SAILPLANE & GLIDING

February — March 1969 4s 6d







AIR CHUTES
IRVIN

LIGHTWEIGHT GLIDER PARACHUTE ASSEMBLY TYPE EB 62

A compact parachute assembly designed especially for use by pilots of British and continental gliders and suitable for canvas or pan type seats. Weight 18 lbs. For full details write to SERVICE MANAGER:

IRVING AIR CHUTE of G.B. LTD.
LETCHWORTH · HERTS · Tel 6262 · Telex 82198

COBB-SLATER INSTRUMENT CO. LTD.

Sole Manufacturers of:

Cook Compasses
and
Electric Variometers
with Audio Unit
Barographs Calibrated

Cosim Variometers
Venturies
Water Traps
Total Energy Units

Leaflets from:

'COSIM' WORKS · DARLEY DALE · MATLOCK
Derbyshire DE4 2GG **Telephone: Darley Dale 2538**

SAILPLANE & GLIDING

OFFICIAL ORGAN OF THE BRITISH GLIDING ASSOCIATION

Editor: Alan Slater, M.A. F.R.Met.S.
Associate Editor and Production Manager: Rika Harwood
Magazine Assistant: Nicky Wilcox — Club News Editor: Yvonne Bonham
Advertisement Manager: Peggy Mieville
Committee: Philip Wills Chairman, G. Harwood, M. Bird, G. Locke

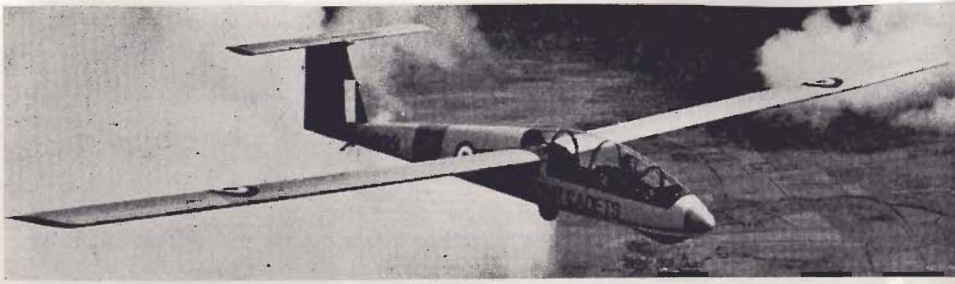
CONTENTS

Chairman's Report on 1968	P. M. Scott	3
The Development of Motor Gliders in Germany	S. Kunz	8
Rhodesian Nationals	R. Moore	10
Vale, Walter	F. G. Irving	12
CVSM Meeting	Ann Welch	13
Instructors' Panel Report	R. A. Neaves	16
Are Your Ailerons Really Necessary?	H. R. Dimock	17
Airspace Committee Report	H. C. N. Goodhart	19
PIO's in Gliders	F. G. Irving	20
Aberdare Wave	I. H. Shattock	24
BGA News		26
Gliding Certificates		29
Stats. from Wills	Ann Welch	29
Paul Tissandier Diploma		31
Annual Statistics 1967/68		32
Rebuilding Slingsby's		34
Jonathan Livingston Seagull	R. Bach	37
2-1-0 Scoring	J. Harrison	42
Flying & Instructing	R. A. Neaves	44
A Good Sea Breeze Day	J. E. Simpson	46
Type Certificate for Cirrus	K. Holighaus	50
Safety Panel Report	J. J. Ellis	52
Kronfeld Club	Yvonne Bonham	56
Aviation Art Society	Yvonne Bonham	57
Technical Committee Report	F. G. Irving	59
Tail Feathers	"Platypus"	60
Two Weeks at Minden Aero-Club	T. K. Simmons	62
Book Review	P. A. Wills	63
Correspondence	C. Forrester, G. King, P. Purdie, P. Warren, P. Weishaupt, P. Hearne, R. Sowerby, G. Harwood, G. Burgess, U. Grande	64
Club News		74
Service News		80
Overseas News		82
Crossword Solution		84

Cover photograph: The Salisbury Gliding Club's Blanik taken at sunset during the 1968 Rhodesian Nationals.—Photo by McGeorge.

Published by the British Gliding Association, 75 Victoria Street, London, S.W.1. 01-799 7548/9
Printed by Hampshire Printers Limited, Rankine Road, Basingstoke, Hants.

Vol. XX No. 1



The Slingsby T.53 all metal, tandem, two-seater, high performance glider for instruction at all levels.

We are happy to announce that the production has re-started on the T.53 after our recent fire and we will be pleased to give quotations for 1969 deliveries of this type.

Slingsby Aircraft Company Limited

Kirkbymoorside, Yorkshire, England.

Telephone: Kirkbymoorside 751/6

CHAIRMAN'S REPORT ON 1968

To follow Philip Wills in any activity is an unenviable task. For 19 years he was Chairman and mainspring of the British Gliding Association—the G.O.M. of our sport, immensely experienced in all aspects of aviation, world champion pilot with Competition No. 1, the lot . . . It is idle to suppose that anyone can adequately replace so great and remarkable a man. But now that you have done me the signal honour of putting me into the hot seat upon his retirement, how lucky we all are that Philip, as our new President, is still there to be consulted, and that I have the solid support of our two Vice-Chairmen—David Carrow and Christopher Simpson.

In reporting to you the progress of the Association during 1968, two features seem likely to be especially important for the future; the reorganisation of the Association as a result of the Study Group Report prepared in 1967, and the call by the Sports Council for a long-term plan for gliding expansion.

The Study Group, headed by Vice-Chairman Carrow, has taken a long hard look at our Association and outlined a number of possible ways in which we could increase efficiency. The Council selected one of these ways and invited lawyer Vice-Chairman Simpson to draw up new Articles of Association providing for a more complete representation of all members of the Association on matters of policy, but also for an Executive Committee of small enough size to operate as an effective decision-making body for the day-to-day business.

This is certainly an essential first step towards any programme of expansion. But we must be sure we are agreed on the policy. By tradition—almost by definition, I was recently told—glider pilots are rugged individualists. For them the "silent sky" is also the lonely sky. Their incomparable sport calls for a degree of courage and skill which is shared by few other mortals. They are a race apart.

Well, there may be some glider pilots who see themselves in this romantic light, but to the vast majority it is evident that thousands more people could enjoy

How to get "SAILPLANE AND GLIDING"

"Sailplane and Gliding" can be obtained in the U.K. at all Gliding Clubs, or send 30s. (post incl.) for an Annual Subscription to: The British Gliding Association, 75 Victoria Street, London, S.W.1. Single copies and most back issues are also available, price 5s. (post incl.). Enquiries regarding bulk orders of 12 or more copies, at wholesale prices, should be made to The British Gliding Association.

OVERSEAS AGENTS

AUSTRALIA :	B. Rowe, Waikerie, South Australia.
CANADA :	T. R. Beasley, Soaring Supplies, P.O. Box 621, St. Laurent 9 P.Q. (single copies 70 c. or U.S. $4.00 annually).
HOLLAND :	J. Th van Eck, Fazantstraat 31, Maassluis, Postrekening 3230, Abonnementsprijs Fl 14.50.
SWEDEN :	Flyg Biblioteket, Ljungbygatan 8, Box 2, Ljungbyhed. Postgiro 44 10 00. (Pren. 21.75 Kr.)
U.S.A.:	Please apply direct to British Gliding Association. Single copies 5s. (post incl.) or 30s. annually (70 cents or U.S. $4.00 annually). (Personal cheques acceptable.)
OR :	T. R. Beasley, Soaring Supplies, 2727 Arizona Avenue, Rt. 6, Yuma, Arizona 85364.

Red Leather Cloth Binder, taking 12 issues (2 years): 18s, postage 2s. from B.G.A. Will also bind your B.G.A. Personal Pilot Logbooks.

gliding if only they had the opportunity to try it for themselves. And if more people **did** take part in gliding, many of the facilities of the sport might be improved, and some of the factors which currently threaten to curtail it might recede.

How, then, can we get more people—lots more—into the air? What are the bottle-necks preventing it? Where are the log-jams?

Gliders, sites, launching facilities, training, publicity, organising ability, dynamism, air space, finance? Lack of some or all of these things may be limiting the expansion of gliding. Many were touched upon in the Study Group Report. The time has come, I believe, to examine each one in detail and to come up with a long-term plan—a five-year plan, perhaps, to clear the offending logs and allow gliding to expand for the enjoyment of many more people and for the greater enjoyment of those who already take part in it. This is a responsibility which rests squarely on the shoulders of the BGA, and indeed such a plan has been called for by the Sports Council. We must now provide it.

As a World Championship Year 1968 was a limited success. From the British point of view we offer many congratulations to George Burton who finished 7th in Poland. Lack of gliders in time for adequate practice and de-bugging must certainly have been a significant factor for the rest of our team. Also to be considered is the fact that as the years go by, with more pilots getting steadily better, the standard of competition becomes steadily hotter. Then, too, the weather was flukey and the tasks did not apparently always work out exactly as the tasksetters hoped. But for many of us the overall results pose the question of the future design and production of British gliders. We believe Sigma will take up a commanding position among the world's sailplanes, and we hope too that a cooking Sigma may be in the offing. Sales of the T-53 all-metal two-seater trainer have been encouraging. But is this enough? In this country we have design talent, we have the tradition and the famous name of Slingsby.* Surely we can look forward to the day when Britain is once again producing the best gliders in the world.

By the best gliders in the world I do not mean only competition gliders, and it is most important that the movement as a whole, and the BGA in particular, do not become excessively competition-minded. But just as racing cars lead to improvements in touring cars, and racing yachts do the same for cruising yachts, so I believe competition gliders increase the enjoyment of every soaring pilot. There is no real reason why a high-performance glider should be substantially more difficult to fly. There is no real reason why good aerodynamic designs should cost more than bad ones as long as there is not too much variable geometry. What we are all looking for are gliders that stay airborne longer and go a nice long way whilst doing so. Quite soon the likelihood of landing "aux vaches" will be remote. The normal end to an out-and-return or triangle task will be to land back at base. Thus more people will fly out-and-returns and triangles without worrying about retrieve problems and that particular delight will be more widely enjoyed than it is today.

There can be few in the gliding movement who do not recognise the immense contribution and life-long dedication which Ann Welch has given to gliding, and we were all delighted to find her appointed an OBE in the Birthday Honours List. Ann is the new Chairman of our Motor Glider Committee.

The development of motor gliders still engenders controversy. Some of us think romantically and puristically that our gliders would be hopelessly contaminated if

---

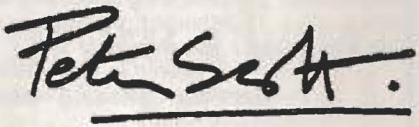
* Since this report was written Slingsby Aircraft Co. was badly damaged by fire on 18th November. This is a serious blow to all who have helped to build up the company since the early days. Also Project Sigma has suffered a serious setback. (See Sigma report below.)

they ever had closer contact with an engine than at the end of a 100-foot rope. Others recognise the sudden and immense liberation from a hundred frustrations that a simple but efficient launching motor can achieve. Your Association decided two years ago that, as no one is likely to be forced to put a motor in his glider and as enormous benefits will certainly accrue on the training side, it should undertake a vigorous programme for the development of motor gliders. David Ince, who, as Chairman of the Powered Trainer Co-ordinating Committee, started the ball rolling, has found himself unable to give the necessary time to the subject, and Ann has now taken up the burden as Chairman of the Motor Glider Committee. With the purchase of a K-14 motor glider things should move ahead rapidly as the advantages are demonstrated to clubs up and down the country.

I hope I may be forgiven for occupying this report not so much with the Association's activities during the last 12 months as with ideas about the future. As with the tortoise, however, no progress can be made without sticking one's neck out. Many of my conclusions may not be acceptable to everyone, but there is not likely to be a shortage of wise experienced vociferous bona-fide flyers to explain my errors to me at General Meetings or in the Councils of the Executive Committee of Management.

The British Gliding Association may or may not be able to influence the things I have been talking about. I believe it has a clear duty to try to do so.

If it succeeds, and if it does not hide its light under a bushel . . . if it can be seen by all its member clubs to be doing a good job for gliding, then I believe the gliding movement will be prepared to support it. It is a question of value for money. It will be my aim while I am Chairman to see that your Association devotes its attention to serving its member clubs and their glider pilot members in all branches of the sport for their greater delight and enjoyment—a simple little aim, but not altogether simple to implement.



* * *

CVSM REPORT. The spring meeting in Paris was mainly concerned with arrangements for the World Gliding Championships in June. This event highlighted the need for CVSM to produce a set of basic World Championships rules—to avoid the need for the host nation to start from the beginning each time, and to rewrite the Championships section of the **Code Sportif,** so that it could be used effectively as a basic set of administrative and operational regulations.

Owing to the Czech crisis the FAI General Conference was organised in London by the Royal Aero Club. To avoid CVSM delegates having to visit Paris for the autumn meeting, this was held in London at the same time, the BGA acting as host.

In addition to the revision of World Championships rules, the main discussion was on the future of the Standard Class and Motor Glider Development.

FINANCE. Our accounts for the year 1st October, 1967, to 30th September, 1968, show, for the first time in three years, an operating profit.

The Association continued its work in the field of accident investigation and analysis, airworthiness of gliders, instructors' and pilots' standard of training. The expense of carrying out this work was recognised last January by the Board of

Trade, who agreed to offset a proportion of our costs in this direction by a grant of £3,000 for the year ending 30th September, 1968.

Revenue from subscriptions shows a slight decrease on the budgeted sum due to a reduction in the income from Private Owner Groups as a result of new members joining late in the year. The surplus from the magazine also shows a slight decrease on the budgeted figure. The BGA sales staff have again made an excellent contribution with a record gross profit of £3,700. Expenditure on rent includes cleaning and the redecoration of some of the offices and the entrance hall. Printing and stationery show a marked increase and can partly be accounted for by the increased costs of paper and printing charges.

As you will see from the report by the Chairman of the Motor Glider Committee, Council have decided to purchase a K-14 powered glider involving the Association in capital expenditure in the coming year, and running costs and depreciation for the period of the evaluation programme.

MAGAZINE COMMITTEE. We hope Rika Harwood and Doc Slater will continue giving their unique touch to S. & G. for many years, but the time has come when we must look for someone to reduce the load.

Having held its price at 3s. 6d. since December, 1964, inflation at last forced us to increase the price of the magazine to 4s. 6d. in June, 1968. We hated doing it, but our loyal readers were undismayed—in fact they seem to be addicts, more than mere readers. Our circulation continued its gentle increase, as did our advertising revenue.

MEMBERSHIP. Between 1st October, 1967, and 30th September, 1968, the Blackpool and Fylde Gliding Club transferred from Associate to Full Membership and the newly-formed Dorset Flying Club and Aviation Centre and the Scout Association Gliding Club (Edinburgh) became Associate Members. The Lands End Gliding Club has ceased operations.

The membership is now (1967 figures in brackets):

Full Member Clubs or Associations - - -	31	(30)
Associate Clubs - - - - - -	31	(31)
Private Owner Groups - - - - -	167	(161)
Individual Associate Members - - - -	45	(33)

The 31 Full Member Clubs or Associations include four Members which have affiliated Clubs as follows:

Army Gliding Association with three Clubs.
Civil Service (CISAVIA) with three Clubs.
RAF Gliding and Soaring Association with eleven Clubs.
RAF (Germany) Gliding and Soaring Association with three Clubs.
Royal Naval Gliding and Soaring Association with five Clubs.

OPERATIONS. During the year under review (the nine-month period for 1967 is given in brackets):

Civilian Clubs flew a total of 53,595 (43,847) hours from club sites from 218,358 (195,610) launches.
Club-owned gliders total 267 (250).
Privately-owned gliders total 295 (244).
The combined Services flew 18,136 (14,827) hours from 96,505 (75,759) launches.

Certificates were issued as follows:

A and B endorsements, including ATC	2,632	(2,196)
C endorsements	375	(406)
Bronze C endorsements	487	(416)
Silver C complete	228	(167)
Gold C complete	30	(19)
Gold C Distance	29	(15)
Gold C Height	47	(35)
Diamond for Goal	36	(22)
Diamond for Height	19	(13)
Diamond for Distance	2	(1)

(The ATC issued 2,291 (2,036) Proficiency Certificates and 1,786 (1,506) holders of these applied for A and B Certificates through the BGA.)

It should be noted that some Clubs ceased operations during the Foot-and-Mouth epidemic and that in many others, flying was seriously restricted.

OSTIV REPORT. To save double postage and duplication of office work, it was arranged some time ago that OSTIV publications, with one exception, would be supplied direct from the Secretariat at NLM Atoomgebouw, Schiphol Oost, Holland, instead of through the London Gliding Club. The exception is World Sailplanes II, all stocks of which are held at Dunstable.

The London Gliding Club has now relinquished the administration of individual membership, which is now also dealt with at Schiphol.

Alan Yates retired from the OSTIV Board and Cedric Vernon was elected to it at the General Conference at Leszno in June, 1968.

SOUTHDOWN AERO SERVICES LIMITED

offers YOU a complete gliding service

Our workshops guarantee first class C's. of A. and repairs carried out by a highly skilled team under ideal conditions.

Our gliding shop now carries a complete range of the best instruments and equipment, as well as all the "bits and pieces" you are bound to want — and it's open at weekends.

Our experts are always ready to help solve your problem.

Call in, write or phone —

KEN FRIPP
Southdown Aero Services Ltd.
Lasham Airfield, Alton, Hants.
Telephone Herriard 359 or 0256-83 359

AGENTS FOR SLINGSBY SAILPLANES LTD., IN SOUTHERN ENGLAND.

Stockists for all PZL Instruments and Equipment.

PROJECT SIGMA. The new very high performance glider project, Sigma, which is being carried through by a separate group, but under the auspices of the BGA, continues successfully.

The research phase had been completed and construction of the first prototype was proceeding. First flight was expected in the spring of 1969. This was the situation on 17th November. On 18th November all the hardware, including the jigs and nearly all the drawings were destroyed by the fire at Slingsby Aircraft Company.

By 24th November the Sigma drawing office had restarted and despite the very severe setback it is still expected that Sigma will be available for the 1970 World Gliding Championships at Marfa.

SITES. This year only one Club, the Universities of Glasgow and Strathclyde G.C., has moved to a new site.

To assure the future of gliding and the continued expansion of the sport, it must be the aim of all clubs to obtain security of tenure of their site since this is the only way in which substantial progress can be made.

P. M. Scott, Chairman.

THE DEVELOPMENT OF MOTOR GLIDERS IN GERMANY

BY SEFF KUNZ

The CVSM (Motorless Flight Committee of FAI) asked the West German representative, Seff Kunz, to report on motor gliders in his country, and the following reports (slightly condensed) were given by him on 1st March in Paris and 27th November in London last year.

I

MORE than 30 years ago, motor gliders were already being designed and built in Germany; but interest in these aircraft was very small and their development made no great strides. However, in recent years an increased activity has taken place; interest in motor gliders has grown considerably, and many new designs have appeared, both single-seater and two-seater. In some the engine is rigidly fixed; in others both the engine and propeller can be retracted and brought out again during flight.

German motor gliders are not all similar in conception. There are some which can hardly be distinguished from high-performance sailplanes, and there are others which look like small aeroplanes. The reasons for these diverse developments are as follows:

(a) The designers have different ideas as to the purpose of a motor glider. Some conceive it as a high-performance sailplane with a motor for self-launching. Others think it should be an aeroplane with a small engine which will enable one to fly every day, whether there are thermals or not, and thus put in more flying time. So two tendencies appear:

(i) Motorised sailplanes;

(ii) Small power-planes.

(b) There were no suitable engines available. The designers often had to design the aircraft around the engine, and not the other way about.

(c) In former times the official regulations still gave rise to difficulties. In some cases, if the glider was equipped with an engine, the conditions for power planes had to be observed.

The German Aero Club has contacted ministries and official authorities in order to further the development of motor gliders. These ministries and authorities have showed deep understanding and are

on our side. Up to now, the following concessions have been obtained:

(a) TECHNICAL REGULATIONS. — The strict regulations for power planes do not apply. The regulations for design correspond to the simpler regulations for gliders. For the engine, only simple regulations have been drawn up. A special category has been created for motor gliders, so that there are now three categories:

(i) Power planes;
(ii) Gliders;
(iii) Motor gliders.

(b) FLYING REGULATIONS.—The regulations for flying training and testing would not be based on the stringent regulations for power planes but on the simple requirements for gliding. A glider pilot can obtain his licence if he carries out five test flights on the motor glider. Permission to fly a motor glider will be entered on his gliding licence. For the motor-glider pilot a very simple and cheap instrument will be developed which can be built into any barograph. This instrument shows:

(i) The moment when the motor is started.
(ii) The moment when the motor is turned off.
(iii) It must record how often and for how long the motor was in action.
(iv) It must record at what heights the motor was turned on and off.

These instruments have already been tried out in competitions and have been proved satisfactory for control over the motor's running time.

Motor gliders have already been produced industrially in small series. Some motor gliders have taken part experimentally in gliding competitions. However, there has still been insufficient experience to enable proposals for competition regulations to be put before the CVSM.

Both high-performance single-seaters with retractable engines and two-seaters with fixed engines can be used for giving navigation practice for pupils and also for meterological research.

II

I would like to add some facts to the information I gave last March.

This year (1968) the technical development of the powered glider has made further progress here in Germany. The development of the single-seater trends towards high-performance soaring; that of the two-seater towards its employment for flight training.

At present we have 130 powered gliders in the German Aero Club.

In 1968, for the first time, we admitted powered gliders to the German Gliding Championships. They had to fly the same daily tasks as the motorless gliders. They were only allowed to use their engines for take-off and climbing to an altitude of 600 m. Three powered gliders took part in this competition. They acquitted themselves very well. On days with good thermals their performance placed them in the top group. The powered gliders made several flights of 300 km. on a triangular course. Two flights of 400 km. were achieved.

This year, for the first time, a distance of 500 km. was covered by a powered glider. Therewith the pilot acquired his third Diamond. In this flight, too, the engine was only employed for starting.

In September a motor glider meeting was organised in which 29 powered gliders took part (see *S. & G.*, Dec.-Jan., p. 496). They took off at intervals of 20 sec. for competition flights. Test flights for performance evaluation were also made.

In 1969 12 powered gliders will take part in the German Gliding Championships.

In the German Aero Club the powered gliders come under the care of the German Gliding Committee. This committee is composed of four sub-committees:

1. Flight training;
2. High-performance gliding;
3. Powered gliders;
4. Flight safety.

The German Gliding Committee is at present working on new regulations for powered gliders:

1. Technical directives for powered gliders;
2. Flight regulations for training;
3. Regulations for powered gliders for participation in gliding competitions;
4. Regulations for recording the flight performance of powered gliders.

I will be giving further information at the CVSM meeting in Paris on 24th January, 1969.

RHODESIAN NATIONALS

By BOB MOORE

THE Championships took place during the two weeks October 14th-26th at the Salisbury Gliding Club's airfield, Warren Hills.

As an experiment, two leagues were run: League 1 flying one pilot per sailplane, and League 2 flying two pilots per sailplane. Fourteen entries were received, including six from outside Rhodesia. Aircraft flown ranged from the BS-1, flown by "Boet" Dommisse from South Africa, to the Olympia 463, flown by Doug Elliot and "Snowy" Snowball in League 2.

Flying was possible on every day and 13 contest days resulted. The tasks were all closed circuits including one 400 and one 500-km out-and-return and two 300-km. triangles.

Day 1:— A 102.5-km triangle was set in moderate blue thermal conditions. Bob Moore's Instamatic camera failed to function at the second turning point and, as he was unable to get round on a second attempt, he lost valuable points.

Leading Results		*km/h.*
C. Brydges	Libelle	88.5
A. Thompson	Vasama	88
A. Martin	Austria SH-1	86

Day 2:— Out-and-return 192 km to Sinoia Railway Station. Again conditions were moderate early on but they improved later in the day. Ted Pearson, who started later than most competitors, managed to get round in 1:45:32 to win the day handsomely.

Leading Results		*km/h*
T. Pearson	Cirrus	109
A. Martin	Austria SH-1	103
R. Moore	Austria S	93.5

Day 3:— The first 312.5 km triangle was set this day. Conditions were still the same as for the previous two days but thermals were good although rather difficult to find. Luckily, visibility was excellent and most pilots were able to find the second turning point, unlike previous years when smoke haze made navigation along the second leg difficult.

Adrian Martin romped home the winner, after having to use hill lift low down in the Mazoe Valley on the final leg. His time (3:04:20) beat the existing Rhodesian open record for this task, and John Colban, in a Ka-6, equalled the Rhodesian national record.

Leading Results		*km/h*
A. Martin	Austria SH-1	101.8
B. Dommisse	BS-1	101
T. Pearson	Cirrus	98.5

Day 4:— The same triangle as yesterday but the other way round. Weather conditions had improved tremendously, with good strong thermals going up to 9,000 ft. above ground level, and for the first time well marked by cloud.

Boet Dommisse went round in 2:55:57, thus breaking Adrian Martin's record yesterday.

Leading Results		*km/h*
B. Dommisse	BS-1	106.2
A. Martin	Austria SH-1	101
R. Moore	Austria S	94

Day 5:— A 102.5 km triangle was set and even this proved too much for some people, two pilots scoring zero points by landing back three times. Boet Dom-



Ted Pearson in his Cirrus.

misse, by good "metmanship", flashed round in 56 min. 56 sec. to win the day.

Leading Results		km/h
B. Dommisse	BS-1	108.2
C. Brydges	Libelle	99.5
J. Colban	Ka-6	87

Day 6:— With the weather picking up again a 192-km. out-and-return was decided upon, and most pilots found quite good conditions along the route.

At the finish line, Boet's BS-1 was seen approaching at high speed, when suddenly it turned away sharply and disappeared behind some trees about half a mile away. Apparently, his airbrakes had come out, due to a fractured mechanism, and he was forced to land. Unfortunately, his aircraft was badly damaged and he had to retire from the contest.

That evening a party "just growed", Ted Pearson entertaining everyone with his singing "Old King Cole" and Boet giving his rendering of some operatic aria plus the occasional throat dampener was much appreciated by all. Ted Pearson also amused everyone with his ideas on how certain other pilots flew.

Leading Results		km/h
A. Martin	Austria SH-1	69
T. Pearson	Cirrus	67
R. Moore	Austria S	66.8

Day 7:— Ted Pearson couldn't believe his bloodshot eyes when he saw that the task set for the day was a 400-km. out-and-return trip to Chatsworth. Good conditions, with the possibility of thunderstorms to the south, were promised. However, although cloud formed, the lift was very broken and difficult to find, and it was only when the leaders reached Beatrice on the way home, about 50 km. out, that the storms appeared. Four pilots managed to push through to get home, most of the others landing just a few miles short. Adrian Martin was first home, but it was later discovered that he had taken the wrong turning point (due, according to the local Press, to a "faulty map").

Leading Results		km/h
R. Moore	Austria S	79.5
T. Pearson	Cirrus	78.5
J. Colban	Ka-6	70.8

RHODESIAN ANNUAL GLIDING CHAMPIONSHIPS

October 13th — 25th inclusive

Overseas Entries Welcomed

ENTRY FEE £20 including all tows.
Accommodation provided free.
Weather guaranteed to provide opportunity for World Class Tasks.

Write to: **ALF THOMPSON, Box 982, SALISBURY.**

Day 8:— "The man from the Met.", Harvey Quail, was not very hopeful of good conditions and pilots were set the old standby of the 102-km. triangle. Vic Brierley, last year's Open champion, at last showed his true capability, and went round in 1:04:48. Bob Moore, after three starts and a relight, eventually contacted good lift and managed to secure second place.

Leading Results		km/h
V. Brierley	Austria SH-1	94.9
R. Moore	Austria S	90.4
J. Colban	Ka-6	79.8

Day 9:— The same 192 km out-and-return as on day 2. Bob Moore and Bob Howse landed away, the latter damaging his Sagitta which, rumour had it, collided with a bird (which happened to be perched in a tree at the time). The repair wasn't finished until the day after the competition.

Leading Results		km/h
C. Brydges	Libelle	101.7
A. Martin	Austria SH-1	100.5
T. Pearson	Cirrus	94.4

Day 10:— Just for a change a 212 km triangle was the task for this day. The conditions were excellent as far as the second turning point, but from there on everyone battled to stay up.

Vic Brierley went round the course in the opposite direction, realised his mistake at the first turning point, and turned back, eventually landing 10-km short of home.

Leading Results		km/h
C. Brydges	Libelle	78.4
R. Moore	Austria S	77.4
T. Pearson	Cirrus	76.3

Day 11:— A 312 km out-and-return trip to Umniati power station, which must be the most photographed power station in Rhodesia, was the day's task. Good lift was readily available and good times were made by a number of pilots.

Leading Results		km/h
C. Brydges	Libelle	99.2
A. Martin	Austria SH-1	94.5
R. Moore	Austria S	94

Day 12:— Once more the promise of excellent conditions was given by Harvey Quail and our task setter, Alf Thompson, decided it was about time for a 500-km. An out-and-return to Fort Victoria was set and around 10.30 a.m. the first pilots made their starts. Several of the "big boys" left a little late and were soon regretting their decision. Lift was there, but broken and hard to centre on. Six pilots completed the task, Harvey Quail, determined to prove his met. forecasting was right, landed away from base, but earned his distance Diamond, plus the threat of a rocket from Air Traffic Control for landing after dark.

Leading Results		km/h
R. Moore	Austria S	92.8
A. Martin	Austria SH-1	88.2
C. Brydges	Libelle	82

Day 13:— This being the last day, a quick 188-km. out-and-return trip was set. Excellent lift, marked by good clouds, was to be had. Adrian Martin made the fastest speed of the contest at 111.9 km/h. Ted Pearson left much too late, and just failed to complete the task by about 5 km., making his first away landing of the competition.



Chuck Brydges, from S. Africa, won the Rhodesian Nationals.

Leading Results		km/h
A. Martin	Austria SH-1	111.9
V. Brierley	Austria S	105
C. Brydges	Libelle	103

Final Leading Results		Pts.
C. Brydges	Libelle	11,407
A. Martin	Austria SH-1	10,976
T. Pearson	Cirrus	10,567

League 2 was won by Harvey Quail flying a Skylark 3, and John Colban, the new Rhodesian National Champion, was also voted best pilot of the competition for his consistent flying in the Ka-6.

At the prize-giving everyone received an engraved copper souvenir ashtray.

VALE, WALTER

AFTER the Extraordinary General Meeting of the BGA which approved the new Articles of Association, Wally Kahn gracefully resigned from the Council after 23 years of service. I hasten to add that there is nothing inherent in the new constitution which drives faithful members to resign: it is simply that the recent demands of his business and the Royal Aero Club leave Wally with little time for other activities. Sadly, we have come to the end of the Kahn era, and the new Executive Committee will be all the poorer for it.

Wally has served on Council in numerous guises: representative of Associate Clubs, of Private Owners, and latterly of the Ouse Club. In his capacity as chief inciter of patronage, he initiated conversations with W. D. & H. O. Wills on the one hand, and the Department of Education and Science on the other, greatly to the enrichment of British Gliding. Those who know him will be aware that his capacity for holding strong views—and expounding them



Wally Kahn.

—is as impressive as his physical aspect. Topics as diverse as public relations, the dreaded rating list, and selection of World Championships pilots have been subjected to the Kahn scrutiny, often with the result that a breath (or gale) of fresh air, somewhat laden with cigar smoke, has blown through the Council. Many a dreary discussion has been enlivened by remarks starting—"But this is nonsense, Mr. Chairman . . ." and going on to produce a spate of constructive, if controversial, ideas. Aficionados of Council discussions will recall how many an uninspiring agenda was enlivened by Wally and Lionel Alexander indulging in some very funny verbal jousting.

Behind all the verbal sound and fury has been an abiding love of gliding, a desire to see it flourish, an urge to press the Council to make decisions which are not only fair but are seen to be fair, and a tremendous capacity for hard and often unremarked work. British Gliding owes Wally a greater debt of gratitude than many members realise, and we hope that his absence from our deliberations will not be permanent.

F. G. IRVING

CVSM MEETING

THIS meeting was held in London on 27th November to coincide with the General Conference of the FAI, organised by the Royal Aero Club at short notice to replace the cancelled Prague meeting scheduled for last September.

Both meetings were of shorter duration than normal. There was more work than usual to be done in the CVSM meetings and, due to shortage of time, it was not possible to deal with some small items of detail. The CVSM meetings were held at Imperial College, where the delegates were entertained to dinner.

World Gliding Championships

Discussion on this subject covered:

(*a*) Review of the 1968 Championships at Leszno.

(*b*) The rewriting of the World Championship Section of the *Code Sportif*. It was agreed that this should be written, with a draft ready for the next CVSM meeting in early March. A sub-committee was set up with Ann Welch (GB) as Chairman, Seff Kunz (Germany) and Bill Ivans (USA) as members. The President of CVSM, A. Gehriger (Switzerland), would automatically be an ex-officio member.

(*c*) The 1970 Championships in USA —in respect of rules and scoring system.

Standard Class

General discussion resulted in agreement that it was neither necessary nor desirable that the Standard Class should be merely the shadow of the Open Class. A full and effective day's contest flying could very satisfactorily be obtained from gliders such as the Standard Libelle, and a more exotic or complex glider was not really required. It was felt that changes should not be made in the Standard Class just for the sake of making changes. It was much more important to allow manufacturers the chance of setting up production of standardised aircraft in bigger quantities, since this was the most practical way of keeping down the present rapidly rising costs.

SWISS DIAMANT — WORLD'S LEADING SAILPLANE



DIAMANT 16.5 DUTY FREE

Diamant 16.5	£2,500 approx.	Glide angle 1.42 at 55 kts.
Diamant 18.	£3,050 approx.	Glide angle 1.45 at 55 kts.

The superb finish and camber changing flaps give the highest inter-thermal speeds plus the ability to climb with the best.

We were so sure of the superiority of DIAMANTS that we reserved last year a large quota for delivery in early 1969.

Write for technical information, finance arrangements and illustrated leaflet to the sole U.K. Agents:

THORPE AVIATION LTD., 177 Lincoln Road, Peterborough. Tel. 68818

Manufacturers:

Flug-und Fahrzeugwerke AG, 9422 Altenrhein, Switzerland.

DIAMANT 18-FIRST U.K. 500 km. TRIANGLE.

It was unanimously agreed that flaps would not be permitted in any form. Airbrakes would have to be efficient, but provided that they were only drag producing, greater freedom would be allowed in their configuration.

It was unanimously agreed to permit retractable undercarriages. These could be made inexpensively and there was considerable evidence that they resulted in a safer glider.

World Championships, Marfa, Texas, 1970

Bill Ivans described the draft proposals for the organisation of this championships. The main points are listed below:

(*a*) Competitors would live in tents, and eat on the airfield.

(*b*) The cost would be $7 per participant per day.

(*c*) The provisional dates would be the last week in June and the first week in July, 1970, preceded by a practice period of one week.

(*d*) 80 gliders would be accepted—40 gliders in each class.

(*e*) The final rules would be available in March, 1969.

(*f*) Photographic evidence of turning points would be the only acceptable proof. The organisers would provide Instamatic cameras and film but competitors would have to fit brackets in the cockpit, angled to include the port wing-tip. Detailed specification for these brackets would be circulated later.

(*g*) Cloud flying would be prohibited and it would not be permitted to carry any gyro instruments.

SMITH & JONES
CHARD, SOMERSET

GLIDER REPAIRS
OVERHAULS
C's OF A

Telephone: Chard 2262

(*h*) Tasks would be approximately half for speed and half for distance and would include Cat's Cradle. CVSM recommended that tasks should be different for each Class.

(*i*) Oxygen equipment for 3 hours' flying would be required.

(*j*) It was likely that competitors would be able to choose their own start times.

Motor Gliders

Seff Kunz (Germany) reported that there were now 130 gliders in Germany. The 1968 German Nationals included 3 motor gliders, flown as gliders, after launching themselves; they made several 300-km. flights. In September last, 29 motor gliders took part in a motor glider rally. In 1969 12 motor gliders will be flying in the German Nationals. Satisfactory legislation for motor gliders existed.

The President reported that CVSM had been asked officially by FAI to look after motor gliders, and also to arrange such things as special competitions and records for them. There was also discussion as to whether CVSM (Commission Vol Sans Moteur) should be changed to CVV (Commission Vol à Voile). No decision was taken on this; the problem only arose in the French language.

Records

Proposals for 750 and 1,000-km. triangles had been received from South Africa. These were not agreed, mainly because they would be possible only in few countries in the world. It was felt that it would be more appropriate to give the first pilot to carry out a 1,000-km. triangle something like the FAI Lilienthal Medal.

World Championships, 1974/5

A proposal from Australia was put forward. In principle this was of great interest, provided that European teams could afford to go. The Australian delegate was asked to see if he could find out what financial help would be forthcoming.

ANN WELCH

INSTRUCTORS' PANEL REPORT

Panel Members: R. A. Neaves (Chairman), V. C. Carr, Flt.Sgt. A. Gough, Air Cmdr. N. W. Kearon, P. Minton, Flt.Lt. J. S. Williamson, Wing Cdr. G. McA. Bacon, G. Collins, Sqd.Ldr. J. Delafield, J. J. Ellis, Sqd.Ldr. R. Feakes, J. A. Findon, J. Hands, R. P. Hubble, Flt.Lt. I. Ladley, E. J. Meddings, K. O'Riley, Wing Cdr. D. Spottiswood.

HAVING only taken over the Panel in April, this report will be unusually short. Perhaps a good thing.

The first task must be to thank Ann Welch for all her tremendous energy and enthusiasm which has established this Panel as a responsible body which is probably second to none in the world at its prime function of looking after the interests of gliding instructors.

The slow uphill battle to raise instructing standards has continued, not without some small successes. Silver C's will, by the end of 1969, be compulsory for all fully-rated instructors and those who are still without this fairly basic qualification will have to revert to an assistant rating. The fact that this step has taken so long to implement has been due to the desire to avoid hardship in the smaller clubs. It is significant that letters have been received from instructors all over the U.K. advocating even higher standards and implementing them sooner. With the introduction of the assistant rating, it has been possible to raise the standards required for the full rating test and this has been reflected in the higher than usual failure rate. Instructors cannot hope to obtain a full rating if a positive effort is not made to extend their theoretical knowledge and practical ability.

Ed Meddings joined the BGA as National Coach in July and organised five Instructors' Courses. He has left the Association to take up a post with an Instrument and Autopilot firm where he will be able to utilise his airline pilot qualifications.

Because of the upswing in the numbers of fully-rated instructors, the accident rate does appear to be improving. As far as instructors are concerned, continued vigilance is necessary in the normal areas; basic instruction, especially in the low speed regime and supervision, and especially in the conversion of pilots to modern equipment. Handling characteristics, noise, acceleration, etc., are changing quite substantially, therefore it behoves instructors to make themselves aware of the vast differences between the modern hot ship and the club hack. The differences between a Prefect and an Olympia are far smaller than between an Olympia and a Dart.

Once again, the Panel assisted in testing candidates taking part in the W. D. & H. O. Wills Competition. The showing in the semi-finals, was rather disappointing when one considers that the pilots were supposed to have been nursed by their CFIs. On the other hand, the finalists were very good, showing that their clubs had really tried. There is no doubt, however, that this competition does tend to improve flying standards throughout the movement and for this, prizes apart, our thanks are due to our benefactors.

The magazine "Instructor" is now appearing quarterly and seems to be the best way of keeping rated instructors informed. There are encouraging signs of feedback in the form of letters to the Editor and it is hoped that this will increase. At present, because of the production costs, the magazine is circulated to instructors holding a full rating only. However, alternative schemes are being con-

sidered so that assistant instructors may also benefit from this publication. In the meantime, fully-rated instructors are asked to share their copies with as many of their colleagues as possible.

What of the future? With only one professional (who is fairly extended in the training role) it is not easy for the Panel to help clubs improve their standards. There have been various suggestions from the movement calling for more standardisation in the form of visits by teams of Panel Examiners and renewal tests for full ratings. The Panel are at present looking at ways of "refreshing" instructors who have held ratings for ten years or more and perhaps, from this, will evolve a scheme for more regular checks. What is needed, perhaps more than checks, is a method of encouraging instructors to keep up to date with changes in training methods and aircraft. Clearly, more examiners will be needed if a concentrated effort is to be made.

Finally, the BGA office staff must be thanked for all their work on behalf of the Panel. Without their help our job would be completely impossible.

R. A. Neaves, Chairman

ARE YOUR AILERONS REALLY NECESSARY?

By HUMPHRY DIMOCK

WHEN travelling to America recently, whilst sitting in the back seat of a VC10 jet liner I observed that when the low-speed flaps were extended, a pair of spoilers acted differentially to assist the ailerons. At no time, from high speed to low speed, did the ailerons move very much, but at very low speeds the lateral control with spoiler assistance was as lively as a Spitfire or a Harvard. The extraordinary thing was that these spoilers were inboard of the ailerons and yet they were so very effective. The spoilers moved 2 inches when the ailerons moved 2 inches, so it seemed.

I should explain here for those who do not know, that the spoilers in a VC10 have another use also; they are raised vertically to the surface of the wing (not differentially this time) to enable the airliner to make extremely rapid descent from flight level to holding level, and they are erected again after touchdown for use as airbrakes.

Now one of the tiresome things in flying a sailplane of large span and comparatively short fuselage is that aileron drag is very powerful. When right stick is applied the nose swings away to the left unless the correct amount of rudder is applied at the same time, and vice versa. Aileron drag is an absolute curse when trying to keep a steady course while cloud flying; it makes the compass swing like a thing demented. This is terribly all-important to competition pilots, who will be very quick to appreciate the benefits of doing away with aileron drag. It is strange to discover, when speaking to some instructors about this proposition, that they are not fully appreciative of the demon aileron drag that seizes on competition pilots when cloud-flying.

Now it occurs to me that if differentially operated spoilers are so very effective inboard to the ailerons on a VC10, and at such a short moment, how much more effective they would be if they were applied to the wingtip of a sailplane. Not only would the moment expressed in foot-pounds be so much greater, but they would also cause a small amount of drag where it was wanted, that is, on the wing to be lowered, and therefore assist in lateral control without interfering with directional stability.

If only I had a workshop and a glider with which I could experiment, first fitting differentially operated spoilers adjacent but to the rear of the main spar, well in front of the ailerons, I would make a shrewd guess that by gradually reducing the amount of aileron movement one would finally find that ailerons were not required at all and that

they could then be fixed, the differentially operated spoilers effecting the lateral control as well as, or even better than, the ailerons—now redundant.

I would also guess that the sailplane would have its performance increased, because the small amount of drag produced by the spoilers would be more than counterbalanced by the bootful of rudder drag now no longer required. In addition there must be a large saving in drag caused by the step in the trailing edge where the aileron joins the wing. Just think of the tormented airflow going past the step when a large amount of aileron is applied. I have always worried about this.

To do without ailerons seemed to me like heresy or aviation blasphemy when I first thought of it. All our lives the ailerons have been an essential integral part of flying; aileron patter and demonstrations have formed a large part of flying instruction, yet now I believe that they can be done away with, at least in sailplanes.

I have had several 18 metre sailplanes, and now have the best one in the world, the Diamant 18, but aileron drag is still a curse.

This proposal is therefore promulgated in the hope that somebody else will see the light and have the courage to experiment with spoilerons, first with spoilers added in front of the ailerons, and then gradually reduce the aileron movement as the spoilers prove their effectiveness.

The only disadvantage that I can visualise is that my proposal might not be very effective for inverted flying, or certain aerobatics, but this should be of small consequence. Differentially operated spoilers should surely assist in spin recovery.

The name "differentially operated spoilers" is rather a mouthful, so therefore a new name is required, and what could be better than "spoilerons"? I hope that some firm or somebody will immediately start experimenting with spoilerons, and I would like to offer my services for any test flying required.

Sailplane flying in future should be much easier to teach, safer, and very much more pleasurable to fly, so the answer to the question in the title, "Are your ailerons really necessary?" would be a very definite "No, not if we have spoilerons available".

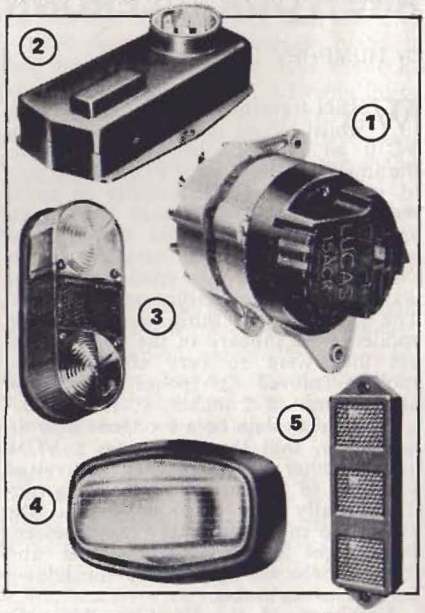


Get reliability in tow . . .

With specialist equipment by Lucas which overcomes all your charging and trailer lighting problems.

1 15 ACR Alternator. **2** 2TU Trailer Signalling & Lighting Relay Unit.
3 L770 Stop/Tail/Flasher Lamp.
4 L740 Front & Side Marker Lamps.
5 Reflex Reflectors.

From Lucas Agents or good garages everywhere.



LUCAS

Electrical equipment

The Best That you can buy.

JOSEPH LUCAS LTD · BIRMINGHAM 19

AIRSPACE COMMITTEE REPORT

Committee Members: H. C. N. Goodhart (Chairman), A. G. Burne (Kent), O. W. Neumark (Derby and Lancs.), D. A. Wilson (Newcastle), T. S. Zealley (London).

THE Year. It has been an unusually quiet year on the airspace front. The biggest change has been the actual appearance of the westward extension of the London TMA; as originally proposed in 1962 this would have obliterated Lasham but as it has now appeared it is comparatively innocuous except to the gliding club at Farnborough.

The fact remains of course that I am, as usual, reporting that we have been forced to concede a little more of the ever-decreasing volume of free airspace without any quid pro quo in the form of de-control of airspace not now used (if indeed it ever was) by the control system. There is, however, better news on this point; NATCS (National Air Traffic Control Services) currently has in progress a study of airway stubs to see if any of these could be shortened or have their bases raised. This does not mean that the outcome of the study will automatically be favourable to gliding but it is a great step forward that the study is at least being made.

The year has seen an increase in the number of infringements of gliding club Aerodrome Traffic Zones by, for the most part, military aircraft. This probably stems from an increase in low level military activity but we have had very good co-operation from the Ministry of Defence in eliminating the problem in cases where we have been able to give exact factual information on infringements.

The 1967 Air Traffic Census has produced its report, the outstanding feature of which is the large reduction of controlled traffic at levels below 10,000 ft. This is a most encouraging trend and should strengthen our case for raising the base of all airways to over 5,000 ft.

The future. As always, there will be strong pressures on the part of commercial aviation for more controlled airspace and for more control within that airspace; this we are used to, but another pressure is beginning to appear which may be more serious. Many small aircraft are now fitted with a VOR (Visual Omni Range) receiver as well as a communications set and consequently tend to fly from VOR to VOR. As the VORs are set up to define the airways this means that the small aircraft tend to fly along these routes at levels immediately under the airways. Collision risk is therefore higher and they are beginning to think in terms of control. The effect of this is that, whereas we were able to form some sort of joint voice with them speaking for FIR (Flight Information Region) users, we are now becoming increasingly divided from them in our aim of free use of FIR airspace.

The Third London Airport is perhaps the largest of a number of demands for increased controlled airspace which can be expected in the next few years. It is important to gliding that a site be chosen (we favour Foulness) where a large part of the resulting TMA can be over the sea. The TMA can be expected to cover a ground area of at least 1,000 sq. nautical miles. We have put a paper before the Third London Airport Commission covering the general effects of such an airport on gliding; individual gliding clubs will have the opportunity to cover local aspects of particular sites when the Commission has produced its short list.

H. C. N. Goodhart, Chairman.

PIO'S IN GLIDERS

By FRANK IRVING

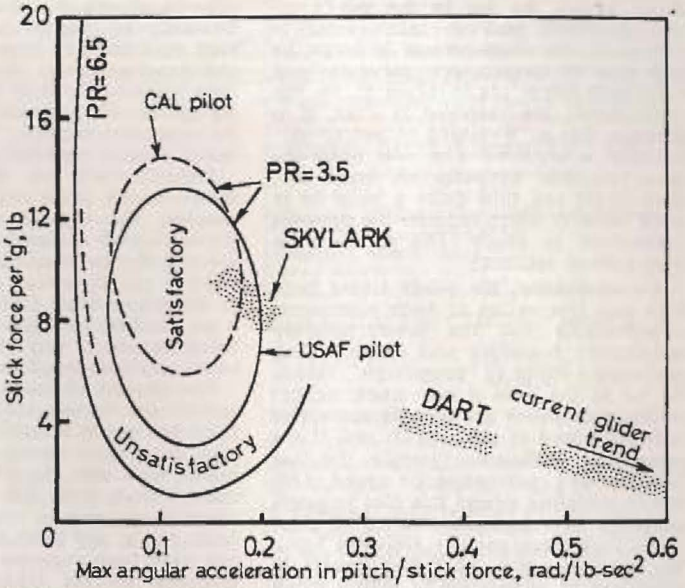
PILOT-INDUCED oscillation (PIO) tendencies have hitherto been regarded as the province of pilots dealing with rather esoteric aeroplanes, particularly under transonic conditions. Such oscillations are associated with the characteristics of the closed-loop pilot-airframe combination: if the characteristics of the airframe associated with pitch response to a stick-force input are not reasonably matched to those of the pilot, who is functioning as a "controller" applying corrections to the stick in response to visual pitch-error inputs, then the pilot-airframe combination may suffer from undesirable oscillations. In particular, if the frequency of the short-period oscillation of the aircraft is high and the stick-forces are light, the pilot's corrections may become badly out-of-phase with those which ought to be applied to suppress the oscillation. Under such circumstances, the oscillations are reinforced by the pilot's actions and rapidly increase in amplitude. From the pilot's point of view, the result is rather alarming, particularly if he is unfamiliar with the phenomenon. He is quite unable to stop the oscillations, which are partly a product of his in-built transfer function, and the only way of dealing with the situation is to open the pilot-airframe loop by releasing the stick, or holding it rigid, or by deliberately performing some different manoeuvre such as a steady pull-up, any of which require noticeable presence of mind.

Such situations will not be unfamiliar to the glider pilot: if a glider starts oscillating in pitch at the top of a winch launch, an inexeprienced pilot will probably make matters worse by trying to fight the oscillation. The solution is to open the loop by putting the nose down. In a different context, an inexperienced trailer-driver may feed in exactly the wrong corrections if the car-trailer combination starts to oscillate in yaw. Whilst the inexperienced "controller" may find that either of these oscillations are quite uncontrollable, they will not necessarily be so to a person with sufficient experience of such situations. It is well known that an experienced trailer driver can stabilise a car-trailer combination at a speed appreciably above that at which it is unstable in the absence of his intervention. What has happened is that his responses have become "pre-programmed", and produce a much more satisfactory transfer function than the unprogrammed human operator.

Several current types of glider have all-moving tails without geared tabs. Their stick-forces per 'g' are extremely low, and their response to a stick-force input is rapid. The conditions favour PIO tendencies, so we can no longer dismiss them as irrelevant to gliding. They can happen to *you*, particularly on your first flight in a strange hot ship. Indeed, their beginnings can be observed even on the relatively innocuous Dart. Many new pilots indulge in quite noticeable pitching oscillations just after take-off on aero-tow. This situation is more critical than free flight, since the pilot is trying to control two things simultaneously: the pitch attitude and the flight path. In free flight, he is usually only controlling the first parameter, and—in the absence of visual data when remote from the ground or other aircraft—he just accepts whatever flight path emerges as a consequence of the behaviour of the glider and the atmosphere.

Since the PIO is associated with the transfer function of the human controller, the situation is extremely complicated (e.g., see Ref. 1). The human transfer function can rarely be represented by a simple analytical function; it can be modified by learning; it can vary from one individual to another; and finally, the human operator can function in various fashions, depending on the circumstances. Notwithstanding all these potential confusions, it is possible to carry out experiments to define, rather vaguely, those combinations of airframe characteristics which are deemed "satisfactory", from the point of view of PIO's, to selected pilots. Ref. 2 describes such a series of experiments carried out by Cornell Aeronautical Laboratory (CAL) using a variable-stability Lockheed T-33 aircraft. It is interesting to examine glider characteristics in the light of their findings.

These are presented in various ways,



Regions of satisfactory and unsatisfactory pilot ratings (PR) from flight tests using a variable stability Lockheed T-33, with glider characteristics superimposed.

but perhaps that most relevant to glider pilots is shown in the diagram. A boundary, separating "satisfactory" and "unsatisfactory" characteristics is plotted in terms of stick-force per 'g' and maximum angular acceleration in pitch per unit stick-force. The PIO tendencies were rated on a scale running numerically from 1: "No tendency for pilot to induce undesirable motions", to 6: "Disturbance or normal pilot control may cause divergent oscillation. Pilot must open control loop by releasing or freezing the stick". The satisfactory/unsatisfactory boundary corresponds to a pilot rating of 3.5, halfway between 3: "Undesirable motions easily induced when pilot initiates abrupt manoeuvres or attempts tight control . . .", and 4: "Oscillations tend to develop when pilot initiates abrupt manoeuvres or attempts tight control . . .". The line showing a pilot rating of 6.5 is off the end of this arbitrary scale: it corresponds to a situation between "bad" and "bad: required a major portion of pilot's attention". It is clear that plots of such subjective assessments are subject to a large scatter, and the resulting boundary is a pretty vague mean line.

The significance of the parameters is easily understood. Stick-force per 'g' is a familiar quantity: for Skylarks, it is somewhere between 8 and 11 lb., and most glider pilots regard this as involving a "heavy" elevator and much re-trimming on entering a turn. At the other end of the scale, anything under about 3 lb. feels very light, and it is easy to apply more 'g' than one intends. The angular acceleration in pitch relates to the motion of the aircraft after applying a step function elevator displacement, and in the case of a rigid manually-controlled aircraft it occurs immediately upon applying the displacement. Thereafter, it decreases as a result of damping effects. As one would expect, it increases as the natural frequency of the short-period longitudinal oscillation increases. Its significance appears to be that it is related to the displacement in pitch which will

occur before the lag in the pilot's response allows him to take corrective action. If this displacement is large, he will tend to overcorrect, particularly if light stick-forces are involved If, on the other hand, the response is slow, it is thought that a "threshold of perception" problem is involved. The pilot notes the slow response, increases his input (i.e., stick-force) and then notes a build-up in pitch velocity which requires the opposite corrections to check. The result is an over-control tendency.

To summarise, the pilots found both high and low values of both parameters objectionable and the satisfactory/unsatisfactory boundary was roughly oval, enclosing a range of "reasonable" values. So far as the pilot is concerned, neither of the parameters are directly associated with the speed of the aircraft and, if the ground is sufficiently remote, he has little sensory perception of speed. One would therefore expect this plot to apply generally to vehicles controlled in pitch on a stick-force/angular response basis. We must, however, be rather careful in extending its application to gliders flying at much lower speeds than the T-33, since the 'g' associated with a given rate of pitch in a glider will be appreciably lower than that of the T-33, and this effect may have an influence on the pilot's assessment of the situation. Also, the T-33 was fitted with an artificial feel system, and one of its effects was to cause the maximum angular acceleration to occur at some finite time after the application of a step-function elevator displacement. It is clear from the diagram that subjective assessments can vary appreciably from one pilot to another, as shown by the different boundaries produced by the CAL and USAF pilots. The USAF pilot's boundary extended down to a stick-force per 'g' of 3 lb. (a rather light glider value), whilst the CAL pilot was unhappy with anything less than 6 lb. So it is probably fair to say that such boundaries are greatly influenced by previous experience, training, and so on. One might therefore expect glider pilots, accustomed to the response of gliders, to produce rather different boundaries from those of power pilots. Nevertheless, since the situations under discussion are ultimately associated with the pilot's transfer function, one is eventually faced with the limits of human performance no matter how much it has been modified and improved by training and experience. So, notwithstanding all these considerations, it is worth comparing glider characteristics with those of the variable-stability T-33, but being rather careful in drawing conclusions.

Superimposed on the diagram are some shaded areas representing, rather roughly, the regions corresponding to the calculated characteristics of Skylarks (3's and 4's) and the Dart 17. The characteristics are shown as areas rather than as sharply-defined points because there is an element of uncertainty in the calculations and in any case the characteristics vary with weight and C.G. position.

The Skylark characteristics are slightly outside the "satisfactory" region (USAF pilot) but not to a significant extent. This pilot did in fact record some satisfactory points well into the Skylark area. One can conclude that, if the T-33 had been adjusted to give a Skylark-type stick-force per 'g' and pitch response, it would not have been regarded as too awful, at any rate by the USAF pilot. This is reasonably in accordance with experience of Skylarks. Although perhaps rather "heavy" by glider standards (in terms of

Glider Towing Workmaster

Lycoming 180 H.P. — with starter
Full electrics
Blind flying panel
Vac. pump
Balloon tyres
Hydraulic brakes
Radio
2 year club C. of A.
Ideal for towing or touring
4 seats

Enquiries to:

F. Horridge,
c/o Lasham Gliding Soc.

or ring Long Sutton (Hants) 258 in the evening

stick-force per 'g'), it is generally thought to be easy to fly, and in gliding circles there is no suspicion of its having PIO tendencies. We then come to the Dart, with a stick-force per 'g' at the lower end of the "satisfactory" range. However, its estimated initial pitching acceleration per lb of stick-force is about twice that at the extreme end of the "satisfactory" boundary. The T-33 pilots would probably have rated it flyable, but requiring a major portion of the pilot's attention. In a gliding context, the situation is obviously not as bad as this comparison would suggest, but it does indicate why the inexperienced Dart pilot can produce oscillations when trying to exercise tight control on aero-tow take-off. In the course of flight-testing the original Dart 17-metre prototype, the writer achieved a PIO whilst endeavouring to recover from one of ARB's unusual attitudes on tow. Opening the loop by releasing from tow was the only solution. At the time, this was regarded as a manifestation of the effects of age on reaction time, but it now seems more likely to have been associated with a genuine feature of the aircraft. (The wing of this machine was later stiffened in bending—see conclusion iv.)

Several of the current breed of glass-fibre gliders have all-moving tails pivoted at the aerodynamic centre and devoid of geared tabs. The only stick-force per 'g' arises from the trimmer springs, and it is usually very low indeed. If the Dart is in the 3-4 lb. bracket, some of these machines must have only 0-2 lb. On the diagram, these aircraft would be even further to the right and lower down than the Dart. By T-33 standards, they would be rated "aircraft just controllable with complete attention", or perhaps even "unflyable". The outstanding example of a machine marginally in the former category was the first HP-14c before it grew tailtabs. The stick-forces were extremely small and the response to a stick displacement was rapid. The pilot was certainly devoting nearly all of his efforts to controlling its pitch attitude, and had very little spare capacity for other aspects of flying it.

Quite apart from these flight tests, a criterion for PIO tendencies has been postulated, making certain assumptions about the behaviour of the pilot. This

Caravans for Gliding Meetings

Rent or Self-Tow Hire. Delivered when required. All popular makes for sale including Sprite, Eccles, Thomson, Fairholme, Bluebird Europe, Knowsley and Cooper Special. Latest models now on display at our Show Site. Open seven days a week. Visit us or write for details.

Surrey Car & Caravan Co., Ltd.

44 Richmond Road, Kingston-on-Thames, Surrey. (01-546 6340)

Show site: Waldegrave Road, Teddington, Middlesex (01-892 7643)

Open Mon. — Sat. 9.30 to 6.30.
Sun. 2.30 to 6.30.

suggests that PIO's can only occur if

$$4\hat{t}\zeta_{SP}\omega_{SP}\Big/\frac{dC_L}{d\alpha} < 1{\cdot}0.$$

In this expression ζ_{SP} is the damping ratio of the short-period oscillation (SPO) of the aircraft (i.e. the ratio of the actual damping to the critical damping), ω_{SP} is the undamped natural frequency of the SPO, $\hat{t}$ is a characteristic time for the aircraft ($m/\rho U_0 S$) and $dC_L/d\alpha$ is the slope of the lift coefficient/angle of attack curve. In the expression for $\hat{t}$, m is the mass of the aircraft (slugs), ρ is the air density (slugs/ft^3), U_0 is the true airspeed (ft/sec) and S is the wing area (ft^2). Since ω_{SP} is in radians/sec and is inversely proportional to $\hat{t}$ the criterion is dimensionless: it depends on the shape of the aircraft, the resulting aerodynamic coefficients and its pitching inertia (in dimensionless terms, the ratio of the radius of gyration to the tail moment arm). For an aeroplane, it will also depend on the Mach Number – not a significant consideration for gliders.

An approximate calculation suggests that for the Dart 17, the value of this criterion is about 2.0, which seems to be comfortably clear of the PIO region. However, this criterion says nothing about stick-forces: faced with the T-33 adjusted to make its criterion 2.0, the pilots tended to choose stick-forces per 'g' of about 5 lb. (USAF pilot) and 8½ lb. (CAL pilot), or about twice that of the Dart. Although gliders in the 17 or 18-metre class all look much the same nowadays, the criterion is sensitive to tail size and, to some extent, to C.G. position. So the range of values might well be about 1.2 to 3.0. At the lower end of the scale (small tailplane, C.G.

far aft), one would expect to be close to the PIO boundary, particularly with light stick-forces.

Whilst it would be unwise to take these various numerical comparisons too literally, we can perhaps come to a few tentative conclusions:

(*i*) Unsatisfactory characteristics are associated with a small stick-force per 'g' and a large angular acceleration in pitch per unit stick-force. For gliders of conventional layout, these two features will tend to occur in conjunction, particularly if the tail is all-moving, fully mass-balanced, and devoid of geared tabs.

(*ii*) Such characteristics are not an inevitable consequence of high performance.

(*iii*) Values of stick-force per 'g' below about 3 lb. appear to be undesirable. On this basis, the OSTIV minimum figure of 0.5 kg. is too low.

(*iv*) Since it seems quite possible to achieve a theoretical PIO criterion only slightly in excess of 1.0, further investigation of PIO tendencies in gliders is required. In particular, these investigations should examine the relevance of existing criteria. In this context, it is significant that pilot ratings in the T-33 could be appreciably modified by the occurrence of structural oscillations. This also appears to be a relevant feature of the behaviour of glass-fibre gliders.

Finally, pilots should remember that a PIO can happen to them, particularly on an early flight in an unfamiliar type with low stick-forces. It is more likely to happen on aero-tow than in free flight. I am not suggesting that it is a frequent phenomenon, and I would not like to start a PIO "scare", but it is quite alarming when it happens. There is no point in trying to fight it if it does start: you will only make it worse. The remedy is to "open the loop". If the glider is on tow, releasing the cable will probably suffice. In free flight, the standard power-plane remedy is to release or freeze the stick but releasing the stick is not always a good idea in a marginally stable glider at high speed. Probably the best remedy is to open the airbrakes and make a conscious effort to freeze the stick.

References

1. Jones, G.M.: "Man-Machine Integration: A Long-term Look". *J.R.Ae.S.* October 1968.
2. DiFranco, D. A.: "Flight Investigation of Longitudinal Short Period Frequency Requirements and PIO Tendencies". *Cornell Aeronautical Laboratory, Inc. Technical Report AFFDL-TR*-66-163, June 1967.

ABERDARE WAVE

By IVOR SHATTOCK, South Wales Gliding Club

TO the pilot who listens to the regular feats of soaring and gliding accomplished across the land, it must seem that one only has to be in the right place at the right time and all is possible. It does help to be there when it happens, but this tale is of the long road to the top of the hill—Aberdare hill and the wave that sits on it.

Since we have been gliding in South Wales, we have seen and photographed waves from every angle (looking up, that is). Visiting pilots ask, "Do you get wave?" Stories of Portmoak seep back to the club and now the 23,000 ft. Skylark 3F of Charlie Ross & Co. lives on our site. Little wonder, then, that something had to give if we were to call ourselves glider pilots—we, too, must take the wave.

With the fine qualities of the 3F and her instrumentation, we began to find new fields of exploration. Up the valleys' ridge soaring 20, 30, 40 miles out-and-

return and even occasional flights to 4,000 ft. a.s.l. in very, very smooth air but no higher.

A visit to Portmoak at the right time brought Diamond and Gold climbs back to the club and many hours of wave know-how. The desire to get up in "Welsh" wave was now even stronger, and terms like "obsolete forms of lift" were bandied about whenever thermal flying was offered.

The last straw came when our long-term efforts at obtaining land at the Black Mountains ground to a halt—well, an imperceptible crawl, anyway. Surely there must be a way to fly these waves from *one* of our plentiful mountains.

Two real problems had to be overcome. Most of our South Wales valleys run NW-SE, i.e., facing SW, and any land suitable for aerotowing is near the sea. To overcome both, we had to find a N or NW-facing hill capable of supporting a glider at fair heights, from which a glider could be launched. It had to have reasonable access and be able to be landed-on in safety.

After many hours of poring over maps and seeking out the most improbable of sharply-topped hills in the weekends of no-flying, we finally settled on Aberdare mountain which, on investigation, had many of the important features.

It was 1,500 ft. high, facing N. It had a road over the top, a sharp face (a bit too sharp, some might say), and was reasonably level on top. The surface left a little to be desired because, although it was sloping, the whole surface was cross-hatched with tiny furrows to shed the 70 in. of water it gets per annum.

The ridge was several miles long (about eight), and had many bowls which, in the event of temporary wind veer, should keep one airborne. The ability to stay airborne in varying wind strength or directions is a big help, as these same variations may be the initial symptoms of wave formation. The last feature of the hill is that it is stepped in plan form so that one can move upwind and down by selecting the appropriate part of the ridge. We don't say that all these features give rise to wave flight, but they do give rise to some interesting conjecture.

Finally, the day came. 3rd November was the Sunday which the Saturday Met. man said would give rise to 15 to 20

DORSET FLYING CLUB

We specialise in Soaring Training.

Sea Breeze Front Flying a Regular Occurrence.

Good Ridges.

Cloud Flying a Speciality.

Silver "C" to P.P.L. and Towing.

Private Owners Welcome.

We will rig, launch and retrieve you.

We are taking bookings for our Two-Seater Courses.

Training — Soaring — Instructors

from

5 days for 22 gns.

Book a Solo Sailplane for your exclusive use for that Silver Height or Distance. From £30.

WE FLY EVERY DAY

Compton Abbas Airfield, Shaftesbury, Dorset.

Telephone: Fontmell Magna 328

knots, N to NE, some cloud, some instability, but fine and dry.

After an hour of phoning, four stalwarts were contacted and the scene was set. Even the preparations for bonfire night would have to take second place!

By 9.45 a.m. the 3F was 20 miles into the hills and on the site. The equipment, consisting of a horizontal pulley, cable, bungy and car, was set out and a windsock erected. The glider was rigged amid a growing crowd of club members, who had seen the message and map left in the clubhouse and come to see the fun. At 12.10 the glider lurched forward and turned in the rising air. I was off.

The ridge gave lift to 1,200 ft. a.s.l. in minutes and there was time to call "Bracken" and report on height and position in a sky which was largely covered with cloud at about 3,500 ft. a.s.l. Small clearances came through and some of these were very slow in their downwind progress. Occasionally, stronger lift presented itself under some of the clouds, and by circling in the stronger stuff (up to 4 knots) my ridge soaring height was doubled to about 2,000 ft.

A large clearance seemed to be coming very slowly and gave me cause for cheer as I needed the warmth, the extra height and something to hope for. The radio didn't seem to be working in all directions of flight, but suddenly at 2,500 ft., in response to my occasional calls, Maypole 2 said he would relay the message. It seemed that Maypole 2 was in tow in the valley with the Ka-6E. We were to have two gliders up in this venture!

The Ka-6E had been sitting for three weeks at our site in appalling rainy conditions, ever since its owner, Earl Duffin, had dragged it from Dunstable; he had flown it once only—at Dunstable.

After what seemed an age, I could see the wings being mated to the fuselage, but the scene was far below and a long way away. Meanwhile my slow climb was beginning to get more consistent, i.e., less down and a little up with many minute climbs of one knot. By creeping forward in any better-than-average patches, I found that I was up to cloudbase and just upwind of the bits of cloud feeding into the more dense cloud over the hill.

Soon one knot turned into two knots and occasionally four until I was at 6,000 ft. above and upwind of the cloud edge. At 7,000 ft. the scene had once again changed. The air suddenly became violent and at times I was zooming upwards at 8 knots and then down to zero —just like a large strong off-centre thermal. At 7,700 ft., i.e., 9,200 ft. a.s.l., the radio crackled again and I decided to go down and let another member have a go. The thermometer had long since gone off the scale and shrunk into its private sphere—I shall have to get a fridge thermometer, I think.

Back down through the wave to meet the Ka-6E on its way up at 1,000 ft. Four launches gave 7¼ hours of flying time—roll on the next Northerly!

* * *

As a postscript we learn that our turbulence is the mixing-in of a second wave system, probably from the Brecon Beacons—if you juggle with the lumps of lift you can get into the second wave when, if you meet turbulence after a smooth climb—and so on. But as one C. Ross says "Who wants to go high anyway?"

BGA NEWS

Articles of Association

The new Articles of Association of the British Gliding Association were approved at an Extraordinary General Meeting held at the Chemical Engineering Theatre, Imperial College, Prince Consort Road, London, on Wednesday, 13th November.

HM Customs and Excise

In brief—Import Deposit, at present 50 per cent of the landed value, is payable at the time of entry. It is repayable, to the same person or firm only, after the prescribed period, at present six months.

Import Deposit is not charged on goods not exceeding £50, nor is it charged in the case of goods which qualify for import duty relief under Treasury Directions.

Notice No. 481 gives information re Import Deposits. Copies of the Notice and further information may be obtained from any Officer of Customs &

Excise or from the Secretary's office, H.M. C. & E., King's Beam House, Mark Lane, London, E.C.3.

Radio Licences (Note increased fees)

The GPO has asked us to remind pilots to renew their radio licences well in advance of the Competition season. It takes well over a month for licences to be granted or renewed as applications have to be referred to the Board of Trade.

Licences are issued by: the GPO, Radio Services Department, Waterloo Bridge House, Waterloo Road, London, S.E.1. Tel. 01-928 7878. Ex. 7526.

Aircraft licence fee £2 10s. per annum (Form K 2005). Car licence fee £4 per annum (Form BR2).

If you are forced to make a last-minute application please state the date on which you wish to use the radio so that the GPO can issue a letter of authority if the licence cannot be issued in time.

Competition Calendar

May 17-26. Open Class Nationals at Lasham.
June 7-15. Standard-Sport Class Nationals at Dunstable.
June 14-22. Western Regionals at Nympsfield.
July 12-20. Dorset Regionals at Compton Abbas.
July 26-August 3. Lasham Regionals at Lasham.
August 9-17. Wycombe Regionals at Booker.
August 16-23. Northern Regionals at Sutton Bank.
August 23-September 1. RAFGSA Inter-Services at Bicester.

Preliminary closing dates for Regional entries 31st March. Entry forms obtainable from the clubs.

Entry selection system for 1970 Nationals

Council decided at its December meeting that the existing entry selection system should continue in force for a further year. Full details of the system were published in SAILPLANE & GLIDING, August-September, 1968.

The main points to note about the system are:

1. Pilots who fly in Nationals in 1969 may also compete in heats in 1969.
2. Pilots may fly in more than one heat and best performance counts for promotion purposes.
3. In all competitions, *handicap* results are used for Entry Selection List purposes.
4. All pilots on the National Entry List for 1969 (published in the December, 1968-January, 1969 edition of SAILPLANE & GLIDING) are, as of now, assumed to have gained their published rating points by flying for four days in a Nationals in 1968.
5. A pilot on the 1969 Entry List who has an X against his name will automatically disappear from the list if he does not fly in a Nationals or a heat in 1969.

Annual Awards 1968

The British Gliding Association has pleasure in announcing the following awards for 1968:

DE HAVILAND CUP for the greatest gain in height: to Paul Thompson (Surrey & Hants Club) for a gain of 23,300 ft. at Portmoak on 11th March. Skylark 3G.

WAKEFIELD TROPHY for the longest flight: to Alf Warminger (Norwich Soaring Group) for a straight flight from Wroxham, Norfolk, to Perranporth, Cornwall, distance 535 km., on 14th April. Dart 17R.

CALIFORNIA IN ENGLAND TROPHY to a woman pilot for the longest flight: to Jane Randle (Midland Club) for a straight flight from Long Mynd to Farce, near Peterborough, distance of 180 km., on 12th May. Olympia 463.

VOLK CUP for the longest predeclared goal-and-return flight: to Brennig James (Thames Valley Club) for

JOHN HULME
Swaffham Road,
Tel. Bottisham 323
Cambs.

REPAIRS, A.R.B. WELDING,
C's of A, OVERHAULS.
T49 and T21B HIRE

flight Booker, Long Mynd, Booker, 350 km., on 9th June. Diamant 18 (achieved in the course of his 505 km. triangular flight).

SEAGERS CUP for the best closed-circuit performance in a two-seater: to Mike Garrod (London Club) and Brian Holloway for a 200-km. triangle, Dunstable, Corby, Edgehill, Dunstable, on 8th April. ASK-13. Speed 44 km/h.

FRANK FOSTER TROPHY for the fastest speed round a 100-km. triangle: to George Burton (Imperial College) for a speed of 85 km./h.; Lasham, Fullerton Junction, Hungerford, Lasham, on 12th April. SHK.

ROBERT PERFECT TROPHY to the club with the highest ratio of new full instructor ratings to club flying members in a two-year period: to East Midlands (RAFGSA), who gained three new instructors with an average membership of 97.

MANIO CUP for the fastest speed round a pre-declared 300-km. triangle: to Brennig James (Thames Valley Club) for a speed of 60.5 km/h.; Booker, Stonebridge, Kemble, Booker, on 5th July. Diamant 18.

DOUGLAS TROPHY to the club putting forward three flights by three different club members in club aircraft, aggregating the largest cross-country mileage: to the Surrey & Hants Club for the following flights:

Christopher Garton—Lasham, Leicester East, Lasham, on 25th April. Dart 17R. 316 km.

Christopher Lovell—Lasham, Sutton Bingham, Lasham, on 19th May. Dart 17R. 235 km.

Richard Brisbourne—Lasham, Chedworth Airfield, Sywell Airfield, Lasham, on 9th June. Skylark 4. 320 km.

Total distance: 871 km. (541 miles).

National Ladder Trophies

ENIGMA TROPHY to the pilot flying a privately-owned glider who has scored the most points in the National Ladder Competition: to Brennig James (Thames Valley Club).

L. DU GARDE PEACH TROPHY to the pilot, all of whose flights were made in a club-owned glider, who has scored the most points in the National Ladder Competition: to Richard Brisbourne (Surrey & Hants Club).

PLANNING?

Why rack your brains to plan the perfect club fleet when Alexander Schleicher's have done it for you. From the first impressionable flight in a glider to the day you seriously aspire to the World Championships. Alexander Schleicher's range of gliders provide a complete and logical step by step progression from the smooth and simple to the smooth and sophisticated. Range of gliders include:

ASK 13 Robust and docile performance two-seater trainer.

K 8B Training single-seater with very good handling and performance.

Ka 6E High performance Standard Class single-seater.

ASW 12 Super high performance Open Class single-seater of fibre-glass sandwich construction.

ASW 15 Standard high performance single-seater designed for competitive flying.

ASK 14 Single-seater powered sailplane with excellent 'engine off' glide performance.

Trailers for all our types can be delivered on request with special towing and brake system.

Glider Dust and Glider All-weather Covers.

Spare parts and construction materials from stock or short-term delivery.

Write for Brochure and Enquiries without obligation to:

ALEXANDER SCHLEICHER

SEGELFLUGZEUGBAU

D-6416 Poppenhausen an der Wasserkuppe, West Germany

or our agent

LONDON SAILPLANES LIMITED
c/o J. Jeffries, Dunstable Downs, Bedfordshire

GLIDING CERTIFICATES

DIAMOND HEIGHT

No.	*Name*	*Club*	1968
3/85	J. C. Rieley	USA	1.10

DIAMOND GOAL

No.	*Name*	*Club*	1968
2/278	F. W. Fay	Coventry	9.6
2/279	G. E. King	Surrey & Hants	14.4

GOLD C COMPLETE

No.	*Name*	*Club*	1968
217	R. P. Brisbourne	Surrey & Hants	14.9
218	E. A. Hales	Bath & Wilts	3.6

GOLD C HEIGHT

Name	*Club*	1968
F. F. G. Waller	Anglia	4.9
C. J. Gowthorpe	Yorkshire	18.8

GOLD C DISTANCE

Name	*Club*	1968
F. W. Fay	Coventry	9.6
D. W. Lilburn	Yorkshire	11.8
P. Young	Two Rivers	1.6
I. C. Woodhouse	Coventry	28.7

SILVER C COMPLETE

No.	*Name*	*Club*	1968
2327	J. B. Scott	Crusaders	11.9
2328	R. G. d'Erlanger	Tiger Club	1.6
2329	T. Steggles	E. Midlands	9.6
2330	P. W. Andrews	Clevelands	7.4
2331	G. P. Berry	Eagle	21.9
2332	P. M. Stevenson	Midland	29.9
2333	C. W. G. Shard	Bicester	22.9
2334	B. W. Davies	London	22.9
2335	A. Hammond	Dorset F.C.	3.9
2336	D. I. Lewis	USA	28.9
2337	N. M. Greenwood	Bristol	18.8
2338	B. J. Platt	Thames Valley	12.4
2339	P. J. Ladd	Bath & Wilts	13.10

STATS. FROM WILLS

By ANN WELCH

IT is difficult to obtain statistical information from a sport like gliding because clubs' ideas are all different, and pilots' activities so individual. The opportunity exists only when something like the Wills Glider Pilot Competition takes place, with everyone working to the same purpose.

The 1967 competition, with its encouragement to train the immediately post-solo pilot to become proficient in a relatively short time, indicated that an analysis might be profitable.

The 1968 competition papers were, therefore, prepared so that useful information might be readily extracted. The sample consisted of pilots who had entered the competition, were all aged between 16 and 39 inclusive, had made at least one solo flight at entry but had not flown more than 10 hours solo, and who were not power pilots. They were all people who had come into gliding, and progressed to solo, on their own initiative. The collection of information began at the stage of the CFI selection tests for the semi-finalists (108 candidates) three months after the competition had started.

In the written paper candidates were asked for information about their previous progress; these questions were, of course, not marked.

Some interesting, but by no means conclusive, information was found from the question "Which aspect of learning did you find difficult, and which easier?" The answers are shown below:

	% *Finding learning this Exercise* *Difficult*	*Easy*
Turns	48	52
Keeping speed correct	57	43
Winch climb	12	88
Circuit planning	56	44
Using airbrakes	28	72
Spin and recovery	16	84
Keeping good lookout	34	66
Flying in strong winds	68	32
Avoiding getting lost (locally)	23	77
Dealing with cross wind	69	31

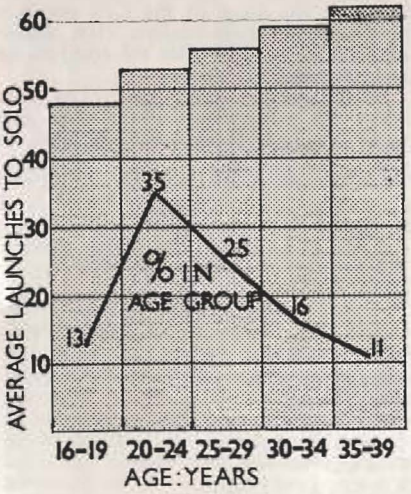
Staying in thermals - -	84	16
Remembering cockpit check -	0	100

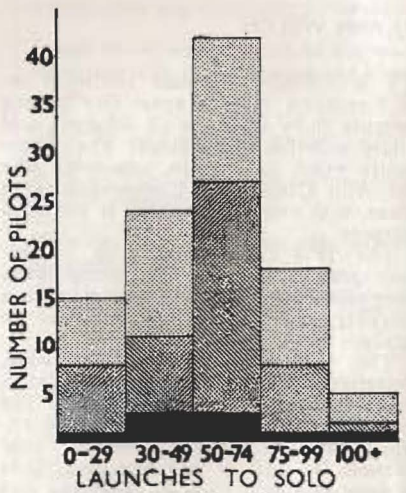
A little surprisingly the learning of turns, maintenance of the correct speed, and circuit planning—all requiring the development of judgement—were found by approximately half the candidates to be easy, and by the other half difficult. The exercises requiring some degree of knack, or arbitrary learning, such as winch climb, spin and recovery and use of airbrakes, were considered to be easy by the majority. Against this, exercises containing an upsetting or unexpected element, such as flying in strong winds and dealing with cross winds, were found by most to be difficult. This was to be expected, as was the difficulty found in learning to use thermals.

At the end of the competition these replies were related to test results in the case of all those reaching the semi-finals, and it was here that some interesting points emerged. Although 66% had said that learning to keep a good lookout was easy, the examiners' comments were general in that lookout was not good enough, thus indicating that lookout is one of those things that pilots often think they do quite well—but do not.

In dealing with cockpit checks every single candidate stated that he found this easy, and this was confirmed on test—good cockpit check gaining the highest average marks (85%). Since, however, accidents do occur through the failure of the pilot in this respect, one is led to look elsewhere than poor training for the answer. To my mind the two most likely causes are (a) carelessness, and (b) distraction; of these, distraction at the launch point probably wins by a handsome margin.

Of the three judgement exercises (turns, speed and circuit planning) which candidates were equally divided about, turns were rated by the examiners at only 61% average, while speed maintenance achieved 77% and circuit planning 72%. Of the exercises candidates declared easy, use of airbrakes gained them an average of only 61%, and spin and recovery 62%. One is left with the impression that candidates had probably obtained only a superficial appreciation of these exercises. In case it is felt that 60% average marks are by no means poor, it should be noted that these pilots were semi-finalists in a national competition undergoing con-





This shows clearly a small but steady increase in the amount of flying training needed before solo with increasing age. After 40 the amount needed would be expected to rise more steeply.



FOURNIER

R.F.4D

Sole Agents:

Sportair Aviation Limited, Luton Airport, Luton, Bedfordshire

Telephone: LUTON 29684

Also at: **STAPLEFORD AERODROME, Near ROMFORD, ESSEX**

Telephone: STAPLEFORD 341

R.F.5 Orders for delivey 1969 taken now

centrated training, and as such ought to be better than the ordinary weekend pilot.

A further question asked at the same time was "Do you intend to become a private owner?" People trying to sell their gliders might wish to get in touch with the 65 people who said Yes. Only 10% said no, and the remainder were not sure.

In the competition pilots had to be solo on entry, so there was no question of special treatment up to this stage. The pilots reaching the semi-finals (60 in number) were looked at to see if their age had any bearing on their speed of learning, and how much flying they had needed to go solo. The results are shown above, and it should remembered that these were successful pilots; the national average would be worse (see page 30).

The semi-finals took place within two weeks of the end of the 1968 World Gliding Championships, and one of the questions was "Who won?" The results were fascinating: 34 out of 60 had no idea. Other replies included Goodhart, Makula, Burton, Williamson, Smith, Prodl or something, Angst (German for fright) of Austria, and those well-known glider pilots, C. Zokoff, Paul Donaldson and Park! Only two candidates gave the correct answer, and it was not much of a surprise to find that these were the two who had eventually won the competition.

In the finals, in both 1967 and 1968, the candidates in the Northern region gained slightly better average marks than the competitors in the South—but I propose to leave someone else to work out the reason for this.

Paul Tissandier Diploma

Congratulations to Paddy Kearon who was awarded the FAI Paul Tissandier Diploma in recognition of his loyal and unswerving devotion to gliding, both as a pilot and as administrator over a period in excess of 20 years.

ANNUAL STATISTICS FOR

Gliding Club	Aircraft Club owned or op. 2S	Sec	HP	PO	TUG	Launches On Club site	Launches By Club gliders	Hours Total	Hours Club gliders
ALBATROSS	1	1	—	—	—	506	506	62	62
AVRO	3	1	1	—	—	2,800	2,800	295	295
BATH & WILTS	2	1	1	7	—	3,656	2,676	973	431
BLACKPOOL & FYLDE	1	1	2	—	—	2,411	2,411	357	357
BRISTOL	2	2	3	16	2	6,603	5,192	1,904	798
BURTON & DERBYSHIRE	2	1	—	4	—	1,883	1,601	251	169
CAMBRIDGE	2	1	2	8	1	2,616	2,398	1,608	944
COLLEGE OF AERONAUTICS	3	1	3	1	—	2,371	1,645	486	394
CORNISH	3	2	1	2	—	3,317	2,640	771	743
COTSWOLD	2	—	2	5	—	3,317	2,640	370	301
COVENTRY	2	1	3	12	—	4,347	3,669	1,973	1,100
CUMBERNAULD	2	1	1	1	—	1,542	1,542	100	100
DERBYSHIRE & LANCASHIRE	2	3	2	12	—	7,134	6,070	1,312	709
DEVON & SOMERSET	1	2	1	4	1	6,255	5,440	635	635
DONCASTER & DISTRICT	2	2	1	8	1	6,295	5,635	1,010	744
DORSET & FL. AVIATION C.	1	—	5	6	4	3,100	2,281	1,330	830
DORSET	2	3	—	9	1	4,192	3,466	953	491
DUMFRIES & DISTRICT	2	—	—	1	—	786	757	66	61
ESSEX	2	1	—	7	—	4,318	3,882	845	580
ESSEX & SUFFOLK	1	—	1	—	1	642	612	292	292
HALIFAX	2	2	—	—	—	570	532	37	33
HANDLEY PAGE	1	1	1	—	—	1,755	1,751	303	303
KENT	3	1	1	5	—	6,566	5,929	1,345	788
LAKES	1	1	1	3	1	2,179	2,050	341	241
LASHAM GLIDING SOCIETY	5	1	—	63	—	26,269	16,019	6,585	2,029
IMPERIAL COLLEGE	1	—	1	1	—	1,700	1,600	450	330
POLISH AIR FORCE ASSOC.	1	—	3	2	—	280	280	140	140
SURREY & HANTS.	—	—	10	—	—	2,397	2,397	1,509	1,509
LEICESTERSHIRE	1	—	2	8	—	1,583	1,149	936	465
LINCOLNSHIRE	3	2	—	5	—	2,889	2,327	321	209
LONDON	6	4	6	36	4	15,525	13,707	3,675	2,368
MIDLAND	2	2	2	10	—	7,578	6,153	2,218	1,258
NEWCASTLE & TEES-SIDE	2	1	1	3	—	1,613	1,507	332	242
NORFOLK	2	2	2	—	—	2,293	2,843	313	265
NORTHUMBRIA	1	1	1	5	—	1,876	1,502	197	140
NORTH WEST OF IRELAND	1	1	1	—	—	500	500	82	82
OUSE	2	2	1	2	—	5,010	N/A	546	N/A
OXFORD	1	—	3	4	1	3,591	3,413	912	698
PERKINS SPORTS ASSOCIATION	1	1	2	—	—	900	850	150	150
PORTHCAWL	1	1	1	—	—	1,316	1,137	110	95
R.A.E. (CISAVIA)	1	—	3	1	—	2,391	2,239	510	432
R.P.E. (CISAVIA)	—	2	1	—	—	1,670	1,664	130	130
SCOTTISH GLIDING UNION	4	2	2	8	2	9,665	8,443	5,199	3,733
SOLENT	1	—	—	—	—	580	580	63	63
SOUTHDOWN	2	2	1	2	—	4,317	3,957	716	536
SOUTH WALES	2	1	—	4	—	1,414	1,335	198	150
STAFFORDSHIRE	2	2	1	2	1	4,626	4,297	811	653
SWINDON	1	1	2	3	—	3,716	3,309	740	536
TRENT VALLEY	1	1	2	—	—	4,011	2,648	313	155
ULSTER & SHORTS	2	1	2	—	—	2,505	2,505	384	384
UNIVERSITIES OF GLASGOW	1	1	1	—	—	913	913	75	75
UPWARD BOUND	4	1	—	—	—	2,277	2,271	147	147
WEST WALES	2	—	3	2	1	4,295	4,253	532	525
WORCESTERSHIRE	5	2	—	8	2	6,737	6,328	938	739
WYCOMBE AIR PARK	3	—	—	11	1	5,245	4,266	2,261	1,202
AIRWAYS	—	—	2	—	—	417	417	317	317
POST OFFICE (CISAVIA)	—	—	1	—	—	258	258	80	80
THAMES VALLEY	2	—	3	2	—	745	745	466	466
YORKSHIRE	2	2	—	4	1	6,072	3,510	3,620	1,520
CIVILIAN TOTAL	110	65	92	295	25	218,358	180,091	53,595	33,224

1st Oct. 1967 — 30th Sept. 1968

Flying days Total	soaring	Cross-country Total miles	By club gliders	Courses No.	Pupils	Certificates AB	C	BC	S c—l	G c—l	Membership Flying	Non-flying	Potential
24	8	—	—	—	—	1	3	5	—	—	29	20	100
120	40	100	100	—	—	7	5	2	—	—	176	30	
94	51	1,690	300	—	—	9	3	4	1—14	1—3	93	5	200
89	68	—	—	2	—	7	6	6	3	—	83	80	
225	138	3,642	58	18	144	15	10	10	8—25	—	188	38	350
57	31	104	—	1	—	6	2	2	1—2	—	56	4	100
162	103	5,507	697	10	38	8	4	7	6—20	—	170	21	210
		2,298	1,000	—	—	6	1	7	7—10	—	133	—	150
186	61	748	638	20	160	2	1	3	1—7	—	98	23	150
78	37	700	100	—	—	12	16	10	6—17	—5	68	10	200
180	76	5,350	350	18	112	15	4	4	3—1	—3	171	41	250
55	20	—	—	1	12	6	1	—	—	—	52	3	100
129	60	—	—	18	288	8	6	6	2—5	—	195	153	350
				8	64	17	4	7	2—7	—	126	14	250
165	76	784	369	10	60	17	3	2	3—10	—	136	53	150
		5,500	2,500	2	6	10	15	12	10—50	—5	46	22	150
101	48	N/A		—	—	14	—	5	6—5	—1	90	61	200
51	7			—	—	1	1	—	—	—	35	—	
116	32	850	150	—	—	11	7	7	6—11	—1	197	108	200
43	27			—	—	3	3	4	—2	—1	29	—	100
		—	—	—	—	—	—	2	—	—	47	12	
85	49	81	81	—	—	3	4	—	—5	—	37	—	45
206	41	2,246	200	25	264	4	4	9	3—14	1—1	150	52	200
87	33		120	4	32	5	2	—	3—3	—	50	10	100
295	80	30,860	N/A	67	288	45	20	10			285	98	300
100	35	700	700	2	16	5	—	6	7—19	—1	68	5	
50	20	170	170	—	—	—	—	—	—	—	35	25	
		N/A		—	—	—	—	1	4—	4—5	252		
89	42	3,601	190	—	—	9	1	4	2—1	2—3	66	5	100
36	15	355	—	—	—	7	6	6	—4	—	80	5	150
288	219	N/A		23	171	20	20	20			521	100	600
163	83	824	207	3	15	17	12	1	10—29	1—1	174	51	
89	48	500	—	3	30	3	4	2	1—3	—1	61	—	200
96	37	500	100	2	10	11	5	9	—5	—	75	11	120
87	40	165	5	—	—	4	2	2	3—4	—3	74	—	200
22	15	173	173	1	4	1	1	1	1—2	—	25	10	75
109	27	170	83	—	—	18	3	5	1—5	—1	137	5	160
92	40	650	74	—	—	8	9	2	—2	—	73	4	85
		50	50	—	—	3	1	—	1—1	—	47	—	50
51		—	—	—	—	5	—	—	—	—	38	—	50
89	39	497	291	—	—	5	6	2	3—10	—	80	5	150
61	11	—	—	—	—	3	4	—	—	—	45	1	80
266	179	3,350	1,830	18	146	23	3	3	4—20	—12	195	46	
											15		
93	33	104	82	3	—	10	3	2	2—7	—	114	52	
78	32	236		1	10	5	3	3	1—4	—2	53	10	100
123	53	N/A		1	20	21	6	3	1—5	—	108	—	250
111	61	3,900	1,750	—	—	10	7	8	3—7	—	85	2	100
79	22	—	—	—	—	11	1	8	—	—	60	46	
79	32	180	180	—	—	—	—	—	2—2	—	47	—	80
40	9	—	—	—	—	6	—	—	—1	—	51	1	100
52	17	—	—	15	51	27	4	1	—	—	N/A		
125	63	60	60	20	205	10	—	1	—2	—	80	—	
203	60	680	30	20	180	32	9	4	—6	—	168	98	250
160	64	1,200				20							
							6		11—	7—	200		
							1			2—	20		
							6	10	9—	4—	145	2	
	286	3,610	190	16	96	18	16	27	8—25	2—3	223	174	
		82,135	12,828	332	2,422						6,155	1,516	

ANNUAL STATISTICS FOR

Gliding Club	Aircraft Club 2-S	Sec	HP	PO	TUG	Launches On Club site	By Club gliders	Hours Total	Club gliders
A.G.A.									
Aldershot & District	1	1	2	—	—	1,903	1,897	211	211
Army Soaring Club	—	—	2	—	—	115	115	185	185
Southern Command	3	3	5	—	1	3,399	3,383	742	724
R.A.F.G.S.A.									
Anglia	2	1	1	—	—	2,499	2,499	322	322
Bannerdown	2	1	3	—	—	4,690	4,690	620	620
Bicester	6	2	8	—	2	21,796	21,796	5,707	5,707
Chilterns	2	1	2	1	—	3,623	3,609	674	666
Clevelands	2	3	3	1	—	11,267	11,267	1,918	1,918
East Midlands	3	—	3	2	—	6,150	6,070	1,230	1,195
Fenland	2	1	2	—	—	5,255	5,255	732	732
Four Counties	2	1	3	—	—	5,418	5,418	927	927
Humber	2	2	—	—	—	3,515	3,500	312	300
Mendips	1	1	1	—	—	4,366	4,366	531	531
Moonrakers	2	—	3	4	1	3,452	3,170	1,337	1,187
Wrekin	2	1	4	—	—	6,188	5,753	807	744
R.N.G.S.A.									
Condor	2	1	—	—	—	3,423	3,423	322	322
Culdrose	2	1	1	—	1	1,550	1,500	250	250
Fulmar	2	2	1	—	1	4,255	4,255	495	495
Heron	1	—	2	—	1	1,315	1,315	457	457
Portsmouth	1	1	2	1	1	2,326	2,278	357	316
Service Total	40	23	48	9	8	96,505	95,559	18,136	17,809
Service and Civilian Total	150	88	140	304	33	314,863	275,640	71,731	51,033
Overseas									
Eagle (Army, Germany)	2	1	2	—	—	2,866	2,659	575	575
Phoenix (RAF, Germany)	3	2	2	—	—	3,220	3,219	457	457
Two Rivers (RAF, Germany)	3	2	2	1	—	5,021	5,021	830	830
Crusaders (RAF, Cyprus)	2	1	1	—	—	5,266	5,266	915	915
Overseas Total	10	6	7	1	—	16,373	16,165	2,777	2,777
Air Training Corps (27 Schools and 2 Centres)	150	15				188,641	188,641		

Key to aircraft categories: 2S=two-seater; Sec.=Secondary; HP=high-performance; PO=privately owned; S=1st column completed Silver C's, 2nd column Silver C legs. G=1st column completed Gold C's, 2nd column Gold C legs. BC=Bronze C.

REBUILDING SLINGSBY'S

IN the short period of 25 days which have elapsed since the fire, we have made great progress to re-establishing ourselves—a completely new 30,000 sq. ft. building has been ordered for erection on the site of the old building lost in the fire. We have been fortunate in obtaining this on extremely short delivery and the contractors have promised that the building will be ready for our use by the end of February, 1969.

Work is progressing with all our employees back on the company on a 3 × 8-hour shift system, and jigs and tools lost in the fire are rapidly being replaced.

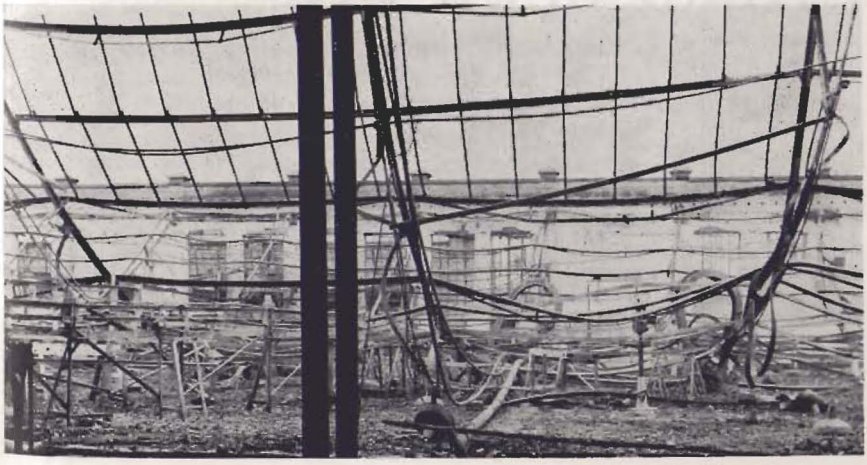
Every effort is being made to quickly replace our lost stocks of proprietary materials, and a total number of 4,670 different individual parts have been ordered, many of which have already been delivered to the company.

Additional to the proprietary parts which have been ordered we have finalised all our future requirements for

Photo opposite : *All that was left of the main glider workshop after the fire.*

1st Oct. 1967 — 30th Sept. 1968

Flying days		Cross-Country		Courses		Certificates					Membership		
Total	Soaring	Total miles	By club gliders	No.	Pupils	AB	C	BC	S c—l	G c—l	Flying	Non-flying	Potential
62	35	600	600	—	—	7	5	1	—3	—	72	18	100
—	—										32		
112	38	4,500	4,500	5	40	12	8	5	2—10	—3	60	80	200
											73		
											73		
239		20,237	20,237	14	225	47	23	52	8—41	4—7	200		250
130	30	2,260	2,260	cont	inuous	15	5	5	7	2	112		150
220	110	2,157	2,157	3	24	51	11	12	6—27	6	128		170
162	76	3,500	3,300	3	30	27	11	10	5—18	1—4	65		100
95	27	844	844	—	—	9	11	8	5—17	2—5	72		100
149	62	968	968	—	—	10	10	15	3—7	6	80		100
100		75	75	—	—				1—5	—	50		150
153	16	127	127	—	—	13	8	12	1—8	—	74		
110	80	5,856	5,606	—	—	9	7	5	5—12	2—6	105		150
200		455	455	—	—	20	5	9	1—11	1	134		
110	25	—	—	—	—	6	7	2	1—1	—	38		60
61	20	N/A									40		
113	36	30	30	2	20	15	6	3	4	—	69		100
60	32	4,470	4,470	—	—	4	4	5	9—27	—3	37		100
91	19	603	62	—	—	1	6	7	2—11	—	101	1	100
		46,682	45,691	27	339						1,575		
		128,817	58,519	359	2,761						7,730	1,618	
100		1,580	1,580	1	10	10	4	3	2—9	—1	36		50
78	35	2,000	2,000	—	—	12	10	9	3—8	—4	50	5	100
127	60	3,571	3,571	cont	inuous	23	14	6	2—12	—3	9	1	75
165	87	160	160	—	—	11	12	9	4—18	—	90		
		7,311	7,311	1	10	56	40	27	11—47	—8	185		
				cont	inuous	2,291	57	6					



equipment, and this, when delivered, will provide the company with a completely modern manufacturing facility, and will considerably improve the service and product we shall be providing.

In addition to work on the establishment of jigs, we have received a contract with Universal Pictures Ltd. for the production of one Sopwith Camel and two Rumplers, together with eight non-flying mock-up aircraft. This has been of considerable help to us in employing all our staff during the interim period before our main production is re-commenced.

Discussions have been held with the Board of Operation Sigma Limited, and the gliding world will be pleased to hear that this project is continuing. Every effort is being made to re-establish the prototype for flying in late 1969. In addition to losing the prototype itself, Operation Sigma also lost some 30% of their design data, but arrangements for additional staff are overcoming this problem.

As soon as work on the jigs and tooling has progressed a little further we shall be in a position to give new information on the delivery of our future products, but would refrain from commenting on this until we are in a position to offer firm delivery dates.

We have recently accepted delivery of a batch of trailers suitable for most modern high-performance gliders, and in view of our current production difficulties can now offer these for immediate sale from stock at an ex-works price of £330.

We would like to take this opportunity of thanking all our friends in the aviation world for their messages of sympathy and offers of help after our recent disaster, and will do our utmost to keep everyone informed of our progress towards re-establishment.

NEW RECORDS (subject homologation) set up in South Africa include a **World** Goal-and-Return of 784 km. by Bobby Clifford of South Africa flying a Libelle 15R on Jan. 1st. **British National Records:** 300-km. Triangle by Ted Pearson in Cirrus, at 104 km./hr. on Jan. 3rd. Alf Warminger and Richard Tucker in 2-32: 300-km. Triangle at 72.3 km./hr. on Dec. 29th.; and Goal-and-Return, 362 km. on Jan. 4th.

THREE COUNTIES AERO CLUB LTD.

Blackbushe Airport, Camberley, Surrey
(ON A30 TRUNK ROAD — 45 MINS. FROM LONDON)

Special Courses for Glider Pilots to obtain Private Pilot's Licence

Normal Courses for Private Pilot's Licence
Night Flying — Instrument Flying — R/T
Board of Trade Approved Courses 35 hours
Residential Courses available
Licensed Bar

C.F.I. Derek Johnson
YATELEY 3747 (Management) 2152 (Operations)



JONATHAN LIVINGSTON SEAGULL

FICTION

This article was recently voted the most popular story in "Soaring" for 1968. We feel sure that our readers who have already seen this article won't mind us reprinting it here so it may receive the deserved widest possible circulation in the gliding world.

By RICHARD BACH

IT was morning, and the early sun sparkled in the soft ripples of a placid sea. A mile from shore, a fishing boat chummed the water, and the word for Breakfast Flock flashed through the air until a crowd of a thousand seagulls came to scream and dodge and fight for bits of food. It was another busy day beginning.

But alone, off by himself, between boat and shore, Jonathan Livingston Seagull was practising. A hundred feet in the air, he lifted his beak, lowered his webbed feet, and strained to hold a steep-twisting camber through his wings. He slowed till the wind was barely a whisper in his face; the ocean stood still below him. His eyes were half closed in fierce concentration. He worked to force one single more degree of camber . . . then, abruptly, his wing feathers ruffled, he stalled and fell.

Seagulls, as you know, never stall. To stall is disgrace, and it is dishonour. But Jonathan Livingston Seagull, undismayed, stretching his wings again in that unnatural steep camber—slowing, slowing, and stalling once more—was no ordinary bird. Most gulls don't bother to learn more than the bare essentials of flight; how to get from shore to food and back again. For them, it is not the flying that matters, but food. For Jonathan Livingston Seagull, however, it was not the food that mattered, but flying.

This kind of thinking is not the way to make oneself popular with other birds. Even his parents were concerned when they found that Jonathan spent whole days alone, make hundreds of low-level glides, investigating T and ground-effect. (If one flies less than half one's wingspan from the water, he discovered, one can stay aloft much longer, and with much less power.)

His maximum-performance glides ended not in a normal feet-down splash in the sea, but in a long flat wake as he touched the surface with his feet retracted firmly in the minimum-drag position.

When he began sliding in to feet-up landings on the sand, his parents were very much concerned indeed.

"Why, son, why? Why can't you be like the rest of us? Why can't you leave the low flying to the pelican and the albatross? Why can't you be a normal, respected, well-fed seagull? Look at you—bone and feathers! Your youngest brother already outweighs you!"

"I don't mind being bone and feathers," he said, "I just want to know what I can do in the air and what I can't. I just like to know."

"Now look, Jonathan," his father said. "Winter isn't far away. Boats will be few, and the surface fish will be swimming deep. If you must study, study food and how to get it. This flying business is all very well, but don't you forget that the reason you fly is to get places, to find food."

Jonathan nodded obediently, and for the next days tried to behave like the

other seagulls, screeching and fighting with the flock around the pier and the fishing boats, diving on scraps of fish and bread. But he couldn't make it work.

It's all so pointless, he thought, deliberately dropping a hard-won anchovy to a hungry old gull chasing him. I could be spending all this time learning to fly . . . there is so much to learn!

It wasn't long before Jonathan Gull was off by himself again, far out at sea, hungry, happy, learning.

The subject was speed, and in one day's practice he learned more about speed than the fastest gull alive.

From a thousand feet, flapping at maximum power, he pushed over into an 80-degree dive towards the waves, and quickly knew why seagulls don't make 80-degree power-dives. It took just six seconds to go through 70-knots airspeed, and at 70 knots he found one's wing becomes very unstable on the upstroke. Time after time it happened. Careful as he was, working at the very peak of his ability, he lost control at high speed.

Climb to 1,000 feet. Full power. Push over, flapping to a vertical dive. Then, every time, his left wing would stall on the up-stroke, he'd roll violently left, stall his right wing in the recovery, and flick instantly into an inverted right snap roll.

He couldn't be careful enough on that up-stroke. He tried ten times, and all ten times, as he went through 70 knots, he turned into a wild churning ball of feathers, completely out of control, crashing down into the sea.

The key, he thought at last, dripping wet, must be to hold the wings still at high speeds . . . to flap up to 50 and then stabilise.

From 2,000 feet he tried again, rolling into the dive, beak straight down, wings full out and stable from the instant he passed 50 knots. It took tremendous strength, but it worked. His airspeed shot up past 80 knots, and Jonathan Gull had set a speed record for seagulls!

Victory, sad to say, was short-lived. The instant he began to pull out, the instant he changed the angle of his wings, he burst into that same wild left-right snap roll. At 80 knots, the force across his body was dynamite . . . Jonathan Seagull virtually exploded in mid-air and smashed down into the brick-hard sea.

He recovered consciousness well after dark, floating in moonlight on the surface of the ocean. His wings were leaden bars, but the weight of failure lay even heavier on his back. He wished feebly, that the weight could be just enough to drag him gently down to the bottom, and end it all.

While he sank down low in the water, a strange hollow voice sounded within him. There's no way around it. I am a seagull. I am limited by my nature. If I were meant to learn maximum performance, I'd have charts for brains. If I were meant to fly at such speeds, I'd have a falcon's short wings and live on mice instead of fish. I must forget all this foolishness. I must fly home and be content as a poor limited seagull.

The voice faded, and Jonathan agreed. The place for a seagull at night was on shore, and from this moment forth, he vowed, he would be a normal gull. It would make everyone happy.

He pushed wearily away from the dark water and flew towards the land, grateful for what he had learned about ground effect.

But no, he thought, I am done with the way I was; I am done with everything I learned. I am a seagull like every other seagull and I shall fly like one. Consequently, he climbed painfully to 70 feet altitude and flapped harder, pressing for shore.

He felt better for his decision to be just another one of the mediocre crowd. There would be no responsibility now to that force that drove him; there would be no more challenge. And it was pretty, just to stop thinking and fly through the dark toward the lights above the beach.

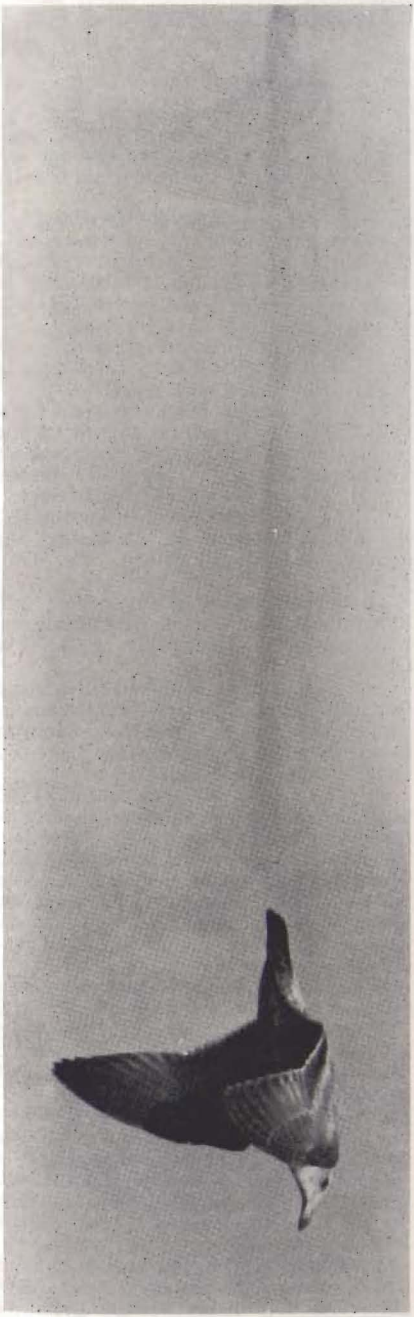
The dark! The hollow voice cracked in alarm. *Seagulls never fly in the dark*!

Jonathan was not alert to listen. It's pretty, he thought. The moon and the lights sparkling on the water, throwing out little beacon trails through the night, and all so peaceful and still . . .

Get down! *Seagulls never fly in the dark*! If you were meant to fly in the dark, you'd have the eyes of an owl! You'd have charts for brains! You'd have a falcon's short wings!

There in the night, 70 feet in the air, Jonathan Livingston Seagull blinked. His pains and his resolutions vanished.

The falcon's short wings! That was the



Seventy knots . . . 90 . . . 120.

answer for speed! What a fool I've been! All I need is a tiny little wing . . . all I need is to hold my main wing section inboard, fly on just the tips alone!

He shot to 2,000 feet above the black sea. Without a moment to think further, he brought his heavy forewings tightly into his body, left only the narrow, swept, wing tips extended, and rolled into a vertical dive.

The wind rose at once to a giant's roar about him. Seventy knots . . . 90 . . . 120 knots and still increasing. The strain at 130 knots with the swept wings wasn't nearly as bad as it had been at 70 with full wing extension, and with the faintest flick of those wing tips he eased out of the dive and shot above the waves, a grey cannonball in flight.

He closed his eyes to slits against the wind and rejoiced. One-hundred-and-thirty knots! And under control! If I made that dive from 5,000 feet instead of 2,000!

All the resolves, all the vows of a moment ago were forgotten, swept away by the wind, and he felt guiltless. Such resolves and such vows were necessary only for those gulls who accept mediocrity. One who has touched excellence through his learning has no need of excuses.

By sun-up, Jonathan Gull was practising again. From 5,000 feet the fishing boats were little specks in the flat, blue water; the other gulls were dustmotes, circling.

He ran through his pre-dive checklist, retracted his forewings, extended the slim swept tips, and without further ceremony plunged directly toward the sea.

By 4,000 feet he had reached terminal velocity, and the wind was a hard solid against which he could move no faster. He stabilised, straight down at 214 knots, knowing a trifle uneasily that if he extended his main wings at that speed he'd be torn to a million tiny shreds of seagull. But the speed was power and the speed was joy and the speed was very, very beautiful.

He began his pull-out at a thousand feet, wings retracted, tips blurring in the force of the air. The fishing boat and its crowd of gulls loomed suddenly and quite directly ahead. He couldn't stop. He had no idea how to turn at that

speed. Any collision would be instant death.

So that morning, just at sunrise, Jonathan Livingston Seagull shot precisely through the centre of the Breakfast Flock ticking off 195 knots, eyes closed, in a great roaring shriek of wind and feathers.

The Gull of Fortune smiled upon him this one time, and he missed them all.

By the time he had pulled his beak straight up, he was still blazing along at 160 knots, climbing 8,000 feet per minute. When he had slowed to 20 and extended his wings again, the fishing boat was a crumb on the water 4,000 feet below.

Terminal velocity! he thought. *Two hundred knots*! It was a breakthrough, the greatest moment in the history of his kind, and in that moment a new world opened for Jonathan Gull. Moving out to his lonely practice area, he set at once to master high-speed manoeuvring.

A single wing-tip feather, he found, moved a fraction of an inch gives a smooth sweeping curve at tremendous velocity. Before he learned this, though, he learned that more feathers moved at that speed yield a bullet-fast aileron roll . . . his first aerobatics and the first aerobatics of any seagull in history.

He spared no time that day for talk with other gulls, but flew on past sunset. He discovered the loop, the barrel roll, the point roll, the inverted spin, the Gull Bunt, the Pinwheel.

When he joined the Flock on the beach, it was full night. He was dizzy and terribly tired. Yet in his elation he flew a loop prior to landing, with a snap roll just before touchdown. When they hear of all this, he thought of the Breakthrough, they'll be wild with joy. How much more there is now to living! Instead of this drab beating back and forth to the fishing boats, now there can be a reason and a purpose to life . . . we can learn to *fly*! We can lift ourselves out of ignorance, we can find ourselves as creatures of excellence and intelligence and skill. We can be free!

The days ahead glowed white with promise.

The gulls were flocked into the Council Gathering when he landed and apparently had been so flocked for some time. They were, in fact, waiting.

"Jonathan Livingston Seagull . . . Stand to Centre," the Elder said. Jonathan was impressed and proud. Stand to Centre meant only great shame or great honour. Stand to Centre for Honour was the way the gulls' greatest leaders were marked.

Of course, he thought, the Breakfast Flock this morning; they saw the Breakthrough! But I wish no honours. I have no wish for leadership. I wish only to share what I've found, those far new horizons . . . He walked forward.

"Jonathan Livingston Seagull," said the Elder. "Stand to Centre for Shame in the sight of your fellow gulls!"

He was stunned. His knees went weak with shock. His feathers sagged to the sand. Centred for Shame! Impossible! The Breakthrough! They can't understand! They're wrong, they're wrong!

". . . for his reckless irresponsibility," the old voice went on, "upsetting the dignity and traditions of the Gull Family . . ."

To be Centred for Shame meant that he would be cast out of the gull society, banished to a solitary life in the Far Cliffs.

". . . one day, Jonathan Livingston Seagull, you shall learn that irresponsibility never pays. That the important thing is food, is eating to keep the body alive as long as possible."

A gull never speaks back to the Flock, but it was Jonathan's voice raised. "Irresponsibility, my brothers!" he cried. "Who is more responsible than the gull who finds and follows a higher purpose for our life? For a thousand years we have scrabbled after fish heads, and now we have a purpose. . . to learn, to discover, to be free!"

But the Flock might as well have been stone.

"The brotherhood is broken," the gulls intoned together, and with one accord, they solemnly closed their ears and turned their backs upon him.

Jonathan Livingston Seagull spurned the Far Cliffs, but he spent the rest of his days alone. His sadness, though, was not solitude, but that other gulls refused to believe the magic of flight that was waiting for them; they refused to open their eyes and see.

He learned more every day. He learned that a streamlined high-speed dive allowed him to catch the rare and tasty fish that schooled ten feet below the



surface of the ocean—he no longer needed fishing boats and stale bread. He learned to sleep in the air, setting a subconscious course at night across the offshore wind, covering up to 400 miles from sunset to sunrise. Using this same mental control, he learned to fly in the heavy sea fogs and to climb above them into a dazzling clear sky, when other gulls saw only mist and rain. He learned to ride the high winds far inland, to feast there on delicate insects.

What he had once wished for the Flock, he now accomplished for himself alone and was not sorry for the price he had paid.

Jonathan Gull discovered that the one reason for a gull's short life was boredom, and with boredom gone from his days, he lived a long fine life.

They came in the evening, after Jonathan had spent years in learning and in gliding alone through his beloved sky. The two gulls that appeared at his wings were white as starlight, and the light from them was soft and warm in the high night air. But most beautiful of all was the skill with which they flew, their wings-tips moving a precise and constant inch from his own.

Without saying a word, Jonathan put them to the Test, a test that no common gull had ever passed. He slowed to 1.01 stall. They slowed with him smoothly locked in position. He folded his wings with practised ease and dropped in a dive to 175 m.p.h. They dropped with him, blazing along in flawless formation. At last he turned that speed full up and into a long vertical slow roll . . . and the two gulls rolled with him, faintly smiling.

"Very well," he said, recovered to level flight, who are you?"

"We're from your flock, Jonathan. We are your brothers." The words were strong and calm. "We've come to take you higher, to take you home."

"Home I have none. Flock I have none . . . I must tell you that I am Out-

cast. And we fly now at the peak of the Great Mountain Wind. Beyond a few more hundred feet, I can lift this old body no higher."

"But you can, Jonathan; for you have learned. One school is finished, and it is time for another to begin."

As it had come to him all of his life, so understanding came that moment to Jonathan Seagull. They were right. He could fly higher, and it was time to go home.

He gave one last, long look across the sky, across that magnificent silver school where he had learned so much.

"I'm ready," he said at last.

And Jonathan Livingston Seagull rose with the two star-bright gulls to disappear in a perfect dark sky.

Reprinted by courtesy of "Soaring".

2-1-0 SCORING

By JACK HARRISON

THE task is a 100 km. out-and-return. Unfortunately, the weather goes wrong, and the headwind on the first leg is 25 knots instead of the expected 10 knots. Ten competitors set off. Five reach the turning point and are then, of course, home and dry. The other five cannot make it to the turning point in such a strong headwind. Let us look at how such a task would be scored; on the current BGA system, on Wallington (and new Wally—*S. & G.*, Aug.-Sept., 1968), and on a proposed system (2-1-0 scoring).

Pilot	Speed/Dist. km./h. kms.	BGA Pts.	Wally	New Wally	2-1-0
A	40	1000	1	100	18
B	38	952	2	98	16
C	36	905	3	96	14
D	34	861	4	94	12
E	32	820	5	92	10
F	48	175	6	90	8
G	45	160	7	88	6
H	42	145	8	86	4
I	39	130	9	84	2
J	36	115	10	82	0

Where X=20 km.

Clearly, on such an unfortunate task (but they do occur), pilot E has, in reality, only done a little better than F. But just look how unfair the BGA system is on F, and all the others who do not make the turning point. True E has done better than F, but surely not 4½ times as well?

Wally can be seen to be much fairer in these circumstances. But what is this 2-1-0?

2-1-0

Quite simply, 2 points are awarded for each competitor beaten, 1 point for each competitor tied with, and, of course, 0 points for everyone else. The criterion for ties is defined, e.g., 1 km./h. for speed, 2 km. for distance. So, in the above example, A has beaten nine others, tied with no one, so scores 18 points; and so on for B, C, etc.

What, then, are the advantages of 2-1-0 over Wallington, to which at first sight it appears identical?

Advantages of 2-1-0

Wally, in all its variations, is quite inadequate in dealing with ties, and closely similar performances. The following example will show how greatly superior 2-1-0 is in this respect.

Three competitors only! Tie criterion 1 km./h.

Pilot	Speed	Wally	2-1-0
A	50	100	3
B	49	100	2
C	48	97	1

Or the following more complex example with ten pilots.

Pilot	Speed	Wally	2-1-0
A	50	100	16
B	49.5	100	15
C	49	100	14
D	48.5	94	12
E	48	94	11
F	47.5	94	10
G	43	90	6
H	41	88	4
I	39	85	1
J	38	85	1

Again, 2-1-0 gives a result similar to that obtained on the placing system, but look how much better it reflects the relative performances of A, B and C. And also, how it avoids the enormous jump in points between D and C.

2-1-0 in Practice

Handicapping.—Handicap speeds and distances are worked out before comparing performances.

Day devaluation.—All those not reaching a predeclared minimum distance (e.g., 40 km.) are considered as one pilot. So, ten competitors, four do not reach the minimum distance (difficult day). Thus winner is considered to have beaten six only, so scores only 12 points (assuming no ties) instead of the 18 he would have scored on a normal, full points day.

So all we need to do is to declare the task, the minimum scoring distance, the criterion for ties, and any Joe Bloggs can work out the scores at the end of the day.

Conclusion

2-1-0 is based on the sound concept that in general it is only possible to say that pilot A has beaten pilot B, but that it is not possible to say by how much (as current systems attempt to do).

Another important principle behind 2-1-0 is that an individual pilot's score is based on his achievement relative to the achievements of every other competing pilot, and not solely on the achievement of one pilot only (i.e., the fastest or furthest). Other advantages of 2-1-0 are listed below.

1. Simplicity.
2. All the advantages of placing systems are preserved.
3. *Every* competitor's performance influences the scores, not just one pilot.
4. The full range of points, from 0 to daily maximum, is used and scores are not crowded in top half as frequently happens at present.
5. Winner gets biggest numerical scores (advantage over original Wally).
6. Similar performances are adequately dealt with.
7. The present anomaly of the "step" in points between the slowest finisher and the furthest non-finisher is avoided.
8. Handicapping is easy to apply.
9. Automatic devaluation occurs when fewer pilots compete (e.g., withdrawn after prang). Surely it is a lesser achievement to beat fewer pilots?
10. A score is a meaningful number (e.g., a score of 20 means a pilot has, in fact, beaten ten others).

(An interesting variation of 2-1-0 might be to use +1, 0 and −1. Scores have an even more obvious interpretation.)

2-1-0 is not an original idea. I must give credit to a non-gliding friend, Mont Forman, for suggesting it to me, but it has, of course, been in use for years in football tables, Bridge scoring, etc. I am not claiming it will give perfect results. But who would be brave enough to claim that the present system gives perfect results? 2-1-0 should give sufficiently similar results to satisfy most people. Perhaps the acid test of any system is "Would I be prepared to fly in a competition using the system?" I would not be happy with a normal placing system, but I would be with 2-1-0.

So let us give it a try for a season, working it in parallel with the conventional system. I am firmly convinced that we would have the same National Champions, same Regional winners and everyone would be just as contented.

NEW BOOKS FOR GLIDER PILOTS

Now available from the British Gliding Association, Artillery Mansions, 75 Victoria Street, London S.W.1.

"FLYING TRAINING IN GLIDERS"

by Ann & Lorne Welch — Revised fifth edition

This manual is a guide to basic instruction, a training manual for the pilot learning to be an instructor and as a reminder of the principles and methods involved.

Price, including p & p **17s. 6d.**

"NEW SOARING PILOT"

by Ann & Lorne Welch & Frank Irving

The authors have incorporated all the latest developments both in craft and techniques in this second edition.

Price, including p & p **£2 14s.**

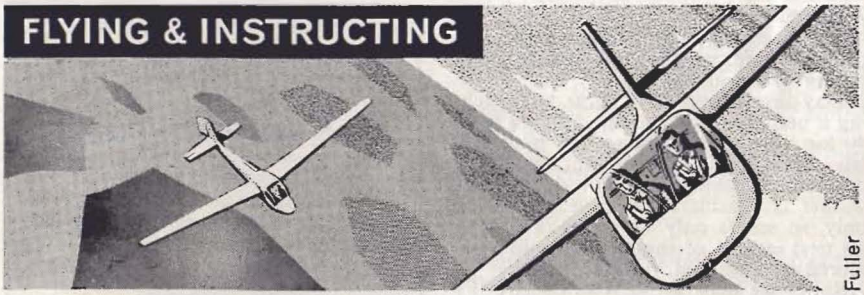
FEBRUARY SALE!

1969 GLIDING DIARIES

9/- *REDUCED TO* **6/-** *POST FREE!!*

Order direct from the
British Gliding Association Office.

FLYING & INSTRUCTING



How to pass a Rating Test by really trying

MEMBERS of the Instructors' Panel are finding widely varying standards when examining candidates for Full Ratings. The main problem appears to be ignorance of the degree of knowledge required. This is not altogether surprising, because nowhere is there written down a full explanation of what is involved. The syllabus is plain for all to see in the Instructors Record, but the standard to be achieved is a very different kettle of fish. The following is an attempt to rectify this situation.

The Aim

The aim of the test is to establish the candidate's flying, instructional and leadership ability, and his depth of theoretical and practical knowledge.

The Examiner

Examiners are practising instructors and volunteer for this task. They perform a vital (and unpaid) function in the task of keeping flying standards at the level where Ministerial comment is kept to a minimum. While the test is a check in the full sense of the word, examiners —contrary to popular belief—are human and try to help the candidate as much as possible. However, there is a limit, and excessive prompting may well lead to failure.

Theoretical Knowledge

The candidate must possess sufficient knowledge to be able to answer authoritatively the sort of questions likely to be asked not only by pupils but by more advanced pilots. They should be capable of helping instructors less experienced than themselves. It follows that candidates should have a sound knowledge of theoretical subjects applicable to gliding and not be just "one page ahead" of their pupils. The following paragraphs give the amount of knowledge required.

Principles of Flight

How a glider flies: the relationship between lift, drag and the glide angle. How lift is produced: lift coefficient (C_L) and changes with angle of attack. Stalling and spinning. The different types of drag, how they vary with speed and angle of attack. Modern Aerofoils, laminar flow. Maneouvres and the forces involved in turns, aerobatics, launches, etc. Ancillary controls: flaps and their uses, tabs, brakes and spoilers.

Meteorology

Synoptic charts: wind, pressure and isobars. Basic frontal theory: ability to draw plan and cross-sectional views of fronts and occlusions. Vertical stability: lapse rates, thermal formation, inversions. Cloud types: thunderstorms, icing, precipitation. Ground effects such as hill lifts, waves, etc. Elementary practical forecasting from newspaper weather maps.

Cross-Country Flying

Basic navigation: triangles of velocity, compass errors, variation and deviation, mental dead-reckoning, map reading—height presentation and conventional signs. Field selection and approach planning, post landing procedures.

Maintenance

Teaching a DI: basic glider construction, instruments ancillaries (release

hooks, brakes, etc.). Cockpit placards: weight and ballast.

Air Law

BGA paper to be completed.

Form of Theoretical Test

It will clearly not be possible to examine the candidate on every subject listed above. The examiner will ask questions on a range of items and will probably probe deeply if a basic deficiency is shown up.

Candidates will also be asked to give short lectures on an examiner selected subject.

It is strongly recommended that candidates try to be brief and to the point. The use of diagrams is particularly important and it is well worth while memorising simple line drawings for illustrating basic arguments. The examiners have seen it all before and are far more likely to be impressed by a few words explaining a diagram than by ten minutes of waffle.

The Flying Test

The examiner will wish to have at least three launches with the candidate, one of which will be by aero-tow, if available. The types of flights will be approximately as follows:

Pilot Ability: One flight will be devoted almost entirely to the candidate's own flying ability, as opposed to instructional evaluation. The aim is smooth, accurate and relaxed flying. The candidate will be asked to perform a few simple manoeuvres such as turn reversals, flying at different speeds, stalls, steep turns and continuous thermal turns. Speeds to fly will be laid down and must be adhered to. "Emergency" situations may very well be attempted during this flight which will be followed by a spot landing. The examiner will assess general airmanship, lookout, planning and safety precautions, etc.

Instructional Technique: The candidate will be required to demonstrate his ability to teach selected basic and advanced exercises. Points to watch are: convincing demonstrations with clear patter synchronised with the glider's movements, audibility and lack of tension in the voice, airmanship considerations and brevity. The examiner will fly in imitation of a pupil to assess the candidate's ability to detect and correct faults. He will also note any tendency to interfere with the controls, which is a certain fail point.

Briefing and De-briefing: will be carried out by the candidate at the appropriate times. Again, clarity and brevity are the main considerations. On the de-briefings, particular attention should be paid to covering *all* the faults. To make it easier for himself, the candidate should deal with the flight in the sequence in which it has been flown. There is no objection to note-making during the flight on a knee-pad or something similar.

Further Hints: Most candidates are somewhat reluctant to try to teach a person who, he knows, has far more experience than himself. There is also the problem of "Checkitis" which in some cases reduces the performance of the examinee to a marked extent. Examiners are aware of these things and will do their best to make appropriate allowances. However, if the candidate is so diffident that he cannot put himself over at all he must expect to be penalised.

Because the flying time is invariably limited, several unconnected exercises will be attempted on each flight. For example, a candidate may well find himself teaching the launch, effects of controls, slow flying, steep turns and the approach and landing, all in one flight. Again, examiners will appreciate the unreality of this and make allowances.

It is vitally important that, before a flight takes place, the candidate is absolutely certain he knows what is expected of him. He must *ask* if he is unsure, it being too late to make excuses afterwards.

Failures

If a candidate does not reach the required standard he will be informed on the spot and the fail points discussed with him. A Full Rating lasts for a lifetime, if kept current, and examiners have a great responsibility to the gliding movement in this respect. Candidates who are only just below standard may be required to have a re-test, within a few weeks, on the subjects in which they failed.

A complete failure is, naturally, disappointing, but will normally be due to the candidate's lack of basic ability. A Fully Rated instructor is in a position of considerable responsibility and he can have an effect on large numbers of pilots. He will be working for a club taking money from the innocent public in return for learning to fly. They deserve the best.

* * *

INSTRUCTOR CHECKS

A RECENT accident report has shown up a deficiency with regard to the checking of instructors and it prompts me to wonder how many CFI's appreciate the necessity of flying with their instructors from time to time. I'm sure that many do, but the evidence is that there are some who do not.

At the moment, there is no rule that requires any flight checks for instructors after their acceptance for the Assistant Rating, with the exception of the Full Rating Test. It is therefore up to CFI's to make sure that all their instructors are teaching the right things and are not developing any bad habits.

I appreciate that two-seater launches are limited at some clubs, but CFI's must be adamant in their demands for launches to be made available for instructor checking, standardisation and advanced training. It is surely not too difficult to convince club members that a few less launches today could mean better instruction tomorrow, not to mention the chances of keeping gliders out of the hands of the repair organisations.

When fatal accidents happen, all sorts of questions get asked and I would strongly recommend CFI's to take a long hard look at their own houses. Could *YOU* stand up in a Coroner's Court with a clear conscience?

R. A. NEAVES

A GOOD SEA BREEZE DAY

By JOHN E. SIMPSON

The glorious gliding 9th of June ("Brennig's Day", or "Day of Days") was also an excellent day for sea breezes.

Sea-breeze fronts moved inland an exceptional distance from the East and South Coasts of England, but interfered very little with the big soaring flights. It is worth while examining their timing and activity; perhaps if we ever have another Day like this, instead of merely avoiding these fronts we might put them to better use.

Weather Situation

On 9th June a trough of low pressure had cleared the country during the previous evening, and the anticyclone which had been moving steadily north-east remained slow-moving over the British Isles. Weak frontal systems affected the extreme north of Scotland. Broken layer cloud lay over the north of England, but over most of the southern part of the country there were 10 to 13 hours of sunshine. Winds were light, the strongest being the sea breezes.

Form of the Front

Sea-breeze fronts were well established by midday, and during the afternoon both Harry Howitt and Henry Mackinnon made photographic sorties in the R.F.4. Fig. 1 shows a view of the front from the air near Selborne, 8 miles SE of Lasham, at 2.15 p.m. (All times will be given in B.S.T.) Fingers of hazy sea-air extended forwards, spaced about $\frac{1}{4}$-$\frac{1}{2}$ mile apart, and curtain clouds at 1,500 feet, well below cumulus cloudbase.

Between Lasham and Basingstoke at



Fig. 1. Sea-breeze front near Selborne, 9th June, 1968 (photo: Harry Howitt).

about 6 p.m., when Harry took his hundredth photograph of the day, the cloud forms were rather different, with three layers of cloud visible in patches. (See Fig. 2.)

Advance from South Coast

The sea breeze began to blow fitfully at Thorney Island as early as 10 a.m., and was well established by 10.45. It continued to blow steadily all day at 10 knots from 200°, dying away at about 9 p.m.

At Lasham, where there was a light drift from N or NE, sea-breeze clouds could be seen to the south by 1 p.m. At this time the front had already passed the South Downs, but was moving very slowly, only at 2 or 3 knots. It passed Lasham at 5.10 p.m., fairly packed full with gliders local-soaring (not to mention about 100 swifts and Harry Howitt in the R.F.4).

The front passed S. Farnborough at 6.05 p.m., where members of the RAE Club noticed the wind-shift, but from the Met. records it does not seem to have been quite so vigorous there.

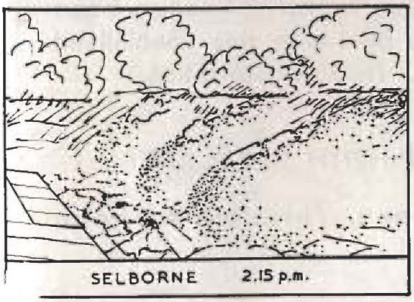


Fig. 1a

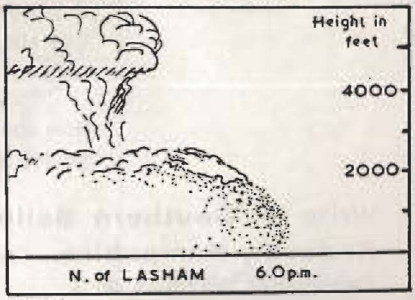


Fig. 2



Harro Wödl, the present world champion in soaring flight, mentioned about his sailplane "CIRRUS":

"I consider the CIRRUS to be the only sailplane which enables me to get the optimum performance in all weather conditions."

An approved type certificate has now been issued for the CIRRUS by the German F.A.A.

SCHEMPP-HIRTH, K.G.
7312 KIRCHHEIM-TECK, WEST GERMANY

SOUTHERN SAILPLANES

Repairs to all types of sailplanes
Modifications — C's of A

A glass-fibre workshop has now been set up to deal with this specialised side of our repair organisation.

Sole agents for:
SCHEMPP-HIRTH SAILPLANES

Write to: **Southern Sailplanes, Thruxton Airfield, Andover, Hampshire.**
Telephone: WEYHILL 373

The front was by then moving faster, and reached Reading still in good shape at 8.40 p.m. This was one of the rare days when the front was still active north of Reading; it was just traceable at Abingdon and Amersham an hour after sunset. At AERE, Harwell, the wind trace at 9.20 p.m. (time of sunset) was very similar to that of Lasham, and with such a sharp front advancing at 7 knots it must have still been highly soarable. The front appears to have passed Booker at about the same time.

Advance from East Coast

(i) Essex and Suffolk.

I have little information from glider pilots in this area, but, thanks to the assistance of the Meteorological Office, the story was not hard to read from records of wind, temperature and humidity.

The sea breeze was a little later in starting, but it then advanced quicker than from the south, Stansted was passed by 6.15 p.m. and the trace from Mildenhall at 8.05 p.m. was as vigorous as one could wish from a soarable front. Soon after this it must have passed Cambridge.

(ii) Lincolnshire and Yorkshire.

Sea breezes were blowing here by midday, and the greatest progress inland was made north of the Humber. The front had passed Sutton Bank by 4 p.m. (Wilson, S. & G. Oct.-Nov. 1968.)

Gliding Flights of the Day

Fig. 3 shows some of the notable flights of the day, together with the winds and positions of the fronts at 7 p.m. (Apologies to those missed out!)

Brennig James's flight has already been described in S. & G. (Aug.-Sept. 1968); he was always clear of sea-air, and on this day the front never managed to penetrate as far as Cranwell.

Those setting out on the big triangle at the Dunstable Regionals had reason to beware of the sea breeze, and Harry

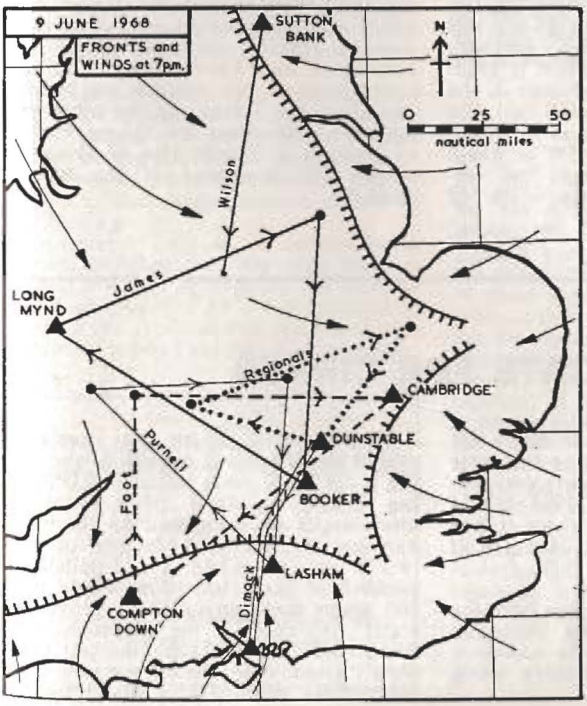


Fig. 3. Flights and fronts and winds on 9th June, 1968.

Douglas had warned them of the possibility of a front at Ely by 5 p.m. Although no one had sea breeze trouble on this route, it is worth reporting that the front did reach Ely, but not until 8 p.m.

Alan Purnell on his final glide met the sea-breeze front 5 miles from Lasham, but it was not in time to cut him off from a successful 400-km. triangle.

The saddest story of the day is that of Ray Foot, who very nearly succeeded in completing a 500-km. triangle in his Skylark 3, from Compton Down, Worcester, Cambridge. The first part of his flight was fast, and he had reached Cambridge by 4 p.m. This last climb was from 500 ft. to 6,000 ft. a.s.l., clear of cloud in a thermal near Newbury at about 6 p.m. He then glided it out to Boscombe Down; he saw no sea-breeze front, only some decaying cumulus in a line roughly N-S, but he landed many miles south of its general line. Perhaps the front was not active in this area, although it had given a strong record much earlier at Porton at 4.15 p.m.

Finally, the greatest puzzle of the day was an amazing flight by Humphry Dimock in his Diamant. He flew to Dunstable and landed there, and later in the day he soared back to Lee-on-Solent. His last proper thermal climb was to cloudbase at 6,000 ft. four miles SW of Reading, and at 6.40 p.m., when the sea-breeze front was 10 miles north of Lasham, he was a few miles south of this airfield at 5,000 feet. He then flew straight to Lee-on-Solent, where he arrived at 4,750 feet without having circled at all, claiming "sea-breeze fronts all the way".

This extraordinary flight doesn't fit into the normal sea breeze theory, and it needs more explanation than just the unaided magic of Dimock+Diamant.

My only suggestion so far is based on what is known to happen at certain islands in the Pacific. Two conflicting sea-breeze winds may meet in the late afternoon, giving a convergence line lying down the middle of the island and parallel to the general wind flow. This line can extend well out to sea off the leeward coast, and is sometimes marked by clouds downwind of the island.

Ten miles diameter seems to be the lower limit for an island to produce any sea-breeze effect, so the Isle of Wight is big enough, and you can read in Alan Watts admirable book "Wind and Sailing Boats" how the sea-breeze effect makes the wind blow round the Island. Certainly wind observations at Calshot often show a marked difference from both Lymington and Lee-on-Solent. Can the convergence of two separate sea breezes, one along the Solent and the other past Spithead, sometimes be strong enough to produce a 20-mile line of Diamant-worthy lift downwind of the Isle of Wight?

TYPE CERTIFICATE FOR CIRRUS

THE Cirrus has now been flying for almost two years. During this time it has been successful in many competitions, particularly in the 1968 World Championships in Poland where it was flown by the winning pilot. However, it was not until November, 1968, that it received its full certification.

The reason for this delay has been the thorough testing of the ship, especially of the wing with its hitherto unknown glass-fibre sandwich construction using foam cores instead of balsa.

Very extensive fatigue tests were conducted under loading conditions simulating a life of 30 years (equal to 9,000 flying hours). A total of 6.5 million stress cycles were imposed on the wing, running through load factors of n= +5.75 to n=−3.45 ("g" units). A number of these tests were made with full water tanks in order to prove the water resistance of the sandwich shell from which the tanks on the test wing were formed. After the fatigue tests were successfully concluded, a static test at

high temperatures of up to 54°C (129° F) was carried out under ultimate design load conditions corresponding to encountering a gust at a speed of 225 km/h. (about 140 m.p.h.) in order to show compliance with the requirements of the "Luftfahrt-Bundesamt" (German Airworthiness Authority). The wing resisted without showing any sign of fatigue. The applied ultimate load could have been considerably increased.

The static tests carried out on the fuselage also showed satisfying results. Consequently, the Luftfahrt-Bundesamt accepted proof of compliance and issued a Type Certificate.

One might say that the Cirrus can be regarded as the sailplane which has to date been tested under the severest conditions. The glass-fibre/foam sandwich construction will doubtless become significant from now on in the advanced design of sailplanes.

About 40 Cirrus were built before certification—enough ships and time to gather experience, especially in competitions under severest flying conditions. This was of benefit to the Cirrus and has resulted in a number of improvements, viz:

The rudder now has a dynamic mass balance to overcome the flutter tendency which became obvious on Harro Woedl's Cirrus during the World Championships in Poland. In addition, a damper was installed in the rudder control system of the fuselage.

In order to increase the control forces a small amount (i.e., the stick reaction forces) the trailing edge of the elevator has been extended by a few millimetres keeping the upper surface plane and thus obtaining a small camber of the chord.





A Cirrus over the Dorest countryside.

The paint used on five of the sailplanes was stated by the supplier to be weatherproof. In fact it turned out to be non-moisture-resistant. This defect showed on Woedl's Cirrus during the training week in Poland. The surface of the wings and fuselage showed a number of small blisters which were removed by rubbing down and respraying. By knowing the reason for this phenomenon, the material and methods have been improved, resulting in the present high standard of finish.

Also a number of minor modifications have been incorporated which improve the comfort and safety of the pilot.

Due to the high rate of progress in sailplane design, it is important that knowledge gained should be applied immediately. This we are doing and it has enabled the Cirrus production to reach its present high degree of quality and the Standard Cirrus has also undoubtedly benefited from this.

KLAUS HOLIGHAUS

SAFETY PANEL REPORT

Panel Members: J. J. Ellis (Chairman), E. J. Meddings, R. A. Neaves, R. C. Stafford Allen.

ONE-HUNDRED-AND-FOUR accidents or incidents have been reported by BGA Clubs in the period October, 1967, to September, 1968. It is very difficult to make a full comparison with last year, firstly because the last report covered a nine-month period only, and secondly because of the early AGM, which requires me to write this report before the annual club statistics are available. Empirically speaking, it would appear that this full year must be an improvement on last year's nine-months, when 106 reports were received. This statement assumes, of course, that the upward trend in numbers of hours and launches has continued, in spite of the poor climate, both meteorological and financial.

Five pilots from BGA clubs and one from the RAFGSA have been killed, four of these six tragic but unnecessary fatalities were caused by inadvertent spins set up for varying reasons. Of the remaining two, one was caused by a mis-rig and the other by an inexperienced but over-confident pilot attempting to land his glider in an unsuitable area.

Previous reports have shown diagrams relating numbers of accidents to the experience of the pilots. This year's diagram is shown in Table 1 (with last year's figures in brackets).

N.B.—The totals shown do not add up to the total number of accidents, as in some cases the P.1. experience has no relevance.

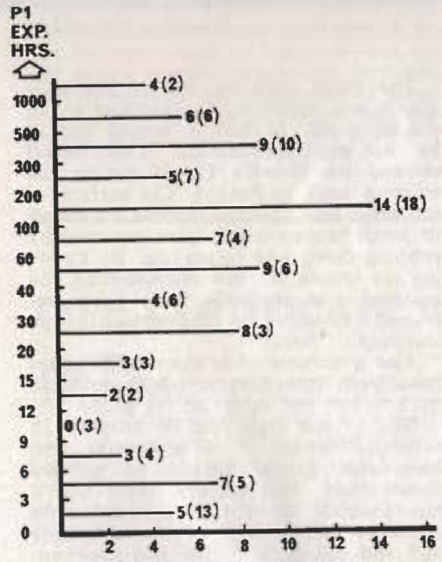


Table 1 (1967 figures in brackets)

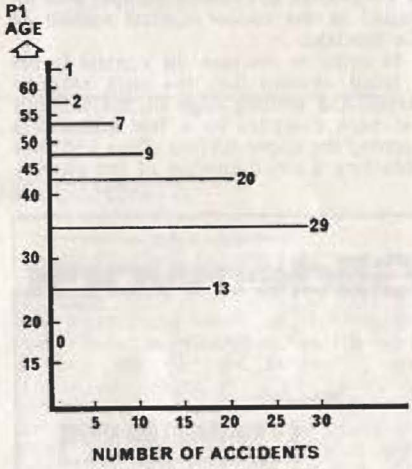


Table 3

From this Table it would appear that Instructors' efforts are now really beginning to show results. There is a clear drop in the accidents to very early solo pilots, and the "10-hour period", which has caused concern in past years, shows for the first time no accidents at all.

While the Safety Panel would like to congratulate Instructors on this improvement, it must be remembered that, statistically speaking, we are dealing with very small numbers, and a favourable trend cannot really be said to have been established on the basis of this one year alone.

The "150-hour bulge", which appeared last year, continues to be apparent, producing again the largest number of accidents. The pattern of the accidents is not quite the same as last year but is shown in Table 2.

Table 2 — Breakdown of accidents to pilots with between 100 and 200 hours P.1 (I=Instructor I/C)

		Type
1.	Instructor mutual flying, confusion as to who was flying, final turn too low (I).	T-49
2.	Heavyish field landing, starboard spar failed at tip attachment.	Skylark 4
3.	Instructor U/T opened brakes fully after low speed cable break (I).	T-49
4.	Hung on to hill lift too long. Spun in off slow turn. Killed.	Dart 15
5.	Wings folded at 500 ft. on winch launch. Faulty rigging. Killed.	SHK
6.	Comp. field landing. Field not as flat as thought. Heavy landing.	Dart 17R
7.	Comp. field landing. Landed downhill hit hedge at far end.	Ka-6CR
8.	Comp. field landing. Collided with running cow and ground looped.	Olympia 2B
9.	Cross-country field landing. Landed on rough ground and intentionally ground looped to avoid still rougher ground.	Dart 15
10.	Poor circuit planning after low launch, cross-wind landing, hit parked glider.	Olympia 463
11.	Landed on rock hidden in runway infilling. Pilot not at fault (I).	T-21B
12.	Comp. field landing. Field selected on other side of hill into a wind of 15-20 kts. Aimed to clear hill by 50-100 ft. Didn't.	Skylark 4
13.	Comp. field landing. Hit trees on near boundary of selected field in very heavy sink.	Skylark 2
14.	Circuit instruction. Too far back, landed out in turbulence behind colliery tip (I).	T-49

A disturbing feature is that exactly half of these accidents have been to pilots landing in fields. Further, and even more disturbing, five of these have been to pilots flying in competitions. Analysis of the total 104 accidents shows that there have been 24 cross-country field landing accidents, or very nearly one quarter of the total; 12 of them to competition standard pilots. In addition to these 24, a further 9 field landing accidents have occurred, basically through non-Bronze C pilots attempting to soar too far from their base airfield and not having the experience or knowledge to make a success of the inevitable. Taking the competition pilots first, it is difficult to know how this record can be improved. The majority of competition pilots do not have field landing accidents; their press-on spirit is tempered by the knowledge that if they have an accident the damage

not only costs them money but loses them the chance to further compete in that competition. Now that clubs are re-equipping with more advanced two-seaters in increasing numbers, Instructors have a real opportunity to improve the standards of their slightly less experienced pilots by indulging in dual cross-country flying at every opportunity. It is felt that the British Gliding movement has not yet woken up in this respect.

The remaining accidents of this class (failing to reach the airfield) come back to a question of supervision and briefing. Pre-Bronze C pilots are not usually briefed for field landings and therefore cannot be expected to make a good job of an inadvertent outlanding. Some clubs institute severe penalties for these, the Safety Panel do not consider this a good idea, in that a pilot, knowing that he can expect to be grounded or whatever, might be tempted to stretch marginal glides with even worse results. It is thought better to try and avoid them by proper briefing, and the avoidance of early soaring flights in conditions of bad visibility and strong winds.

The launch failure accident has reappeared in force. Three of these have been caused by straight breaks at low altitude, but most of the remainder have been due to pilots making slow or incorrect decisions during failure launches. In general, the instruction and briefing for straight breaks is very good, but Instructors do not seem, as yet, to realise the necessity to properly consider all the other launch emergencies in their training programmes.

The Swallow has been something of a problem child in past years. This has not been true in the period under review. While there have been Swallow accidents, they have been for a variety of reasons, and in most cases, it cannot be said that they are due specifically to the aircraft characteristics. However, the "conversion" problem remains, and it must be repeated here that clubs with only spoilered

SPEEDWELL SAILPLANES

SHEPLEY LANE,
HAWK GREEN,
MARPLE,
CHESHIRE.
Postcode: SK6 7JW

Telephone: 061-427 2488

You may think from our recent adverts that we only make the best trailers available today. Well, we do, but we are also the largest firm devoted to Glider and Light Aircraft repair and overhauls in the North and Midlands.

Reasonable prices, Efficient Service, and first class work.

two-seaters must take great care when converting pilots to air-braked single-seaters.

On the subject of conversions, Instructors should not make the mistake of thinking that they know it all. They should keep themselves in practise on all the club gliders, even the most humble, so that they can brief from recent knowledge. Similarly, when a club buys a new type of two-seater, Instructors should be sure to familiarise themselves fully on the type before using it for instruction.

It has been suggested that age may have a bearing on accident potentiality. Purely for information, Table 3 relates numbers of accidents to pilots' ages. It is felt that the theory is not proven, and that all the Table indicates is the relative age groups involved in gliding. (See page 52 for Table 3.)

There have been two near misses and one collision in competition cloud flying. In two cases, the gliders involved have been on different radio frequencies, and in the other there may have been a procedural misunderstanding over radio. This would appear to be an administrative problem which it is hoped will have resolved before the 1969 competition season starts.

Technical causes of accidents or incidents remain few, which once again reflects credit on the BGA Inspection and Maintenance system. The few technical accidents are mainly confined to undercarriage failures and the, by now "famous", Skylark tip incident. However, a potential cause of accidents has been the excessively large number of launching "linked ring" failures. Due to the vigilance of clubs, an oval or collapsed ring has only caused one accident; however, the Panel expects more if the standard of these rings cannot be improved.

Remaining accidents follow the well-worn pattern and a General Analysis is shown in Table 4.

Table 4 — General Accident Analysis

1.	Pilot not to blame	16
2.	Competition field landings	12
3.	Non-competition, cross-country, field landings	12
4.	Field landings outside airfield	9
5.	Instructors instructing	8
6.	Failure to recover from launch failures (excluding instructors)	11
7.	Poor judgement during approach on landing (excluding instructors or field landings)	16
8.	Airbrakes opened inadvertently	5
9.	Tow ropes or cables fouling	6
10.	Mis-rigging	1
11.	Miscellaneous—ground handling, mid-air collision, tug accidents, etc.	8
	Total	104

The basis for accident reporting within the BGA is different from that of the Board of Trade, who are, from a data collection point of view, only concerned with "substantial" damage or "severe" injury. The BGA expects reports on all accidents and incidents to BGA gliders or from BGA sites and, to date, all reports received have been included as an annual, total number, of accidents.

It is thought that this practice may be giving a false picture of the true situation, and in any case probably discourages clubs from reporting incidents. Therefore,

as from the next review, incidents will be shown separately. For this year, Table 5 gives an idea of the recent situation.

Table 5

	1967 (9 months)	1968
Substantial damage	43	52
Minor damage	49	38
Incidents	14	14
Fatalities (BGA)	6	5
Fatalities (RAFGSA)	1	1
Severe injuries	4	5

It should be emphasised that all the annual reviews are based on reports actually received by the BGA. In the vast majority of cases, Clubs, CFIs and Safety Officers are most meticulous and can only be congratulated. However, the Panel is aware that some accidents are not reported, and can only assume that there are a few Clubs and some individuals that are not interested in Safety, or cannot spare the time to fill out the reporting form.

For the future, there is a revised reporting form which, it is hoped, will make the task a little easier. The Panel will continue to liaise closely with the Instructors' Panel, the Technical Committee and the National Coach. Quarterly (approx.) reports will continue to be given in the "Instructor" magazine, which has proved the best medium available for the purpose.

In conclusion, many thanks for the continued co-operation and interest shown by the Board of Trade (Mr. Mike Langman), the BGA staff for their extremely hard work during the year and, of course, Club CFIs and Safety Officers.

J. J. Ellis, Chairman



AT the Annual General Meeting of the Club held on the 30th October, 1968, Commander John Stanley, RN, was elected Chairman for the ensuing two years. John is no stranger, being well known at Lasham and also a member of the Kronfeld Club and Art Society.

The retiring Chairman, Hugo Trotter, was warmly thanked for his untiring efforts and was presented by the Committee and members with a very fine clock in recognition of his services. Cliff Tippett, the Honorary Secretary, recalled the history of the club over the past 14 years, which commenced when Hugo obtained the lease of the then almost derelict basement at 74 Eccleston Square for only £1 a week. Cliff told too of the inaugural meeting held at the Aviation Centre, Londonderry House, Park Lane, and of the work put in by the small band of enthusiasts who pledged themselves that night and organised the place into a habitable condition with a magnificent bar and lounge in the now lecture room and a lecture room in the present lounge. It was Hugo's drive and determination that led to all this and the subsequent purchase of a long lease of the premises some

four years ago, which resulted in the Club being virtually rebuilt internally as it is today.

The Committee elected for 1969 was as follows:

Chairman, John Stanley.
Hon. Secretary, Clifford Tippett.
Treasurer, Diana Thomas-Ellam.
Wine C'ttee, Ron Willbie, Eddie Pollard, David Scallon.
Hon. Membership Sec. Rosamund Hervey.
Editor News Letter, Mary Overton.
Lecturer Organiser, May Marven.
Art Soc. Hon. Sec. and Treas., Yvonne Bonham.
Tiger Club Rep., Michael Jones.

As far as possible we are trying to revert to a weekly lecture programme in 1969. The first Wednesday in the month has not proved popular and has resulted in even smaller Wednesday attendances in spite of interesting lecture subjects.

Please see posters for coming events.

* * *

AVIATION ART SOCIETY

THE annual report of the Society stated that during the year ended the 31st August, 1968, pictures to the value of £750 were sold and commissioned. This figure excluded sales from the most successful RAF Anniversary Collection, which travelled around the country during the summer months. The Society now has 82 active members on its books, almost all of whom exhibited at one or other exhibition during the year.

The standard of work has risen tremendously over the past couple of years. This was particularly noticeable at the recent annual exhibition when, as the judge said, the whole exhibition was of professional standard, but perhaps was the least memorable of any annual exhibition.

The problems of not frightening off the keen amateur painter and at the same time preserving the interest of the commercial aviation artist members are interminable. A working party of two non-professional members (John Blake and Brian Withams) and two professional members (Ken McDonough and Roger Steel), plus a representative from the Kronfeld Club, has been formed to try and sort out this and other problems relating to the future development of the Society.

The next Exhibition scheduled is at the Biggin Hill Air Fair in May. Likely subjects for 1969 are the Transatlantic Air Race and the Battle of Britain film; we hope to make special collections based on these subjects.

The Harry Cooper Memorial Trophy will be awarded in 1969 for the best painting of an air racing subject.

An Exhibition of the late Harry Cooper's works (by kind permission of Leonard Cooper), totalling 20 pictures in all, will be on show in the Club lecture room for a month from 20th January.

All enquiries regarding the Society, whose headquarters are in the Kronfeld Club, should be addressed to Mrs. Y. Bonham, 11 Great Spilmans, London, S.E.22. Tel.: 01-693 3033.

CROSSFELL ELECTRIC AUDIO VARIOMETERS

Compact and Inexpensive.

Used by the foremost soaring pilots since 1959.

EQUIP YOURSELF NOW.

Also available without Audio.

Agents throughout the World.

Crossfell Variometers
10 Borrowdale Road, Malvern, Worcs., England.

NATIONAL COACH

The British Gliding Association is happy to announce that Bill Scull, currently CFI Lasham Gliding Society, has been appointed National Coach. He will commence his duties on 17th February.

POLISH GLIDERS

FOR HAPPIER, SAFER GLIDING



HERE ARE JUST TWO GLIDERS—BOTH DESIGNED FOR PERFORMANCE FLIGHTS UNDER VARIOUS ATMOSPHERIC CONDITIONS.

SINGLE-SEATER, FOKA 4 is built to conform with the standard class of OSTIV, and is designed for performance flights under any atmospheric conditions.

Wing span: 15 metres. Aspect ratio: 18.5. Best gliding ratio: 34

Never exceed speed: 260 kilometres per hour. Flying weight: 386 kilogrammes.

TWO-SEATER, BOCIAN

Due to its many flight qualities under varying thermic conditions, Bocian is suitable for all types of performance flights. The pilots' seats are in tandem, and there are coupled control columns, which make the glider ideal for basic training.

Wing span: 18 metres. Aspect ratio: 16.5. Best gliding ratio: 26

Never exceed speed: 200 kilometres per hour. Flying weight: 525 kilogrammes.

MOTOIMPORT

PRZEMYSLOWA 26, WARSAW, POLAND

Cables: Motorim, Warszawa. *Tel:* 28-50-71

Sole Agent in U.K.

NORCO AVIATION LIMITED

BURRELL ROAD, HAYWARDS HEATH, SUSSEX. *Tel:* 51771

TECHNICAL COMMITTEE REPORT

Committee Members: F. G. Irving (Chairman), R. C. Stafford Allen (Chief Technical Officer), P. Bisgood, J. D. Jones J. Leach, K. R. Obee, A. J. Page, C. O. Vernon, B. E. Warner, L. Welch, R. B. Stratton.

Advisor to the Committee: Lt.Cmdr. R. Brett-Knowles (Instrument Development Co-ordinator).

TERMS OF REFERENCE: To advise the Council on technical matters; in particular to supervise the Airworthiness Scheme.
1. Supervision of the issue of Certificates of Airworthiness.
2. Supervision of the approval of Inspectors.
3. Consideration of all technical problems.

WORK OF THE COMMITTEE	1968 (12 months)	1967 (9 months)
Number of Meetings	7	7
New Certificates of Airworthiness Issued	46	47
Permits to Fly Issued	10	3
Certificate of Airworthiness Renewals	491*	383*
Major Overhauls	30	38
New Glider Types Certified	5	6
Renewals of Inspection Approval	89	90
Renewals of Senior Inspection Approval	23	25
New Inspectors Approved	9	6
New Senior Inspectors Approved	7	3

* Includes Major Overhauls

SINCE the above statistics largely speak for themselves and, most important of all, indicate that the BGA Technical Committee is responsible for the airworthiness of about 540 gliders, this report is best devoted to a survey of the current airworthiness scene.

It is a sad fact that of the 46 new C.s of A. issued in the last year only 6 went to British-built gliders. The remainder were all imported, mostly from Germany. These imported machines are good and we wish our foreign friends every success, but it is deplorable to find that in 1968 the British industry was unable to satisfy more than a small fraction of the demand for straightforward club aircraft on the one hand and high-performance machines on the other. The latter category tends to imply glass-fibre, and here we must record another disquieting situation: of the three important types imported into this country, none has a full C. of A. in its country of origin. One has suffered severe flutter in the hands of a British pilot, another was subjected, until recently, to severe restrictions by the manufacturers, and the Technical Committee has applied some restrictions to the third. It would be a brave Technical Committee which refuses to have anything to do with these types until they were fully certificated: their performance is clearly superb, and they are much in demand by pilots who want the best available. So, on the basis of their national permits to fly, we too have granted permits. They are, however, a source of worry. Fortunately, the flutter seldom seems to cause actual failure in

the air although it can do considerable damage, and no doubt the designers would argue that such occurrences are one of the penalties of rapid progress, particularly when the relevant airworthiness requirements do not seem entirely adequate. But some of the handling characteristics are quite inexcusable: an obviously inadequate stick-force per "g" is **not** an inevitable consequence of high performance. We are keeping a close watch on the modification and certification of these machines in their own countries, and it is pleasant to report that all of the major foreign manufacturers are most helpful in providing test reports and other information.

Nearer home, the Air Registration Board expressed a wish "to limit its activities in the sport of gliding, thus giving the maximum freedom from restriction and expense to all those concerned". The outcome of this enlightened attitude is the agreement published in the October-November **Sailplane & Gliding,** in which the major alteration, compared with previous arrangements, is that if an owner wishes to renew a Board of Trade C. of A. he will now do so via the BGA airworthiness system.

Airworthiness is also likely to be involved in the deliberations of the Motor Glider Committee. Messrs. R. Stafford Allen and R. B. Stratton now represent the Technical Committee in this increasingly important activity.

Early in the year, two courses on light alloy repairs to gliders were kindly provided by BEA Apprentice School, under the auspices of Mr. Page and other members of BEA staff. These courses were of the highest quality and much appreciated by the inspectors who attended. It is hoped that further courses will be provided this winter.

Ray Stafford Allen continues to be a tower of strength: not only does he process the vast flood of airworthiness paperwork, but he personally interviews applicants for inspection approval, investigates some accidents on behalf of the Accidents Investigation branch of the Board of Trade, and writes his excellent News-sheets. Yet again we are most grateful to him, the BGA staff and an increasingly long list of people and organisations who provide help, understanding and enormously interesting work to the Committee.

F. G. Irving, Chairman

TAIL FEATHERS



By Platypus

THE notoriously unreliable Tail Feather News Team, just back from covering a motor glider jamboree on the Continent, report yet another sporting vignette of triumph and tragedy.

It appears that mountaineer Rudi Heidensieck has shinned up the North Face of the Eiger in world record time. When quizzed by our newshound as to whether his performance was aided in any way by the squadron of balloons and helicopters that dangled safety nets below him, the famed alpinist replied with scorn, he had never used the nets

at any time, so how could they have helped him? Collapse of stout newsman.

However, his doughty rival, Sir Fotheringay Tidworthy, so far from reaching the summit, actually failed to get on to the escarpment at all. Scorning all artificial aids in his bid to storm the Eiger, Sir Fotheringay insisted on walk-



ing and swimming the whole 500 miles from his home, stately Bucktooth Abbey, Wilts., to the foot of the dreaded mountain, whereupon our exhausted hero expired. As if in homage, the pound sterling dipped another couple of points on foreign exchange markets. His few remaining admirers subscribed for a plaque to mark the spot, engraved with the family motto, a fitting epitaph to a most British gentleman — Nice Guys Finish Last.

The Annual Accident Reports make dismal reading again, and I only hope that our reaction is to say "there but for the grace of God . . ." and "what can



be learnt from those fellows' experience", rather than showing smugness or patronising for the unfortunates.

All the same, I am intrigued by the report "collided with *running* cow". What was wrong with just saying "Hit cow"? Well, for a start, it would look un-British; as the previous story reminds us, we are not the types to shoot at sitting pheasants out of season, or ram stationary browsing cattle with sailplanes, right in mid-cud, as it were. The other implication is that it was really all the cow's fault for running into the



glider; had the ruminant beast's nerve not cracked, the whole fracas would have been avoided.

Fair enough; however, I suspect that she was one of the last of the anti-invasion breed of 1941, trained to charge enemy gliders: these are recognisable by a ring through the nose, a strange lack of Pinta-gear and answering (if you have time to ask) to the name "Fred".

* * *

More doggerel, in honour of a relation of the Oriental Poet whose verses don't scan but who gets as many words into the last line as he possibly can—and two giants from the BGA's Hall of Fame. . . .

See you later, Calculator
or I've got the divine wind.

*

A soaring young man of Japan
Did finals without any plan
"Without my John-Willy
I land short, looking silly—
Or I come screaming in with far to much height
At a speed Frank Irving would ban."



TWO WEEKS AT MINDEN AERO-CLUB

By T. K. SIMMONS

EVERY year the gliding club at Bad Oeynhausen, near Minden, holds a two-week course for young people. This year some English pilots were invited to attend. Unfortunately I was the only one who took up their very generous offer. As this offer was open only to people between 16 and 19, I think many were put off by the cost of travelling to and from Germany. Luckily I was intending to go to Germany anyway, so I was able to get over this hurdle.

The course began on 28th June. I arrived the day before, having travelled down from Hamburg. At first sight the airfield seems extremely small considering the number of aircraft that operate there. There are three gliding clubs and a power-flying club using the one very narrow grass strip. With so many aircraft in the area, one soon learns to keep a good look-out, if one has not bothered to do so before.

To the NE of the airstrip one can see the hill which provides some of the best hill-soaring in West Germany. It operates best when the wind is from the SW. On several occasions it was possible to get over 3,000 ft., but unfortunately cloud usually intervened. It also provides one with a good opportunity to try for Silver C duration.

The club has an excellent selection of aircraft. For training and early solos there are two Ka-7's. One then progresses to a Ka-8 and eventually on to the Ka-6CR. There is also a motor-glider, a Scheibe SF-25B, generally called the "Moses". Launching is done by aerotow only. This service is provided by an Elster C and a Bölkow Junior.

I had two check flights in the Ka-7, and had a little difficulty with the instruments, which, of course, were calibrated in metres and kilometres, but I soon got used to them. I then flew the Ka-8 for the first time. I liked it very much, but discovered that it had no penetration when I had to leave the hill and return to the airfield upwind, when the wind was over 35 knots. I also flew the Ka 6CR and found it delightful. Someone said one has to fly it for a year before being able to soar it properly. I found this to be very true.

I was hoping to get either my Silver C duration or height, but came back with neither. Weather and the law intervened. When the wind is from the SW and there is good hill-soaring, one invariably gets thunderstorms in the afternoon. On the few occasions when there was good hill lift, the thunderstorms came too early. In fact, only one person did five hours in the two weeks and he got above 1,000 ft. only twice (the hill is 900 ft. high!), and only just beat the storm, having done 5 hrs. 13 mins. Unfortunately, cloud-flying in gliders is prohibited in Germany, and the cloud was generally too low (although it would not have done much good anyway because I forgot to switch on the barograph on two occasions). On some days the thermals were quite fantastic, sometimes over 4 metres/sec. I did my longest flight, nearly three hours, in such thermals.

The airfield has a nickname, so be warned! It is usually called "Fineti Airport". "Fineti" is a type of schnapps which I found to be real firewater, to say the least. I can still hear the cries of "Fineti Test" ringing in my ears—when I have nightmares. One needs a hard head and a strong stomach for it.

I would like to take this opportunity of thanking the CFI, Mr. Nolte, for putting up with me, the tug pilots, Margot and Gunther Engler, for being so kind to me, and particularly Mr. Lüdecke, who arranged it all, and, of course, anyone whom I might have omitted.

The club is running another of these courses next year, although I am not sure what the dates are yet. Some English people between 16 and 19 years old are invited. A knowledge of German is unnecessary as most speak some English. (They have sworn to improve my German next year, which should be amusing!) The club will probably be able to provide some financial help towards flying fees, etc. Will anyone who is at all interested please contact me at "Hawthorns", Titchfield Lane, Wickham, Hants. (Return air fare by BEA would be about £25.)

BOOK REVIEW

New Soaring Pilot. By ANN & LORNE WELCH and FRANK IRVING. Published by John Murray, London, 1968. Obtainable from BGA, price 50s., plus 4s. postage and packing.

THE books that a glider pilot *must* have can just about be numbered on the fingers of one hand. *The Soaring Pilot* was one. The thirteen years which have elapsed since it was first published have brought such advances in both technical and operational fields that an up-to-date and enlarged version was a felt want—and here it is.

How does the *New Soaring Pilot* compare with his Elderly Forbears? He seems to me (one of the aforesaid E.F.s) to be rather a formidable and daunting character. As early as Chapter 2 he is coping with remarks like "As explained in Chapter 5, a conventional glider may be just acceptable with zero stick-fixed stability, provided that the stick-free stability is still positive, and for a glider whose stick-free neutral point is aft of the stick-fixed neutral point this may well determine the aftmost position of the centre of gravity."

By the time he has passed Appendix 10, an eyeball to eyeball encounter with a passing Reynolds Number leaves him unscathed.

He is meticulous and omniscient, but perhaps rather solemn. I only found two jokes in the 297 fact-filled pages, and one of them (maybe I am a bit suspicious) seemed unintentional. "Ideally, the cruising speed should be determined by the rate of climb which will be achieved in the next thermal, and not the preceding one, but this is a counsel of perfection."

But the sheer range of practical and theoretical knowledge of the authors is nothing less than encyclopaedic. Who would have thought that a suitable material for weak links is the wire used in the common coat-hanger? Every now and then even the Elderly Forbear comes across a tip which solves a practical point which has been worrying him for years. How does one assess when to slow down to the maximum permitted speed in rough air? How rough is rough? "A very rough and conservative rule is that if one genuinely leaves the seat whilst flying fast, it then pays to slow down to the maximum speed in rough air." (I suppose this tip only really works if the seat, after you have genuinely left it, is still there when you return to it.)

An absolutely priceless new addition is Appendix 7: "A task selector for Gliding Championships." This must in future be compulsory reading for all concerned. The amount of fun which has been lost, the rage caused, the hundreds-of-thousands of unnecessary trailering miles which have been covered, all due to bad task-setting, over the past 20 years of competition flying, is beyond computation. For the expenditure of fifty bob, this need never happen again.

You can get a lot of fun out of gliding without reading all of this book, but if you really want to get to the top, it's a MUST.

P. A. W.

BREEZE LIGHT AIRCRAFT LIMITED

Senior Inspector Approval C's of A
Major or Minor Repairs
Glider Trailers for Sale

Higher Valley Workshop
Dunkeswell,
Honiton,
Devon.
Telephone: LUPPITT 645

Licence No. 1/A/003M
Formerly Dunkeswell Light Aircraft Limited

INSTRUCTOR TRAINING – 1969

LASHAM

Apply for a place now on one of the nine-day instructors' courses to be held at Lasham starting 15th March and 16th August, 1969. Early application is advisable – we were over-subscribed in 1968.

Details from:
The General Manager, Lasham Gliding Centre, Nr. Alton, Hants.
Telephone: HERRIARD 270

CORRESPONDENCE

A NEW VARIOMETER IN PRACTICE

Dear Sir,

I read with interest Mr. Deane-Drummond's article "A New Variometer in Practice" in the Aug.-Sept. issue of SAILPLANE & GLIDING. This informative article will help publicise an instrument that may well become a useful tool for every competition pilot.

While this device is an advance indeed in the art of soaring, it does have limitations. I refer to the sentence from the article: "This is particularly useful during a final glide and there is no need to pinpoint positions every few miles—the instrument tells one whether the glide angle is being achieved or not." This is true only if the wind is calm, which it seldom ever is. Since getting home is of paramount importance, it behoves the astute glider pilot to cross-check his *achieved* glide angle by means of pilotage. The Mark 2 can provide glide angle relative to the air mass, but it can't determine whether the mass is moving or not; possibly away from base at 25 kts.!

Your fine magazine is welcomed for its diversified content. Pity it isn't a monthly.

Indianapolis, Ind. CHARLES C. FORRESTER,
Indiana SSA State Governor.

POWERED GLIDERS

Dear Sir,

Time, or rather lack of it, is mentioned six times in Ann Welch's recent article "Motor Gliders—Philosophy". I quote: "All this adds up, fundamentally, to having more fun for a reduced expenditure of that shrinking commodity, time."

This attitude, I am afraid, makes 1968 what it is in that few people are prepared to put much effort into things. However, there may be consolation in that the pianola, which was invented for people too lazy to learn the piano, is now obsolete.

Lancing, Sussex. G. E. KING.

ANN WELCH comments: Time! Generally there are two sorts of people who are short of time: those whose job takes up most of their working hours, or who have their free time chopped into little bits on account of the nature of their work, and those who are unable to organise their time.

The first category contains many skilled and able people who would be valuable to the gliding movement, as well as obtaining great enjoyment from soaring. The motor glider will, at last, make it practicable for such people to take up gliding.

For those unable to organise their time, or increase the effort they are prepared to make, the motor glider will, at least, reduce the time that keener people will have to wait for their turn.

Incidentally, I won't hear a word against the pianola. As a child it enabled me to spend hours working out how I was going to get flying, without my parents thinking I was doing nothing. By-products were a lasting enjoyment of music, and leg muscles developed well enough to be able to push gliders all day long.

1969 NATIONALS ENTRY LIST

Dear Sir,

The new substitute for a rating list raises some interesting points. Some pilots who flew in the Nationals are lower placed than one would expect; because poor performances two years ago are reflected in their end-of-1967 rating figure. Other pilots who flew less than eight contest days in 1966 and 1967 have had their rating reduced because of this, and although they now have more than eight days this derating still affects their position on the 1969 Entry List.

Regionals pilots, however, are judged on their placing in their best 1968 competition only. In my case, the result is that although I was placed in the top half of

the Open Class Nationals, with 65 per cent of the National Champion's score, I may not qualify for entry to the 1969 Nationals. The pilot above me on the Entry List was placed in the bottom half of his Regional, with only 60 per cent of the winner's score.

Was this kind of result the desired effect of the new system? In introducing the original 1968 rating system, a paragraph was devoted to extolling the fairness of it. I notice that no such introduction is given to the new scheme.

Norwich, Norfolk. P. G. H. PURDIE

GERRY BURGESS, *Member BGA Flying Committee, writes*:—Sgt. Purdie's case is exceptional in that he gained entry to the Open Nationals from 153rd place on the Rating List. The system in force is such that it is much easier for pilots at this level than it is to re-qualify via a Nationals. (There is nothing to prevent a pilot trying both methods, if he has the time and the money, in that only the most advantageous result counts.)

It is not, of course, claimed that the system is entirely fair to all individuals but it can be claimed that it is achieving its main desired effects, i.e. to guarantee 30 Nationals places each year to pilots promoted from Heats and to preserve the principle that Nationals pilots' performances are judged over a two-year period (for the purists: it is not precisely a two-year period).

There is one understandable error in Sgt. Purdie's letter; the pilot immediately above him on the Entry List was 14th out of 38 in his Heat, not in the "bottom half". The reason for this is that the Bicester Heat, with BGA agreement, was seeded by the Organisers into Open and Club Classes but only Open Class pilots could qualify for promotion to Nationals, and for promotion purposes the official "Heat Size" was 38 entries.

POWERED GLIDING

Dear Sir,

Congratulations to Ann Welch and the BGA Motor Glider Committee on the big steps already taken in the right direction towards powered gliding.

I would heartily agree with the purpose and draft general definition of a motor glider (*S. & G.*, Oct./Nov., 1968) and also with the comments on Philosophy (*S. & G.*, Dec./Jan., 1969).

However, there seems to me to be a method of controlling the development of a suitable motor glider which has not been mentioned with very much force. To ensure that the resulting machine possesses performance and handling characteristics similar to that of gliders in current use, some fairly strict figures will have to be decided upon with regard to the performance as a glider. I would suggest that we must have a minimum rate of sink of not more than 3½ to 4 ft./sec. and a best gliding angle of not less than, say, 20:1, with motor stopped. Obviously, single-seaters of high performance will better this, but there is a danger, perhaps more so with two-seaters, that glide performance will creep lower and lower whilst power-on performance creeps higher and higher as bigger engines get crammed into smaller machines.

Then the fear which Ann Welch holds will become an enemy and powered gliding will become powered flying.

The first essential is that the BGA should control powered gliding in the same way as it does gliding. To obtain this authority the BGA must make clear that a powered glider is not a light aircraft, and must ensure that the types developed are kept strictly within the former category.

There will, of course, be nothing to stop a pilot with PPL from buying a motor glider with ARB C of A and flying it like a normal aeroplane, but I do not regard this a major threat to the scheme. How many people will want to sit in a powered glider with the motor on all the time, or travel from A to B at about 50 knots? Not many.

The biggest single way to prevent motor gliding from becoming power flying on the cheap is to ensure that flying done on powered gliders does not qualify towards the attainment of a PPL, at least, no more so than gliding does at present.

This would make it impossible for flying clubs to re-equip with motor gliders to do cheap power flying courses. The BGA should be responsible for airworthiness as with gliders, but some thought will have to be given to the problem of motor maintenance. Clubs manage with tugs, so a motor glider should not be impossible to cope with.

Who will be qualified to fly a motor glider?

Obviously anyone with a PPL. Instructors instructing on motor gliders should have a BGA instructor's endorsement for motor gliders, whether they hold a PPL or not. This could easily become part of the BGA instructor's course. Pupils should be permitted to fly solo on powered gliders under the supervision of an instructor and eventually without supervision in much the same way as they do now with high performance club gliders.

The biggest factor in the future of powered gliding is, without doubt, the performance as a glider. Big engines and rocket-like climbs must be avoided at all costs. The emphasis must be on low, quiet power, moderate rate of climb and high gliding performance. People who want to fly streamlined bricks must put up with the necessity and cost of ARB certification and a PPL.

I think the right approach is typified by the SF-27M and the SF-25, which would appear to be true motor gliders. The RF4 and RF5, delightful though they must be to fly, seem to have too high a power performance and too low a glide performance. I must, however, say this with reservation, as I have not flown any of these machines. I look forward to the day when I can join a club which has a motor glider so that I can book an hour or two of gliding which I *know* I will get so that I can enjoy the pleasure of gliding which has so long eluded me under the present methods of getting airborne.

Ipswich, Suffolk. PETER M. WARREN

ANN WELCH comments: Peter Warren's letter is most welcome as he says very clearly what the Motor Glider Committee is hoping to achieve. I only hope that we will be able to make the pleasures of gliding available to him before long.

TRIANGULAR THOUGHTS

Dear Sir,

The FAI Gliding Committee is studying a proposal from the Royal Danish Aero Club to change some of the present rules for triangles. The reason why the proposal comes from Denmark is that this is a small country where big triangles are difficult to fit in, but with some modification to the existing rules the situation could be improved.

According to the present rules "a triangular flight is a flight made around two turning points with return to the point of departure".

You are not compelled to follow the straight lines between the three points, but obviously you will aim to do so, as this gives you the shortest distance to fly. However, meteorological or geographical reasons will make it necessary or advantageous to deviate from the straight lines in order to be able to carry out the flight at all — or to make it faster under better conditions. So our "triangles" in reality can have very peculiar shapes.

Under the present definition you must, however, start and land in one of the corners of the triangle. This means in Denmark that from many sites it is simply impossible to fly, say a 300-km triangle, as one or both of the turning points will have to be situated in the sea! Or, at any rate, so near the coast that the sea breeze effect makes it difficult or impossible to get around them. This applies, e.g., to our National Centre, Arnborg, which we placed in the middle of the Jutland peninsula in order to be where the thermal conditions are best.

If, however, the definition of a triangle is changed to "a flight around two or three turning points of a triangular course with return to the point of departure" we could arrange the triangle with Arnborg at or near the shortest (28°) leg, go around the three turning points and return. This definition will make many more triangles possible in Denmark and probably also in other countries.

As already mentioned you must start in a corner of the triangle. You can start from there by winch, you can be aerotowed to this point, or you can soar there from any point inside or outside the triangle, provided you cross the start line at no more than 1,000 metres. But after arriving back you must **land** within a circle of 1,000 metres radius centred on the point of departure, even if your base is away from this point. You are not allowed to soar straight home after passing the finishing line. Why?

Therefore our second proposal to the FAI is that the return to the point of departure should also be considered as fulfilled if the finishing line at the point of departure is overflown according to the present rules for certificates of arrival and for photographic evidence.

In our proposal there is nothing about relaxation of the necessary documentation of the flight but, as you see, only a liberalisation with regard to where the start, finish and landing should take place. It will probably always be more difficult to fly a 300-km triangle in Denmark than say, in the United States or Poland, but with a new wording which we hope the FAI will accept in March it will be possible to perform triangles where it now often is impossible.

Copenhagen, Denmark. PER WEISHAUPT.

GLASS-FIBRE GLIDERS

Dear Sir,

Being a professional and practising aeronautical engineer, the academic study of the aerodynamics and structures of windmills is rather outside my experience, so I am sorry that my necessarily oversimplified remarks concerning the construction of glass-fibre gliders were not quite exact enough for Frank Irving.

The significant point about glass-fibre machines is that they underline the perils of our hitherto insular approach to sailplane design.

The numbers of sailplanes produced and operated by other Continental countries such as Germany, Poland, France, etc., far exceeds the small output of the SBSC (Single British Sailplane Constructor) and the number of operational hours flown in these countries is well ahead of the UK. Consequently, these countries have a wealth of experience which they have not failed to exploit, which explains in a large part why, except in the field of instrumentation, their standard of sailplane design and manufacture is consistently ahead of ours.

Despite our relatively modest achievements in the UK, our technical pride has often appeared to lead us at first to neglect or actively reject these other countries' developments principally on the grounds that "It wasn't invented here". Low-drag glider aerofoils, sensible handling requirements, non-wooden construction, the list is endless.

For example, for years we have concentrated on making gliders "Aunty proof" rather than teaching Aunty to fly advanced aircraft, thereby making her "glider proof". At one time this policy actively militated against the importation of contemporary foreign sailplanes and although, after some battles (remember the Mucha Standard!) this phase is happily over, the consequence of our belief that the British, i.e. BGA, approach is best, has been a continuous decline of UK glider design capability relative to other countries.

The perils of abdicating from advanced design concepts are seen clearly in the effects of the present Government's policy with regard to the UK military aircraft industry.

The present glass-fibre scene and the absence of effective UK competitors, made in any type of material, shows how near we are to achieving the same self-inflicted defeat on the British sailplane industry. Although Sigma will help, it is a pace-setter rather than a money-earner and an urgent effort is needed now in the UK to produce even one decent Standard Class machine from which a 1 in 44 L/D Open Class machine suitable for our climate could evolve.

Since we have not yet produced an aircraft to compete with the Ka-6E, a ten-year-old basic design, it is going to be a very uphill job.

Wateringbury, Kent. P. A. HEARNE.

TAILS AND TABS

Dear Sir,

I am compelled to make some comment on Frank Irving's article "The Gliders at Leszno" in S. & G. Oct.-Nov., 1968.

Mr. Irving seems to believe that, while handling qualities are often poor with an all-moving horizontal tail, the situation can be improved by adopting a tab trimmer, as commonly used on elevators. Let us look at some of the design approaches, which may help to understand the situation.

Since a large part of the drag of a good glider (especially at high speed) is skin friction, it is desirable to reduce this as much as possible. There are two ways of doing this: reduction of wetted area, and achievement of as much laminar flow as possible. An all-moving tail can fit this requirement both ways, provided that it is out of the body wake, and also that it has no large tabs (such as elevators) to bend the camber line and take it out of the laminar regime.

Now suppose that the tail is pivoted at its aerodynamic centre. The stick force is then zero at all useable aircraft speeds, stick-free stability is zero, and trimming becomes irrelevant. So let us fit a geared tab to give us some stability and "feel". If we must then trim with a tab, then the tab must deflect in the opposite sense to that of the geared tab, leading to a high-drag situation, not to mention the weight, cost and trouble of two tab linkages, one of them going all the way to the cockpit. So what have we got? Two tabs fighting each other, except at a fortuitous speed (which depends on C.G. position) when both tabs are faired, plus some cables, linkages and a bit of drag we don't need.

Now if we fit a feel spring instead of the geared tab, we have saved a lot of trouble, for this can be placed right at the stick, and can also be biased very simply to provide trim, i.e., the zero-feel condition. But—and this is what Mr. Irving is complaining about—the stick force per "g" is not constant, and if good stability at high speed is needed, then low-speed feel is heavy, relative to the ailerons which have the opposite characteristics. One solution may be to aerodynamically balance the ailerons, and provide spring feel on them, too, so that the "balance" between lateral and longitudinal stick forces would be maintained. This could possibly give better handling, but I don't think anyone has tried it yet.

However, to go back to the beginning, we could consider pivoting the tail forward of its aero centre, which would give "natural" feel, and allow us to use a trim system of our preference. When pencil is put to paper, unfortunately, a reasonable-looking tail has its aero centre close to its root maximum thickness (about 40 per cent), which is the obvious place for a pivot bearing, especially when the horizontal tail is on top of the fin. I don't think much "natural" feel can be achieved with an all-moving tail, and besides, the cost-weight-complexity arguments favour the spring trim overwhelmingly, so why not use it for feel as well?

It is worth noting that in the early days of power controls on high speed aircraft it was considered necessary to provide the pilot with "g" feel to simulate an unpowered control, but with lower forces. Some complex schemes were evolved to do this, but the disadvantages of these were many, and most have now been neglected in favour of simple feel related to control deflection, since it was found that new pilots can adapt to "non-g" feel as easily as their predecessors had adapted to the aerodynamic feel forces.

Montreal, Canada. RUSSELL SOWERBY

FRANK IRVING comments:—I should have been more explicit: I meant to say that, from the point of view of the stick-force/steady speed situation, and the stick-force per "g", an all-moving tail pivoted at its aerodynamic centre will behave much like a conventional tail if it is fitted with a geared tab rotating in the same sense as the tail, with its datum setting variable for trimming purposes. There is then no question of one tab fighting another. Since the stick force is due to tab deflection, the latter will also be zero if the stick-force is trimmed out (assuming an absence of bob-weights and springs in the circuit). The only drag will then be due to any surface gaps, and these can be made very small in glass-fibre.

Pivoting an untabbed tail ahead of its aerodynamic centre would be most undesirable, since the stick force, at a series of steady speeds, would vary in the wrong sense (i.e., push at low speeds, pull at high speeds). Pivoting it aft of its aerodynamic centre would be even more disastrous: the tail itself would be unstable about its pivot point. So, in the absence of a tab, the only possible pivot point is *at* the aerodynamic centre. Much further information on all-moving tails is given in the authoritative work mentioned in the Reference.

I have yet to meet a glider in which spring "feel" really works. Rather unkindly taking a specific example, that on the BS-1 is totally fallacious.

Many of the current high-performance gliders have negligible fore-and-aft stick-forces, and this situation is not confined to those made of glass-fibre. Such an arrangement *may* be acceptable—as is said to be the case for the Standard Elfe. But it is much more likely to lead to trouble, as discussed elsewhere in this issue. Finally, let us not forget that characteristics acceptable in clear air (designed in countries in which cloud-flying is not permitted) may be very unpleasant in a rough cloud.

REFERENCE: Irving, F. G. *An Introduction to the Longitudinal Static Stability of Low-Speed Aircraft*. Pergamon, 1966.

FAI BADGES AND MOTOR GLIDERS

Dear Sir,

On page 439, S. & G. October, 1968, it is stated that a distance of 500 km has been covered from Germany to France in a motor glider without use of the engine and that the pilot has thus acquired his third Diamond for the FAI Gold C badge.

There is, to my mind, an inevitable psychological difference in the mental attitude of a pilot who has with him the means of getting out of trouble as compared with a "pure" glider pilot. Having myself flown motor gliders on cross-country, and being strongly in favour of them, I am nevertheless very strongly opposed to the idea of acquiring badges awarded for soaring performances in such types of glider. I hope, therefore, that the German authorities who have made this award will be informed that it should not be recognised internationally.

London, SW9. GODFREY HARWOOD

COMPETITION SCORING AND HANDICAPPING

Dear Sir,

In my enthusiasm to rush into print on the above subject in the December 1968-January 1969 edition of SAILPLANE & GLIDING I failed to notice that:

(a) Mr. Charles Ellis had said some of it before in the April-May 1968 edition of SAILPLANE & GLIDING; my apologies to Mr. Ellis.

(b) The race scoring system suggested could, in certain circumstances, encourage a pilot to land short of the goal (. . . ridiculous!).

This latter point can be satisfactorily covered by the introduction of an additional rule which says, in effect, that in *any* task no glider will score less than 90 per cent of the marks of the next fastest or next furthest glider.

It just so happens that the introduction of a rule such as this has the happy side effect of giving a conventional scoring system an element of the "placing" concept just when it is needed, i.e. when there would otherwise be a large step in the scoring (for whatever the reason).

Marlow, Bucks. GERRY BURGESS.

DONUTS AND HUMOR

Dear Sir,

SAILPLANE & GLIDING is a delight to read even for overseas readers who may only know the characters through its pages. I should in particular mention Mr. Frank Irving who writes with apparent humor and courage. His discussion of vortex rings might strike desert dwellers used to seeing long snakes of "dust devils" as absurd since we do not see "donuts" dotting the sky, but since in England thermals are

often not visible he probably attracted a number of "suckers" to his bait and generated thought in their heads.

His recent "The Gliders at Leszno", telling how the winning gliders are inferior, was excellent. Having read Andy Gough's description of the Cirrus in S. & G. (. . . but for comfort, superb handling and ease of de-rigging, the Schempp-Hirth Cirrus, designed by young Klaus Holighaus, will take some beating), one might view Mr. Irving's reference to the Italian team and their Cirruses thinking that possibly the "credibility gap" had spread to S. & G. until one recalls that this was the man who attended the World Championships dressed in a diving costume. Then it is seen that he is a jester and a master of the ridiculous.

It seems a pity that the audience for such wit is not wider. I would like to see him write a piece for the medical journals on "The Role of Storks in Childbirth" or in the scientific press on "The Determination of Sign of the Zodiac for Children Born on Space Voyages". But until we are so lucky, three cheers for S. & G.!

Palo Alto, Calif., U.S.A. U. N. "TONTO" GRANDE

FRANK IRVING comments:—Alas, how fragile is one's public image! Five minutes of frivolity at a Leszno briefing and one is regarded as a ridiculous jester. Perhaps it is as well that Mr. Grande did not see my Carnaby Street party shirt, which so alarmed Fritz and Marshall ("Gee, Frank, what are you going to wear at Marfa?"). He might have regarded me as decadent, too. In fact, as the BGA Technical Committee and Sigma Board will testify, I am really a very serious-minded chap, much given to profound mathematical meditation. It is very unlikely that I will indulge in such wild flights of fancy as he suggests: it would be much better to record the expressions on Mr. Grande's face if he ever has to carry the wing-root of a big glass-fibre glider in the desert, surrounded by dust-devils. Seriously, it is nice to know that we are appreciated in Palo Alto.

Advertisements, with remittance, should be sent to Cheiron Press Ltd., 5 Crawford Street, London, W1 (01-935 2814). Rate 1/6 a word. Minimum 21/-. Box numbers 6/- extra. Replies to Box numbers should be sent to the same address.

FOR SALE

SHACKLETON AVIATION LTD. are Europe's largest aircraft dealers. We always have a large supply of single- and twin-engined aircraft from £650 upwards. Gliders, Cars, Aircraft taken in part-exchange. Hire purchase available. All enquiries welcome. Head office: 175 Piccadilly, London, W.1. 01-493 2448. Telex.: 263975.

1963 FOKA, only 100 hours, British C. of A. until July 1968. Complete with instruments and trailer, £1,395. Hire purchase terms available. Thorpe Aviation Ltd., 177 Lincoln Road, Peterborough.

OLYMPIA 2B TRAILER in good condition, fully roadworthy. Canvas covered. Will take any 15-metre aircraft. £75 o.n.o. C. J. Woodier, 9 Raleigh Road, Coventry, CV2 4AA.

1966 K7 with wheel-brake; instruments and open trailer. Bubble canopy on order. 120 hours. C. of A. April 1969. Offers to Box No. S.G. 309.

• 1001 Genuine Bargains interest everyone! •

Huge stocks **GOVERNMENT SURPLUS CLOTHING AND EQUIPMENT**, inc. flying suits from 25s.; flying helmets, anaraks, outdoor clothing, camping, immense variety of miscellaneous ex-Government equipment. Ever so useful—you will be sure to find something you need—and at a bargain price too! Send TODAY for our 30-page CATALOGUE—8d. post free or please call at **LAURENCE CORNER, 62-64 Hampstead Rd., London, N.W.1.** 2 mins. Euston, Warren St. It will be well worth while! Postal customers buy with confidence—prompt despatch, refund guarantee. Dept. SG.

GENUINE reconditioned steel grey ex-RAF Flying Overalls. 47/6, postage 3/6. State height and chest measurements. Huge selection of camping equipment, specialists in group camping. Tarpaulin & Tent Mfg. Co., 101-3 Brixton Hill, London, S.W.2. TULse Hill 0121.

WEIHE Sailplane for sale. C. of A. to February, 1970. Complete with instruments, parachute and trailer. £495. Horne, Greensleeves, Bramley Corner, Basingstoke, Hants. Bramley Green 420.

FOR SALE (continued)

BLANIK fuselage, O.K. except for rear few feet. Fin and Tailplane repairable. Also damaged wings, one repairable possibly both (aircraft was blown over). Also 2 ASI's compasses, turn and slips. PZL various, Bendix J8's with invertors, etc. Thorpe Aviation, 177 Lincoln Road, Peterborough. Tel. Peterborough 68818.

"SWALLOW" T45. Basic instruments and trailer. Very good condition. £800 o.n.o. Swindon Gliding Club Secretary, 7 Capel Ed Lane, Goytre, Pontypool, Monmouthshire.

SKYLARK 3B (F canopy) 10-year C. of A. last March; needs wing modification. Full panel barograph and trailer. £900. Hart, Brinkworth (Wilts) 268.

T21B. Canopy and Ballast mods. Basic instruments. Good cond. £800. T45 Basic instruments and trailer. Very good cond. £850. Swindon Gliding Club, 48 Trenchard Road, Stanton Fritzwarren. Wilts. Phone: Stratton St. Margarets 2299.

SKYLARK 2. Excellent condition. Always privately owned and professionally maintained. Current C. of A. to November 1969. Available February/March. With basic instruments, £800. N. F. Cunningham, 76 Bridge Road, East Molesey, Surrey.

PYE Bantam transceiver on 130.4 mc/s, £85. Irving Mk 32 fully adjustable glider parachute, £45. Normalair 400 litre (4½ in. dia.) oxygen bottle £12. Peter Wildbur, 56 Stanley Park Road, Carshalton, Surrey (Office: 01-636 5254).

THAMES VALLEY CLUB Olympia 2B. Panel includes electric vario and horizon. £550. J. Wood, High Wycombe 28256.

SEDBERGH and Prefect built 1953 (never pranged), without instruments, excellent condition. Information. Illustrious, Merodeplein 17, Tilburg, Netherlands.

OLYMPIA 2B. Extended canopy, wing roots faired. Much improved performance. Trailer, instruments, barograph, new parachute. £800 o.n.o. Wright, Overton (Hants) 296.

WINTER Barographs should be ordered now for delivery in time for the soaring season. Price £50 12s. 6d. U.K. Import Duty, packing and postage paid. Calibration chart (if required) £3 15s. 0d. extra. State height range required when ordering. Thermal Equipment Limited, 158B Acre Road, Kingston, Surrey.

OLYMPIA 463. Twelve months C. of A. Instruments. £1,075. Details, Midland Gliding Club, Church Stretton, Salop.

DART 17 (March 1966). One owner. No prangs. Fixed wheel (foolproof). C. of A. April 1969. Immediate delivery complete with tailored, streamlined trailer. £1,650 o.n.o. M. Garrod, 2 Crosspath, Radlett, Herts.

SALE, Motor Spatz highly efficient motor Sailplane £850, also Tipsy ultra-light aircraft, two-seater, £650; both full permits. Swinn, Swainby, Northallerton, Yorks. Tel. Hutton Rudby 553.

M-100s 15 metre, complete with full panel, barograph, parachute, radio and lightweight trailer. £1,250 o.n.o. Hire purchase terms available. Hooper, Maiden Castle Farm, Dorchester, Dorset. Tel. Dorchester 356.

PROFESSIONALLY built closed trailer, Rubery Owen axle, fittings for Blanik, but should suit any other glider, cost £325, will accept £175, very good condition. Thorpe Aviation, 177 Lincoln Road, Peterborough. Telephone Peterborough 68818.

SWALLOW and OLYMPIA 2B with or without trailer. Apply: Secretary, Coventry Gliding Club, 42 St. Stephens Street, Aston, Birmingham 6.

ASK 13 Two-seater, White, New February 1968, Flown 500 hours, Both Cockpits Instrumented, offers.

T21 B, Red/Yellow, New C of A, Instrumented, Good Condition, £750.

Auster JIN, Four-Seater, New C of A, Engine 500 hours to Run, Tow-Hook, £850.

J. S. THORNE
Compton Abbas Airfield,
Shaftesbury, Dorset.

FOR SALE (continued)

SKYLARK 2. Completely reconditioned. Recovered and resprayed with major C. of A. and instruments £750

T.31B. In excellent condition, completely recovered, finished in flame, complete major C. of A. and instruments £375

SKYLARK 2B. Modified nose section incorporating Skylark 4 canopy with adjustable seat back, mass balanced tailplane, completely recovered and resprayed, with instruments and major C. of A. £800

DONCASTER SAILPLANE SERVICES
YORK ROAD, DONCASTER
Telephone: 0302-65381

SKYLARK 3F, Competition No. 180. C. of A. Excellent condition, maintained by BGA Senior Inspector. No prangs. Birch spar inserts. 650 hours, 350 launches. Fully equipped including transistorised horizon, PZL and audio Crossfell, barograph, oxygen and trailer £1,250. Doug Jones, 24a Goldney Road, Clifton, Bristol, 8.

THE PHOEBUS 17 offers 1 in 42 together with low speed performance to match British conditions. Price £2,550 ex works. Write to P. A. Hearne, The Limes, Wateringbury, Kent.

FOURNIER R.F.4, private C. of A. 580 engine hours before first overhaul. Several extras, including Class 1 Bendix RT221 radio. £2,285 o.n.o. Box No. SG 310.

T.21B for early sale at reasonable price. C. of A. available to February, 1970. Box No. SG 311.

DIAMANT 16.5 complete with trailer for sale together or separately. Would consider exchange deal for less "competition-bred" glider if in immaculate condition. G. T. Collins, 31 Boscawen Street, Truro. Telephone Truro 2887.

FOKA 3 (379). Fully instrumented, oxygen, barograph, parachute, new Ultra radio, trailer — aircraft resprayed this year. £1,450 complete. Telephone: J. Rouse, Radnage 2393.

SKYLARK 3B (with 3F modifications). C. of A. valid until 1970 and no wing modification required. Aircraft and well built trailer in first class condition. Inspect at Lasham. Telephone Walker: Winchester 4715. Price £1,250.

DRAWINGS for building KITTIWAKE 1 all metal monoplane. Full introductory package 10/-. For information, prices appointments to view prototype: Procter, Greenball, Crawley Ridge, Camberley, Surrey.

AUTO-TOW. Paraglide Tensiometer Quick Release for tow vehicle allows any driver to maintain optimum cable tension for each phase of EVERY launch and to fully compensate for wind change with height and gusts. Fifteen Tensiometers have been in use since 1967. Price £22 plus postage. Weight 42 lbs. Paraglide Ltd., 2 Churwell Avenue, Heaton Mersey, Stockport, Cheshire. Telephone 061-432 7315 (evenings).

Ka-6CR. Top condition. Modified canopy. 12 months C. of A. £1,150. Instruments to choice and self-loading trailer if required. Lying at Dunstable. Telephone 01-950 3824 (evenings).

SWALLOW, good condition, £700 or offer. For full details, contact Bill Dean, Pale Farmhouse, Chipperfield, Herts. Telephone Kings Langley 3122 office 01-606 8888 (ext. 235).

CAPSTAN, £1,400, available now, current C. of A., basic instruments, trailer extra if required. Derbyshire & Lancashire Gliding Club, Great Hucklow, Derbyshire.

T31 built 1953, with 10-year C. of A. £295. Ford Mercury V8 engined winch. £50. Offers to: The Secretary, Avro Gliding Club, Hawker Siddeley Aviation Ltd., Woodford, Cheshire.

OLYMPIA 2. Very good condition, trailer, basic instruments, just completed C. of A. £680 o.n.o. Sqn. Ldr. Lamb, RAF College, Cranwell.

KRANICH 1 two-seater. Low hours. Good condition. Eminently soarable. (Useful for Dart baiting.) With trailer and one year's C. of A. £600 o.n.o. Teagle, 28 Russell Avenue, Stockport, Cheshire. Telephone Disley 3614.

COOK Vario, with total energy capsule and 419 speed-to-fly scale. Speed of response too fast for the 419. Offers to E. A. Hales, 33 Princess Gardens, Hilperton March, Trowbridge, Wilts.

FOR SALE (continued)

MOTORFALKE two-seater self-launching motorglider. Permit to February, 1970. Only 125 airframe, 75 engine hours. Olympia soaring performance. 70-knot cruising speed. £1,800. Ross, 13 Pound Crescent, Marlow, Bucks. Tel. 5740.

DART 17R. C. of A. March, 1970. Available in as new condition, fully instrumented with lightweight trailer, handling trolley, parachute and barograph. Price to be negotiated. Peter Pratelli, 90 Oxford Road, Garsington, Oxford, Ox 9 9AE. Tel. Garsington 233.

SUPERSAGITTA 17 m. 1963. Dutch built, flown only privately, very good condition. Gliding angle 37, very strong, max. speed 250 km./h., elementary instruments and coverings. Price equivalent to $2,000 may be paid on British bank account. Radio 1 watt transistorised and open universal trailer optional. H. Smet, 2 Gretrystr, Antwerpen, Belgium.

Order your **JSW CALCULATOR** early in the season from
Flt.Lt. J. S. WILLIAMSON
c/o Box G.S.312, Cheiron Press Limited
5 Crawford Street, London W.1.

WANTED

WANTED — Ka-13 as soon as possible with or without instruments and trailer. Please state age, hours and price to Box No. S.G. 307.

"WINTER" BAROGRAPH, good condition essential. Details please to Mutimer, Braiseworth Lodge, Eye, Suffolk.

WANTED complete glider radio outfit. Townsend, 5 High View, Meir Heath, Stoke-on-Trent. Blythe Bridge 3597 (Evenings).

PERSONAL

SURVEY YOUR LIFE ASSURANCE Glider pilot—Life Assurance Consultant will gladly advise pundits.
Tel. Wilcox at London NATional 4811.

FINANCE

FINANCE for your glider or aircraft purchase can be arranged by telephoning or writing to Colin Donald (B.G.A. Instructor), Burghley Finance Company Ltd., 177 Lincoln Road, Peterborough. Tel. Peterborough 68818.

SITUATIONS VACANT

LASHAM

Qualified Senior BGA (full rated) Instructor required to replace Bill Scull, now appointed National Coach. Salary dependent upon qualifications and experience within £1,400 to £1,800.

Other benefits, including pension scheme.

Seasonal Staff 1969:

(a) One gliding instructor.

(b) One driver—cutting grass/tow car driver.

(c) Two barmen/tow car drivers.

For further details of the above posts apply to:

The General Manager, Lasham Gliding Society Ltd., Alton, Hampshire.

INSURANCE

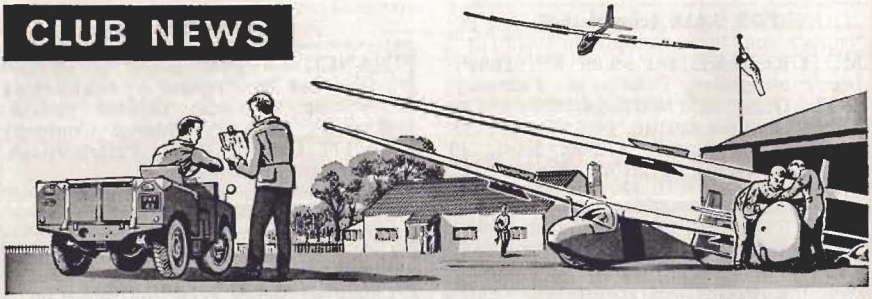
WE are experts in glider and aircraft insurance. Let us quote you the lowest rates with the most reliable companies. Write to Peter Marlow, Marlow, Gardner & Cooke, 170A Lincoln Road, Peterborough. Telephone 68544.

PUBLICATIONS

"SOARING"—official organ of the Soaring Society of America. Edited by Bennett Muir Rogers. Address: Box 66071, Los Angeles, California 90066, USA. Subscription: $5.00 outside USA; apply to your post office for a form.

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

CLUB NEWS



WITH very little news reported this issue, most Clubs are preparing their aircraft and equipment for the coming soaring season.

News for the April-May issue should reach me by 12th February and that for the June-July issue by 16th April. Please type news double spaced on foolscap paper. Don't forget to send any photographs that may be of interest.

13th December, 1968.

YVONNE BONHAM (MRS.),
Club News Editor.

BRISTOL

SINCE the last issue we have had very poor flying conditions, but on the few good days at the weekends, 14 or 15 sailplanes have soared at once. Several syndicates have taken their aircraft to Portmoak, unfortunately no great heights were recorded.

Due to extra duty on fuel our launch charges will have to be raised.

New arrivals to the Club are Derek Venhard and Partners with a splendid new Ka-6E, it will be flown both here and at Aston Down. Derek Johnson has brought a Dart 15 from Lasham for the winter. We hope he enjoys our winter weather—January and February usually bring very good weather with the possibilities of wave conditions.

To conclude we wish all fellow Clubs a Happy and Soarable New Year.

B. F. W.

CAMBRIDGE

DESPITE the mediocre weather, a fair amount of cross-country flying was done this summer. One of the best days was 31st May which unfortunately coincided with the AGM, and caused several people to miss it. Among them was David Evans who landed out at Bassingbourn. He had no sooner been retrieved than he set off to Northampton to retrieve Ned Sneyd, who had just completed his Silver C. Meanwhile, Ian Pringle had landed out while attempting a 100-km. triangle.

Several people suffered the disappointment of doing their Silver C distance only to find that they had no barograph on board. We hope to buy another next year, so that there is one for each solo glider.

We are very grateful to the Midland Club for our two camps there. In June we collected 5 Silver C legs in two days —3 of which were in the Ka-7. The September camp was not so lucky with the weather, but two people went solo. Wave has been encountered again locally, in July by Siegfrid Neumann in a northerly wind, and in November several people found reduced sink in a westerly wind.

This winter we have been holding meetings every Thursday evening, and we were pleased to have some members of Perkins with us on two occasions.

P. A. K.

COVENTRY

THE main news at the moment is on the social side.

On Saturday, 14th December, we held a very stimulating informal meeting in the Clubhouse, which took the form of a "cuss-it-and-discuss-it" forum! Several members, with ideas of their own for

the Club's future, were freely able to express these in an informal and leisurely manner, and it is felt that such meetings can do nothing but good.

On Friday, 20th December, we held the Annual Dinner Dance at the Manor Hotel, Leamington, where we were once again "done proud". It is on these occasions that the glorious achievements of the past soaring season can be overheard amongst the tinkling glasses, but this year, unfortunately, there was not much glory, so much talk was heard of impending achievements next year.

We seem likely to have several Committee changes in the New Year, as quite a few members are retiring, and our Chairman, John Large, finding more and more of his time being taken up with BGA affairs, is relinquishing office in the spring.

F. A. T.

DERBYSHIRE AND LANCS

WE were very sorry to lose Allan and Wynne, our stewards, in November, who have taken over an hotel in Sheffield after 2½ years with us. Mrs. "Binkie" Binks left also, after more years than we like to remember, and so the occasion was doubly sad. A farewell party was arranged, though, and heavily attended.

Our new stewards, Allan and Elsie, took over the next weekend, and we have been very lucky again.

During 1969 we have decided to run 16 double courses, with resident instructor and winch driver, as many people had to be turned away late this year. Scouts, Guides and other youth movements have made block bookings already. We also intend to offer weekday flying facilities to visiting pilots and syndicates, providing they are willing to accept the rigours (and economies) of sleeping in the Folly.

The building scheme grinds remorselessly on and, as yet, nothing has delayed its progress overmuch.

With no tow plane of our own, we are managing to carry out field inspection and map reading exercises from local power club machines.

The Viking syndicate from Husbands Bosworth visited us recently and left their machine for some hill flying, since when the weather has *clamped*!

Our Ka-8 has met with a good reception, though there are niggling doubts about it—like why were the brakes set to come out only halfway—and what *would* have happened on a VNE dive?

A syndicate has been formed to fly our last Tutor, and it has been dusted, refurbished, C of A'd, insured, and even flown. One wonders how the syndicate mix of inexperienced and very experienced pilots will work out.

The Olympia 463 No. 301 syndicate trailer is almost ready to leave the hangar and workshop after four months fettling in the dry and great inconvenience to hangar packers. Three of the four owners are on the Committee . . .

An old ambulance has been acquired and converted to a field observation vehicle, with timekeeper's table and light signals.

R. H.

DEVON AND SOMERSET

THIS is the time of the year when club notes contain more gen on the past year's working than exciting stories of flying exploits. Our first part year at North Hill showed a substantial loss of over £1,000 in the Club's finances and it says much for the Committee and members that by dint of careful management and hard work, the year ended 30th September, 1968, came up with a surplus of over £800. Considering the heavy capital commitments and the fact that this was accomplished with an addition of one aircraft to our fleet, we now have to be careful not to pat ourselves too hard on the back and induce autorotation from which it would be difficult to recover!

The eastern entrance to the site, known as Wheelbarrow Lane, has been purchased, the workshops and hangar are more than half-erected and a Pratten 48 ft. by 24 ft. clubhouse acquired. In spite of indifferent weather our launch rate per annum increased last year to nearly 6,200 and this with a very low accident record, which is perhaps the most important feature. The vital factor is, of course, the Club morale which appears to have flourished in the face of adversity, albeit the flourishing has at times been fraught.

Our Club Secretary-cum-tow-pilot,

Geoff Tregonning, has found it necessary to resign his office and we shall miss him sorely. He has performed immaculately during 2½ of the most difficult years the Club has known.

A. E. R. H.

ESSEX

BROWSING through the last issue, it would appear that most clubs in our part of the world have had a poor year weather wise, and that their flying has suffered in consequence. At North Weald, however, we have, in the same number of flying days, packed in more launches and hours than in any previous year. So, with hopes of better weather next year, we're looking forward to a bumper season.

Our Clubhouse has taken on a new look over the last few months, thanks entirely to the efforts of several hard-working members, and we have taken advantage of this by holding monthly parties. Bar profits are, therefore, on a very healthy polar curve.

Our AGM was held in the Clubhouse at the end of November with some 70-80 members attending (the largest turnout we've ever had). Only a third of the old faces remain on the Committee so, with new blood, this promises to be a year of even greater activity.

We're going to be busy next year with 13 aircraft operating from the site, nine privately owned and four club owned. Our fleet consisting of T-21, Swallow, Ka-7 and, by the time of publication, a shiny, new, don't - touch - if - your-hands-aren't-clean, K-13. The Ka-7 is taking a rest from its *ab-initio* circuit bashing and will be promoted to advanced instruction and solo flying.

Our Instructor Rota is slowly expanding at the moment and an instructor training programme starting this winter should improve the situation even further.

G. F. M.

LAKES

OUR white and red T-53 now soars supreme over the Lakeland Hills. How lucky we were to take delivery from Slingsby's of this fine machine before their disastrous fire. We wish them well in their reconstruction.

Black Come's lee wave has been working well. In a NE wind which arrives at Walney via Scafell, the Lake District's highest mountain, two Gold C heights to 15,000 ft. were made by our Chairman, Len Redshaw, and Sid Wearing, both flying Skylark 3's. The T-21 reached 6,000 ft. in a round trip taking the exhilarated pilots only 31 minutes. The Olympia managed Silver C height without difficulty. Our met. friends at Preston confirmed the wave conditions and strength using the Casswell Method.

Two new Instructors join the team, Ian Ronald and Peter Redshaw, who both passed the 10-day course at Lasham. We are all set for a great winter, the weather in the north is, perhaps, not so bad after all!

P. E. G.

LINCOLNSHIRE

BY the time this reaches print we shall have had our Clubhouse Warming/Christmas Party in what was once a derelict wartime control tower, now a pleasantly furnished Clubhouse with all the modern facilities thanks to the team of craftsmen piloted by Dennis Robinson.

The Club recently took part in a "Hobbies for All" Exhibition held at Grimsby and there were displays ranging from gliders to the Grimsby Cartophilic Society! We pride ourselves on our stand and thanks must go to those members of our Club who took it on themselves to produce an excellent display. The Exhibition raised quite a considerable amount of interest in gliding and has already brought us some new members.

The pulley system of launching which was used at RAF Swinderby and for a short time at Bardney has been withdrawn, partly because of the critical length of the runway and partly for safety reasons. We now use straight autotow and two new twin-drum winches which have been built by Messrs. Parker and Jennings and their Merry Men! We also have a retrieve winch well on the way which is being built by Messrs. Platz and Co. This retrieve winch is necessary due to the airfield's resemblance to a "duck pond" in wet weather. Incidentally, Mr. Platz would welcome any ideas on a braking system that people who have had experience with this type of winch may have.

May we take this opportunity of welcoming anyone who is passing through the area and may care to pay us a visit—ten miles due east of Lincoln.

A happy and soarable New Year to everyone . . .

C. P.

LONDON

1968 was not a good year for the Club in terms of hours flown and cross-country flights, but we can justifiably blame the weather for not behaving itself, particularly at weekends. Up until early June there were some excellent days, but July onwards was well below par. The autumn produced some wave flying of a limited fashion. The Plate remained at Dunstable from late July, a sure piece of evidence that soaring days were few and far between.

With 1968 behind us, plans are laid for 1969. A marked change in Club training policies is in the offing, aimed at improving quality of pilots. Quantity training has not proved to be an asset. Weekday activities are to be expanded during the summer months to replace the reduction in courses. The fleet will consist almost entirely of K-13's and K-8's, the Prefects and T-21's being phased out.

The winter will bring several new gliders to the site, apart from a regular stream of Ka-6E's. Frank Pozerskis has acquired a Cirrus, while John Jeffries and John Cardiff are expecting an ASW-12. An ASW-15 will also arrive early in the spring. Dave Paton, our workshop manager, has recently spent several weeks in Germany studying methods of repair work, with particular reference to glass-fibre aircraft, so if we do get any minor prangery we hope to repair glass-fibre gliders on the site.

After a quiet period with little or no "filling in" taking place, the Club has made a more favourable contract. No doubt we shall be wallowing in mud again before long but this time we have a substantial sum of cash in advance. We shall also have a new road at some stage in the proceedings.

Another Gold and Diamond rush to the gliding "Klondyke" will occur again this spring, last year having produced two Diamonds and several Gold heights. For those not prepared to travel so far, Dishforth seems to offer similar possibilities.

The Club has now got an offspring, namely the Balloon Club. A syndicate hot-air balloon, Picard variety, has been operating since mid-summer, and Roger Barrett is now solo. Other syndicate members under training are Martin Moroney, Gwen Bellew, Ray Stafford Allen, Tim Godfrey, Tim Hervey and Peter Langford. Tales of frightening experiences are to be heard most weekends in the bar, and Gwen has fir cones to prove it!

The threat of development of Luton airport still hangs over us, but so far planning permission has not yet been sought. The Club will be represented at any public enquiry, but if the powers that be succeed in overcoming the noise problem, it seems hardly likely that they will take into account the restriction of a gliding club. A third London airport is also a potential threat, a proposed site at Milton Keynes being the most serious. The only item on the cheerful side has been the closure of Bovingdon, though the presence of the RAF there rarely interfered with our operations.

M. P. G.

MIDLANDS

MIKE VALENTINE, who was our second professional instructor during the course season, has now departed for Saudi Arabia. We wish him luck and envy the sunshine he's gone to.

On 9th November we held our usual Trogs' party, which was well supported and enjoyed by all who came. On 15th December we were in a festive mood at our Christmas Dinner (not held last year because of foot-and-mouth).

Our CFI, Ernie Ainscough, has outlined the Flying Committee's plans for the Club fleet and we have ordered a Ka-8 to replace one of the Olympia 460's.

Louis Rotter, Cecil Greenhill and Tony Caveen are now operating their RF-4 from Shobdon. Another member is rumoured to have an RF-5 on order. Are these signs of the times?

K. R. M.

NORTHUMBRIA

AT the Annual Dinner-Dance in November, the Northumbria Cup for the pilot at the top of the club ladder was presented to John Greenwell. The

Cawthorn Cup for services to the club was awarded to Harold Wharfe. He joined because his son was interested in gliding and within a few months became secretary. Since then Harold's guidance as club secretary and architect has brought the club hangar project to fruition.

Following the AGM the management council of ten members remained almost as before, the only changes are that Jack Little is our new Chairman, and Ray Robson is in charge of the social side of our activities. Ray is planning a series of "pie and pea" suppers with film shows to keep the gliding interest alive throughout the winter months.

The Ka-7 suffered a heavy landing following a cable break and is now off site undergoing repairs and a ten-year C of A. C's of A on the other private gliders are under way or imminent, and the club's Jaskolka trailer is being extensively repaired and returned to a roadworthy condition.

J. R. G.

OUSE

WE started our winter social season in fine style, with our seventh Annual Dinner-Dance in the medieval Merchant Taylors' Hall in Aldwark, York. Our guests were Ann Welch, OBE; Group Captain John Lewis, AFC (Station Commander, RAF, Linton-on-Ouse), and his wife, Joanna; Donald Westerside (Chairman, Doncaster Gliding Club) and Mrs. Westerside; Hendryk Doktor (CFI, Yorkshire Gliding Club) and Mrs. Doktor. Members attended from all parts of Yorkshire, from Hull and Beverley in the east to Halifax and Huddersfield in the west.

Ann Welch won all hearts. She is such a great personality, a wonderful mixer. Virtually everybody in the club met her at the reception, and all were thrilled by her fine speech as guest of honour. She has done so much in gliding, as pilot, organiser and administrator. And her sunny smile is worth a fortune. In front of her, at the top table, was a beautiful floral glider—an HP-14! When she returned to London by train the next morning the rain was pouring down. We told her that Yorkshire was crying its heart out because she was leaving us! But the memory of her visit, and her warm personality, will never leave us.

1968 was not a good year from a weather point of view. The last quarter was abnormally wet and windy. But we maintained good launch figures, did a



Ann Welch presents Ouse Club trophies to (l. to r.): Stanley Park (CFI's trophy), Derek Moore (ladder winner) and Kevin Atkinson (soloed on 16th birthday).

lot of interesting flying, had a lot of fun, lost a Swallow in the tragic Slingsby fire, watched Kevin Atkinson (Leeds) go solo on his 16th birthday, arranged for Father Christmas to fly in for the children's Christmas Party, enjoyed our winter social programme, and now we are all set for a tremendous training and soaring programme this year.

A. H. S.

STAFFORDSHIRE

CONSIDERABLE re-arrangement of syndicates has been the main area of activity in recent months. The private fleet has been increased by the addition of a Skylark 3F now being operated by the Townsend partnership, while their former mount, an Olympia, has been taken over by a new syndicate headed by Pete Massey. All this reflects to some extent the tremendous increase in soaring which took place in 1968 due to the decision to concentrate on aerotow as a launching medium. So many pilots find themselves waiting several hours for flights on good days instead of minutes that the necessary pressure to form syndicates has been generated. The aerotowing also offsets to some extent the very poor soaring conditions which generally prevailed from July onwards by enabling even poor conditions to be utilised.

The new instructor rating will have an adverse effect on our total strength in this area as very few of our non-rated assistants managed to complete courses before the deadline. However, there is new talent coming along to replace the losses and we should be back to full strength by the summer.

A. W. H. L. W.

THAMES VALLEY

THE club owns one Ka-13, one Ka-7, two Skylark 3G's and one Olympia 2B.

On Sunday, 3rd November, a strong NNW wind on Chinnor Ridge resulted in John Kape completing his Silver C with a 5½-hour duration and John Goult a Bronze leg with 2½ hours. He could have sat there for 5 hours but he played the perfect gentleman and came down to let another aspirant take over. They were both in Skylarks and soared the ridge at 2,200 ft. ASL. The wind was about 17 knots. We also aerotowed a Ka-7 and several members were checked out for ridge soaring.

The field we use at Chinnor has an overhead high-tension cable 30 ft. high at the approach end; this is highly recommended to improve field landing technique and correct use of air brakes. Our thanks go to Mr. Hill, who owns the field.

Bungy Baker recently flew off on course for South Marston with the intention of returning with the Cup, at present held by the Swindon Club. He ran out of lift at Ewelme and looking around for a suitable field observed a metal scrap yard adjacent to a good corn field. On landing he completed a business deal with the proprietor of the yard and returned to Booker minus the Cup but with a smile on his face and ordered lagers all round.

J. W.

GLIDER FINANCE

Finance for your glider or aircraft purchase can be arranged by telephone or write to *COLIN DONALD (B.G.A. Instructor).*

Burghley Finance Company Ltd.
177 LINCOLN ROAD,
PETERBOROUGH
Telephone: Peterborough 68818

YORKSHIRE

OUR end-of-season party was a great success, though we regretted saying goodbye to our resident assistant instructor, David Pietsch. He has now left us to go back to his native Australia and the energy and enthusiasm he put into his job will be sadly missed.

The bonfire party for the children had plenty of adult observers. The firework display was magnificent, though the effect of the rockets was somewhat spoiled as they all disappeared into low cloud immediately after take-off.

We are looking forward to seeing the results of Joe Provins' hard work this Spring, when he hopes to have finished his own HP-14. He has been putting in up to 30 hours a week on the aircraft.

P. M.

SERVICE NEWS

CULDROSE

RECENT changes see Dave Alty once again as CFI and John Williams has taken over as deputy CFI from Phil Parsons, who is now out in the Far East.

Neville Scholes and Les Martin, who joined in August, obtained their A and B certificates in October. They have also been working hard on the Club coach and ground equipment. Neville's wife Anne has taken over the "Butty Bar", an invaluable asset at the launch point, from Edith Wells. During the time her husband has been at sea, Edith's services have been greatly appreciated. Neville runs the newly formed bar in the evenings.

A successful Dinner-Dance was held in September and the club trophies were presented by our Chairman, Keith Read. Paul Roach won both the Cup for the ab-initio pilot who has made the most progress and also the Cup for the winner of our Spot Landing competition.

The club would like to show its appreciation to Billie and Alan Davie both for the use of their winch and for all their hard work every weekend for several months and for very little flying. Now that the Tiger Moth has been rejuvenated, we are able to repay Billie and Alan a little by getting their new Diamant airborne more frequently on aerotow.

Having achieved almost 100 per cent improvement in our launch rate over the previous year, we look forward to further improvements next year and hope that the Club, with its present core of very keen members, will go from strength to strength.

J. G. J.

FENLAND

COMPLAINTS from past and present members have made us renew our efforts to make a regular subscription to these pages. (To help the author, we have a sheet of paper on the notice-board in the Clubroom on which members can jot down anything which they think should be included in this column. In this manner we hope to produce a more interesting newsletter.)

The first five months of last year started off very well, with hours and launches being well above the previous years' totals. Then the Grunau went in for a major inspection and under the "surgical knife" of Jim Pignott and Jock McCarry the incision revealed far more work than was anticipated; subsequently, the Grunau did not reappear on the field until November. The Ka-6E spent most of the summer away at competitions; one disadvantage of having decentralised competitions as far as service clubs are concerned. With the complete loss of the



Bannerdown *Club is running a full lecture programme in its new briefing room this winter. Above, the CFI, Al Whiffen, makes a point about lift.*

Grunau and limited use of the Ka-6E, we finished up the year well down on totals. During the past year we have sent only ten pupils solo, against 29 in 1966 and 26 in 1967, even though we have extensively advertised our presences. Maybe the Government squeeze is having an effect after all! The Club fleet at present consists of T-21, Bocian, Grunau, Olympia Ka6E and a recent addition in the form of a Prefect owned by Derek and Gillian Bridson. Our American friend, Capt. Jorgenson, and his family have returned to Offutt in Nebraska, complete with a new Diamant tucked under his arm. We wish him and his family good luck in their new surroundings.

We have a welcome visit from Hank Hancox, an ex-member, now CFI of Sharjah Gliding Club; he painted such a nice picture of Gold C heights that some members were thinking of volunteering to join him!

Wing/Cdr. Cheesborough and Sqd./Ldr. Clubb are our new Chairman and Vice-Chairman respectively. Ben Bennett is now Deputy CFI. The Club held its AGM on the 22nd November, followed by a barrel of beer and a film show. A good attendance was recorded and everyone had a most enjoyable evening.

J. A. B.

FOUR COUNTIES

LATE in October the club organised two expeditions, one to Sutton Bank and one to Portmoak, both for a fortnight; neither were very successful. At Sutton Bank one day's flying out of 16 and at Portmoak, 3 days, which together only produced one 5-hour leg.

On the 23rd November the club held its AGM and the reports from all Committee members were favourable, especially the one from the field Treasurer, which was posted from the Bahamas! At the meeting Chris Waller was presented with the Baldwin Trophy for the best cross-country flight of the year by the President, Air Marshal Sir John Baldwin.

Early in the New Year our Chairman, Gp. Capt. Mallorie, leaves us and we thank him for all the support he has given us. Also leaving is Chris Waller, posted to Cyprus.

During October the club fleet changed a great deal; the T-21 was changed for a canopied one, the Ka-6CR finished its major and appeared in new colours. Arriving from Bicester was a new Ka-8 and Ka-6E. The fleet is now T-21, Bocian, Ka-8, Grunau 3, Ka-6CR, Ka-6E and the private Olympia 2 and 463.

All we need now is a good soaring season.

C. I. J.

WREKIN

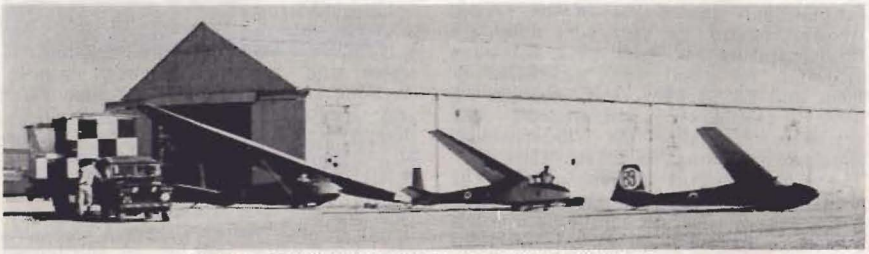
AT the recent AGM of the RAFGSA we were delighted to learn that we had retained the Bicester Cup for a further year, and also won the Founders Cup. It was entirely fitting that our CFI, Norman Smith, should go up to the platform to receive congratulations from Sir Theodore McEvoy. Norman is leaving us for pastures new in January, and it is largely due to his enthusiasm and drive that the club won the Cups. We shall be very sorry to lose him, and all wish him every success in his new life.

At our own AGM, the "Tutor Pewter" for the most notable flight of the year was awarded to Chris Jocelyn. He declared Staverton as a goal on his first-ever cross-country flight, and achieved it.

Suitably engraved log-books were presented by our Chairman. Gp. Capt. H. A. J. Mills, OBE, to the best Adult and the best Apprentice trainee of the year. Kev Kiely received the adult award; he started gliding this year, and got his A and B, C, Bronze C and two Silver legs, and is currently doing great stuff as our number two aircraft repair man. Colin Dewhurst was awarded the other. He also started this year and has his A and B and C, and is a very enthusiastic club member, and a fine example to new members.

In the Competitions this year, Simon Morrison was placed eighth in the Senior Inter-Service, and our CFI was tenth in the National Sport Class, both flying the Club Ka-6E. Norman was unfortunate enough to have his trailer and aircraft severely damaged by a passing motorist during a retrieve—but for this he might have finished even higher.

H. F. O.



Crusaders' fleet in front of their borrowed hangar.

CRUSADERS
(Dhekella, Cyprus)

AS Doc Saundby wrote in the December-January '67/'68 *S. & G.*, page 465, our tame sea-breeze front often sits a mile or two inland, leaving us in the stable sea air. To extend our soaring and front exploration possibilities, we are in the final stages of convincing a local Cessna 172 syndicate of the advantages of their fitting an aerotow hook.

Our Committee have decided to go ahead with the Ka-13 project. We hear that delivery dates are now nearly 1970, which unfortunately means that few of the present Committee will be here to see their plans come to fruition.

Several members have attained Silver C legs, all heights, among them Ann Scott, with a barograph this time. Congratulations to George Brindle on completion of the Instructors' Course at Bicester in late November.

M. I. O.

OVERSEAS NEWS



We would be pleased to receive news for this section from every country in the world where soaring is done—A. E. SLATER, *Overseas News Editor.*

AUSTRALIA

POSSIBLE INTERNATIONALS OFFER.—New moves, including a special feasibility study, have been introduced to claim the right to hold the World Gliding Competitions in Australia, it was stated at the Annual General Meeting at Gawler, S.A.

A "training list" of six world competition candidate pilots and potential crews will be selected after the next Australian contests. The eventual team to the US in 1970 will be selected from these, with the possible addition of the subsequent Australian champions if they are not included in this list.

SOUTH AUSTRALIA CHAMPIONSHIPS.—Orange Week at Waikerie came of age in 1968, having grown in stature and appeal, particularly in the last six years, to attain championship status.

All tasks were closed circuits, generally

SAILPLANE AND ENGINEERING SERVICES LIMITED
Holmfield Road, Buxton
Derbyshire
Adjoining A53

Ring Buxton 4365 NOW
C of A's
REPAIRS
TRAILERS, STEEL TUBE AND WOODEN FRAME, COVERED PLY OR ALUMINIUM
STEEL FABRICATIONS
WELDING AND MACHINING

FOR SALE
DART 15m Inst. and Trailer **£1,375**
PREFECT 30 B **£350 o.n.o.**
GRUNAU 3 **£250**

ranging between 100 and 150 km., and cross-country flying totalled 8,500 miles (13.600 km.). Competitors numbered 70, many of them sharing the use of sailplanes. These included Libelles, Diamant, Austria, Blaniks, ASK-13's, Ka-6, K-8 and Arrow, one Kingfisher and lots of Boomerangs. Eleven Clubs took part.

The Standard Class, in which 46 competitors scored, was won by Rob Moore (Adelaide). Malcolm Jinks (Waikerie), with a Diamant, won the Open Class, in which 10 scored. In the Two-seater Class, in which 5 scored, John Rowe (Waikerie) won with a Blanik and Peter Carlson (Tumbarumba, NSW) was runner-up with an ASK-13; though both put up maximum possible scores, John took first place "on a count-back".

Only one of the nine days was not a contest day, due to a complete overcast. The best day was Tuesday, 3rd September, when 2,000 total miles were flown round a triangle via Renmark and Loxton, 148 km. (87 miles). Peter Rohrlach (Waikerie) in a Libelle averaged 60 m.p.h., using 10 ft./sec. lift to cloud-base at 6,000 ft.

Only one "incident" is reported, a Ka-6 wing being "slightly bent" in an out-landing. On another day Bill Riley landed his Blanik in the middle of a 2,000-ft. sand drift; a tractor had to be borrowed to pull out not only the glider but a car and trailer as well.

Four tugs were operating: a Pawnee, Citabria, Auster and Tiger Moth.

KINGAROY WAVE.—Until winter, 1968, this wave had only been used twice—to 9,000 ft. in 1966 and 10,000 ft. in 1967. But during the past winter (in mid-year) "almost every senior pilot of the Kingaroy Club has sampled the wave". On different days Jim Moore made 16,800 ft., Harold Powell 16,800 ft. and Ian Aspland 15,000 ft. Twenty other flights reached 10,000 ft. or more.

Kingaroy is on the east side of the Great Dividing Range, which sets up lee waves in the strong S.W. winds of the winter months. The ridge is 10 miles long with an average height of 3,000 ft. a.s.l, or 1,500 ft. above surrounding terrain. A high-pressure cell over the continent favours the wave, but only if there is a depression off the N.S.W. coast do lenticular clouds appear; more often the wave has to be sought for.

Australian Gliding.

AUSTRIA

YOUNGEST Silver C pilot in the country is Josef Klafsky, 17 next birthday. His Austrian certificate is No. 1223.

Austroflug.

BELGIUM

NATIONAL CHAMPIONSHIPS.—These will be held from 11th to 17th May, 1969, at the St. Hubert National Centre. The present national champion is Henry Stouffs.

The three-day "Journées de Gand" (Ghent) last year brought 35 competitors from Belgium, Germany, Holland and France. Litt, Dekkers (Holland) and Gross (Germany) were the daily winners. Overall winner was Dekkers (Diamant) with 2,951 points; Gross (BS-1) totalled 2,909 and Bluekens (Belgium, Ka-6E) 2,770.

Conquête de l'Air.

IRELAND (Dublin)

WE have been so busy flying during 1968 that we have not had time to write. We got away to an early start at Easter with Michael Slazenger going to Kilcock, Colum Curley to Roscrea and John Byrne to Sallins. In May, Michael Slazenger and CFI Gerry Connolly flew the Blanik to Limerick, setting up a new two-seater record of 118 miles. On the same day Tom Evans nearly took Stanley Gerrard-Dunne's record with a flight in the Ka-6 to Mallow, while Con McNulty had over 100 miles in the Club Ka-6 on an attempted triangle, landing at Kinnegad on the final leg to Baldonnel. Next day John Byrne declared Portarlington and return; he landed the Petrel on his way back at Durrow.

Then Derek Piggott visited us and arranged to star the Blanik and Petrel in the new Walt Disney film "Guns in the Heather" shooting at Oranmore Airfield in Galway. We had a wonderful weekend but no soaring. Andy Gough was on hand also.

29th June waved. Graham Liddy in the club Ka-6 got to 17,000 ft., getting his Gold C and breaking the Irish gain-of-height and absolute altitude records. Louis Treacy got his Silver C with 6,500 ft. in the Ka-8B, followed by Maurice Cronin, who got 12,000 ft. to gain his Gold C height. Deputy CFI Tom Granville got Gold C height in the Ka-6 with 12,000 ft. The club Ka-7 took to the air with Ian Hood and Gerry Connolly and they established a new two-seater height record with 13,100 ft. But read on: there is more to come. Stanley Gerrard-Dunne in the syndicate Ka-6 went to 18,200 ft.: a Diamond to him, the first in the country and a new Irish record. Late in the evening Michael Slazenger took off in his Blanik and after a great struggle took it to 16,750 ft. and earned his Gold C after three hours 12 minutes of hard work.

We next made a Safari with the Blanik, Ka-6 and later the Ka-8B to the new Castlebar Airport on the Atlantic coast, and for two weeks took advantage of the most wonderful conditions. Gerry Stanley flew the first Irish cat's-cradle, Tom Granville got his Silver C distance and duration. In all, we had 87 flights with 73 hours flown. The average flight time was 50 minutes, bearing in mind that we had set a limit of one hour on the two-seater.

By the time this appears we will have our new ASK-13 flying. We have withdrawn the Ka-7 for a complete overhaul and are fitting a new blown canopy also. Club members are showing their worth and working on this project. One Ka-8B has been worked on also.

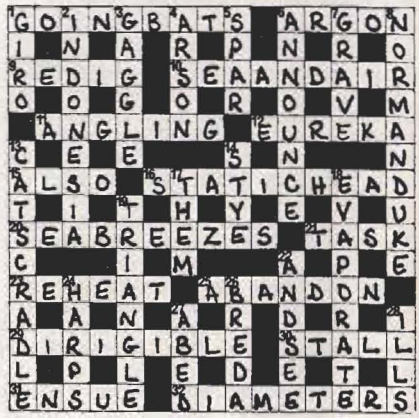
After a lull we are now enjoying a membership boom and have had four first solos since writing you last. We have had quite a few visitors. (You are always welcome in Dublin.) Derek Piggott was flying from the field at Baldonnel on the "Darling Lily" film together with Charles Boddington and they became "regulars". Paddy Kearon came along and helped out while our friend Grenville Hill, Ulster's CFI, is always a welcome visitor. We were also glad to greet Mr. and Mrs. Armstrong, of Camphill, and the one and only Charlie Ross, of Portmoak.

Cupid has also been flying in our midst: congratulations to CFI Gerry Connolly and his charming bride Diana; also club members Nuala Hegarty and Colum Curley, who are engaged. Tom Redmond and John McNeill have left to join the RAF.

J. P. J.

CROSSWORD SOLUTION

Page 511, December issue



SOUTH AFRICA

A PATRON FOR MARFA.—The Gliding Committee of the Aero Club has accepted a proposal by a wealthy Johannesburg businessman, Mr. Hugh Keartland, which will virtually ensure South Africa's participation in the 1970 World Gliding Championships to be held at Marfa, Texas. The proposal, which was adopted unanimously, is as follows:—

Mr. Keartland has offered to organise South Africa's participation in the World Championships at Marfa, USA, in June, 1970, and he has also offered to gather funds in the name of the Aero Club of South Africa and, if necessary, to personally underwrite the following projects:

1. The construction of a BJ-3A to fly, if possible, in the 1968-69 National Championships, and throughout 1969.
2. The construction of two BJ-4's to be developed out of the BJ-3A and which are to constitute the two entries in the Open Class at the Internationals.
3. To make two entries in the Standard Class at Marfa, and arrange for the hire of suitable Standard Class sailplanes.
4. To arrange for tow cars, trailers and other necessary equipment as well as crew.

Because of the magnitude of the project it has been given top priority, and the following appointments have been made by the Committee:

Mr. Keartland, Project Manager, Team Manager.

Mr. "Boet" Dommisse, Team Captain, Team Coach.

Mr. Pat Beatty, Technical Manager and Convener of the Pilot Selection Committee.

Mr. Keartland has proposed that he would afterwards dispose of one BJ-4 in America and keep the second for his personal use.

Mr. Keartland recently completed the 5-hour leg of his Silver C in his Schweizer 1-26 "Snow Goose". He also flies his 2-22 Schweizer, has a share in a Libelle, and is importing an RF-4 Fournier "avion planeur".

Hugh Keartland was actually one of the South African glider pioneers, together with Boet Dommisse and others, who used to bunjy from the Quaggapoort Heights near Pretoria in a Grunau 9 Primary back in 1936-1938. Now, having succeeded in his printing and publishing business, Hugh Keartland is out to enjoy gliding—and to put something back into it.

A NEW BJ-3.—A team is already hard at work on the construction in the Beatty workshops of the BJ-3A. Robert Speth, of the S.A. German Gliding Club, who works in the Aerodynamics Division of the C.S.I.R. in Pretoria, is batting out overtime at the drawing board producing engineering drawings to the highest professional standards for the new ship, which has been re-designed by Fritz Johl.

Pat Beatty, with hired help instead of all on his lonesome as in the past, has already started laying down jigs for the construction work, and bits and pieces are being farmed out to machine shops and engineering works for fabrication.

The BJ-3 Mark II is really a new fuselage and tail sporting the BJ-3 wings seen at Bloemfontein last year. The new fuselage is only 28 inches deep and is long and sleek with a bunny-nose canopy, somewhat like that of the BS-1. Innovations are many and, apart from exotic structure and materials, include the adoption of a retractable bicycle undercarriage.

The T-tail configuration of former sailplanes in the BJ series has been abandoned. In its place an all-flying tailplane with anti-balance tab is located on the fuselage centre line *aft* of a tall high-aspect-ratio fin and rudder which includes a substantial sub-fin located beneath the centre line.

A unique innovation is the adoption of an external aerofoil flap as a rudder rather than the conventional camber-changing flap rudder.

These and all other changes are directed towards producing a lighter, more streamlined fuselage and, hopefully, better performance. It is expected that control and handling at low airspeeds will be considerably improved. The flaps are likely to be hydraulically actuated.

All this adds up to make a formidable sailplane—and certainly one of the most sophisticated flying in the world at present. The fuselage has a metal struc-

ture fleshed in a streamlined glass-fibre "cigar", while the empennage is of all-metal construction.

Gliding Newsletter.
Editor: B. P. PAUTZ.

SOVIET UNION

THIRTIETH NATIONAL CHAMPIONSHIPS.—Eighty thousand kilometres, or twice round the Earth, was the distance flown by the 62 competitors in the 30th Soviet National Championships, which were held during the latter half of July, 1968, at Orel. The progress of Soviet gliding has been considerable since 1951, when, during the 17th Championships, only one pilot succeeded in completing a 100-km. triangle. In these championships 20 teams, each consisting of two men and one woman, took part (presumably in Blaniks).

Seventeen pilots completed the first task, a 100-km. triangle; 31 the second, a 200 km. triangle; 46 the third, a 200-km. out-and-return; and 20 the fourth, twice round a 100-km. triangle, the winner, Yevgeny Rudyenski, taking 3 hrs. 9 mins. He also won the fifth task, a 300-km. triangle, taking 4 hrs. 1 min.; in this, 54 out of 61 finished the course.

The sixth and last task was a 500-km. triangle. The sensation of the day was caused by 20-year-old Oleg Pasyechnik, from the Chekov region, near Moscow. He flew 359 km., beating Rudyenski, who came second with 343 km. Oleg has been gliding for only three years. The flights of all the competitors on this day averaged 300 km.

Leading final results were:

1st (men): Rudyenski, Ukraine, 5.301.

1st (women): Sudeykit, Lithuania, 4,700.

2nd (men): Pilipshuk, Ukraine, 5.057.

2nd (women): Afrikanova, 4,472.

3rd: Chuvikov, Centr. Russ. Fed., 5.044.

Leading teams: Ukraine, 14,613; Lithuania 1st, 13.729; Lithuania 2nd, 13,176; Moscow 1st, 12.435.

The performance of the pilots exceeded all expectations. Of the 21 First Rank Sportsmen, 18 fulfilled the standards for the title "Master of Sport". The contests were dedicated to the 50th anniversary of the Lenin Comsomols.

COMMENT.—Suslov, Verietenikov and Yarushevichus, who were in the World Championships in England, do not appear to have been in the competition. V. Goncharenko, the opera singer from Kiev, who flew in the 1958 World Championships in Poland, was not in the Championships either.

Translated and condensed from "Krilya Rodiny" by C. WILLS.

Bristol Gliding Club

NYMPSFIELD, GLOUCESTER

We offer excellent thermal, hill and wave soaring at a site on the western edge of the Cotswolds, near Stroud.

Fleet includes Skylark II, Olympia, Swallow, Prefect and Dual Training Machines. Aerotowing available.

Comfortable Clubhouse, first-class Canteen, Bunkhouse and Bar.

Summer Gliding Holidays for ab-initio Non-Members.

Write to: BRISTOL GLIDING CLUB
NYMPSFIELD, Nr. STONEHOUSE, GLOS.
Telephone: ULEY 342

1969 COURSES

Cambridge University Gliding Club

Marshalls Aerodrome, Cambridge

Training in Ka7. Solo flying in Swallow, Olympia 2b and Skylark 4. Instruction given in thermal soaring, aerobatics, instrument and cloud flying. ALL LAUNCHES BY AERO-TOW.

18-20 Gns. per week, not including accommodation.

Details: Mr. R. C. Haddon, 54 Brampton Rd., Cambridge CB1 3HL.

CORNISH GLIDING & FLYING CLUB

Gliding courses in modern fleet from MAY 5th — B.G.A. categorised instructors — fine soaring — lovely coastal airfield — ideal for a different family holiday.

AERO-TOW COURSES AVAILABLE.

Details with pleasure from: **The Course Secretary, Cornish Gliding & Flying Club, Trevellas Airfield, Perranporth, Cornwall.**

DERBYSHIRE AND LANCASHIRE GLIDING CLUB

Hill top plateau in Peak District National Park ● Thermal, wave and hill soaring for N.W. to S.E. on 3 mile west and 5 mile south escarpments from field itself ● East wind soaring from winch launch ● Wave worked to 15,000 ft. so far ● Modern Fleet under constant review. Capstan, Swallows, Ka 8, 463 ● Fine Winch Fleet ● Hitch Facilities.

VISITORS WELCOME – Temporary or Daily Membership for Syndicates and Solo Pilots.
Phone or write for accommodation – notice appreciated.

MANY COURSES – ALL INCLUSIVE
Early Spring –
– Late Autumn.

Details sent with pleasure.

Resident Steward and Stewardess.

Full Board in heated twin bunks, and male and female bunkrooms (Weekends only at present in Winter). Separate Messroom, Clubroom, and Bar with real atmosphere.

Telephone: TIDESWELL 207

GREAT HUCKLOW,
Nr. TIDESWELL, DERBYSHIRE.

1969!

9-day Approved Instructors' Courses beginning 7th March, 21st March, 17th October, 31st October.

Weekly Holiday Courses for beginners and others: April – October.

Visiting gliders very welcome. Winch or aerotow launches.

Try a 60/KM. out and return on our ridge!

Modern residential clubhouse with licensed bar.

Full details from:

KENT GLIDING CLUB

Challock, Nr. Ashford, Kent
Tel. Challock 307

WEST WALES

Withybush Airfield, Haverfordwest, Pembrokeshire

The Club is centrally situated for over 70 miles of National Park coastline offering unspoilt beaches and excellent facilities for open air holidays.

Gliding Holiday Courses open any week during summer.

Launching from three runways by auto-tow and aero-tow.

For the beginner, instruction on side-by-side Slingsby T-21 and solo on Pirate, Olympia 463 or Skylark II.

For the advanced, high performance training on Capstan. Aero-tows by Tugmaster. Soaring on N, E, W and S facing cliffs. Accommodation in fully licensed residential Clubhouse, with male and female dormitories with full interior sprung single beds.

Illustrated brochure and details from Gliding Secretary, Flying Control, Tel. Haverfordwest 3665 or 3156 or Tenby 2705.

LONDON GLIDING CLUB

Dunstable Downs, Bedfordshire.
Telephone: OLU 2 63419

Situated at the foot of the Chiltern hills, and within easy reach of London and the Midlands by road (just off the M1). The Club has a comprehensive fleet of dual and solo aircraft, reliable launching equipment including four tugs. This famous site has plentiful thermals in summer and hill soaring with favourable winds throughout the year. Resident instructors, catering every day (weekends only in winter), licensed bar, accommodation and other facilities. Visitors welcome.

For details of membership write to the Manager (SG).

MIDLAND GLIDING CLUB LIMITED

LONG MYND, SHROPSHIRE
Telephone: Linley 206

BUNGEE LAUNCH???
Where else?

5 mile ridge – frequent wave.

Excellent clubhouse, comfortable bunkhouse, dining room – 3 meals a day – snug bar.

5 day courses for ab-initios, advanced pilots and private owners.

Club fleet includes Ka 13s, 460s and Swallows.

Associate membership (1 month) £1.

Further details from: H. HILTON, 22 Landsdowne Crescent, Bayston Hill, Salop.

INDEX TO ADVERTISERS

Breeze Light Aviation Ltd.	63
Bristol Gliding Club	86
British Gliding Association	43
Burghley Finance Co. Ltd.	79
Cambridge University Gliding Club	86
Classifieds	70-73
Peter Clifford Aviation Ltd.	Back Cover
Cobb-Slater Instrument Co. Ltd.	Inside Front Cover
Cornish Gliding Club	86
Crossfell Variometers	57
Derbyshire and Lancashire Gliding Club	87
Doncaster Sailplane Services	72
Dorset Flying Club	25
Gliderwork	51
F. Horridge	22
J. Hulme	27
Irving Air Chute of Great Britain Ltd.	Inside Front Cover
Kent Gliding Club	87
Lasham Gliding Centre	63, 73, Inside Back Cover
Victor Laurence (Merchants) Ltd.	70
London Gliding Club	87
Joseph Lucas Ltd.	18
Midland Gliding Club	87
Motoimport	58
Rhodesian Gliding Championships	11
Sailplane & Engineering Services Ltd.	83
Sailplane & Gliding	3
Schempp-Hirth K.G.	48
Alexander Schleicher Segelfluzeugbau	28
Scottish Gliding Union	Inside Back Cover
Slingsby Aircraft Ltd.	2
Smith & Jones	15
Southdown Aero Services Ltd.	7
Southern Sailplanes	48
Speedwell Sailplanes	54
Sportair Aviation Ltd.	31
Surrey Car & Caravan Co. Ltd.	23
Thames Valley Gliding Club	Inside Back Cover
J. S. Thorne	71
Thorpe Aviation Ltd.	14
Three Counties Aero Club Ltd.	36
West Wales Gliding Association	87
Worcestershire Gliding Club	88
Yorkshire Gliding Club	88

WORCESTERSHIRE GLIDING CLUB
BIDFORD-ON-AVON

Come to Shakespeare's country for your 1969 Gliding Holiday.

Weekly courses for beginners from April to October.

Special courses have been arranged for the advanced pilot.

Fully staffed modern residential clubhouse with licensed bar.

We try to make your holiday something to remember.

Send for free brochure for full details.

DO YOU ONLY WANT TO FLY AT WEEKENDS?

OF COURSE YOU DON'T!

with the

YORKSHIRE GLIDING CLUB
AT SUTTON BANK

it is possible to SOAR on any day of the week, at any time of the year . . . as well as the good thermal soaring conditions that are to be found over the Vale of York in the summer months. Excellent hill and wave soaring in the lee of the Pennines can be enjoyed during all months of the year.

The club specialises in holiday courses for beginners and in advanced courses . . . full-time, professional instructors are employed.

Visitors from other clubs are welcome . launching by winch or aero-tow.

The Clubhouse is fully residential and is of a very high standard. There is a licensed bar and catering is provided for all meals . . . centrally-heated bedrooms, each with hot and cold water! Visitors can bring their wives and families to Sutton Bank confidently knowing that they *too* will have an enjoyable holiday.

The Club is ideally situated for exploring the magnificent scenery of the North Yorkshire National Park.

Modern fleet of training and high performance sailplanes.

For more information write to:
The Secretary,
THE YORKSHIRE GLIDING CLUB,
SUTTON BANK, THIRSK,
YORKSHIRE.
Telephone: Sutton (Thirsk) 237

SCOTTISH GLIDING UNION

PORTMOAK, SCOTLANDWELL, BY KINROSS

Telephone: Scotlandwell 234

THE WAVE SITE

Excellent Hill, Thermal and Wave Soaring in beautiful surroundings

Comfortable Clubrooms, excellent bedroom accommodation, full catering and bar

Seven days per week

Balanced Club Fleet

Resident Instructor

Aero Tow Facilities

COURSES FOR BEGINNERS AND OTHERS JUNE TO SEPTEMBER

Visitors and visiting aircraft welcome

Write to the Secretary for further details

ADVANCED BOOKINGS NECESSARY IN WRITING

Thames Valley Gliding Club

BOOKER

Whether experienced or inexperienced you will enjoy the facilities offered at Booker.

Training on Ka7 machines followed by Olympias and early conversion to our Skylark 3g's.

The efficient all aerotow operation at Booker coupled with the many gliders available offers a unique service to members throughout the year, both midweek and weekends.

Restaurant and Bar open at all times.

Write for details or better still visit us at WYCOMBE AIR PARK, BOOKER, Nr. HIGH WYCOMBE, BUCKS.

LASHAM

(NATIONAL GLIDING CENTRE)

Weekly elementary and advanced courses all year at inclusive rates. Modern centrally-heated clubhouse, canteen and bar. Accommodation provided. Full time professional instructors always available, club solo and two-seater flying every day, private owners welcome.

Club Fleet for 1969

2 Capstans	**2 ASK 13's**
3 K 8B's	**2 Skylark IIIF's**
3 Skylark IV's	**2 Dart 17R's**

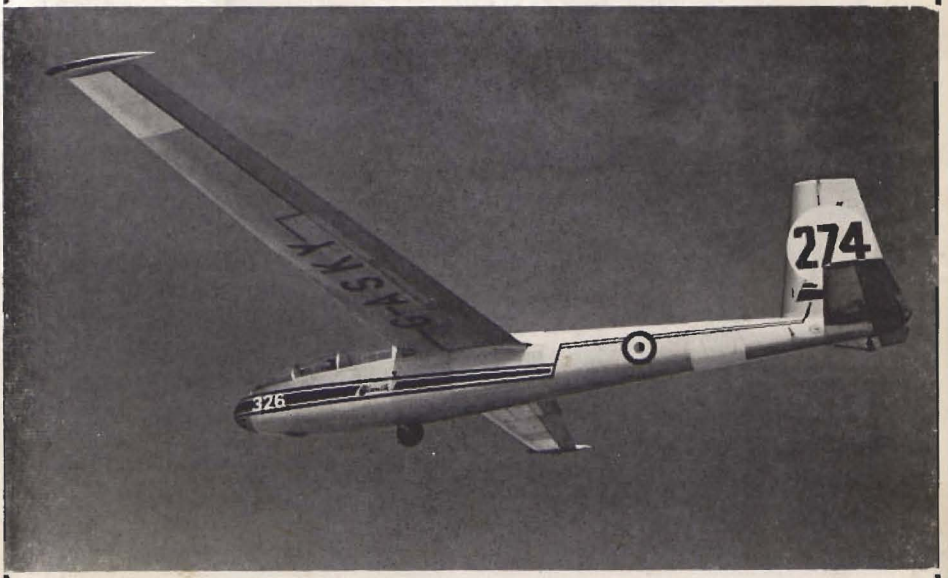
Trailers for all aircraft, Landrover for retrieves. Aircraft available for weekly hire, expeditions and contests.

LASHAM GLIDING CENTRE, Nr. ALTON, HANTS. TEL. HERRIARD 270

LASHAM GLIDING SOCIETY
SURREY & HANTS GLIDING CLUB

GLIDE AHEAD WITH A 'BLANIK'

HOLDER OF THE U.K. TWO-SEAT HEIGHT RECORD



★ Unsurpassed two-seat performance

★ Fully aerobatic – Flies equally well inverted

★ Corrosion proof all metal manufacture – Low maintenance costs

★ High launches achieved through low drag and weight (Empty 650 lbs.)

★ Perfect for all training especially instrument flying

★ All purpose sailplane – ideal for club or syndicate

★ Winch belly hook now fitted

WELL PROVEN—OVER ONE THOUSAND BUILT

Delivered U.K. £2,275
(including instruments)

Duty £270
(if applicable)

IMMEDIATE DELIVERY

H.P. FINANCE ARRANGED

OVERSEAS ENQUIRIES WELCOMED

Distributor for U.K., Eire and Canada:

Peter Clifford Aviation Limited, Oxford Airport, Kidlington, Oxford.

Tel. Kidlington 4262

Cables: Cliffair, Oxford

Sole Exporter for Czechoslovak Aviation Products:

Omnipol Limited, Washingtonova 11, Prague 1, Czechoslovakia.