 thousand feet. Numerous dust devils (quite spectacular to see) are to be seen

between 10 and 5 any hot day . . . on Saturday it was 95°. These dust devils are visible evidence of tremendous thermals. The only disadvantage to this location is that it is in the heart of Mojave Desert, 140 miles from L.A. Alexis Dawydoff once said its landscape looked like the moon.

Paul checked me out on a ' TG1 ' and then let me fly his ' 1-23.' The tow plane was a ' PT23 ' (Cornell with 225 h.p.—2,000 ft. in 5-6 min.) Brieglieb, himself, was tow pilot and used his skill to show me exactly where to go to take advantage of the shear wind.

The air was extremely turbulent after take off, worse than I have ever experienced—then a lull—then tremendous lift. When I released at Brieglieb's signal the lift was between 800-1,000 ft./min. Without the slightest effort on my part to centralize (could not find centre) I was tossed up from 4,300 ft. (airport at 2,800 ft.) the release altitude, to 11,100 ft. in 7½ minutes.

Visibility was very bad. In addition there must have been a strong wind. I soon lost the airport and the dry lake. However the Sierras below (with peaks to 7,200 ft.) proved an effective guide to my small tour of California. I headed along the Sierras in the general direction of El Mirage at 25 m.p.h., with a sink of 200-300 ft./min. At 7,500 ft. I contacted Edwards Field, after which I soon saw El Mirage in the distance through the haze. The remainder of the flight proved uneventful. It was too bad to have to return, it would have been so easy to push on."

VOL A VOILE—BUCKINGHAM GLIDING CLUB

We had our first good soaring weather on Sunday, April 19. By 9.30 the blue sky was studded with white cumulus puffs. Don Melliship went for the ' 1-19 ' at Pendleton and was first seen back over Buckingham at an altitude of 5,700 ft., where the icy air forced him down. By that time Jean Guy Joyce had the ' 2-22 ' up to 6,000 ft., but he also came down after an hour and a half because of the cold. By 2.30 Don and Wayman were back again at cloud base at 6,500 ft. with lift ' all over the place.' Thermals of 1,300 to 1,500 ft./min. were often encountered. It is the first time I realized what it is to fly a glider down to the ground. At 5.30 on the hangar flight to 600 ft. I stayed up 20 min. Our two craft made a little better than 9 hrs. of soaring all in all.

The club suffers a loss with the departure of Don Melliship. A most active, experienced pilot and instructor, talented in all respects and gifted with very amiable qualities, he helped along our little club just at the right moment. The Club held a special meeting on April 24 to wish him success as a pilot with the Wheeler Airlines.

The Buckingham Gliding Club became incorporated on Dec. 31, 1952. The first meeting of the Directors was held on April 24 when several by-laws were enacted for the betterment of the club. Four new members joined the Junior Section.

A. Wayman successfully wrote the DOT exams. for the Glider Pilot Certificate. He is barely fifteen years old and thus he can claim to be the youngest Canadian Glider Pilot.

The performance curves of the ' 2-22 ' have been drawn up after several flight tests for the purpose. They are strikingly similar to those published for the ' 1-19 ' before modification in the November-December 1952 issue of *Soaring*. The best gliding ratio was found to be about 12.5 at 45 m.p.h., with a sinking speed of 6 ft./minute. The best sink is 3.5 ft./min. at 28-30 m.p.h. We have undertaken modifications which will improve this performance by eliminating several sources of drag. BRO. HORMISDAS.

Acknowledgments to *Free Flight*.

BREVITIES

Argentina

BY kind invitation of the Sporting Department of Chile and the Santiago Gliding Club a delegation of Argentine glider pilots, headed by the President of the Federation of Gliding Clubs, visited the neighbouring country aboard a Bristol aircraft. The party included Sr. Gallman and the respective winners of Class A and Class B of the Fifth National Contest, Waldemar Sturm and Gerardo Garcia.

By courtesy of the Government ten ' Grunau 9 ' gliders and one ' Grunau Baby IIa ' sailplane were given to Chile. One of the primaries, the ' Baby ' and a ' Kranich ' two-seater were flown to Chile inside the same aeroplane which took the delegation, with the idea of participating in the aviation display which took place in the city of Santiago from the 1st to the 6th April.

Seven new gliding clubs are in process of being formed in Argentina—the ' Mendoza,' ' Gaviotin,' ' El Dorado,' ' Empedrado,' ' Zarate,' ' Cafayate,' ' Eva Peron.' Two of these are in the province of Buenos Aires, the rest scattered over the republic.

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CORRESPONDENCE

SIR,

I wish to congratulate you upon your article ' The Answer to Mr. Fletcher's Prayer ' in the April issue. A glider similar to the ' Tondo Kuro III,' the ' Kobold ' or a smaller version of the ' Fauvel A.V.36,' would, I feel, answer the common man's requirements for a light simple sailplane, especially in a country like New Zealand where conditions are rather different to Europe. Keep up the good work.

Yours,

C. NORRISON,

Boyd Avenue,

Auckland, S.E.5.

From R. Lilienfield

Why does the Silver C require a task of 5 hours duration ? In this enlightened day and age the emphasis seems to be on speed ; in the International Championships the stress is on getting somewhere fast. In breaking the world's distance record Dick Johnson covered over 500 kms. at one stage in under 5 hours. People have soared well above diamond height in under this time. So, given the time, the place and the equipment, someone is going to qualify for three diamonds and not possess a Silver C !

In the early days of soaring the main endeavour was to stay up ; this meant time not height nor distance. Most of the flying in those days was done on soaring slopes, and from what I can gather the majority of the 5-hour duration flights still are. Why, therefore, should the pilot who has no slope be penalised to the extent of having to do excessive thermalling for this length of time ? The skill required for this is surely far greater than that required by the slope soarer. Turning in thermals for 5 hours is probably equivalent to having your own weight doubled for a lot of the time without a proportionate increase in sitting area !

Then take the distance ; a modern sailplane and one good thermal is all that is required to fly the 50 kms. Also, in some parts of the world the 1,000 metre gain of height is so easy that it usually is accomplished on one's maiden thermal flight. *Surely the time has come to revise the rules governing the Silver C ?*

Recently it was announced that Gold C distance would be acceptable if flown on a triangular course, the legs of which are to be not less than 100 kms. Surely this should qualify the successful pilot to a diamond, as the turning points have to be nominated and observed, and the goal (base) declared ? Then again what about an out-and-return flight covering 300 kms. or more ? Here again the goal is nominated.

In both these cases the skill required surely outweighs the element of luck attached to venturing 300 kms. into the unknown.

FOR SALE

Copies of *Sailplane and Glider*, dating back to 1931. In bulk or singly. Write.—W. R. Grant, Rowallan, Forres, Morayshire, Scotland.

ARGENTINA

FIFTH NATIONAL CONTEST

THE Argentine Gliding Federation chose the Cordoba Gliding Club as the field on which to hold the National Contest, which ran from the 18th to the 27th February. Seventeen groups took part, representing various clubs, the Air Force, and the Air Ministry. There were thirty-six sailplanes, one of which arrived in free flight having covered 320 km. from its base at Esperanza. This was a ' Meise,' piloted by Luis Vastik.

Among the participants were several foreigners. The French pilot Charles Atger, holder of the world single-seater duration record with 56 hours 15 minutes in an ' Air 100 ' ; Jorge S. Munch of Brazil, who flew in the world championships in Spain last summer ; and Ociél Aravena Grez and Guillermo Pena Vargas from Chile, who have recently completed a course of training at Monflorite, Huesca.

As before entries could be made in either of two classes ; Category A, free for all, and Category B, reserved for training machines. In each class only one pilot from each institution could participate.

18/2/53. The contest for the first day consisted of a distance flight for Cat. A and speed in a goal flight (to La Cruz, 118 km.) for Cat. B. The results were undoubtedly a surprise. Nobody could have foreseen such a variety of performances but the unlucky ones will have learnt their lesson—that thermals to the South of Cordoba are few and far between.

Luis Vastik and Osvaldo Faggi triumphed brilliantly in Cat. A with 208 km. Four ' Grunau Baby ' pilots arrived at their goal. The best was Joe Ortner with 73.7 km. per hour, followed by Di Santo, only two minutes behind. Astonishing speeds for ' Baby's.'

The best flight of the day was that of Heinz Scheidhauer on his ' Flying Wing.' He did 353 km., landing at Nicolas Bruzzone. Captain Hector Bravo flying a ' Sky ' did 320 km. but on landing at Vicuña Mackenna on a ploughed field he damaged his machine and had to abandon the contest.

A great satisfaction for our country and more especially for the Club Urdinarrain was the flight of Senorita Rosa B. Minkevich, who broke the feminine distance record with 198 km. to Estacion Chucul. This magnificent flight beat the existing best of Nedda ' Pinguina ' Kehl, 145 km. This was the only record made during the contests in accordance with the F.A.I.

The system of taking off in Indian file (as was done at Orebro, Sweden) was a great success, both for speed and simplicity.

19/2/53. Since it had not been possible to retrieve all the Cat. A sailplanes in time, the second day was only for training machines. The test was velocity to Villa Maria (156 km.). This proved to be very difficult, only one pilot reaching the goal. Juan Soria of Pehuajo set up a speed of 39.7 km. per hour. Gerardo Garcia came second but in spite of his noble effort he was unable to get to the goal.

21/2/53. In spite of the strong wind which lasted almost throughout the contests this Saturday looked

a good day. The test for the ' A ' class was a speed flight with its goal at Rio Cuarto, 217 km. from the start at Juarez Celman. Jose Cuadrado won this one, registering 77.9 km. per hour, which was the best Argentine speed for a goal flight of over 200 km. Luis Vastik came second with 75.6 km./h., taking only 5 minutes longer. Eight pilots in this category reached the goal.

In Category B the test was goal flight, pilot's choice. Five of the entrants chose Rio Cuarto (217 km.) and arrived safely, gaining the maximum 1,000 points. Jorge Münch made an interesting flight. He chose Alcira (172 km.), took a couple of photographs vertically above his goal, and went on to land at Holmberg (221 km.), so gaining a Brazilian record for distance. The Chilean, Ociel Aravena Grez, also made a distance record for his country of 108 km. but did not reach his goal. Sincere congratulations to them both.

24/2/53. The meteorologists must have made a bad guess on this day for the test was a return flight for both categories. Cat. A had speed over a triangular course with a total distance of 117.5 km. The turning points were Jesus Maria (32 km.), Piquillin (47 km.) and Juarez Celman (39 km.). Unhappily the wind conspired against this interesting programme, perhaps the best test of quality among the pilots. Not one competitor succeeded in completing the triangle—a grave problem for the Committee, which had not allowed for such a result. By a majority it was decided that the flights should be registered as uncompleted goal flights. ' Pelusa ' Sturm, who had with great labour covered two legs of the three, gained 86 points, which brought him to the top. A notable second place went to Lorenzo Rodriguez in a ' Grunau Baby,' ahead of the rest of the high performance sailplanes.

In Class B. the test was speed over an out-and-return flight to Piquillin. This also proved impossible with the exception of the champion Gerardo Garcia who, by successfully completing the out-and-return, quadrupled the points gained by his nearest rivals—excluding Sadi Valdez, who came second with 56 km. and 366 points. Of the rest, only four arrived at the turning point. Among these was Joe Ortner who took advantage of the little altitude still left over Piquillin to glide back two kilometres and so gain 17 points over those who merely landed at Piquillin.

25/2/53. The first place in the contest was obviously now going to one of the first three to date. The picture was as follows :—

	Sturm.	Vastik.	Faggi.	Rodriguez.	Cuadrado.
Distance	720	1,025	1,025	154	78
Speed	748	976	868	789	1,000
Triangle	1,180	200	215	532	362
Total	2,648	2,201	2,108	1,475	1,440

As one can see Rodriguez had scored excellently since he was only flying a ' Grunau Baby,' but both his chances and those of Cuadrado were remote. The latter, although he won both this day and the next, was unable to advance more than two places. In actual fact it was not necessary to wait till the last day to know the result. After the fourth test

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Waldemar Sturm was already well ahead. The test was speed to Villa Maria, a distance of 156 km. Jose Cuadrado won with 66.8 km./h.; Sturm came second. Both Vastik and Faggi were penalised by arriving three kilometres short of their goal, our system of points showing an exorbitant difference between those who arrived and those who fell short.

Outside the contest, Marcelo Garcia and his 'Sky' made 76.7 km./h.; an excellent flight. Charles Atger did equally well in arriving at Villa Maria in the old 'Viking.'

In Class B. the results were remarkable and Gerardo Garcia was already well in the lead.

	Garcia.	Ortner.	Di Santo.	Haberle.	Valdez.
Speed	348	1,000	987	32	776
Goal	412	73	362	360	117
Out and back	1,000	574	1,000	1,000	1,000
Distance	1,174	263	246	246	366
	932	942	248	1,112	453
Totals	3,866	2,852	2,843	2,750	2,712

Claus Haberle gained 1,112 points with his grand flight of 360 km. to Del Campillo. This is the best Argentine distance so far achieved in a 'Grunau Baby.' Ortner landed in General Levalle, 315 km.; Gerardo Garcia flew 312 km., landing very near Ortner.

As a result of this day's contest there was very little to choose between the points gained by the four pilots after Garcia.

26/2/53. By good retrieving the Class A sailplanes were enabled to compete on this fifth and last day. Excellent work! The strong wind made it appear that this would be a record day, so the test was made one of distance. The prospects were fulfilled with some good flights. Once more Jose Cuadrado was in the lead; he and Luis Vastik landed together at Intendente Alvea with 452 and 450 km. respectively. No other pilot did over 400 km.

The new champion Waldemar Sturm landed at Melo (355 km.). Faggi with his heavy 'Kranich' achieved 332 km. On the 'laminar' Baby Reinaldo Picchio did his best flight of the contest with 330 km. to General Levalle. Near there landed Roberto Vilches (310 km.). Charles Atger took the old 'Viking' for the longest outing of its career and covered 365 km. to Jovita.

27/2/53. The first places in the Baby class were still in doubt. The test was Juarez Celman to La Cruz, speed, as on the first day.

Since Gerardo Garcia already had a lead of more than a thousand points over his nearest competitors he could afford to risk a rapid flight straight to the goal, but he preferred to be comfortable and hit up an average speed of only 45.3 km./h. He only had to cover a few kilometres to win, so he complied with the conditions and came well up in the final marks. We congratulate this fine pilot from whom, doubtless, we shall have many brilliant flights in future.

Claus Haberle won the test with the exceptional average of 74.5 km./h., thus gaining second place. His first three flights in the contest amply justified his final result.

The veteran instructor Sadi Valdez came second with the high average speed of 70.8 km./h., making him fifth in the final. Carlos Di Santo, third in the day's test, maintained his place. The fourth was Ortner, who made only 56 km./h. and so lost ground in the final results.

All these, including Jorge Münch, flew extremely well in the contests, since they were kept on their toes by the small margin of points between them.

CONCLUSION.

In general the Contest was most successful, but from our point of view it suffered from one disadvantage which is not helpful to gliding in our country. The system of entering only one pilot on behalf of an institution transforms the contests into a club competition and not into a struggle between individual pilots, which would give a better idea of the capabilities of each one and be of greater general interest.

The final results as between the various clubs and entries are as follows:—

	Entry.	Class A.	Class B.	Total.
1.	Esperanza	3,683	4,622	8,305
2.	Condor	4,341	3,750	8,091
3.	Albatros	3,534	3,716	7,250
4.	Air Ministry ..	3,236	3,668	6,904
5.	Otto Ballod ..	1,913	3,731	5,644
6.	Tucuman	1,828	2,233	4,061
7.	Pehuajo	755	1,739	2,494
8.	Cordoba	600	1,549	2,149
9.	Urdinarrain ..	1,370	593	1,963
10.	Air Force	—	1,911	1,911
11.	Trenque Lauquen ..	—	1,500	1,500
12.	Azul..	1,416	—	1,416
13.	InAV	1,292	—	1,292
14.	Rosario	0	613	613
15.	Parana	31	529	560
16.	San Martin ..	—	456	456
17.	Punta Indio ..	—	394	394

We would not like to end this commentary without reference to the valiant help given once again by the Argentine Gliding Institute. Professor Georgii, father of gliding, with the efficient help of Senor Rovesti—in charge of the Department of Aerophysics of InAV—gave daily meteorological reports to all the contestants and thus enabled them to make the best use of local weather conditions. VUELO SILENCIOSO.

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ROYAL AERO CLUB CERTIFICATES

(Issued under delegation by the B.G.A.) MAY, 1953

CERTIFICATES 'A' .. 144 (16208-16351)
'B' .. 157
'C' .. 28
Silver 'C' 4
Gold 'C' —

'B' CERTIFICATES

No.	Name.	A.T.C. School or Gliding Club.	Date taken
3155	B. T. Bellis	R.A.F., Detling	23. 4.53
7116	N. F. Cutter	Western Area G.C.	19. 4.53

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The C  **SOARING BADGE**

Silver C  **and Golden C**

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No.	*Name.*	*A.T.C. School or Gliding Club.*	*Date taken*
7216	R. G. Proctor	Army G.C.	10. 4.53
10601	J. E. Hutchinson	Cambridge U.G.C.	24. 2.53
12003	J. Dale	No. 146 G.S.	23. 5.53
12468	B. N. St. Clair Turner	Cranwell G.C.	10. 5.53
13802	R. A. J. Clegg	No. 48 G.S.	10. 5.53
14294	J. A. Lackie	No. 7 G.S.	26. 4.53
14438	R. Haughan	No. 1 G.S.	26. 4.53
14521	E. Grant	No. 84 G.S.	10. 5.53
14568	R. Dispain	Bristol G.C.	3. 5.53
15274	B. R. King	No. 102 G.S.	23. 5.53
15808	A. E. James	No. 168 G.S.	10. 4.53
15953	K. R. Pearson	No. 44 G.S.	9. 5.53
16104	B. Hoggart	No. 26 G.S.	26. 4.53
16208	H. E. B. Mayes	No. 83 G.S.	26. 4.53
16209	B. J. Cannon	No. 141 G.S.	25. 4.53
16210	D. W. Nobbs	No. 89 G.S.	7. 4.53
16211	P. I. Pilkington	No. 24 G.S.	8. 3.53
16212	S. C. Peck	No. 84 G.S.	19. 4.53
16213	B. Watson	No. 31 G.S.	19. 4.53
16214	H. Clarke	No. 31 G.S.	19. 4.53
16215	B. R. Armitage	No. 23 G.S.	19. 4.53
16216	D. G. M. Davis	No. 89 G.S.	3. 4.53
16217	W. J. Browne	Moonrakers G.C.	19. 4.53
16218	R. G. Sollars	H.C.G.I.S.	15. 4.53
16219	R. S. Craigie	No. 125 G.S.	26. 4.53
16220	R. E. Baker	No. 24 G.S.	22. 3.53
16222	R. P. Coleman	No. 146 G.S.	26. 4.53
16223	B. Davidson	No. 166 G.S.	26. 4.52
16224	T. E. Jones	No. 166 G.S.	15. 3.53
16225	J. Liston	No. 2 G.S.	19. 4.53
16226	D. A. Plant	No. 92 G.S.	25. 4.53
16227	B. J. Whitlock	No. 130 G.S.	4. 4.53
16228	L. Scott	No. 31 G.S.	3. 4.53
16229	W. Collier	No. 31 G.S.	12. 4.53
16230	S. G. Johnson	No. 125 G.S.	3. 5.53
16231	B. Cox	No. 31 G.S.	3. 5.53
16232	D. C. Ibbott	No. 122 G.S.	25. 4.53
16233	M. E. Paul	No. 168 G.S.	10. 4.53
16234	F. J. Sharpe	No. 31 G.S.	3. 5.53
16235	G. W. Smith	No. 104 G.S.	25. 4.53
16236	B. T. Gray	No. 146 G.S.	26. 4.53
16237	R. J. C. Candy	No. 31 G.S.	22. 2.53
16238	E. A. W. Griffin	No. 92 G.S.	25. 4.53
16239	D. J. Harper	No. 43 G.S.	3. 5.53
16240	W. J. Lambert	No. 44 G.S.	3. 5.53
16241	J. G. Silver	No. 125 G.S.	26. 4.53
16242	A. J. Sweet	No. 92 G.S.	25. 4.53
16243	J. B. Franklin	No. 125 G.S.	3. 5.53
16244	D. R. Sutton	No. 122 G.S.	25. 4.53
16245	D. Hinde	No. 1 G.S.	3. 5.53
16246	V. S. Crabb	No. 82 G.S.	26. 4.53
16247	T. W. Ellis	No. 1 G.S.	3. 5.53
16248	B. H. Fieldhouse	No. 43 G.S.	3. 5.53
16249	P. C. Phillips	H.C.G.I.S.	23. 4.53
16250	B. M. Sadgrove	No. 122 G.S.	8. 4.53
16251	A. C. A. Whittal	No. 42 G.S.	4. 4.53
16252	V. H. Price	No. 82 G.S.	3. 5.53
16253	W. Mackay	No. 188 G.S.	15. 3.53
16254	A. Mitchell	No. 82 G.S.	12. 4.53
16255	K. E. Fountain	No. 126 G.S.	3. 5.53
16256	E. P. Topsfield	R.A.F., Detling	22. 4.53
16257	J. L. Hoyle	No. 7 G.S.	3. 5.53
16258	B. Cross	No. 7 G.S.	3. 5.53
16259	W. P. J. Hodkinson	Bristol G.C.	22. 8.52
16260	T. R. H. Parkes	Bristol G.C.	9. 5.53
16261	G. Holmes	No. 188 G.S.	3. 5.53
16262	M. Croft	No. 188 G.S.	3. 5.53
16263	S. Wallace	No. 188 G.S.	3. 5.53
16264	F. E. Anderson	No. 31 G.S.	10. 5.53
16265	B. O. H. Brice	Bristol G.C.	9. 5.53
16266	M. Doggett	No. 141 G.S.	10. 5.53
16267	A. K. Jones	No. 104 G.S.	9. 5.53
16268	B. R. Moyses	No. 141 G.S.	10. 5.53
16269	A. W. McLeland	No. 142 G.S.	10. 5.53
16270	C. F. Warner	H.C.G.I.S.	9. 5.53
16271	D. B. Sharman	No. 166 G.S.	10. 5.53
16272	W. M. Moncur	Royal Engineers	22. 4.53
16273	T. D. Newark	No. 161 G.S.	10. 5.53
16274	Michael Wade	No. 141 G.S.	10. 5.53
16275	J. M. Mange	No. 126 G.S.	10. 5.53
16276	J. C. Young	No. 89 G.S.	3. 4.53
16277	R. P. Allen	No. 49 G.S.	15. 3.53
16278	P. J. Mitchell	No. 104 G.S.	3. 5.53
16279	N. G. Anderson	No. 2 G.S.	10. 5.53
16280	G. F. Fisher	Bristol G.C.	3. 5.53
16281	J. Lennox	No. 2 G.S.	25. 4.53
16282	M. D. Coates	No. 23 G.S.	3. 5.53
16283	D. McLennan	No. 7 G.S.	26. 4.53
16284	D. H. T. Henry	No. 161 G.S.	10. 5.53
16285	P. H. Hickman	No. 126 G.S.	15. 2.53
16286	J. W. Tomlinson	No. 92 G.S.	10. 5.53
16287	A. E. Boyett	No. 89 G.S.	15. 3.53
16288	D. C. Budd	Watton Area G.C.	10. 5.53
16289	A. B. Stokes	No. 123 G.S.	3. 5.53
16290	T. Hawkins	No. 130 G.S.	15. 3.53
16291	R. M. G. Garner	No. 105 G.S.	1. 3.53
16292	J. J. Rooke	No. 122 G.S.	26. 4.53

No.	Name.	A.T.C. School or Gliding Club.	Date taken
16293	M. C. Messenger	Moonrakers G.C.	25. 4.53
16294	L. G. D. Richards	No. 48 G.S.	6. 5.53
16295	J. C. Beatty	No. 68 G.S.	17. 5.53
16297	D. N. Birch	No. 23 G.S.	10. 5.53
16298	R. E. F. Collins	No. 105 G.S.	2. 5.53
16299	E. W. C. Emery	Watton Area G.C.	4. 3.53
16300	B. Spires	No. 123 G.S.	9. 5.53
16301	L. J. Thistleton	No. 89 G.S.	7. 4.53
16302	F. Wright	Luneburg G.C.	28. 3.53
16303	B. T. Uren	No. 82 G.S.	21.12.52
16304	M. J. Reseigh	No. 82 G.S.	28. 9.52
16305	J. L. Dayer	No. 89 G.S.	23.11.52
16306	A. W. D. Ferns	No. 2 G.S.	10. 5.53
16307	H. E. Holmes	No. 24 G.S.	3. 5.53
16308	V. G. Howells	No. 68 G.S.	3. 5.53
16309	R. Miller	No. 2 G.S.	25. 4.53
16310	J. White	No. 2 G.S.	19. 4.53
16311	J. Wrigley	No. 126 G.S.	17. 5.53
16312	Pauline M. Ady	Surrey G.C.	13. 5.53
16313	Edwin W. Richardson	No. 104 G.S.	10. 5.53
16314	J. S. B. Gardiner	No. 2 G.S.	19. 4.53
16315	J. F. Wild	No. 183 G.S.	12. 5.53
16316	V. C. Redfern	London G.C.	7. 7.50
16317	R. H. McArthur	No. 183 G.S.	12. 5.53
16318	D. F. Burnett	No. 84 G.S.	10. 5.53
16319	A. F. Wright	London G.C.	2. 8.52
16320	S. Fryer	No. 23 G.S.	10. 5.53
16321	W. Roberts	No. 186 G.S.	26. 4.53
16322	A. T. Crawford	Newcastle G.C.	26. 4.53
16323	B. A. G. Barclay	Westminster School	24. 5.53
16324	A. Bain	No. 7 G.S.	3. 5.53
16325	V. D. Keir	No. 7 G.S.	26. 4.53
16326	A. G. Carnan	H.C.G.I.S.	27. 3.53
16327	E. C. Halliday	Bristol G.C.	4.10.52
16328	R. Jillings	No. 104 G.S.	10. 5.53
16329	B. Page	No. 104 G.S.	5. 4.53
16330	T. J. Rickett	No. 186 G.S.	3. 5.53
16331	D. C. Devall	Halton Apprentices	20. 5.53
16332	I. J. Gilmore	Halton Apprentices	20. 5.53
16333	J. H. Compton	No. 2 G.S.	9. 5.53
16334	J. R. Mayne	Surrey G.C.	13. 5.53
16335	Beryl M. Bigg	Bristol G.C.	23. 5.53
16336	G. S. Stephenson	No. 123 G.S.	23. 5.53
16337	T. C. Miall	No. 130 G.S.	1. 3.53
16338	J. A. Gray	No. 106 G.S.	17. 5.53
16339	D. A. Else	No. 22 G.S.	6. 4.53
16340	P. A. J. Nash	No. 68 G.S.	24. 5.53
16341	W. A. Ingram	Midland G.C.	8. 3.53
16342	D. A. Reynolds	No. 126 G.S.	19. 4.53
16343	Margaret R. Crabtree	Southdown G.C.	24. 5.53
16344	C. Christianson	Avro G.C.	24. 5.53
16345	A. J. W. Whitaker	Cranwell G.C.	10. 5.53
16346	M. N. Bishop	R.A.F., Detling	10. 5.53
16347	L. F. Boniface	No. 168 G.S.	10. 5.53
16348	P. C. Aranha	No. 104 G.S.	22. 3.53
16349	R. F. S. Ely	No. 104 G.S.	22. 3.53
16350	J. N. Stevens	No. 104 G.S.	22. 3.53
16351	R. Carley	No. 102 G.S.	25. 5.53

'C' CERTIFICATES

No.	Name.	A.T.C. School or Gliding Club.	Date taken
6448	G. R. Scott	No. 48 G.S.	1. 8.51
10601	J. E. Hutchinson	Cambridge U.G.C.	24. 3.53
10953	Eileen F. Tylee	Surrey G.C.	9. 5.53
11615	G. C. French	Gutersloh G.C.	14. 5.53
11781	J. E. Toplis	No. 80 G.S.	4. 4.53
12848	G. C. Lewis	No. 143 G.S.	26. 4.53
12924	W. T. L. Reed	R.A.F., Fassberg G.C.	17. 7.52
13486	H. Hedayat	No. 80 G.S.	2. 8.52
13509	J. F. G. Stonham	No. 203 G.S.	13. 9.52
13609	M. G. De Garis	No. 44 G.S.	9. 5.53
13968	J. P. B. Youngman	Cambridge U. G.C.	30. 3.53
14093	G. A. Cropper	Coll. of Aeronautics	24. 3.53
14111	R. C. Hastings	Coll. of Aeronautics	23. 3.53
14204	B. D. C. McCarthy	No. 80 G.S.	31. 7.52
14480	C. A. E. Fenn	No. 83 G.S.	26. 4.53
14809	J. Graham	Oxford G.C.	26. 4.53
15113	R. C. Anderson	No. 123 G.S.	26. 4.53
15227	S. T. Little	R.A.F., Wahn G.C.	26. 4.53
15447	G. G. Graham	No. 168 G.S.	18. 5.53
15646	B. M. Nicholson	Moonrakers G.C.	29. 4.53
15866	J. R. E. Mills	Derby & Lancs.	25. 1.53
15898	G. E. P. Pipe	H.C.G.I.S.	9. 5.53
16270	C. F. Warner	H.C.G.I.S.	9. 5.53
16302	P. Wright	Luneburg G.C.	3. 5.53
16316	V. C. Redfern	London G.C.	14. 7.50
16327	E. C. Halliday	Bristol G.C.	9. 5.53
16341	W. A. Ingram	Midland G.C.	12. 4.53
16252	V. H. Price	No. 68 G.S.	3. 5.53

SILVER 'C'

No.	Name.	A.T.C. School or Gliding Club.	Date taken
418	John Bishop	2nd T.A.F. G.C.	13. 4.53
419	Allan Pickup	Midland G.C.	10. 5.53
420	John Welsh	Luneburg G.C.	17. 5.53
421	Charles Dorman	Army G.C.	25. 5.53

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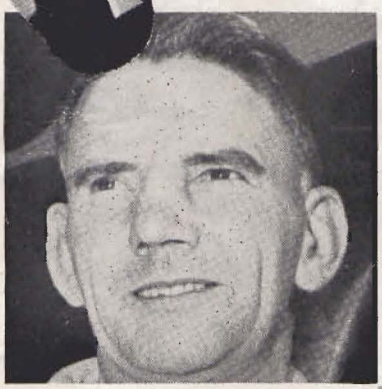
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