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Sailplane and Glider

The First Journal devoted to Soaring and Gliding

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Sailplane and Glider

Founded in 1930

and ULTRA LIGHT AIRCRAFT

THE FIRST JOURNAL DEVOTED TO SOARING AND GLIDING

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COVER PHOTO:

Richard H. Johnson, winner 21st National Soaring Contests, Elsinore, California, July 27th–August 5th.

Editorial

AS we go to press with this last issue of our Volume XXII, our future hangs in the balance. We are uncertain as yet whether we will resume normal monthly publication in January 1955, or perhaps, through economic reasons, be compelled to continue with our bi-monthly issues. We had hoped to be able to increase the number of pages at sometime during this year to help offset our less frequent appearances. To do this it was necessary to increase our subscription lists very considerably and more important, gain greater support by way of advertising from those engaged in the manufacture of sailplane and gliding equipment generally. We enrolled many new readers, though not really enough, but advertising support fell far short of expectations so we were unable to increase our size. We can only conclude that the demand for new machines and instruments at home must be very poor indeed and everyone is beginning to feel the pinch. A surprising thing is that our readership overseas still out-number that in this country and it is largely for that reason that so much of our space is given to the reports of foreign items. We find too that our friends abroad are far more willing and regular with their news and photographs than our own clubs which is a regrettable fact. *Sailplane and Glider* has become the leading International journal devoted to those whose interest lies in the pursuance of motorless flight, but it is first and foremost the leading British journal and we would be a lot happier to see regular contributions from Club Secretaries in this country; accounts, too, of flights by the ordinary Club member. Most readers we have found, have always been more interested in personal accounts by the small men, who after all are the backbone of any Club, than the grand reports from world champion and record breakers who have the time, money, and of course skill for such pursuits. Nevertheless, we would all be the poorer without their contributions from which all can learn.

Christmas provides us with a good opportunity to thank all who have supported us during the past year for their help and advice and for the many kind letters we continually receive from this country and readers in our Commonwealth countries—Australia, Canada, New Zealand, South Africa, Malaya; and to all who have sent news and reports and photographs from Poland, France, Belgium, Japan, Italy, Spain, to mention only a few. We look forward to hearing from all our friends again in the New Year and to making many new ones.

We conclude by wishing you all a Very Happy Christmas and plenty of Good Soaring Days in the New Year.

R.G.B.

THREE WEEKS WITH THE BIRDMEN By J. WILCOCK

All hands to the pump. Mr. Wilcock, author of this article, is on the extreme right

A non-technical echo of the Championships—Mr. J. Wilcock, Driver Salesman Instructor, Shell Mex and BP, has written these impressions of the meeting.

WE arrive at Great Hucklow, Driver Charlie Gregory and myself, and make preparations for our three weeks' stay, 1,300 feet above sea level, for the first international gliding championships to be held in England. Between us and the escarpment of Bradwell Edge are lined up 45 gliders from all over the world, and 250 visitors, camped on this hilltop.

Lord Brabazon of Tara performs the opening ceremony, and as one of the Derbyshire and Lancashire Club machines, piloted by the chief instructor, skims over our heads the flags of 19 nations break out into the wind—a very impressive sight.

The practice runs start and with them comes the first ' flap.' The met. men come over. ' Please come to the control room and see the charts.' As the visiting vehicles move across the field the thin lines on the charts spread into two-inch-thick black smudges. Can we suggest anything? Yes, we ring Divisional Office and 100 suppressors are here next morning, 75 are fitted, and the met. men are happy. Many thanks for our assistance. Customers become to drift into our servicing bay and now the fun begins. Litres and gallons, five and one pound notes, and the change thereof. Most of them with not one word of English, much pointing and counting of fingers. Five minutes of jabbering means just Yes or No. They get used to us, we show the price card and the meter and they get the hang of it. One of the Swedes comes for oil. ' Have we a pit got? Yes—No? ' ' Sorry we have no pit.' But wait. From a sloping field to a low wall we put two planks. ' O.K.? ' ' O.K.' Everybody knows ' O.K.' This is a great help. The pit becomes international workshops for the duration.

An unusual quietness this morning. The Austrians' ace pilot is dead. Half a wing snapped off his glider and he crashes in the valley below us. Gliding is possible the next day and this eases the tension.

We do a tour of the lines this morning with dusters, sponges, phrase books, maps, etc. These are much appreciated by all. We are getting used to everyone now and they to us. The Yugoslavs pass by. Smiles, greetings, and hand raising. They are hefty fellows in jerseys, always bunched together like a rugby scrum.

It rains all day, all night, all day again, and, to make a change, the clouds come low and envelop us in fog. Between us and the lines is now a bog. We collect a good ton of topping stone from the walls and build an island. The more timid ones do not visit us now. They stay in the car park and get supplies in town. French, Spanish, Yugoslavs and Argentines always show up. To see them tear down the field through the bog to the island is a great sight.

Met. men say a break in the weather by noon and the rush starts. Out come all the gliders and the fixing of wings begins, at the double. The jabbering among the Spanish and Italian teams is terrific. The crew manager shouts at a big, heavy Spaniard, he jumps back four or five feet and lands on the toes of a small chappie holding up a wing. The latter lets out a terrific yell and rolls away holding his toes, and nothing will coax him back until the wings are fixed. The noise from the Italians gets louder and fiercer, everybody stops work and squares up to each other. Whatever the trouble, this appears to settle the matter and work continues.

The gliders are towed to the launching point and the crews return to take up their position on the

trucks for radio-telephone conversations with the pilots. The Argentine pilot steps by as usual, his lady on his arm, and, she, as always, in national costume. The unusual sharp features and magnificent carriage of this couple is regal to a degree. From a sixteenth-century Spanish Court? We always look behind them expecting to see a retinue of servants in attendance.

The gliders have gone and now the crews come to us with the names of the places their pilots have reached. We pinpoint these on their maps and make out a list of towns through which they should pass to collect them. With many a ' Gracio, senor ' they are on their way.

Again the gliders are up, a nice sunny day, but no cloud variations to give them a lift. For five hours they cross and re-cross Bradwell Edge. José, the happy Spaniard, sings love songs in a rich, deep voice. He has done some bullfighting and, seeing a lone sheep, gives ns a demonstration.

Heavy rain comes down again, lots of it. We walk into the hangar. The German glider is in—a lovely thing this. It cost £7,000 to build, and by its performance it is going to be worth it, being exceptionally fast.

The Austrian team spend their spare time fashioning a large piece of rough Derbyshire stone as a memorial to their dead comrade. With this setback, and the weather, they have not much heart for gliding.

In the hangar are the Finns, the Swedes, the Swiss and the Dutch, all working away in silence. These teams rarely speak unless spoken to. Over and under the wings of the Belgian glider is painted, in large letters, in Flemish, ' NOTHING CAN REPLACE WOOL.' On the fuselage is painted the records they hold. We visit the bar and join the South Africans. One always wears a red fez; the other a bowler, around which, in white chalk, is ' What! No Gliding?' The Spanish boys see us and come over to have a drink and we form a circle and clink glasses. José says, ' Bueno, Major Amigo,' and we drink up. Happy days.

A beautiful morning, the two-seaters are up. If they get away the championships are completed. They are off, and this is it. The French have won the singles and the Yugoslavs the doubles.

The last day and the final fill-up. The U.S.A. call, ' You sure has given us some service, buddy.' We thank you. So long, and good luck.' The quiet little Dutch lady stops. ' Thank you for all you have done.' ' It's a pleasure, lady. Good-bye.' The winning French team manager presents us with their photograph. Across the top is written, ' To our friends of the Shell and BP.' The Yugoslavs come enbloc, the manager hands us their club badge, the winning pilot takes out a photograph, autographs it and passes it round. All the team sign.

Argentina's English-speaking member comes across. Will we please autograph his trousers? Amidst the hundreds of names we find a small space, we sign, he bows and present us with a silk pennant, we thank him, he conveys the thanks and good wishes of his team manager and crew, and departs. José and his merry men arrive, last as usual, and very fussy with us this morning. The team manager hands us their pennant. From the crew we receive photographs, on the back of which are addresses and farewell messages.

Electrical Turn and Slip Indicator, Mk. 2a

A NOVEL and entirely new form of slip indicator is incorporated in the new Pullin Turn and Slip Indicator Mk. IIA recently granted M.O.S. approval and called up under Stores Ref. 6A/3953. The instrument follows the American cum Continental presentation now standardised for the R.A.F. and N.A.T.O., and has the turn needle and ball type layout, but is the first instrument to achieve this without using the conventional ball in arcuate tube filled with liquid.

It has been found that with the usual ball in tube type of Slip Indicator it is not possible to fluorise the moving ball efficiently and therefore the backing card to the tube has been fluorised as a compromise.

In the new Pullin instrument, slip is portrayed by a fluorised pointer bob which is supported through a narrow slot in the dial. The mechanism consists of a first pendulum attached direct to the copper drag cup of a magnetic damper. The sensitivity of the pendulum is increased by the use of an inverted pendulum which it engages by means of a slot and pin. Due to the increased sensitivity of the first pendulum the fluorised bob travels through a full deflection of some 25° when the instrument is inclined at 14°. This lever and pivot arrangement provides a slip indicator which has very little friction and exceptionally good zeroising characteristics.

A further innovation is the introduction of a power failure indicator which shows the word ' off ' on the face of the instrument only when the gyro rotor speed falls below that at which it ceases to be of practical value. The device consists of a hollow light alloy drum which is free to rotate a nominal 60° between stops so that a flat face, on which is engraved ' OFF ' appears in, or disappears from a window in the front of the dial. The drum actually operates in the window so that the face engraved ' OFF ' is flush with the front of the dial, so making the warning more visible at oblique angles of vision. The drum is actuated by a spring and magnetic attraction in moving from ' ON ' to ' OFF ' and by magnetic repulsion in moving from ' OFF ' to ' ON ', pressing against the spring during the latter half of the movement. In both movements the supply voltage is made or broken by a centrifugal switch on the gyro gimbal.

This new Turn and Slip Indicator is produced by Messrs. R. B. Pullin & Co., Ltd., Phoenix Works, Great West Road, Brentford, Middx.

THREE WEEKS WITH THE BIRDMEN—*contd.*

They are all aboard and lined up. They move off in a line with terrific blowing of horns. As they pass us come cries of ' So long, Adios, Auf Wiedersehen, Hasta la vista, and a great shout from the Slavs that drowns them all. One by one they disappear over the hill, horns still blowing, to North America, South America, Australia, to the ends of the earth. They are gone. Adios, senors, we shall never see you again.

It is very quiet. We warm up the engine and make a dash for the road. One doubtful minute, but we are through. As we take the road past the airfield the sheep are moving in. Great Hucklow is back to normal.—"*Shell & B.P. News.*"

FIRST NATIONAL SOARING CONTEST IN BRAZIL

(We regret the late appearance of this report due to pressure of space).

THIS Contest took place between the 7th and 16th January last at the aerodrome of the Aero Club Ribeirao Preto, chosen partly for its meteorological conditions and partly because it lies among a network of aerodromes and roads. The tests were divided into two classes, the first for high-performance machines, and the second for training sailplanes.

Owing to continued bad weather several of the contestants had not been able to arrive in time for the opening day (which was originally intended to be the 4th), but luckily conditions improved so much that flying was possible on seven out of the nine days left. Entries in Class A were :—

Class ' A.'	J. C. de B. Neiva	Gliding Club Duque de Caixas ..	' Prototype BN-1 '
	B. Cesar	Aeroclub Bauru	' Spalinger S-25A '
	V. Pinto	Aeroclub Bauru	' Leister Kaufmann '
	H. Widmer	Aeroclub Bauru	' Flamingo (prototype)
	S. de Oliveira	Polytechic Gliding Club	' Rhonbussard '
	C. G. Cheren	Gliding Club Duque de Caixas ..	' Weihe '
	George Munch	Polytechnic Gliding Club	' Kranich I '
Class ' B.'	N. C. Pinto	Aeroclub Bauru	' Neiva-B '
	J. Kovacs	Aeroclub S.J. dos Compos	' Neiva-B '
	L. S. C. Linz	Aeroclub S.J. dos Campos	' Neiva-B '
	J. Duvivier	Aeroclub S.J. dos Campos	' Neiva-B '
	A. W. V. da Rosa	Aeroclub S.J. dos Campos	' Grunau Baby '
	J. Magalhaes	Aeroclub Juiz de Fora	' Neiva-B '
	J. N. de Carvalho	Aeroclub Bauru	' Grunau Baby '

7th January. Speed out and back to Batatais (70 km.).

Class ' A.'	1st ..	Jose C. de B. Neiva	1,000 points
	2nd ..	George Munch	965 ,,
	3rd ..	Cid Guedes Cherem	936 ,,

On this date unfortunately three sailplanes suffered serious damage, causing their withdrawal from the contest.

Class ' B.' Ribeiro Preto-Serrana and back (46 km.). Only A. W. Vieira da Rosa made a computable flight, thus gaining the 1,000 points for first place.

8th January. Class ' A ' and Class ' B.' Speed over measured distance to goal.

Class ' A.'	Ribeira Preto-Pirassununga (160 km.).		
	1st ..	C. G. Cheren (45 km.)	1,000 points.
	2nd ..	J. C. de B. Neiva (28 km.)	833 ,,
Class ' B.'	Ribeira Preto-Vassununga (38 km.).		
	1st ..	Jose Kovacs (38 km.)	1,000 points.

No pilot in either class managed to reach the goal, so points were given in accordance with the distances covered. The prototype ' BN-1 ' suffered damage on landing, which was a pity as it had caused many favourable comments.

9th January. Speed on goal flight, same goal for both classes. Pilots were asked to fly to Bebedouro (75 km.). Before the test a trial flight was made by members of the Committee. This was a great help and was repeated on subsequent days, improving the results considerably.

Class ' A.'	1st	—	George Munch, in 2 hrs. 01 mins.	1,000 points.
	2nd	—	C. G. Cherem	341 ,,
	3rd	—	B. Cesar	332 ,,
Class ' B.'	1st	—	Ney Cunha (65 km.)	1,000 points.
	2nd	—	Julio Magahaes (52 km.)	840 ,,

10th January. Speed on goal flight, same for both classes—Vassununga (67 km.).

Class ' A.'	1st	—	George Munch in 1 hr. 05 mins.	1,000 points.
	2nd	—	C. G. Cherem in 1 hr. 15 mins.	895 ,,
	3rd	—	Vasco Pinto	683 ,,
Class ' B.'	1st	—	A. W. V. da Rosa in 1 hr. 20 mins.	1,000 points.
	2nd	—	Jose Kovacs in 1 hr. 25 mins.	980 ,,
	3rd	—	J. Magalhaes in 1 hr. 35 mins.	910 ,,
	4th	—	Luiz Sapucahy in 1 hr. 56 mins.	805 ,,

11th January. Rest day.

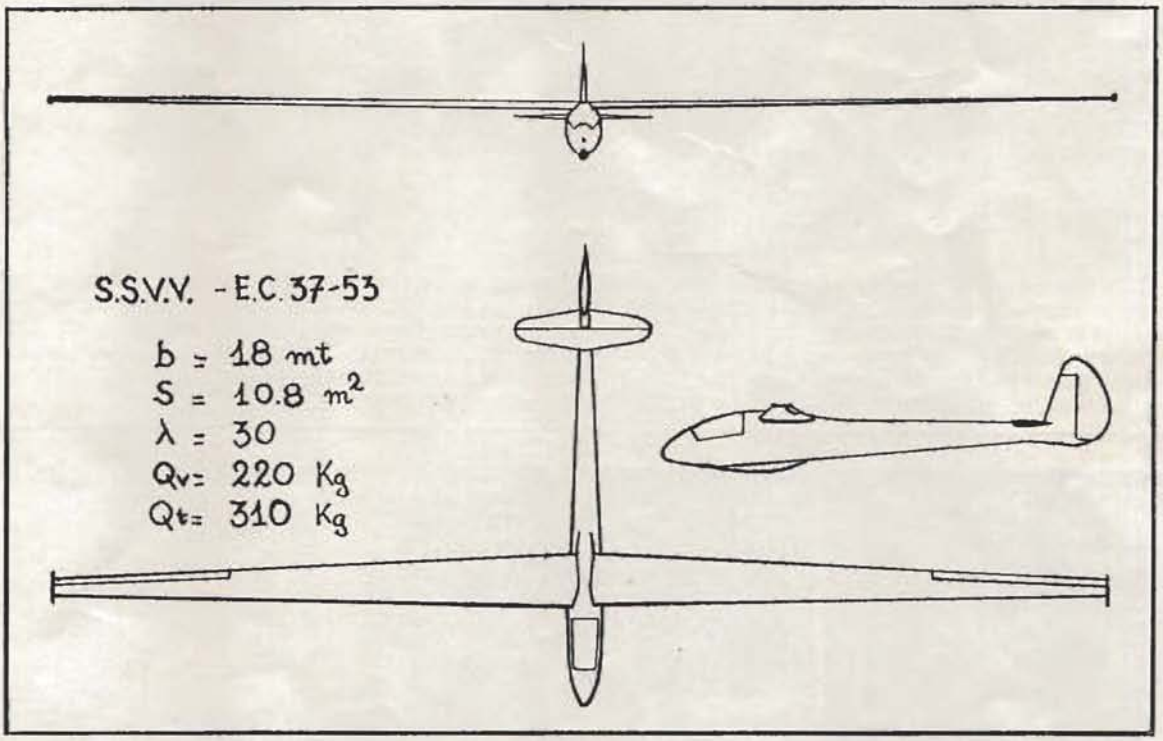
12th January. Goal flight, pilot's choice, both classes. During this task George Munch established a national goal flight record to Itu. This flight of 242 km. also constituted a national distance record, thus beating his own previous record of 221 km., made while flying in the Argentine 5th National Contest.

1st	—	George Munch	1,000 points.
2nd	—	Vasco Pinto	438 ,,
3rd	—	C. G. Cherem	438 ,,

(Continued on page 6)

Brief Notes on the . . . EC 37-53 'SPILLO'

The EC 37-53 'Spillo'



The EC 37-53 'Spillo' sailplane. Built for the 1954 International Contest. Drawings by Edgardo Ciani : building by S.S.V.V. von Milano (Museo of Sainza and Teenica). Normal wood construction, very simple : the prototype costs nearly 3,000,000L (that is £1,700).

Wing span 18 mt. (60 ft.). Length 7,75 mt. (25 ft. 6 ins.). Surface 10,8 mg. Aspect ratio = λ = 30. Weight empty 220 Kg. (Max. total weight 315 Kg. Coefficiente a rottura 7. Min. sinking speed 0,55 m./sec. at 75—80 Km./h. At 100 Km./h. sink 0,7—0,75 m./sec. At 140 Km./h. sink 1,5—1,7 m./sec. Best gliding ratio, over 40.

These are flight measured data : because the plane had its first flight the 9th last, they are not well measured : ± 10% errors are possible. At the International Contest this machine was piloted by Brigliadori.

FIRST NATIONAL SOARING CONTEST IN BRAZIL—*(continued from page 4)*

Class ' B.'	1st	—	A. W. V. da Rosa	1,000 points.
	2nd	—	Jose Kovacs	979 ,,
	3rd	—	Julio Magalhaes	880 ,,

13th January. Distance for both classes.

Class ' A.'	1st	—	George Munch (163 km.)	1,000 points.
	2nd	—	B. Cesar (140 km.)	861 ,,
	3rd	—	V. Pinto (125 km.)	757 ,,
Class ' B.'	1st	—	Jose Kovacs (140 km.)	1,000 points.
	2nd	—	A. W. V. da Rosa (137 km.)	979 ,,
	3rd	—	L. Sapucahy (85 km.)	612 ,,

14th January. Rest and retrieving.

15th January. Last test day of the competitions. Speed over a triangular circuit for both classes. Class ' A ' over a total distance of 130 km., and Class ' B ' over a distance of 67 km. Again George Munch was the winner, establishing the first speed record over a triangular course and also in one of the flights making a new height record of 3,550 metres gained. He is evidently a future international competitor to be watched.

Class ' A.'	1st	—	George Munch in 2 hrs. 59 mins. (43.7 km./h.)	1,000 points.
	2nd	—	C. G. Cherem	359 ,,
Class ' B.'	1st	—	A. W. V. da Rosa in 1 hr. 40 mins.	1,000 points.
	2nd	—	Jose Kovacs in 1 hr. 42 mins.	989 ,,
	3rd	—	L. Sapucahy in 2 hrs. 56 mins.	796 ,,

The final results were as follows :—

Class ' A.'	1st	—	George Munch	5,965 points.
	2nd	—	Cid Guedes Cherem	4,611 ,,
	3rd	—	Vasco Pinto	1,878 ,,
	4th	—	J. C. de Barros Neiva	1,833 ,,
	5th	—	Benedito Cesar	1,557 ,,
Class ' B.'	1st	—	A. W. V. da Rosa	5,414 points.
	2nd	—	Jose Kovacs	5,380 ,,
	3rd	—	Luiz Sapucahy	3,397 ,,
	4th	—	Julio Magalhaes	3,076 ,,
	5th	—	Ney Cunha	2,472 ,,
	6th	—	Jean Duvivier	1,189 ,,
	7th	—	F. C. R. Leao	156 ,,

It is interesting to note that George Munch won this contest flying the ' Kranich I ' as a single-seater and even so managed to keep definitely ahead of the ' Weihe.' In Class ' B,' da Rosa in a ' Grunau Baby ' and Kovacs in a ' Neiva-B ' (very similar to the ' Grunau ') were running neck and neck and indeed on the 13th January (free distance) both were keeping well up with the high-performance machines. It was very unfortunate that both the ' Flamingo ' and the ' BN-1 ' were so damaged that they were unable to finish the competition, because they both showed signs of being interesting prototypes.

H. M. Whitcombe

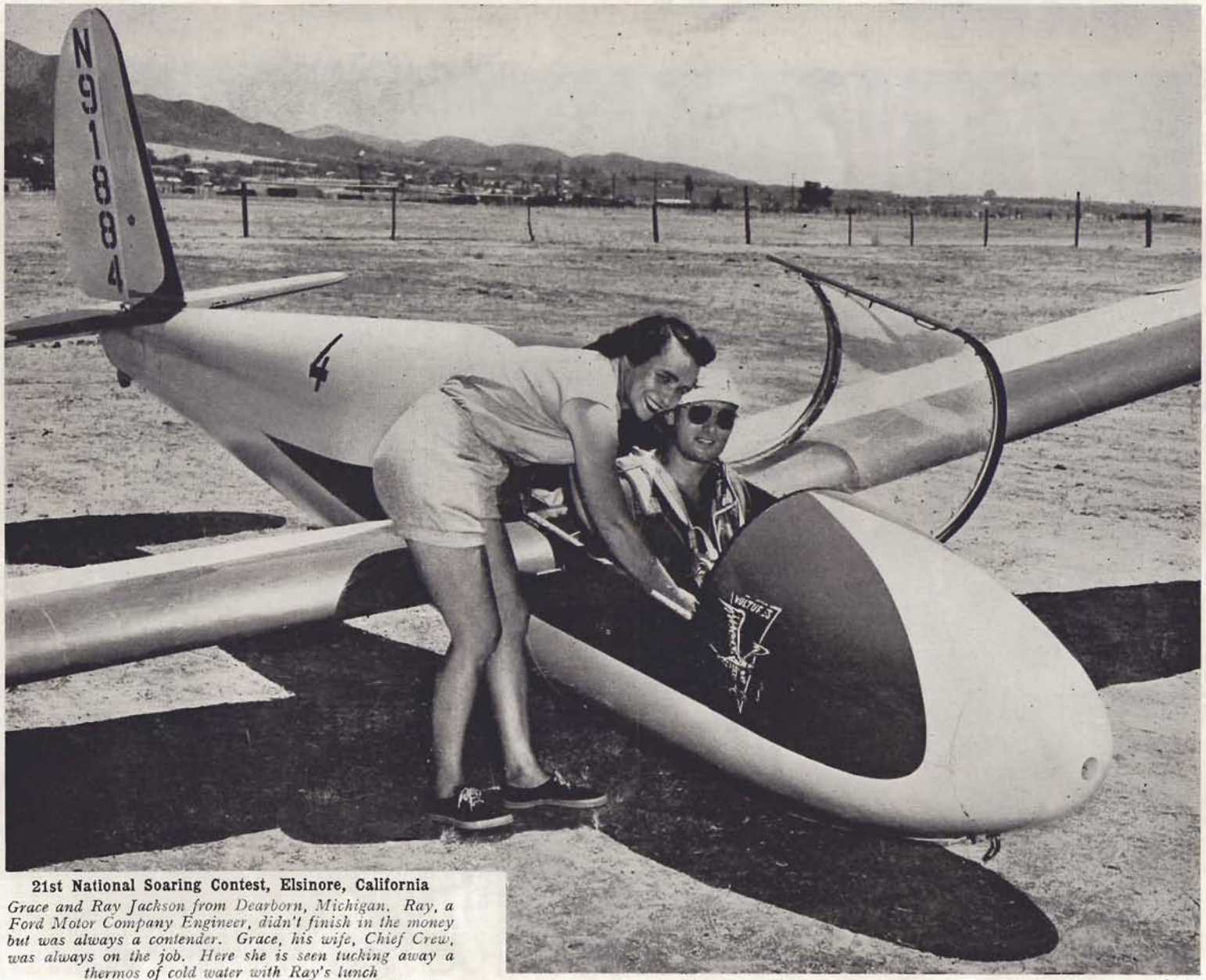
N. H. Steinbock

R. B. PULLIN & CO. LTD.,
GREAT WEST ROAD,
BRENTFORD,

have pleasure in announcing the appointment as additional Directors, from the 1st October, 1954, of Mr. N. H. M. Steinbock and Mr. H. M. Whitcombe.

Mr. Steinbock has been associated with the Pullin Group for several years, previously as General Manager of Measuring Instruments (Pullin) Ltd., and for the last four years as General Manager of the Parent Company.

Mr. Whitcombe joined the Company on its incorporation in 1932 as Test Engineer. He later took over the duties of Chief of Test Department, and in 1948 was appointed Technical Sales Manager, in control of the Sales and Contracts Departments.



21st National Soaring Contest, Elsinore, California

Grace and Ray Jackson from Dearborn, Michigan. Ray, a Ford Motor Company Engineer, didn't finish in the money but was always a contender. Grace, his wife, Chief Crew, was always on the job. Here she is seen tucking away a thermos of cold water with Ray's lunch

(Photo : Leigh Sargent)

PICTURES FROM POLAND

TWO ITALIAN RECORDS

ON the 22nd of February last Adrian Mantelli, Italian pilot in the World Championships two-seater class, took off in a 'Canguro' at 8.40 a.m. from the Dell-Urbe airport near Rome. His intention was to put in a few hours' training and while doing so, to try out a small radio set. As arranged, the tug took off in the direction of Vigna de Valle; at 9 a.m. and 400 metres the sailplane cast off the tow near the side of a hill to the South of Lake Bracciano. There was a strong north wind (called in Italy the Tramontana) and using this Mantelli flew for several hours in a series of figure eights. Later on thermals began to form and he decided to stay up a while longer, to gain more height and try out the radio which was already in communication with the Vigna di Valle airfield. And so the hours passed. . . .

By afternoon Mantelli began to feel he was in a standing wave, and after a while found he was not mistaken. He then decided to fly some time longer. By 7 p.m. he had already done ten hours and was by then at 4,400 metres, a gain in height of 4,000 metres. This meant he had already broken his own national record by 700 metres. He was beautifully set in a large zone to the north of Vigna di Valle in the lee of the Cimino. It was dark and he had had nothing but a cup of coffee, and there was nothing at all on board—neither food nor water. On top of that the instruments were not illuminated and he was therefore blind-flying and relying entirely on his senses. But the waves were wonderful and Mantelli decided to stay up all night.

Half an hour before midnight the moon began to give some light which helped him considerably with his instruments. This was just as well for he was already beginning to suffer from eyestrain from trying to make them out. His one consolation during the whole flight was the little radio which he had taken solely as an experiment. It worked beautifully and every fifteen minutes he was in communication with Vigna di Valle. There a large number of officers stayed up and followed the progress of the flight with great enthusiasm.

At four o'clock in the morning they asked Mantelli how much longer he could stick it out. He replied that if only the Tramontana would keep on blowing he would keep on flying—at least till he had broken the world duration record. But at 7 a.m. the wind began to drop. Mantelli managed to fly for yet another couple of hours, though steadily losing height; and at 9 a.m. he finally landed.

He had soared for exactly 24 hours—a day and a night! This beat the previous Italian duration record by twelve hours, and he had also bettered the height record by 700 metres. 'VUELO SILENCIOSO.'

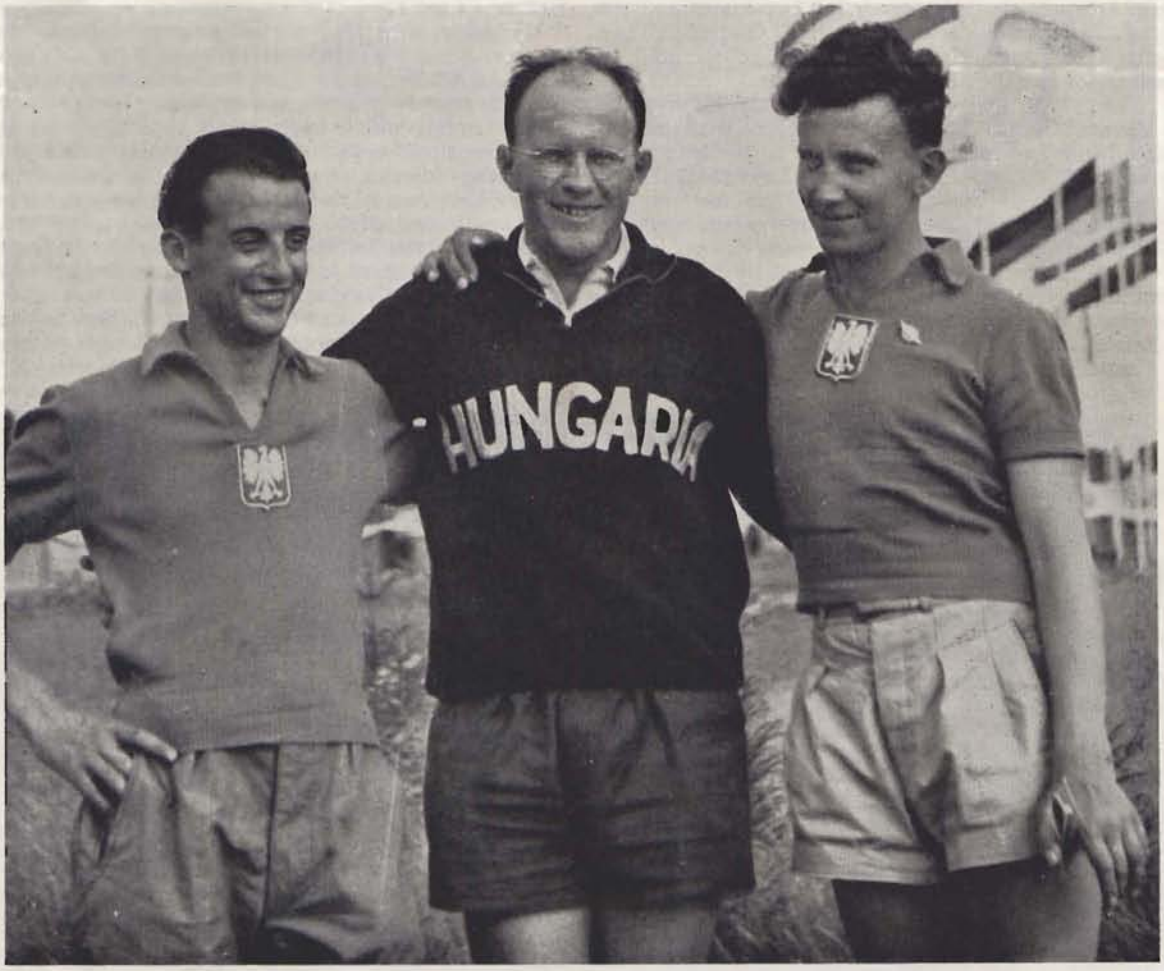
MIDGET SAILPLANES—WHY NOT?

By Grace Hoinville

I'VE a few disagreements to talk over with you, about your article ' Midget Sailplanes : Why ? ' (Sept./Oct. *Sailplane and Glider*).

In this article you compare the ' Horten X ' with ' another midget sailplane.' I assume you refer to the ' EPB-1,' the little ' Flying Plank ' which the Texas boys built and are now flying with such success that six more are being built in Grand Prairie alone, probably more by now. (By the way, they had the ' Plank ' up to 8,000 feet for 2½ hours at a pageant recently).

First disagreement here follows : You say the ' Plank ' (I'll have to assume you mean that when you refer to the ' other midget sailplane ') will require the same number of helpers and expensive launching equipment as those required by orthodox competition giants and thus the total cost per soaring hour will be higher than that of the most practical sailplane. Huh ? As co-owner of the biggest glider in Australia, I just don't GET that. My husband, Fred, and I own a 14 h.p. Morris Oxford (lacking a motor-bike, horse, camel or motorboat), and the only sort of tow we can give the ' Schweizer TG-3 ' with that little Oxford is strictly a slow tow from the hangar out to where the ' Tiger Moth ' waits with a sad ' doggone-it-here-they-come-again ' look on her little puss. We could launch the ' Schweizer ' with a powerful winch or a bigger car, but we have neither. Now whatever gives you the idea that it will require the same number of helpers to launch the little ' Plank ' as it would to launch the ' Schweizer ' ? Fred and I couldn't operate the ' Schweizer ' by



Left hand page.—A general view of the field at the International Gliding Competition at Leszno. The sailplanes are ' Jaskolka '

Above.—The winning pilots of the Contest. Left to right : Jerzy Popiel (Poland) 3rd place ; Geörgy Mezö (Hungary) 2nd place ; Edward Mikula (Poland) 1st place

ourselves but we COULD—and pretty soon, will, we hope—operate a ' Plank ' alone. When the growing-pains of our young business and our rapidly expanding young family ease off and allow us time to go about acquiring a midget sailplane, we propose to have fittings on the roof of the car to take it—that, or a light trailer. As it's a one-piece wing all we do when we get to the paddock we've decided to launch from is to take it off and set it on the ground ; then one of us gets into the ' Plank ' and the other gets into the car and that's all there is to it. Cross-country retrieves will present no problems, for there'll be no de-rigging and the little ' Plank ' can be put down in places where we'd never dream of taking the ' Schweizer.'

To get the ' Schweizer ' into the air, from a de-rigged state, we need four or five large, strong healthy men and a medium-sized elephant, then a long pause while everyone but the elephant lies flat on their backs wheezing. If we had a powerful car, we'd need a mile-run for the launch. This circus performance is true of every big two-seater and it's true to a lesser degree of gliders like ' Olympia's ' and even ' Grunau's.' None of them can be operated by a team of two, but the ' Plank ' can !

Then, O.W.N., you talk about developing the ' Horten X ' into a three-piece sailplane with detachable wings and increasing the span to 30 feet. There you go COMPLICATING things ! Next thing, someone will decide to shove another five feet on and pretty soon you're back to 40 feet and gotten nowhere. What's wrong with a one-piece wing ? One reason why the 25 feet span was suggested by Fred as the maximum FOR A MIDGET CLASS, was that here we have plenty outback country where you'll find a narrow dirt road running dead straight for hundreds of miles through clumpy Pilliga scrub, or trees, or dry ground so eroded its full of miniature canyons and gullies. You go putting another five feet on to your 25 footer then try landing on that road, and, boy, you'll finish up with a 25 footer again, only not so neat and tidy.

The essential formula for cheaper soaring IS to set a limitation of span, because if you don't set the limitation then the span is going to start creeping up again—just as O.W.N. wants to add five feet to the ' Horten X '—and you've lost the idea of establishing a mini-midget class.

Any week-end, you'll find Sydney Harbour (never mind how Our 'arbour got into this—Sydneysiders always manage to drag it into any conversation), just bobbing with little yachts—nine-footers of the ' VJ ' class. Before the little ' VJ's ' were designed, yachting was a sport for well-heeled people. Now any kid can build himself a ' VJ ' and sail off under Sydney Harbour Bridge (we always drag that in too) and take part in competitions and eventually, mark this well, please, build himself a bigger yacht. The thing is that the designing of that midget yacht and the setting of a limit on that particular class, made it possible for anyone at all to sail a yacht on the harbour and have the fun of competitive sailing, with all its attendant gain in knowledge and skill.

That's why we should keep to the smallest practical span for a midget class of sailplanes.

O.W.N. believes that the ' Horten X ' may become ' the most important sailplane, when further developed, for the next decade, not because it's cheapest,' he says, ' but because it's most practical.'

Brother, you and I just don't see eye to eye. Or maybe you've got big strong legs like I haven't. Or maybe you folk can always take off from and land on polo-grounds, bowling greens, smooth mown fields and the like. Down here, our paddocks get kind of tattered from the attention of rabbits ; in the summer, even the most civilised gliding field is likely to have venomous snakes prowling round it, not to mention cattle with their uninhibited, un-house-trained habits. Anybody coming in to land ' with stiff legs as on water-skis ' or even just running like mad, is likely to leave a pair of legs of which he was rather fond in the first rabbit burrow, snapped off at the knees, or he'll be so busy looking for snakes not to tread on that he'll trip over a clump of grass, or he'll skid through a cattle's aforementioned habit and none of his friends will go near him the rest of the day, gliding places usually being short of washing facilities.

My respect for Dr. Horten amounts almost to reverence, but I feel that the ' Horten X ' is a design for the specialist. Even when used with the skid, the pilot, in a prone position, is dangerously exposed and a bad landing which might result in a nasty jar in a conventional-type sailplane, would result in horrifying injuries, even death, in a prone-type glider. Let's face it, the human bottom has a remarkable cushioning effect on the body as anyone who trained on primaries will agree, but the human front just wasn't designed to be scraped along the ground. There is no pilot living who can say that he will never make a mistake when he's landing. If there is one such living, he ain't gonna live much longer, is my prediction. So, it is my belief, that the ' Horten X.' while making a great and wonderfully imaginative contribution to gliding, is not a glider which can be safely flown by anyone.

O.W.N. points out that the ' Horten X ' can be launched from a slope by the pilot himself. May I ask howinell the pilot is going to get the ' Horten X ' up to the top of a soaring slope in a soaring wind all by himself ? Back in the olden days when we used a slope for primary soaring (now out of bounds under Civil Aviation Regulations—airline passes right over it) it took six husky characters to hold a glider on the ground. The thought of one man trying to walk up such a hill wearing a 30 foot (or even a 25 foot) glider round his neck positively enchants me, in a gruesome sort of way.

Another thing about this aspect of the ' Horten X ' —Australia is possibly the most glider-hungry country in the world, but we don't have one club operating on a slope-soaring site. So even if O.W.N. comes up with a patented idea of doing a one-man git-up-the-hill-and-go, it's still no use to us in Australia.

As O.W.N. hasn't actually named the other midget sailplane, it's a bit hard to discuss this particular aspect, but if he is referring to the EPB-1 ' Flying Plank,' then the following remarks are germane. (Lovely word, been trying to work it into a conversation for ages).

The ' EPB-1 ' HASN'T a much higher wing loading than the ' Horten X.' Its wing loading is

3 p.s.f. as against the ' Horten X's ' 2½ p.s.f. Its landing speed is low, it won't stall, it won't spin. The ' EPB-1 ' prototype took 650 hours to build and that included the inevitable ' mucking around.' The ' Horten X ' is expected to take ' a little over 1,000 hours,' but O.W.N. suggests its development to 30 feet span, detachable wings, retractable skid, retractable fairing—and that's going to bump the time way up again.

I'd like to mention that neither Fred nor I have a fanatical gleam in our eyes or a little hatchet to chop down to 25 feet all the big gliders we know. Hats off to the Dick Johnson's and the ' RJ-5's ' of every nation ! They've lifted gliding to a field of high human endeavour and achievement. And they've done it the hard way, literally with blood, sweat and tears. What started Fred and me thinking along Mini-midget lines was the fact that we meet so many people who yearn to fly gliders but can't—because they live too far from a gliding club, or the club can't take trainees, or family and business responsibilities made gliding impractical for them. Not just dozens of people, but hundreds of people. We have flown to many outback aero clubs to take part in pageants and everywhere we have been, we have found pilots just itching to fly gliders as well as powered planes. Fred, as President of A.O.P.A. (Aircraft Owners' and Pilots' Association—close on 1,000 members) in Australia, is in a position to know just how many frustrated soaring pilots there are among the power-flying fraternity.

That's why Fred started writing about a glider of 25 feet span, one that could do for gliding what the ' VJ ' Yacht did for yachting, what the old ' Tin Lizzie ' did for motoring ; one that doesn't have to be taken to bits and put together again, one with conventional controls and a conventional seating position, that can be operated by two people. When Al Backstrom wrote and told us about the ' EPB-1 ' we knew our personal search for the little glider that would meet all Fred's specifications was successfully ended.

And now phooey to Flying Saucers, here come the Flying Planks !

NOTES

Austria. Gliding is now permitted in the Russian Zone of Austria.

Germany. In spite of the appalling weather, the contests held in Nordrhein-Westfalen were surprisingly successful and in the six days there were about 400 flights. The winners were :—

1st. Aero-Club Krefeld — ' Spatz ' — Blank and Tiling — 3,072 points.

2nd. Cologne Sportfliejer-Club — ' Condor ' — Uli von Scheidt — 2,407 points.

3rd. Dortmund Police Luftsportgruppe — ' Baby IIb ' — Sunderweisr and Schellong — 2,234 points.

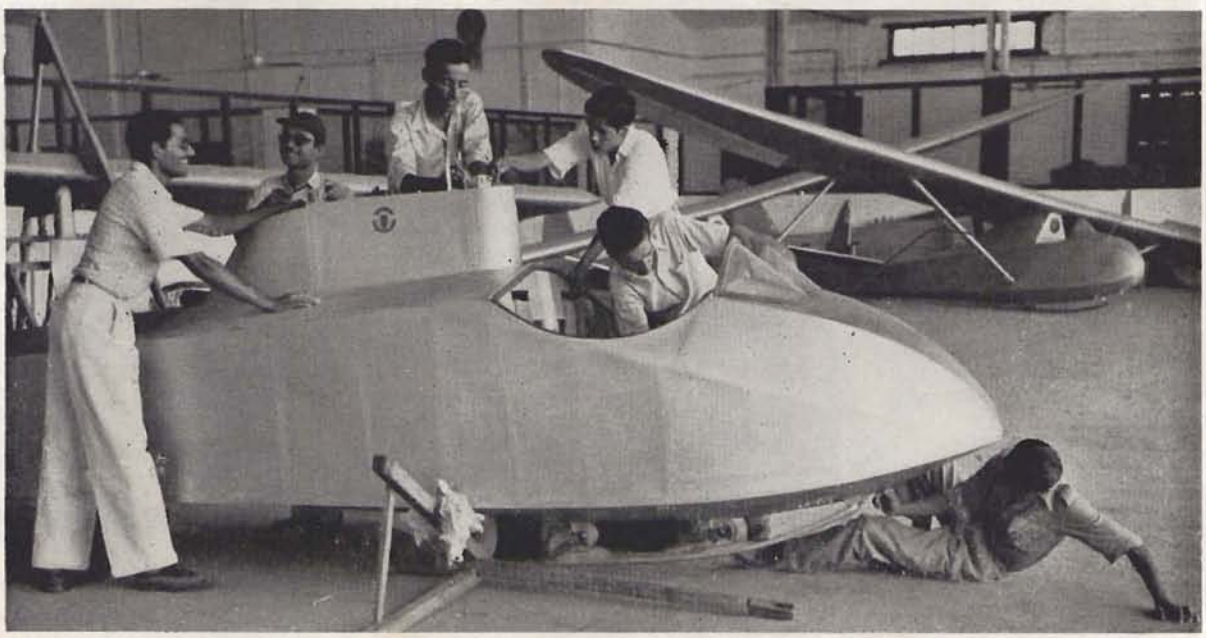
Germany. In a 3-day contest held by the Minden Aero Club, 17 sailplanes covered 5,934 km. in 218 hours 46 minutes' total flying time. These included 7 triangular flights of 60 km. and 3 goal flights of 85 km. The winners were :—

1st, ' Weihe ' ; 2nd, ' Mü 13 ' ; 3rd, ' Grunau Baby IIb.'

Germany. The famous Wasserkuppe is in full activity again, 12 courses of 11 days each having been held between the 6th April to the 22nd Oct.

MIDGET SAILPLANES—WHY NOT ? *From previous column.*

GLIDING IN INDIA



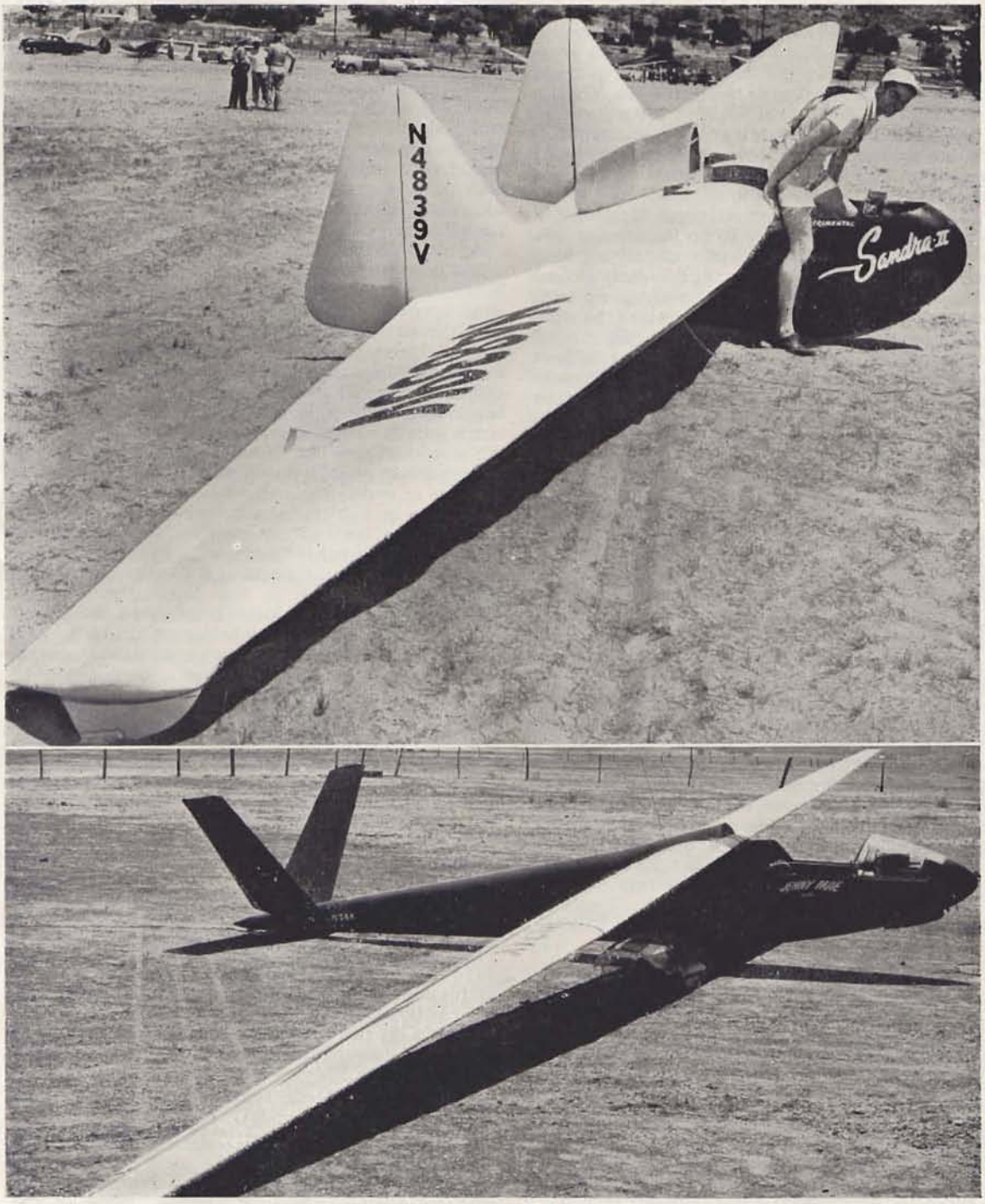
The workshop of the Delhi Gliding Club

(PHOTO : PRESS INFORMATION BUREAU—GOVERNMENT OF INDIA)

SCENES at the 21st NATIONAL SOARING CONTEST,

Top left : Carl Zilerin in the ' Prue.' This ship is used for insignia of Elsinore Glider Club
Bottom left : Pre-contest flight line looking north-west up Elsinore valley. June Ponpaugh helps Paul Bikle on with his 'chute
Top right : Fred Jukich, from Mill Valley, Northern California, built the ' Fauvel ' from a kit and plans and pictures sent from France. Some slight modifications, a fibre glass pod and ball-bearing controls were incorporated. Fred had opportunity for only brief trials before bringing the ' wing ' to the meet. Although not entered as a contestant, flights of the ' wing ' were watched by many interested pilots

ELSINORE, CALIF. July 27 - August 5 *By* LEIGH SARGENT



Bottom right : The ' Kerns-Maxey ' designed and built by two aircraft engineers—Frank Kerns and Lyle Maxey. Features included laminar flow flush riveted wings, fuselage speed brakes, retractable landing gear, butterfly tail, twelve-hour oxygen supply and unusually complete instrumentation. Span, 48 feet ; aspect ratio, 23 ; length 20 feet ; design maximum speed, 150 m.p.h. ; stall at 45 m.p.h. ; minimum sink rate, 2.3 feet per second ; glide ratio at 100 m.p.h. of 24:1 ; gross weight (approx.), 650 lb. ; maximum lift to drag ratio of 38 ; designed for ultimate load factor of 9

A BIRD IN THE HAND

By GERARDO GARCIA.

THE time was 11 o'clock on a midsummer day and it was my turn to fly the ' Sky.' With a completely blue sky and a wind from the North of about 30 km./h., the meteorologists predicted an increase with height to about 70 km./h., at 1,000 metres. I was not very impressed and at first selected Rio Cuarto as my goal, but in view of the continued optimism around me I changed this to Huinca Renanco, 400 km. to the South.

By the time I had prepared everything for a distance flight and was ready to be launched it was 12.10, and I cut loose at 400 m., immediately catching a thermal of 1 m./s. I had intended to wait around over the field and do my flight in company with Sturm in the ' Olympia,' but at 800 metres the wind was so strong that I was already over the city of Cordoba. So I decided to go on, but almost immediately ran into trouble. From 800 m. I came down to 600, then a little while in zero lift and on down to 300, where I picked a landing field in Rio Tercero. But just in time a little thermal appeared, only half a metre but how glad I was to see it. With this I got up again to 900 metres where the wind was blowing at 50 km./h., and scratching my way along, still with only half metre thermals, I managed by 3.15 to get to Rio Cuarto, with 900 metres height.

Here I began to breathe freely again and took time off to calculate my average speed—70 km./h.—not bad, seeing that I had not hurried at all but only struggled to keep up. The other side of Rio Cuarto conditions began to improve, and when I had climbed to 2,000 metres I began to hurry my ' Sky ' a little, flying then at 120 km./h. The thermals slackened off, the wind increased, there was a lot of dust and sand flying about and the visibility was steadily deteriorating.

At 5.40 I was in sight of Huinca Renanco and just then I found a thermal much better than any before. I only needed to put on my brakes, land in Huinca Renanco, and the Argentine goal record would be mine—but I was still climbing at 2 m./s. . . . It was a difficult choice. Should I try for the 500 km., or should I be content with my goal of 400 km. ? It looked as if I had a sporting chance of getting that famous 500 km., which no Argentine had yet managed to pass—but it would also be easy to have a nice rest in the hotel with the rosy glow of satisfaction at achieving the goal record. It was already 5.50; South of me behind a misty bit I could make out storm clouds; my altimeter indicated 1,200 metres, my variometer zero. I calculated that with this height and wind I could easily reach 450 km., and that with only two more thermals I could reach the 500 km., especially when I could hope to continue flying till 8.30 p.m., if I could reach the storm front.

At last I decided to chance it and off I went. With a last look at the goal record behind me I continued South, but the air was too tranquil for my liking, the wind appeared to be lessening, and one could see the dust careering along the ground as it does in those regions. A few minutes later and I almost despaired, for behind the mist I found a thick coating of cirrus beginning to cover the sun. We were not losing much height but there were no thermals left, and all the cirrus area lay between me and the storm.

Since I had now lost all hope of finding thermals it behove me to guard every inch of height, so I began to circle in every reasonable bit—sometimes in zero, sometimes in half a metre down—in an endeavour to make the best of the wind's displacement. In this I continued till I was down to 30 metres and so landed in a field near Arata at 6.40, having covered a distance of 490 km.

With the aid of some locals I unhooked my ' Sky ' and put her in a barn, but before we could get the fuselage stored there came a very cold wind from the South of almost 100 km., herald of a storm front. If only that had appeared one hour earlier it would have helped me to gain those elusive ten kilo metres which were all that separated me from the 500 km. and the Argentine distance record.

After that experience, the next time I succeed in a goal flight, even if it is only three o'clock and I am in a thermal of 7 m./s., and with 2,000 metres of height in hand—I SHALL LAND AT MY GOAL ! !

NOTES

Holland. National gliding records are as follows :

Distance	.. ..	201 km.
Goal flight	.. ..	123 km.
Gain in height	.. ..	3,670 metres.
Absolute height	..	4,680 metres.

France. The first glider race in three stages ever held between Paris and Bienitz was won by Fonteilles in 17 hours 53 minutes. Thaon was second, in 21 hours 7 minutes, and Combettes third in 29 hours 39 minutes. Of 12 competitors these were the only three to finish all three stages.

India. The youngest glider pilot in the world, Rashid, aged 9, has his ' B ' but has to continue in a primary because the Club's ' Grunau Baby ' cannot be adapted to his small size.

Holland. Three new Dutch records were made during training flights for the World Championships. Van Noorden in an ' Olympia ' made a goal-and-return flight from Gilzerijen to Venlo and back—180 km. And Koch in a ' Sky ' gained 5,850 metres in a flight to 6,500 metres (of which he can only count 6,000 metres because his barograph read no higher).

France. The ' Breguet-903 ' or stratosphere sailplane of M. Jarnaud will have a wingspan of 24.20 metres and a length of 14 m. Its ceiling is estimated to be 16,000 metres.

Austria. Fritz Fohringer of Vienna, flying in Jugoslavia, has made a new Austrian record with a flight of 123 km.

South Africa. Helli Lasch together with Hans Wurth, K. Newman and G. Green, has bought a ' Fauvel AV-36.' Pat Beatty, R. Lilienfeld and P. Leppon share a ' Skylark.'

U.S.A. Harry Perl and Ted Nelson have now produced their ' Penetrator,' latest version of the ' Hummingbird,' and nicknamed ' Supersonic.' In test flights it has shown a gliding angle of 1:32, and a rate of descent of 0.6 m/s. The wing is in sandwich form, with a filling of cellular cellulose acetate.

GLIDING IN MALAYA

By R. L. AKERS

(PERAK FLYING CLUB)

AFTER World War II the flying clubs established in the early thirties at Kuala Lumpur (Selangor), Ipoh (Perak) and Penang considered restarting. They had played their part nobly in the closing phases of the Japanese campaign in 1941-42. All pilots were mobilised into the Malayan Volunteer Air Force and the aircraft belonging to the clubs were handed over to the Government and became operational alongside units of the Australian and Royal Air Force. The three flights were employed on communication duties and filled a vital role of plotting day by day the movement of Japanese forces particularly along the East Coast. As our forces retreated down the mainland the aircraft were evacuated first to Singapore island then to Palembang in Sumatra and finally to Batavia. The aircraft were destroyed and the lucky members of the crews escaped to India and Australia whilst the remainder were captured.

His Majesty's Government accepted the claim made by all the Flying Clubs for the payment of compensation for aircraft and installations lost during the occupation. Singapore and Kuala Lumpur were lucky in having certain buildings, notably their club house and hangars standing, but the Perak Flying Club had nothing except one small building 20 feet x 60 feet which was pre-war the tool shed to the club hangar.

When it was known that compensation of around $80,000/- would be received, the club held its first meeting on February 12th, 1948, to decide future policy. It was lucky to have amongst its members Messrs. J. D. Mead and R. J. Morton who were founder members of the club in 1934 and Mr. T. S. Haynes who, although a new member, had extensive experience after the war in the organisation and development of a R.A.F. gliding school in Germany.

Flying charges pre-war were of the order of $6/- per hour solo, the Malayan dollar being worth 2 shillings and 4 pence. In 1949 costs had risen several fold but there was little indication that wages and salaries would rise to the same extent. There was also no prospect of obtaining the subsidy which the clubs received pre-war. The Perak Flying Club made a bold move. It decided that as its policy was to promote airmindedness in the youth of Perak and as power flying would be too expensive to attract the youth, they would operate a gliding club instead of a powered flying club. In 1948-49 five gliders were purchased from Elliots of Newbury. The fleet consisted of one 'Olympia' high performance glider, two slab-sided secondary gliders ('Grunau' type) capable of soaring in thermal lift, and two primary gliders for training purposes. Mr. H. G. Oates, now O.C. Singapore M.A.A.F. Wing, constructed a launching winch on a 15 cwt. Ford V8 chassis and the club started training in September 1949. It was most unfortunate that the one man with previous experience who could have directed training—Mr. Haynes—was transferred within a few weeks of the arrival of the aircraft. The burden of learning how to glide and then to train pilots fell on Mr. Oates, Mrs. Wood and Mr. Channer; they did a magnificent job. There were several minor mishaps and one serious one which wrote off one of the secondaries. At this time and for the following two-and-a-half years no ground staff were employed. All repairs were carried out by the members in addition to the handling, winching and retrieving. This was an incredible achievement when it was remembered that the air temperatures are in the nineties and there is a very high humidity. Mr. Oates was transferred in late 1950 and the work was carried on by an enthusiastic team including Messrs. Channer, Akers, Weller, Robertson, Delme Radcliffe and others. The strain was very great and as comparatively little soaring was achieved the club showed a steady financial loss.

In 1949 the 'Emergency' in Malaya started. Other clubs with powered aircraft soon adapted themselves to a very useful role by dropping money by air to estates and mines thus avoiding the necessity of heavily escorted convoys taking cash through dangerous bandit areas.

The Emergency activities of these clubs enabled them to pay their way against rising costs and subsidise the club flying and bring it within the pocket of the upper salary bracket man.

At the end of 1951 the Perak Flying Club made another bold decision. They decided to purchase two second-hand 'Tiger Moth' aircraft and to employ a ground engineer. The aircraft arrived in May 1952 and powered flying commenced in June 1952. Immediately the finances of the club took on a healthier note, the losses per month dwindled and by the middle of 1953 providing there was no serious accident a small profit was being shown.

In May 1952, the Air Training Corps formed its first unit in Ipoh and in August the Perak Flying Club accepted responsibility for the glider training of the Squadron. Eight cadets obtained their 'A' and 'B' certificates before the end of 1952, but early in 1953 one of them had a serious accident and completely wrecked one primary glider. The second was damaged a week later and training came to a standstill until the middle of the year. The Perak State Government took a keen interest in the Air Training Corps and in May 1953 voted funds for the

(*Continued on page* 16)

THE EDITOR'S FORTHCOMING VISITS

From mid-January to the end of February, Mrs. J. W. Platt will be visiting India, Ceylon, Malaya, Indo-China and possibly the Lebanon. Our Editor will be delighted to meet old friends and new, and arrangements to contact her should be made through the local SHELL offices as usual.

GLIDING IN MALAYA—*(continued from page 15)*

purchase of a ' Slingsby T 21B ' two-seater training glider. This was a tremendous help to glider training. It had long been realised, as in other countries, that the single-seater method did not give the trainee a sufficiently high standard of instruction particularly on turns, stalls and spins. The use of the two-seater gave the instructor the ideal tool for ab initio flying training. The glider was delivered at Ipoh in August 1953 and christened by H.H. the Sultan of Perak the ' Sultan Yussof ' on 27th September, 1953. By the end of the year the changeover in training schedules had been completed and cadets will be receiving the full course of instructions on the two-seater before going solo.

The normal standard of training is to the Royal Aero Club ' C ' Certificate. Cross country flights have not been encouraged although a triangular course of 50 kilometres centred around the aerodrome has been mapped to enable pilots to attempt their Silver ' C ' certificate. The period of soaring conditions so far encountered in the vicinity of the airfield is usually only from noon to 1700 hours. It is therefore very difficult to attain Silver ' C ' duration. Cloud base is usually between 2,500 to 4,500 feet and it is the exceptional day when heights of 5,000 feet can be obtained except under nimbus conditions. Blind flying is being approached with great caution. Because of the ' Emergency ' and the lack of landing places in a country 70 per cent. covered by rubber plantation and jungle, it is always necessary to remain within gliding distance of the airfield. Our present knowledge of local meteorological conditions, and particularly the direction and strength of wind under storm conditions, is still elementary. However as experience and skill develops it is expected that the ' Olympia ' will explore the local large cumulus developments which are so common in this country.

A summary of glider flying to the end of 1953 is given below.

	No. of Launches				*Total hours flown*
	Primary	*Secondary*	*'Olympia'*	*2-seater*	
1949-Dec. 31, 1950	1,342 37 hr.	266 19 hr.	121 14 hr.	— —	70 hr. 08
1951 ..	436 11½ hr.	256 24 hr.	201 42 hr.	— —	77 hr. 31
1952 ..	1,192 17½ hr.	169 19 hr.	276 57 hr.	— —	93 hr. 06
1953 ..	594 8¾ hr.	205 26 hr.	85 23 hr.	345 27½hr.	85 hr. 26

The original single drum winch is still in action and the development of a 2-drum winch is in progress. It is powered by a V8 engine driving through a lorry back axle to two drums fitted instead of wheels. Difficulty is being experienced in fitting clutches to the steel axles so that each drum can be driven independently.

The activities of the club during the past four years have proved that there is a large potential of youths in Malaya ripe for introduction to the mastery of the air as their fathers were introduced to cars and mechanisation of industry. The Air Training Corps is an excellent medium for fostering the yearn for knowledge in this direction and no better practical introduction to it can be found than that of gliding. The first steps to the Malayan Air Force of the future are being laid in the Air Training Corps and the glider training of the Perak Flying Club.

'SLINGSBY T-42'

INTRODUCTION

(We regret the late publication of these notes due to pressure on space)

THE ' Slingsby Type 42 ' has been designed to meet the need for a high performance two-seater training sailplane which can serve as a replacement for the medium or low performance machines at present in use.

The design is intended to incorporate all the features which experience has shown to be desirable in training gliders. The design of the structure is simple and robust and allows for easy servicing and maintenance.

The machine should have a performance which is in advance of any two-seater sailplane at present available. A moderately low wing loading (4.6 lbs. at max. all-up weight) has been chosen to provide a good performance at low speeds and a low landing speed. The machine can be flown solo from the front cockpit by the removal of a ballast weight from the tail end of the fuselage. As a single-seater the performance should be comparable with the present ' Sky ' sailplane.

Although designed as a training machine the 'Type 42' should be an excellent all round high performance two-seater and be quite suitable for contest flying. The stressing weight of 1,100 lbs. should allow ample margin for special installations, such as radio and oxygen to be fitted.

The 'Type 42' can be transported in any trailer which will take a ' Sedbergh.'

TECHNICAL DATA

Span	58 ft.
Length	26 ft.
Wing Area	240 sq. ft.
Aspect Ratio	14
Mean Chord	4.14 ft.
Estimated Tare Weight	630 lb.
Maximum All Up Weight	1,100 lb.
Maximum Permissable Load ..	470 lb.
Tailplane and Elevator Area ..	37.5 sq. ft.
Tailplane and Elevator Span ..	12 ft.
Fin and Rudder Area ..	19.58 sq. ft. (gross)
Fin and Rudder Height	5 ft. 8 in.
Positive Stressing Factor	8.6
Negative Stressing Factor	5.6
Airfoil Sections—	
Wing Root NACA	63_3—618
Wing Tip NACA	4,412
Tail Units NACA	64—009
Wing Aerodynamic Twist	3°
Wing Root Incidence	5°
Wing Dihedral	2°

(Continued on page 17)

GLIDING IN MALAYA—*continued*

'SLINGSBY T-42'—*continued*

GENERAL DESCRIPTION

All structural components, with the exception of fittings are constructed of wood. Fibre glass laminates are used where suitable for fairings, lightly stressed skins and cockpit fitments.

Fuselage.

The fuselage is built as one component which also incorporates the fin. The forward part of the fuselage, which contains the two cockpits and the wing attachment frames, has a structure consisting of frames, stringers and longerons and is plywood covered. The rear fuselage is a diagonally braced structure which is fabric covered.

Cockpits.

The cockpits are positioned in front of the wing and provide good visibility for both pilots. The rear pilot's rudder pedals are located at the side of the front pilot's seat, this allows the two pilots to be sufficiently close together for normal conversation to be carried on without the need for any system of inter-comm.

All controls are fully duplicated and space is available for a full set of instruments in both cockpits.

Access to the cockpits is obtained by opening the coupe, either pilot can enter or leave the machine without disturbing the other. The seats accommodate back type parachutes, if these are not worn seat backs can be fitted.

Undercarriage.

The main undercarriage consists of a skid and a wheel. The skid is mounted on rubber shock absorber blocks, it is made of ash and has a replaceable steel rubbing plate on the underside. The wheel has a diameter of fifteen inches and a tyre size of 6.00 x 4.00; it is located directly under the main frame and is solidly mounted.

A tail-skid is fitted at the rear end of the fuselage, this consists of a metal spoon mounted on a leaf spring.

Report from South-West Africa

By Peter Riedel.

THE South-West African Gliding Club has just finished a most successful training course for gliding on the airport Osona near Okahandja. The course was held from April 16 to 22, and quite a number of new gliding enthusiasts came from all over South-West. The weather was not too favourable during the first days. Rainstorms and lightning made temporary interruptions of the flying activities necessary. By more efficient organisation of the ground services, mainly the transport of the tow cable back to the point of take-off, the number of flights could be increased to a maximum of 43 per day.

The planes used were the following: for dual instruction one two-seater 'Slingsby'; for passenger flights one 'Mue-13 E Bergfalke' which recently arrived in South-West Africa from Austria; two 'Grunau Baby II', one owned by the Club and one the private property of our member Mr. Erich Hackl from Okahandja. The results of the week were excellent. Without the slightest damage to any plane 184 take-offs were made with a total flying time of 54 hours and 41 minutes.

One of the sensations was the first solo flight of one of the female students. Miss Gisela Reichelt of Windhoek made her first flight in the Club's 'Grunau Baby' on Thursday, April 22, and stayed eight minutes in the air, before coming down to a perfect landing.

Another member, Mr. Theo Keil from Outjo, made not only his first solo flight during the course but by a flight of 29 minutes' duration acquired his 'C' licence.

Mr. Willi Betz from Outjo, who was a glider pilot before the war, renewed his 'C' licence by a number of solo flights on the 'Grunau Baby.'

The longest flight was made by Mr. Guenter Voigts, a farmer from near Okahandja, who stayed 5 hours and 12 minutes in the air. Mr. Voigts who made his first solo flight some two months ago, fulfilled by this flight the second condition for his international Silver 'C,' the last condition required being a distance flight of more than 35 miles.

Mr. Oskar Kaufholz, jr., from Okahandja, also an advanced student, stayed more than four hours up, while Mr. Horst Stahn from Maltahoehe made the third longest flight of the meeting with three and a half hours.

These long flights were made possible by the friendly co-operation of Mr. Erich Hackl from Okahandja who placed his own 'Grunau Baby' at the disposal of Mr. Voigts and Mr. Stahn.

As instructors, acted Messrs. Peter Riedel, Hermann Winter and Alfred Haretsmueller. Mr. Haretsmueller arrived recently as an immigrant in South West Africa and brought a new 'Mue-13 E Bergfalke' along from his native Linz, Austria. He had built this plane within a few months before his departure and made the first flight with it during our Osona meeting. The first to fly with Mr. Haretsmueller was our President, Mr. R. G. Schultheiss. Later a number of students and visitors were taken along on the second seat of the 'Bergfalke' which is the first high performance plane to be stationed permanently on the Osona airport.

SAILPLANE PHOTO CONTEST — RESULTS

THERE were a very large number of entries for the *Sailplane* Photograph Contest announced in the July/August issue, but it was unfortunate that the accent was more on quantity than quality.

Mainly the entries were the subject of the World Gliding Contests and here whilst many of the pictures were nicely composed and well-thought-out they lacked sparkle possibly a lot to do with the wintery conditions experienced at Camphill during those two weeks. But it was a pity to see so many nice pictures which had been spoilt by spotty marks caused by bad processing and careless handling of the negatives.

Since most glider pilots are keen on making photographic records we would like to draw readers' attention to the announcement on page 23 which gives details of a new *Sailplane* service for high quality development and printing, enlarging, etc., of roll films at particularly keen prices.

To get back to the Contest we had a lot of trouble to decide the winners, but our opinions were as follows :—

September/October Contest—

1st— £2. 2s. 0d. J. Ash, 45 Wallis Street, Fenton, Stoke-on-Trent. His charming picture of four-year-old Nicholas Kernahan appeared on the front cover of the Sept./Oct. issue.

2nd— £1. 1s. 0d. G. B. Ventress, R.A.F. Thornaby, Yorks. 'Meise' after landing at St. Auban. This was taken when he and a few R.A.F. 'types' spent fourteen days at St. Auban during August. (Shown below).

November/December Contest—

1st— £2. 2s. 0d. Leigh Sargent, Elsinore, California. Mr. Sargent submitted a large number of prints taken at Elsinore Gliderport during the 21st National Soaring Contest, July 27-August 5. Five of his prints are reproduced on pages 7, 12 and 13, which earned him 'top marks.'

2nd— £1. 1s. 0d. J. D. Light, 3 Moreton Place, Harpenden, Herts., shows Arthur Doughty of London Gliding Club in the cockpit of the 'Kite II.' (Reproduced opposite).

Consolation prizes (a free year's subscription to *Sailplane*) were awarded as follows :—

F/O B. Sharman, Royal Air Force, Fassberg, 2nd T.A.F., B.A.O.R. 30.

2nd *Prize—Sept./Oct.* *'Meise' after landing at St. Auban.* *1/50 F32 2x yellow filter—G. B. Ventress*

2nd *Prize—Nov./Dec. Arthur Doughty in cockpit of ' Kite II ' at the London Gliding Club. (No data)—J. D. Light*

George S. Ruskiewicz, 137 Uvendale Crescent, New Addington, Surrey.
Carl A. Beck, Marlborough Park (Central), Belfast, Northern Ireland.
C. D. Beehl, Twentywell Lane, Bradway, Sheffield.

(These pictures are reproduced on page 23).

This is a chance for all our readers with a camera to win a cash prize of £2. 2s. 0d., £1. 1s. 0d., or a year's free copies of *Sailplane and Glider*. Just send us your best gliding photograph and negative please if available (any size providing it is no smaller than 2¼ inches square). On the back put your name and address in block letters together with a brief description of the picture. Glossy prints preferred. We cannot guarantee to send back your prints unless they are accompanied by a stamped envelope of suitable size.

The competition is open to readers both home and abroad and will remain open until further notice.

We reserve the right to publish any photograph submitted and photos must be the copyright of the Sender.

The deadline for entries in the Jan./Feb. Contest has been extended to January 5th.

Send to : Photo Contest, ' Sailplane and Glider,' 8, Lower Belgrave Street, London, S.W.1.

A Test for U.K. Sailplanes

By Our Air Correspondent

DURING the past week or so, the finest sailplane pilots from 19 nations have been gathering at Camphill, near Great Hucklow, in Derbyshire, for the World Gliding Championships which start to-day.

What is particularly significant about the Championships is that out of the 45 sailplanes participating, no less than 14 of them, or nearly one-third, are British designed and built. Furthermore, the majority of these are entered by teams from foreign countries.

This is a tribute to the small but highly efficient section of the British aircraft industry which specialises in the construction of sailplanes. This section of the industry is small because there are only two manufacturers concerned: Elliott's, of Newbury, who built the ' Olympia ' high-performance sailplane and other secondary and primary types; and Slingsby Sailplanes, of Kirbymoorside, in Yorkshire, who build the ' Sky,' also a high-performance aircraft, and a range of other sailplanes, including two-seaters.

As to efficiency, it is recognised that these manufacturers can build sailplanes that are among the finest in the world, while the strength of the foreign entry of British-built aircraft testifies to their standing in overseas markets. Indeed, the ratio of export sales to total production is one of the highest in the whole aircraft industry. Moreover, these exports are won in the face of strong foreign competition.

The Championships are a supreme test not only of pilots but also of machines, and during the next two weeks the manufacturers will be watching them with interest, for in them new British sailplanes will be meeting for the first time in open competition the best that other countries have to offer, including a number of recent designs.

The new British sailplanes are the ' Olympia ' Mk. IV, Elliott's latest version of a sailplane widely used by home and foreign clubs, incorporating the new laminar-flow wing design, and the Slingsby ' T-42 ' tandem two-seater, a high-performance aircraft designed for training purposes. It had been hoped to include another new British design, the ' K-1 ' designed by Mr. Hugh Kendall, but there has been insufficient time to modify this prototype to the airworthiness conditions require for the competition.

It is hoped that from these prototypes much valuable data will be obtained, which will be embodied in future production machines. Another aspect of the Championships which cannot be ignored is the prestige to the manufacturer of the winning aircraft.

That the British manufacturers have been able to provide new aircraft for the Championships reflects on their initiative and enterprise, for sailplane building in this country is a private venture, unsupported by Government contracts and very expensive to undertake.

A prototype can cost up to £10,000, and the manufacturer has to find this money himself, often without the assurance of a big enough demand to enable him to sell sufficient production machines to recoup on his outlay.

Production costs are also high. Sailplane construction is essentially a specialised task, calling for skilled labour, and it takes several hundreds of man-hours to produce one aircraft. The result is that the finished sailplane is expensive and this in turn affects the level of demand.

There are only 28 private gliding clubs in this country, apart from those operated by the Services and the Air Training Corps. Since these private clubs are financed almost entirely by their members in the form of subscriptions and flying fees (although under certain circumstances money is forthcoming from the Kemsley Flying Trust), and new sailplanes can cost between £800 and £1,000 or more, it is not surprising to find that the level of demand from the home market is small.

Export sales are accordingly of high importance to the manufacturer, but even these would have been low in the past had it not been for large orders received from Governments abroad. A number of foreign countries are becoming increasingly aware of the value of gliding as a means of promoting air-mindedness and aiding pilot training, and this is especially true of India and Pakistan.

India is at present contemplating placing an order with the British manufacturers for between 30 and 40 aircraft, due to the experience gained in a trial period of operating British sailplanes in its Air Force, while Pakistan has already bought a large number.

While these orders have been, and are, extremely helpful to the British manufacturers, it requires similar orders from a large number of other countries to make it worthwhile for the manufacturer to spend between £7,000 and £10,000 on a prototype from which a production machine costing £1,000 will emerge.

But in view of the strength of world competition, both actual and potential, in the limited world market for sailplanes, it is essential that the British manufacturers continue to spend money on developing new and improved types, for without this their export successes of the past will not be maintained.

The World Championships which start to-day can play an important part in stimulating the interest in gliding generally and in British sailplanes in particular, without which the orders will not come, and the manufacturers' outlays be in vain.

(*Reprinted from the ' Financial Times.*'

EIGHT HOURS IN 'MU-13'

By STAN RYS

JULY 28th dawned dull and unpromising in Arnprior, where the eastern section of the Canadian National Soaring Meet was being held, however, at 10 a.m. the clouds started breaking with a promise of a fair soaring day. St. John Airport, 155 miles to the east, appeared to be a reasonable goal.

I was aerotowed in the 'MU' at 11.12, releasing at 1,600 feet in a good lift. Two minutes later I entered a cloud at 2,000 feet. Low clouds spelled precarious flying and inevitable compass trouble. I was often forced to work a poor lift at an uncomfortable proximity to the ground. Clouds were flat and small, their bases still at 2,000 feet.

The 'MU-13d' has got a remarkably low sinking speed and a high soaring efficiency plus a reasonably good gliding angle. However the ship is very slow. I had been flying at 50 to 55 m.p.h. between thermals, and when I arrived over Pendleton Airport, less than half-way to St. John's, my average ground speed was well below 20 m.p.h.

Eventually I arrived over St. Eugene, 30 miles from Pendleton, lost 2,000 feet in a downdraft and spent the following half hour trying out all familiar sources of lift without much success. Time was 5 p.m. and it appeared that my flight was about to terminate. When I was reluctantly preparing to land I ran into an area of very smooth lift directly over the airport at 300 feet. The glider rose steadily at 2 to 3 m.p.s. spiralling at constant bank exactly over one spot. I climbed in this way to 4,300 feet which was my best altitude during the flight.

A number of rather large fat-looking clouds were hanging like gigantic barrage balloons over the woods which stretch from St. Eugene as far as the junction of Ottawa and St. Lawrence Rivers near Montreal. Taking advantage of stable air between the clouds I increased the airspeed to 65 m.p.h. Strong and smooth lift was encountered below and inside each cloud. My average ground speed had now improved in spite of a light head wind.

I crossed the St. Lawrence River flying at the best gliding angle, aiming at the smoke above some chemical plants. There was no lift there. Time was 6.30 and 30 miles to go. Some lift was encountered over a small town nearby in which I climbed 400 feet in 10 minutes. A chance of reaching my goal was gone as only plain farmland extended between me and St. John's with clear skies.

A village some 5 miles ahead was identified as St. Philomene—a very suitable place to land I thought. I left the weakening thermal and arrived over the village at 300 feet. To my distress I found the fields either under crops or occupied by cattle. Almost at the last moment I selected a hay field ignoring obvious trenches running across it. A downwind landing towards the village was foolishly undertaken. The glider stopped uncomfortably close to a fence. Time was 19.03. I had been airborne for 7 hours 51 minutes. The distance flown was 129 miles.

My average cross-country speed was 16 m.p.h. I attributed this low average to my half-hearted and inefficient cloud flying technique. I believe that with

only basic blind-flying instruments in the cockpit, a great deal of practice is needed, plus a lot of ' guts.'

How does one feel flying a glider for 8 hours? I find that it is very much less exhausting than driving a car non-stop for the same time, provided the pilot is seated comfortably. However as the time progressed one's soaring became less precise, brain-work slowed down, and indifference set in. I became somewhat unaware of being actually airborne, a frame of mind not very suitable at a forced landing in a field!

' FREE FLIGHT.'

'LOUDON' PLANS ARE READY

AT long last arrangements have been completed for the distribution of drawings for the construction of the ' Loudon,' outstanding Canadian-designed glider. A brief descriptive article and a 3-view drawing of the glider are available free of charge to those who may be interested in building.

The actual production drawings comprise some 80 sheets of different sizes and are for sale by the Soaring Association of Canada for $25.00.

The production of ' Loudon ' plans has been a long awaited event and the S.A.C. looks forward to much activity in their manufacture.

Apply either to: D. A. Shenstone, Box 108, RR 1, Westboro, Ont., or: Soaring Association of Canada, Box 851, Ottawa, Ont.

The University of Toronto ' Loudon ' is a Canadian designed advanced training sailplane. The prototype first flew in November 1949, and since that time has obtained several successes. The outstanding are :—

1950. F. H. Brame's flight cross-country	118 miles
1952. J. W. Ames' goal flight	76 miles
1952. P. B. Tingskou's duration ..	5 hr. 18 min.
1952. P. B. Tingskou's cross-country ..	80 miles
1952. J. W. Ames' duration	5 hr. 4 min.

The total time flown up to the end of 1953 was over 200 hours.

Specifications

Span	45.0 ft.
Wing area	175.0 sq. ft.
Aspect ratio	11.6
Wing loading	3.21 p.s.f.
Design gross weight	562.0 lb.
Best glide	22:1
Minimum sink	2.25 f.p.s.

RICHARD H. JOHNSON

RICHARD H. JOHNSON pictured on our Front Cover has again become the Winner of the ' Nationals '—this year, the 21st, held at Lake Elsinore, California. ' Dick,' a native of Canada, now lives in Grand Prairie, Texas.

He won the 1950 ' Nationals ' at Grand Prairie and two years later he was again successful at Elmira and set a new National Distance Record of 365 miles. At the close of the 1952 Contest at Elmira he entered at another meeting at Grand Prairie and set a new World Distance Record of 513 miles and a new International Speed Record of 52.8 m.p.h.

A VISIT TO AUCKLAND

" LAND of the Long White Cloud "—that is the Maori name for New Zealand, and I suppose it refers to the famous Arch formation which rests so often over almost the length of the two islands. This time I was not lucky enough to see it, but my luck was in in another respect for I happened to be in Auckland over the weekend and so was able to fly.

Like most gliding fields, Mangere lies some distance from the city and is only approachable by car. It is a pleasant field with a tarmac strip, which I was surprised to find gliders using for take-off and landing, instead of the grass alongside. On that particular Sunday there was only the Auckland Gliding Club tandem two-seater trainer in action with a handful of pupils including one girl. (Visitors to our International Gliding Exhibition will have seen several colour slides taken on that afternoon—unfortunately we have no means of reproducing them, though it would be pleasant if one day we could offer colour pages in *Sailplane*).

Launching is by autotow and they were getting remarkably high launches of about 1,200 feet on that long runway—time enough even on a day without thermals to get a reasonable amount of instruction and a good look over the surrounding country.

Mangere is not by any means an ideal place for thermals. It lies on a very narrow neck of land all broken up by inlets of the sea on both sides and it must be very rare that thermals can build up at all. But the country around is very beautiful—brilliantly green and gently rolling grasslands dotted here and there with small white painted single-storey homesteads and occasional clumps of trees. There is a cadets' school operating from the same field and the Club are able to use their canteen. I was taken there and very well fed, thence back to the field for a couple of launches to blow away the cobwebs, and so returned to Auckland. The kindness of gliding people all over the world is really astonishing and I always leave feeling I have made friends for life—and perhaps even longer if pilots have a special corner reserved for them, as I am sure they must have.

VERONICA PRATT.

Consolation Prize Winners

(1) *Dr. Paul Macready interested in the instruments of the Danish ' Olympia ' (No. 19). H. W. Jensen and two members of the Danish team on far side of cockpit. International Contests, Camphill, July 1954.—By Carl A. Beck, Belfast, Northern Ireland.*

(2) *Front to rear: The ' Grunau,' ' Meise,' and ' Weihe ' at Scharfoldendorf Contests.—By F/O J. Sharman.*

(3) *Spanish crew and the ' Sky.' World Contests, Camphill. —C. D. Beehl, Bradway, Sheffield.*

(4) *' The tea is served,' 1954 Bristol G.I. Club Course. Centre, wearing sun glasses is Bill Gotch, Course Manager. As can be seen a good time was had by all! —George Ruskiewicz, New Addington, Surrey.*

(1)

(2)

(3)

(4)

SMALL ADVERTISEMENTS

If you have something to sell or there is something that you need why not advertise with a small advertisement in *Sailplane and Glider*? The cost is not high and full details will be sent on request.

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PLANS of 'Scud I' in any condition at all. Write Box F.6, 'Sailplane,' 8, Lower Belgrave St., S.W.1.

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Argentine Gliding Magazine. Monthly. Address: Casilla de Correo 800, Buenos Aires. Price $3 Argentine per copy.

'WINGS FOR PAULINE'

A 16 mm. sound copy of the film 'Wings for Pauline' is available for hire from 'Sailplane.' Price £1. 1. 0. Write for details.

'THE PLAIN MAN'S GUIDE TO GLIDING'

By Godfrey Lee. Copies of this instructive booklet are available from 'Sailplane' Office, price 6d. per copy.

PHOTOGRAPHS are always required for the Front Cover of *Sailplane* and one guinea will be paid for each one published. Prints must have a vertical axis and should be sent with a stamped envelope for return. Address prints to 'Front Cover,' 'Sailplane and Glider,' 8, Lower Belgrave Street, London, S.W.1.

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Royal Aero Club Certificates

(Issued under delegation by the B.G.A.) SEPTEMBER, 1954

'A' CERTIFICATES	219
'B' CERTIFICATES	220
'C' CERTIFICATES	48
SILVER 'C'	2
GOLD 'C'	—

'C' CERTIFICATES

No.	Name.	A.T.C. School or Gliding Club.	Date taken
18625	J. H. Wagstaff	Perak Flying Club	22. 8.54
18646	G. W. Mackworth-Young	Army G.C.	28. 8.54
18650	M. J. Jobling	R.A.F. Deversoir	24. 7.54
18692	G. Naylor	R.A.F. Fassberg	2. 7.50
18701	G. H. Crump	No. 43 G.S.	1. 7.54
18702	F. E. Eastwick	Southdown G.C.	29. 8.54
18719	C. R. Charrington	Surrey G.C.	7. 9.54
18720	G. Heginbotham	Derbyshire & Lancs. G.C.	20. 6.54
18721	J. E. Rickett	Midland G.C.	3. 9.54
18722	Frances M. Wilson	Midland G.C.	2. 9.54
18731	D. Clarke	London G.C.	6. 9.54
18732	S. P. Welch	Perak Flying Club	29. 5.54
18748	J. R. Duggle	Midland G.C.	14. 8.54
18771	J. A. Allsop	Derbyshire & Lancs. G.C.	19. 9.54
18786	R. A. Young, Jnr.	Surrey G.C.	28. 8.54
18792	M. L. Hall	Southdown G.C.	11. 9.54
6431	G. Brown	Royal Naval G.C.	26. 8.54
9610	A. J. Peters	No. 122 G.S.	5. 9.54
10788	Wendy S. Price	Midland G.C.	31. 8.54
12175	G. Nelson	Southdown G.C.	8. 9.54
12854	A. F. Murray	Midland G.C.	2. 9.54
13096	J. W. Wisbey	R.A.F. Scharfoldendorf	14. 5.54
13533	P. C. Dirs	London G.C.	29. 7.54
13896	J. G. S. Temple	No. 31 G.S.	5. 9.54
14098	P. G. Maccabee	College of Aeronautics G.C.	24. 3.53
14333	C. A. McMillan	No. 1 G.S.	22. 8.54
14881	M. E. S. Evans	Midland G.C.	9. 8.54
15953	K. R. Pearson	No. 44 G.S.	15. 8.54
16121	G. Haigh	No. 45 G.S.	4. 4.54
16533	M. Revell	Newcastle G.C.	5. 8.54
16554	P. Cowling	64 Group Summer G.C.	31. 8.54
16665	A. G. Bound-Pearce	Bristol G.C.	24. 7.54
16804	W. E. Yuille	Scottish G.U.	30. 8.54
16926	D. Bradley	64 Group Summer G.C.	31. 8.54
16970	F. Adams	London G.C.	15.11.53
17026	C. J. Horsley	No. 80 G.S.	14. 8.54
17219	D. L. McQuillan	Yorkshire G.C.	31. 7.54
17268	A. Laird-Philip	Scottish G.U.	24. 7.54
17393	J. A. Lockie	London G.C.	12. 9.54
17446	P. Trist	No. 80 G.S.	15. 8.54
17622	J. D. Tweedie	Scottish G.U.	30. 7.54
17666	J. W. Thom	Scottish G.U.	30. 7.54
17691	P. L. Folkes	Coventry G.C.	7. 9.54
17897	D. A. Bishop	Army G.C.	3. 9.54
18020	J. N. Young	No. 31 G.S.	5. 9.54
18070	R. Dodd	64 Group Summer G.C.	31. 8.54
18133	J. Fields	R.A.F. Kabrit	1. 9.54
18776	R. O. Barnes	Southdown G.C.	25. 9.54

SILVER 'C'

No.	Name.	A.T.C. School or Gliding Club.	Date taken
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475	J. V. Inglesby	Wessex G.C. (R.A.F. G.S.A.)	28. 8.54

OCTOBER, 1954

'C' CERTIFICATES

No.	Name.	A.T.C. School or Gliding Club.	Date taken
18859	F. Scott	H.Q. 2nd T.A.F.	6. 9.53
18862	H. B. Chubb	London G.C.	11. 9.54
18887	W. J. Simpson	Surrey G.C.	12. 9.54
18916	E. Wright	Derbyshire & Lancs. G.C.	7. 7.54
18975	B. G. Dodd	No. 48 G.S.	28. 6.54
18979	M. G. Foley	Perak Flying Club	10. 6.54
694	A. P. Goodfellow	London G.C.	25. 9.54
10501	T. H. Sheppard	H.Q. 2nd T.A.F.	12. 4.54
11651	M. F. Balchin	R.A.F. Oldenburg	19. 9.54
11853	E. H. Leggett	London G.C.	25. 9.54
13344	R. M. I. Dare	No. 84 G.S.	1. 7.50
14305	D. E. Lynch	No. 68 G.S.	24. 6.54
15000	R. B. Newton	Surrey G.C.	18. 4.54
16322	A. T. Crawford	Newcastle G.C.	5. 9.54
17060	A. A. A. Wells	No. 80 G.S.	24. 4.54
17422	P. Pozerskis	London G.C.	12.10.54
17752	R. J. Carter	Oxford G.C.	28. 8.54
17802	J. E. Houghton	Bristol G.C.	14. 8.54
18046	E. B. Noxon	No. 80 G.S.	15. 8.54
18134	J. A. Drake	London G.C.	26. 9.54
18274	I. R. Carter	R.A.F. St. Athan	12. 9.54
18275	J. Edwards	R.A.F. St. Athan	12. 9.54
18415	N. A. W. Haran	Midland G.C.	19. 9.54

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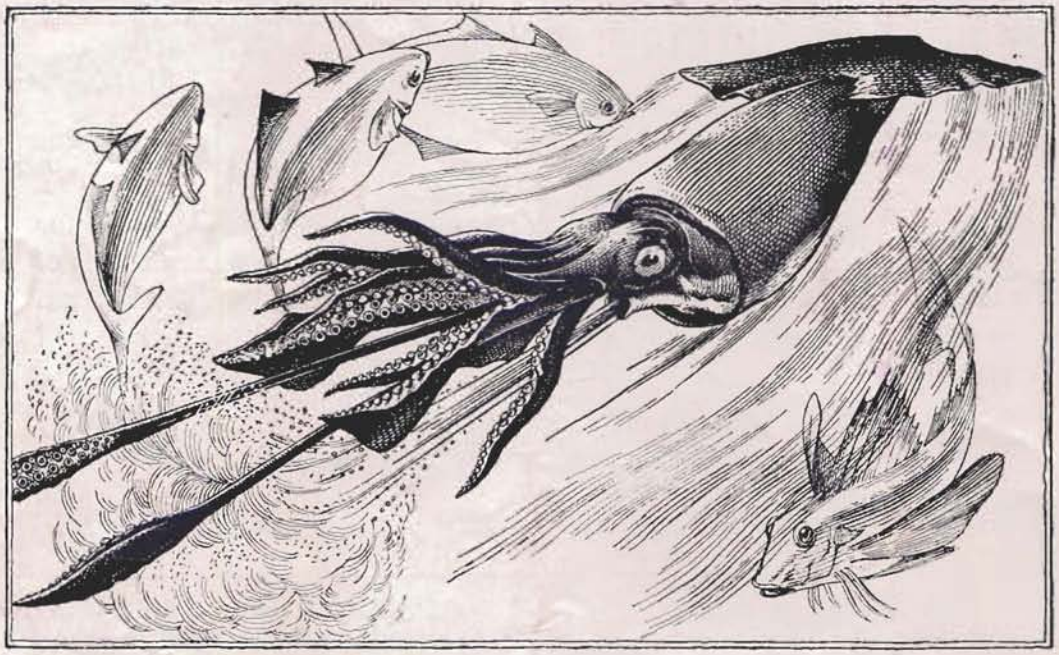
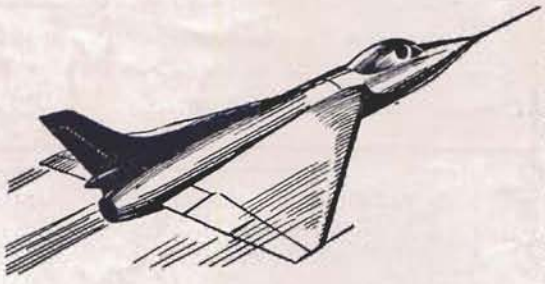


JET PROPULSION

For a few years jets have propelled men at almost fantastic speeds through the air. For a few million years they have propelled squids through the water.

Man devised this technique of locomotion



to solve a particular and difficult problem. So did Nature. The problem was the same: to achieve greater speed. For the squid is a creature of prey. To catch the darting, elusive fish he feeds on he has long clutching arms, lined with suckers and sometimes with teeth and hooks. But none of this elaborate equipment would serve him unless he could move fast.

So Nature adapted the "foot" that all molluscs have (the squid is a kind of mollusc) into a siphon. An "intake" — a slit to the front of the squid's underpart — scoops in water, which is then forcibly ejected through a narrow nozzle by muscular contraction. The velocity of this method of swimming is remarkable. The men of the *Kon-Tiki* saw squids shooting clear of the surface with the power of their jets, and often found them in the morning on the roof of their cabin, where prodigious leaps had landed them during the night.

Jet propulsion is ultra-modern — and prehistoric. Its development has been one of the greatest advances man has made since he learnt to fly — and an advance that Nature made before men walked.

Pilots who fly jet-propelled aircraft — like those who fly all other types — value the excellent and helpful service, at all Britain's major airfields, of the Shell and BP Aviation Service.

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