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SEPTEMBER 1953

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THE FIRST JOURNAL DEVOTED
TO SOARING AND GLIDING

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Cover Photo:

Any more for the "Skylark"—seen at the National Competitions, Camphill.

Editorial

IS GLIDING at last undergoing a revival? In the nineteen-twenties and the beginning of the nineteen-thirties it had all the charm of novelty and clubs sprang up all over the place. Certainly some of these are still going but the great majority fell by the wayside just before the War and the rest have been having a hard tussle ever since. We thought that the War would give a great fillip to aviation—that the younger generation would be aching to fly, to get in the air at all costs in as many ways as possible, and that gliding would be overcrowded. We guessed wrong—partly because rising costs and material shortages made the purchase of sailplanes almost prohibitive but partly also because the world has grown accustomed to flying and is really rather bored by it than otherwise. Children no longer lift their heads when something goes over the garden and their elders are either blasé about air travel or think it a thing too dangerous to be encouraged. Against this lack of interest we seemed to be powerless.

But there has been a sudden resurgence of gliding everywhere. News comes in almost daily of the formation of new gliding clubs abroad or the resuscitation of old ones; and thanks to good publicity for the various soaring contests in the national newspapers even the general public now knows a little about us. Perhaps it is the reaction against noise and excessive speed, but for once we can really see an improvement. People know about gliders, they are interested and they want to know more. In this country England's victory in the International Contest made headline news, and the 'Sky' has taken its rightful place among the leading sailplanes of the world. But if we are to keep our present lead we must have more Clubs, more sailplanes, and above all, more pilots. Where is the younger generation? It is their turn to take up the running. Have they the enthusiasm and the stamina to emulate the giants of the past or are we going to be left behind when eventually those giants retire? It would be sad if gliding were to stagnate in this country just when it is really going ahead in the rest of the world. What can we do to ginger it up?

BRITISH NATIONAL CONTESTS

THE CLOSING DAYS

RESULTS

Final results of the 1953 Championships were as follows :—

INDIVIDUAL CLASS

											points
1.	Geoffrey Stephenson (' Sky ')	..	..	..	..	..	..	..	..	..	551
2.	Dan Smith (' Olympia ')	..	..	..	..	..	..	..	..	..	454
3.	Philip Wills (' Sky ')	..	..	..	..	..	..	..	..	..	452
4.	Frank Foster (' Olympia ')	..	..	..	..	..	..	..	..	..	451
5.	Tony Deane-Drummond (' Skylark ')	..	..	..	..	..	..	..	..	..	311

TEAM CLASS

											points
1.	Empire Test Pilots' School (' Sky ')	..	..	..	..	..	..	..	..	..	414
2.	London Gliding Club (' Olympia ')	Charles Ellis and Godfrey Lee	..	..	..	..	..	..	..	..	351
3.	Alan Yates and Geoffrey Nixon (' Olympia ')	..	..	..	..	..	..	..	..	..	336
4.	Charles Dorman and Stewart Morrison (' Olympia ')	..	..	..	..	..	..	..	..	..	288
5.	2nd T.A.F. Gliding Club (' Weihe ')	Cpls. McKerchner and Brennan	..	..	..	..	..	..	..	..	267



PREPARATION

Contestants prepare for the first days flying. Above can be seen the ultimate winner Geoffrey Stephenson with his wife Beryl and Dan Smith, London Gliding Club, who was placed second.



*Top Left: The Derby and Lincs. Club House. Right: The R.A.F. team in funny hats.
Bottom Left: Coulson. Right: Small fields with black stone walls—part of the local view.*

AWARDS

Geoffrey Stephenson receives the Londonderry Cup and the Empire Test Pilots' School Team the L. Du Garde Peach Trophy. The Kemsley Cup, awarded for the best club team goes to the London Gliding Club, whose 'Olympia' was flown by Lee and Ellis. Stephenson also receives the Firth-Vickers Trophy, awarded for the best performance by a British pilot in a British designed and built glider. Dan Smith receives the EON cup for the best performance in an 'Olympia,' while two new trophies for two-seaters, the Furlong Trophy (greatest number of points) and the Slingsby Trophy (most meritorious flight) will

most probably be awarded to the A.T.C. 'Sedbergh' flown by F/L A. D. Piggott and F/O E. J. Meddings.

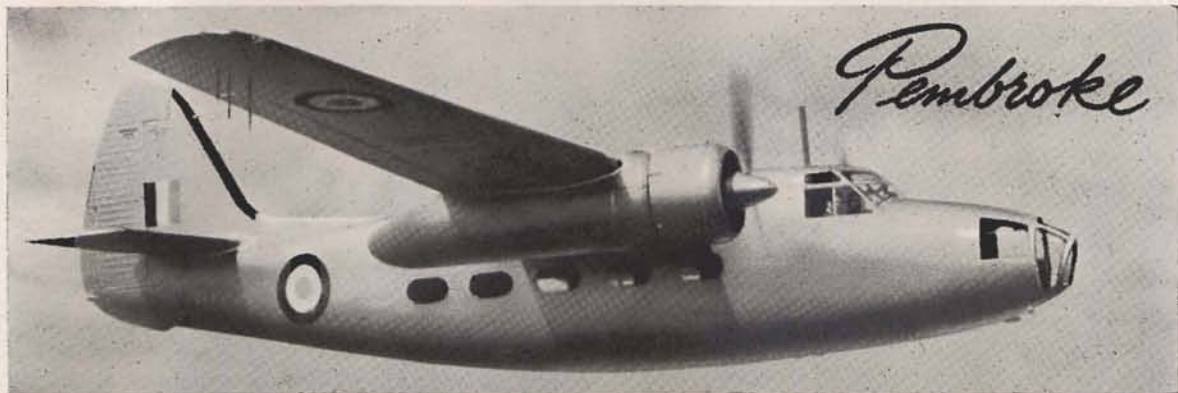
Friday, 31st July, 1953.

Friday was declared a rest day. There was flying only for those who wanted it, but the wind made hill-soaring practically impossible and it was believed that convection would be weak. Few of the competitors flew.

Saturday, 1st August, 1953.

Task 1. Out-and-return speed to Rearsby (143° T, 50 m.).

(Continued on page 6)



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The PRINCE, powered again by 'Leonides' engines is also in service in large numbers with the Royal Navy as a communications aircraft and as a 'flying classroom' for radio, radar and navigation training. The PEMBROKE, the R.A.F. version of the PRINCE, ordered in

quantity by, and now in service with, the Royal Air Force, has also been adopted by the Southern Rhodesian Air Force and the Royal Belgian Air Force. The functions of the PEMBROKE include passenger transport in rearward facing seats, freighting, supply dropping by parachute, casualty evacuation, aerial survey and photography and twin engine pilot training. A classroom version for training Navigators and Bomb Aimers has also been developed.

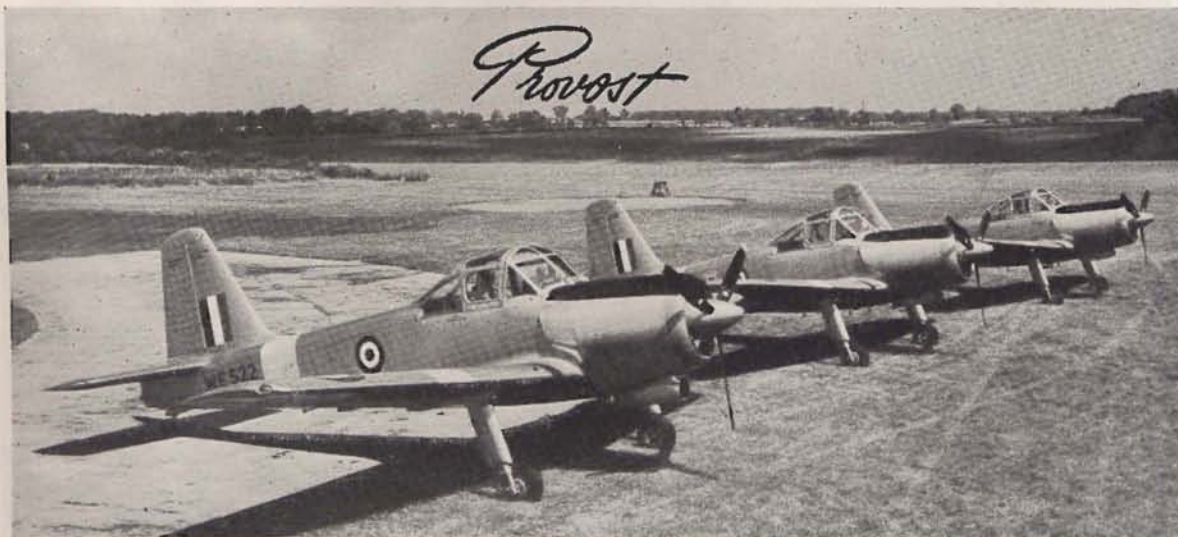
For civil operation the PRINCE serves in many countries throughout the World for executive travel and with internal airlines, carrying 8 to 12 passengers. PRINCES have also been supplied to the British Ministry of Civil Aviation for radar and radio aids, calibration and testing. Its exceptional capacity, comfort and high performance meet the exacting demands of world-wide operating conditions, whilst versatility is exemplified by the SURVEY PRINCE, the only modern British aircraft developed especially for aerial photography mapping and land survey.



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NATIONAL CONTESTS—continued from page 4

Daily Prize. Slowest to complete task.

Met. An anticyclone west of Ireland moving slowly east.

W/V 2,000 ft. 280/14 k.

5,000 ft. 290/14 k.

Cloud Cu Base 2,000 ft. above site, rising slowly to 3 and 4,000 ft. Some Cu tops spreading out, but not generally. Good lift forecast to 5,000 ft. in late morning and afternoon.

Winds were higher than forecast, making track keeping more difficult, particularly for the slower machines. Only Philip Wills completed the course, Stephenson failing by only a few miles. The Cambridge 'T.21.B' did well to get to Rearsby and a few miles back.

Sunday, 2nd August, 1953.

Task 1. Flight round a triangular course : Cement Chimney (Bradwell) — Bolsover Castle (106° T, 19.5 miles) — Ashbourne Aerodrome (226° T, 22.9 miles) — Camphill (356° T, 21 miles).

Daily Prize. Best height.

Met. Small anticyclone over Scotland, warm front west of Ireland.

W/V 2,000 ft. 310/14 k.

5,000 ft. 320/16 k.

10,000 ft. 320/18 k.

Cloud similar to yesterday. Hill lift not strong.

Bisgood (E.T.P.S.) completed course.

Daily Prize : No. 11, 8,800 ft.

Placing : Individual—Stephenson, Smith, Wills.

Team—E.T.P.S., Yates, London G.C.

Monday, 3rd August, 1953.

Task 3. Straight distance flight on track of 143° T, crossing coast at Lympne.

Daily Prize. Longest distance.

Met. Ridge of high pressure moving east, but warm front is held up.

W/V Surface light, N.-NW.

2,000 ft. 320/10 k.

5,000 ft. 320/12 k.

10,000 ft. 320/16 k.

Clouds Cu base 2,000-2,500 ft. above site, lifting to 4,000 ft. Tops 8,000 ft., but higher in South East. Fair thermals early.

Best Performances.

Yates	..	Near Bedford	..	..	88 miles
Wills	..	Southend	..	..	157 miles
Stephenson	..	Lympne	..	..	193 miles
(Goal, Gold 'C,' one diamond)					
Foster	..	Near Buntingford	..	..	118 miles
Smith	..	7 miles west of Colchester	..	..	141 miles
Ellis	..	Southend	..	..	157 miles
Pelling	..	Wyton	..	..	93 miles
Neilan	..	Matching	..	..	145 miles
Piggott	..	Oundle	..	..	79 miles

(Best two-seater flight during competitions)



The A.T.C. is interviewed for the B.B.C.

Southdown Gliding Club

NEW members have been joining us at a steady rate this year, most coming from far afield, several of whom from near London. Training therefore has been our main concern. A number of pupils were soloed in time to go to Long Mynd to fly our 'Tutor,' which together with the 'Olympia' spent a fortnight there in July. Everyone had a very enjoyable time. We obtained four 'C' Certificates and one five hours. Ray Brigden got his Silver 'C' height and landed fifteen miles away near Cressage. Dr. Jameson flew to Kinnerley, 25 miles. Together both aircraft flew 120 hours for about the same number of launches.

The northerly winds which were the curse of most hill sites during the early summer, gave us at Friston some thermal flying with heights of up to three thousand feet being reached. Peter Crabtree got an almost unique 'C' Certificate at Friston by climbing from 650 feet to 1,200 feet in a thermal. On Sunday, 17th May, we had a visit from the Surrey Gliding Club's 'GreenO.' The cliffs obliged on this day and were so arable to Beachy Head, but lift died away just after midday. Two of our lady members, Margaret Crabtree and Joan Cloke, obtained their 'C' Certificates over the cliffs on Sunday, 21st June, and then on Sunday the 26th July, Roger Sweatman did five hours.

A course was run at Friston from 15th to 22nd of August mainly to enable pilots of little gliding experience to get some soaring. It turned out to be a great success, due to the hard work put in by the instructors, Len Lennard who looked after the secretarial side and a few others who took their holiday time to give a hand. The course members, who were an enthusiastic international group, including an American, a Canadian and an Australian, all had a very enjoyable time and plenty of soaring in pleasant surroundings.

We have already this year exceeded our last year's total of launches and hours.—A.R.S.

Right : Twelve views at the National Contest



THE AMERICAN NATIONAL CONTEST

ELMIRA—7th July to 16th July, 1953

OFFICIAL STANDINGS AT CLOSE OF 20TH NATIONAL SOARING CONTEST

Pilot	Points	Class
MacCready ..	1,889	A
Smith, S. ..	1,677	A
Schweizer ..	1,574	A
Bennis ..	1,506	A
Goodhart ..	1,279	A
Coverdale ..	1,170	A
Beuby ..	1,130	A
Klein ..	958	A
Burr ..	834	A
Miller ..	768	A
Woodward ..	679	A
Lehecka ..	624	B
Smith, R. ..	585	A
Gehrlein, Sr. ..	415	A
Pfeiffer ..	386	A
Frutchy ..	361	A
Brooks ..	189	B
Hoverman ..	100	C
Seymour ..	79	C
Ball ..	58	C
Norton ..	58	B
Wilkins ..	61	C
Gehrlein, Jr. ..	43	C
Placek ..	36	

THE 20th National Soaring Contest was officially opened at Harris Hill on Tuesday, the 7th July, by Vice-Admiral L. K. Rice, Deputy Chief of Naval Operations for Air. He referred briefly to the boundary layer experiments of Dr. August Raspet and to other help, mainly meteorological that might be given to the gliding movement in America, but encouraged the clubs to look after themselves as far as possible. General Lindsay followed, saying that the Army is as interested in soaring as the Navy. The Meeting was declared open and Bob Taylor was able to get his first contestant away by 11.12 a.m. First to take off was Paul MacCready (who finally won the Contest for the third time).

It was a perfect day and the results were most encouraging. It was declared an open day, so that pilots could fly in any direction and to any destination. The total number of entries was 38 pilots and 35 sailplanes, and by 2 p.m. 27 had taken off and 23 were already away. Paul MacCready jumped into the lead with a 215 mile goal flight to Simsbury Airport at Hartford, Connecticut. Paul Schweizer was second with a goal flight of 204 miles to Hicksville, New York, and there was a tie for third place—Stan Smith (the 1933 Champion), Stephen Bennis, and our own Nick Goodhart, who all made their goal of Idlewild Airport, New York, 191 miles. Two other pilots made goal flights. Howard Burr was flying his new 'Schweizer 1-24' and did 185 miles to Pittsfield, Mass., and Bob Smith got to Ithaca. Other good flights, though not to their goals were made by Coverdale (193 m.), Betsy Woodward (175 m.),

Lehecka, 1938 Champion, (160 m.), Frutchy (119 m.), Beuby (109 m.). Four others made between fifty and a hundred miles.

8th July. Paul MacCready held his lead though Steve Bennis came into second place with the longest flight. It was a goal-and-return flight with the turning point at Tunkhannock, Pennsylvania. Take-offs were delayed by a squall so he did not get off till 2.45 p.m. He reached the turning point and made Laceyville on return, a total distance of 75 miles, with a maximum altitude of 14,000 feet. MacCready and Schweizer landed short of Tunkhannock, the first with 56 miles and the next with 55 miles. Then came Stan Smith with 35 miles. Nick Goodhart made two attempts but failed to reach the necessary 25 miles in either case. However, he is still fifth with 220 points. It was rather a disappointing day.

9th July. Flying conditions for both today and tomorrow are excellent, so the contest committee set another goal-and-return, this time to Albany, a distance of 162 miles each way. A large cool air mass is moving into the North East and pilots flying to Albany will find 20 m.p.h. winds against them between 4,000 and 6,000 feet. Actually none of the pilots completed the task, but Stan Smith at least came 15 miles back while MacCready and Schweizer reached Albany. Bennis was out of luck with only 140 miles, but Goodhart reached Albany and got six miles on the return journey. Smith made 159 miles, Beuby 144 miles, Coverdale 141 miles. The points now stand as follows:—

MacCready ..	684
Schweizer ..	663
Bennis ..	652
Smith ..	631
Goodhart ..	557
Coverdale ..	477
Kline ..	371
Lehecka ..	352
Beuby ..	288
Pfeiffer ..	247

10th July. Today's task is a double goal-and-return to Norwich. The distance is 76 miles so that a complete four leg flight would have been 304 miles. MacCready completed three legs—228 miles. Next was Stan Smith with 173 miles, which was enough to bring him up into second place, for Schweizer managed 113 miles and Bennis dropped back with only 32 miles. Goodhart's score was 68 miles. Actually only fifteen pilots made contest flights. Beuby in his 'Weihe' stayed up for 8½ hours, the best duration so far.

11th July. The day's task was for a triangular course, Harris Hill to Owego to Ithaca to Harris Hill. MacCready brought his score up to 1,231 points by flying nearly twice round the course, a total of 155 miles. Stan Smith remained in second place with 1,069 points, and Bennis came up into third place with 890 points. After that we have Schweizer 886,

Coverdale 739, Goodhart 726, Kline 523, Betsy Woodward 497, Beuby 495, Lehecka 408, Burr 368.

12th July. Sunday was declared a No-contest day but there was a spot-landing competition won by Bill Frutchy and he and Darling also took place in an aerobatics display to amuse the thousands of spectators.

13th July. Poor soaring weather, so no take-off's in the morning. The day was declared an open one but 'nobody went no-place,' so Macready remained in the lead.

14th July. Conditions still far from ideal, so today also is an open day. The first take-off's took place about 10.30 a.m. and Paul Macready kept his lead by completing a goal flight to Rochester (79 miles). Six other pilots set Rochester as their goal and several announced it as the turning point of an out-and-return. One of these was Paul Schweizer who reached Rochester and came as far back as Corning, a distance of 150 miles. This brought him into third place again. Stan Smith held his second place with a landing at Bath on the way back from Rochester, a distance of 136 miles. Bill Coverdale announced his intention of making as many flights as possible between Harris Hill and Binghampton. He completed one round-trip and went as far as Tioga on the third leg, a total of 115 miles. The Committee are still trying to decide how to count the points. The rest for today are:—

Macready	1,681
Stan Smith	1,536
Schweizer	1,383
Bennis	1,316
Goodhart	1,134
Beuby	987

15th July. Today is the final day of the Contest and the task is a goal-and-return flight to Utica, 100 miles away. Conditions are a little more difficult than they were yesterday but it is still regarded as a good soaring day. However, no pilot was able to complete the task, the best for the day being Paul Macready, who reached Utica and stayed firmly at the head of the points list. The second best flight was by Paul Schweizer, who made 95 miles. Then came Coverdale with 93 miles, Placek with 85 miles and Bennis with 82 miles. There were 10 other contest flights. Four pilots landed at Norwich, a distance of 75 miles (Kline, Miller, Bob Smith, and Beuby). Stan Smith and Nick Goodhart each made 72 miles and Burr made 60 miles. So we have Paul Macready with the title for the third time. (Three others have also won it three times: Richard du Pont, 1934-35-36; John Robinson, 1940-41-46; and Richard Johnson, 1950-51-52. Johnson did not defend his title this year).

The final points placing was as follows:—

Macready	1,889
Stan Smith	1,677
Schweizer	1,574
Bennis	1,506
Goodhart	1,279

SHEER HERESY

By Peter Fletcher

IT is probably true to say that of every ten new entries to gliding clubs six will have left the movement within two years, and of this six, four by the end of the first year.

That this broadly speaking is true can be shown over a period of years, but it is not correct to assume that the entire wastage rate is amongst the ab initio and pre-'C' category: it would be better if it were. However, this is not so, quite a high percentage of the wastage comes from 'B' and 'C' holders almost as soon as they obtain their certificates, or soon afterwards.

Over say a three year period the intake of new members just about balances the outgoing wastage from all causes. The Clubs therefore devote a high percentage of their launches, effort and equipment to ab initio training but no matter how hard their ab initio instructors work the ab initio pupil will never get any smaller because of this constant wastage rate, new members are constantly sought and trained to balance the outgoers: it is a never ending system which is wasteful and wrong.

In my view far too much time and effort is being devoted to ab initio and pre-'C' pupils and not nearly enough to the post-'C' and advanced side which is why the average age of our best competition pilots is nearer 40 than 20 and is now creeping beyond 40. Promising young pilots with a modest total of soaring drift out of the movement through sheer frustration.

I can already hear the time-worn croak of 'new members are the life blood of soaring.' I must answer that this is utter clap-trap. Two out of every ten newcomers may one day be so termed, of the rest most will be gone within a year, and while they half-heartedly play at gliding and monopolise the two-seater instructors' time, they will be directly responsible for preventing post-'C' instruction in advanced soaring to the really keen and useful, so that not only do they themselves, the half-hearts eventually leave a Club, but they are directly responsible for more promising material departing as well.

I have spent some years now as a two-seater instructor and I am increasingly convinced that this policy of the unrestricted admission of ab initio's to gliding clubs is a fundamental mistake, surely a system of only admitting sufficient new members to absorb a reasonable proportion of two-seater time, while leaving some of the two-seater time for advanced instruction is a much sounder long term view?

This is not as difficult as it sounds, firstly if you offer serious advanced training to post-'C' pilots the wastage rate amongst this category will undoubtedly decline with the result that a club will get an overall higher aircraft utilisation factor, which will itself mean more revenue, also it will get a gradually

increasing number of more experienced and well trained soaring pilots which presumably is the ultimate object, at the same time the ab initio intake could now be made smaller to balance the now lower wastage rate and so release two-seater and instructor time for advanced instruction. Provided the total number of members is kept at an economic optimum, it does not matter what stage the individuals are at. Actually I think that a high percentage of advanced members would mean more revenue because of their ability to exploit a wider variety of weather conditions and use equipment when ab initio's cannot do so, soaring time brings in money, circuits barely break even on the books, although of course some are essential.

The results of the present policy can clearly be seen in competition flying, generally speaking the older pre-war pilots win all the prizes and the younger generation are way astern because nobody has time to teach them serious advanced soaring. No sir, there is always that odd fifty ab initio's to cope with and next season there will be another fifty and so on *ad infinitum*.

By carefully watching the development of new pilots over a period I have come to the firm conclusion that owing to the lack of serious and regular advanced instruction only these gifted with very exceptional natural ability or those in the happy position of being able to devote unlimited time and money to their hobby ever get anywhere worthwhile, the rest, however keen, seem fairly soon to reach a mediocre ceiling of achievement and without advanced instruction they just do not get any better, at any rate not for an incredible time, measured in years and years, not months. That these people would improve their technique rapidly with good advanced teaching is in my mind a definite fact.

It is these pilots who are the true life blood of our movement, not the eternal half-hearted ab initio's

who crowd the two-seaters in the summer months and are gone before the first breath of winter.

That my views will in some places be regarded as these of a complete heretic I am well aware, but I stick firmly to them, because I have had enough pupils through my hands now to know that I am right, and that only about two in ten are real devotees of our sport and are prepared for the long hard trail to the goal of a good soaring pilot, the rest range from those who do it for a bit of a lark one summer, to those who merely want to impress the girl friend, and if they join they get the best that the instructors can give them, regardless of their motives. What a waste!!

If a curve could be drawn for every post 'C' pilot in this country of his potential achievement and alongside it one plotted for his actual achievement, the difference in most of the cases would be staggering, the only way to close this gap is more advanced instruction.

How many clubs in the United Kingdom offer serious and regular advanced dual soaring? Is there anywhere in this country where a glider pilot can obtain instrument flying practice in a two-seater sailplane? Come to that how many two-seaters are even fitted up for serious instrument work? Not many I am sure, and probably those that are will be Service operated, and so not available to civilians.

The popular saying 'look after a man to his 'C,' and then he will look after himself' is the purest nonsense, it is after a pilot has his 'C' and has proved that his initial interest and keenness is being maintained that he should be taken in hand by a competent soaring instructor and developed.

Well there it is, smaller intakes and a balanced advanced programme, with a much smaller wastage/frustration rate, and it can be done I am sure.

Now you can all write and tell me how wrong and wicked I am but I am quite unrepentant.

NEW ARGENTINE GOAL FLIGHT RECORD

ESPERANZA—LABOULAYE. 380 km.

By G. A. BERON

THE record previously held by Joe Ortnier (302 km.) has been handsomely beaten by Marcelo Garcia. Analysing this flight only serves to show that great flights are the result of tenacity and careful observation.

For a long time the Garcia brothers had planned to attack the goal flight record. In December of last year they tried to fly from Esperanza to Resistencia, but had no luck. The day proved to be disappointing in spite of promising well and they covered only two-thirds of the distance, landing in Villa Ocampo, 360 km. from Esperanza, a notable formation flight. Thinking it over later on, Marcelo decided that his flight should have been to Rio Cuarto.

Before I continue I would like to stress a detail that I consider important. When Chourrout broke the distance record we read in his article that his observations of certain atmospheric conditions produced after the passing of a front in a certain place assured him that the following day would produce

just exactly the weather that he needed in order to try a long-distance flight up the river bank. Similarly Garcia had declared to us: 'In summertime there is always an extra good day two or three days after rain; you just have to wait for it. February came and with it a rainy day. All looked well, the sky the night before was clear and starry. I studied the map again and decided to go for Laboulaye.' In each case the pilot had made his own observations over a long period and had acted upon them. We will let Garcia tell his own story:—

'On the following day the wind was at 90° across my course but that remained to be proved, since people talked always of a North wind in the Province of Cordoba. So in the hope of finding this I set out and at quarter-to-twelve released at 220 metres. I found half a metre rise at once but this died out at 450 metres and I began to descend. I found another thermal at my release height and went up to 1,500 metres. There I set out; the good visibility was most



encouraging and there were plenty of thermals; and although the wind continued to be across my path it was decreasing in intensity. I flew the first 60 kms. over the road to Córdoba as far as Angélica where I hoped to encounter the usual North wind but on arrival there I found it blowing from the East—so I decided to go straight for Laboulaye and be damned to the wind. I sloped off towards La Carlota, passing between Marcos Juárez and Bell Ville at 14.45 after having gone a little off my course by flying over San Jorge. I then calculated that if I wanted to complete my flight I should have to get to La Carlota by 16.45; I actually arrived there at 16.50—five minutes late and after two hours of really hard work.

I left La Carlota with an altitude of 1,700 metres. With one more thermal I could manage it but this didn't arrive and I was steadily losing height. 1,500, 1,300, 1,100 and at last appeared a zero. There was no sign of more lift but then little by little I began to climb until I reached 1,700 metres again, and there was Laboulaye barely in sight! I still had 40 km. to cover but it was calm up above and I was getting along nicely; I did 15 kilometres without losing altitude and by then I was sure of reaching my destination. I opened the window to get a breath of fresh air and began to suck a lemon, thinking, "Ah,

good old Sky!"

I used about fifty thermals to reach my goal and I had one bad moment—as in nearly all such flights, more or less at the same hour—between half past two and half past three. At that time the cumulus had very little pulling power and I had to be extremely careful.

As soon as I landed I made for a telephone, to find a delay of one hour. I had waited about twenty minutes when a man came in great haste and asked for a call to Córdoba. I don't know why but he looked like a sailplane pilot, so I followed him out and there sitting in a car, very sunburnt, and disguised by a white cap, I saw Scheidhauer! He had flown from Juarez Célman, also with Laboulaye as his goal, accompanying Captain Bravo in the 'Flying Wing' two-seater. That was a grand day.

Although Garcia tells us that this flight was nothing in particular and that any other pilot could have done the same I venture to disagree. To carry out such a flight to a successful conclusion a certain amount of thought and preparation is necessary as well as a great deal of experience; it is this that enables one to get the best out of a situation at exactly the right moment, and we congratulate Garcia on a notable flight.

WAVE SOARING AT N.S.W. DISPLAY

SEVERAL Sydney pilots made flights recently in what appeared to be standing wave lift. The pilots were taking part in a gliding display at Albion Park, 75 miles south of Sydney, on June 27 and 28.

The display had been arranged by the Hinkler Soaring Club to help in establishing a gliding club in the Albion Park district.

The Hinkler Club's 'Olympia' was taken to Albion Park by road and the 'Grunau', flown by Ray Ash, was aero-towed from Camden by Mervyn Waghorn in Dr. Heydon's 'Tiger Moth', VH-ATH.

A strong westerly wind blew over the Blue Mountains during the week-end, creating strong turbulence.

Several pilots found that by flying upwind towards the mountains they could gain height slowly.

Ray Ash reported, 'I released from an auto-tow launch in the 'Olympia' at 1,500 feet and found myself in gently rising air.

'By heading into wind and slowly approaching the

1,500 feet high mountains I rose to over 2,000 feet.

'I then returned to the aerodrome, losing height all the way.

'As soon as I turned back into wind I started to go up again and once more rose to 2,000 feet.

'I repeated the process several times before eventually landing to let someone else fly.'

It is estimated that more than 500 people watched the display during the two days on which it was held.

Profit from the display amounted to over £30.

Aerobatics, thermal soaring, auto and aero-tow launches were some of the items provided.

A demonstration of control line model aeroplane flying was also featured.

During the display the 'Grunau' was flown by Leo Diekman and Clive Martin and the 'Olympia' by Aub Parsons, Ray Ash, Mervyn Waghorn and Keith Colyer.

A catering service was supplied by members of the proposed Albion Park Club. —*Australian Gliding*.

GLIDING IN INDIA

By Mr. F. Mascarenhas, J.P.

(Founder Member of Managing Council of the Indian Gliding Association, Ltd.)

GLIDING AT POONA

Poona is the headquarters of the Indian Gliding Association Ltd., which was formed in 1935 under the Presidentship of the then D.G.C.A., Mr. F. Tymms, now Sir Frederick, permanent British representative at I.C.A.O.

At that time the I.G.A. operated from Aundh with the financial assistance and encouragement of the Maharajah.

Poona itself came into the picture in 1949 and the opening ceremony there was performed by Pundit Nehru, Prime Minister of India, in 1950.

Up to date the Government have donated about Rs.2,000,000 (£15,000) towards capital expenditure and give a recurring grant of Rs.20,000 (£1,500) each year.

The centre is equipped with 3 'Primary' trainers, 2 Slingsby 'Grunau Babies,' 2 two-seater Slingsby machines and an 'Hympha' sailplane.

The present Chairman is Mr. P. M. Kabali who founded Air Services of India before World War II.

ON behalf of the Indian Gliding Association, Ltd., I have been asked to write something about Gliding in India, a subject of the greatest importance to this country today. We desire to awaken young Indians in particular to the vast opportunities awaiting them in this field of aeronautics.

Of the numerous aeronautical activities which have developed since the war, gliding holds unique interest for the world. The restrictions which were placed by the Treaty of Versailles on the air force of Germany gave a wonderful impetus to the art of gliding which has now become an art of national importance and utility, with almost all nations of the world.

One of the most startling developments of the war has been the increasing use of glider aircraft. These, which in the very beginning, were no more than a sporting toy, have now become a vital part of modern airpower. They have become a deadly instrument of modern war, and it is not difficult to see that the practical use of gliders both in war and peace may bring about a development of the world which will be comparable to those changes which occurred with the growth of railways and the invention and production of the automobile. Up to the outbreak of war the art of soaring, that is, using motorless aircraft and relying upon air currents for power, had not been put to practical purposes. Although India has much leeway to make up, it is true to say that she has begun to realise the importance of aviation in the development of her communications and commerce, and that flying has taken its rightful place in the national life. To this generalization, however, we would make one exception, and that is that India has still not yet made up its mind fully in realising the potentialities of gliding, or air travel without mechanical power.

Air-planes equipped with a motor engine were first seen in India at the beginning of this century, and now it may seem that they will monopolise all flight in the air hereafter. This is a big mistake, and we in India particularly should not be misled by it. Gliding is an essential complementary service which is now growing apace in Europe and is even more adaptable to India. Weather conditions are ideal for Gliding in India, and almost unapproachable for excellence

anywhere else in the world.

A few miles from the Poona station lies Hadapsar where the town ends and the beautiful village of Purnsungi begins. The beauty of the village lies not in its natural scenes or in its velvety green fields, not on the big 'river' the Nulla that flows majestically round the village nor on its rustic people, but its greatest charm and attraction lies in the Gliding club which it harbours in its midst.

For those weary of the hum-drum round of daily life there is nothing so refreshing as Gliding and Soaring and for those who actually partake in it no other sport is so exhilarating as this—the greatest sport that man ever could imagine—a day spent with the Glider. To fly and soar like a bird was the biggest ambition of man since centuries ago, and at last he realised it in Gliding and Soaring.

A little off from the main road is the runway to the centre. Through ploughed fields it leads one to the hangars and to the gliderdrome.

Surrounded by the ghats on either side like an elongated horseshoe, with plenty of ploughed fields all over, the Gliding field itself is ideally situated. Throughout the year the wind blows favourably and it is seldom that machines are grounded even during monsoon.

For those who like to play with clouds and seek adventure in the sky, there is nothing like the big cumulus clouds that hang on for hours together over the field. And during summer the thermals or the up-currents are so lively that it is a very hard task indeed to keep the machines on the ground. Sometimes big dust storms which give lifts of a hundred feet or so are plentiful. During the monsoon the neighbouring hills give a good slope wind which could be used for slope soaring. And after monsoon there come the beautiful 'cloud streets,' one cumulus cloud nearly touching the other for miles and miles. It stretches all round as far as the eye could see, and every soarer longs to get into it, to go cross-country or to make or break a record.

Off the Gliding field are the two hangars, with a club house, built entirely by the Gliding boys, which houses the office too. In one hangar one will see the gliders and sailplanes, in the other the winch and the

workshop with the broken-up machines for repairs. The workshop is well equipped with all the latest tools and accessories.

In the hangar are the 'Primary' glider, the secondary 'Grunau Baby,' the 'Olympia' and the two-seater, and on one side hangs the board wherein all the basic principles of gliding, soaring and winching are explained in a very simple way diagrammatically.

In the beginning Poona centre had three 'Primaries,' two 'Grunau Babies' and one 'Olympia.' Two two-seaters came later.

For launching the glider we use a winch. The cable is wound round the drums attached to the rear of the motor with the necessary gadgets attached.

Although the idea of starting a club formed earlier, the difficulty of getting a suitable winch at a price which the club could pay out of the meagre sum allotted to it by the Government was the first drawback. Then there came on the scene a local manufacturer who voluntarily designed and built the winch that gave us so much service. It is of as simple a construction as a novice could handle. It gives tremendous power and ease in launching and could easily take up very heavy loads like the launching of the two-seater in no wind.

As soon as the sun is up and the haze rises from the neighbouring ploughed fields, our boys start their day's activities. From the hangars the gliders are brought out and checked by the Ground Engineer, then pulled by the boys it goes on its way to the fields. The winch is tuned up, and with the jeep—the club transport trailing behind with the boys—starts for the fields. The long procession of gliders in front, the winch at the back, the jeep following and the visitors at the sides, is really the most impressive scene indeed.

On the Gliderdrome which is said to be the largest in the world today, the winch is placed at one end, the glider at the other end. It is so placed always that the glider faces into the wind.

As soon as the winch is stationed correctly, the jeep pulls the cable to the glider which is placed at the other end. The pulling of the cable necessitates some training on the part of the jeep driver. A jerky movement while driving might break the cable, rash driving might give too much slack in the cables resulting in unpleasant forced landings of the glider which neither the pilot nor the instructor appreciates much.

As soon as the cable is brought the pilot straps himself in his seat and checks the controls and instruments. Then the cable is attached, the signal given and the winch starts pulling slowly at first; when the glider gains momentum and the cable's slack is taken up, the winch pulls him up with increased acceleration. Every nerve and muscle of the trainee or pilot as well as the winch-man is alert during a launch, in case the cable should break or the winch stall. The maximum height depends on the wind conditions, for in a strong wind the glider could attain as much as thirteen to fourteen hundred feet. There it drops the cable and starts to glide down or to soar as the case might be.

To start with, we had only four new young members

who took up the Instructor's course. They had a nice time and as this was the first time gliding was taken up on a large scale a lot of visitors used to flow in. It was quite a treat to watch their faces registering surprise and then bewilderment as these motorless crafts flew for hours together.

Slowly our strength grew up. Gliding attracted the Air Force and Army boys too. There came F/L's Bhatnagar, the late Piggot and Lee. All were very impressed by gliding in spite of the fact that they were flying instructors in the Air Force with hundreds of hours to their credit. From the Army came Major Sharma, Lt. Mody and a host of others in their wake. The Army boys were so impressed and interested in gliding and soaring that they have now a club of their own in Kirkee near their camp, entirely financed by themselves.

Gliding attracted people from the Civil Aviation Centre too. There came Capt. Nam Joshi, Capt. Arya and others. From the Flying Clubs came others.

Days rolled on, some of the boys finished their flying training and some carried on the torch and had the opportunity of starting new centres. F/L Bhatnagar now runs the Delhi Gliding Club and Capt. Arya was flying the newly built 'Primary' at the Allahabad centre. The rest of us, not so enterprising, are watching for the day when some more clubs will be started.

Poona is an ideal place for some achievements. It is best suited for duration, altitude and cross-country. During our training, we have soared to as high as 12,000 feet above sea-level on dry thermals, and on some days during summer when the dust devils are at play—the whirlwind that gives terrific up-draughts—we endured four, five hours of sustained flight in the single-seater as well as the two-seaters. The recent cross country of 57 miles would only be possible from a place like Poona. But India is heaven for Soaring. Right from the Himalayas down to Cape Comarin there are very many suitable sites.

Some of our previous records of height and duration were not recorded properly as the lack of recording instruments, such as barographs, was a handicap.

Gliding has come to stay in India and the sooner the people and the Government realise this, the better. This is the time for all those gliding enthusiasts to get together and plan to revive this much neglected sport.

Those of the members, mostly boys and young men, who took up gliding on the promise of the Government of India that they would start many clubs as soon as they have finished their training, have had a sore disappointment. Even our existing centre is running at a loss. Unless something is done and that too, soon, this king of sport will be extinct in its early stages.

As for the future, there are many bright prospects for Gliding. Spirit and enthusiasm is not lacking in this country nor the right people. It is only left to our Government to take the initiative to encourage local manufacturers and to introduce in every school and college in India, Gliding in their curriculum, so that in days to come the boys themselves can build their own gliders and fly them in their own back yards.

MORE ABOUT THE JET STREAM

By Reynolds Phillips

(Reproduced, with acknowledgments, from 'Boeing Magazine,' March, 1953)

BACK in 1920 an Army major named R. W. Schroeder climbed into an ungainly 'LePere' biplane and flew it higher than man had ever dared fly before. At an altitude of 33,000 feet over Dayton, Ohio, he pointed his biplane into the west. To his amazement, he wound up *east* of his starting point.

All Major Schroeder understood about it at the time was that he had come up against a headwind of unaccountable fury. Actually, posterity should credit him as the discoverer of one of nature's important phenomena.

A quarter century later, 'B-29's' bombing-bound over Japan often encountered similarly phenomenal winds. Some crews returned with the story that they had been pinned virtually motionless in the air. A group of R.A.F. bombers, headed for Berlin, was caught in a violent wind and carried far south of its target; one found itself over Leipzig, another over Paris *en route* home when it should have been over Southern England.

Across the years, such bits and pieces of information as these became available to students of the upper atmosphere. But there was no pattern to them until, in 1947, weather experts at the University of Chicago organised the facts. The Chicago people even produced a name for the high-altitude winds: jet streams.

Thereafter, various weather authorities suggested that one day enough might be known about these jet streams to put them to work on behalf of commercial aviation. Even so recently as two years ago, however, one authority warned that 'the only trouble with . . . planning (for long-distance flights) is that it's a lot easier to say afterwards that you were in a jet stream than it was to predict the place where the strong winds will be later on.'

It remained for Pan American World Airways to demonstrate that commercial aviation, as of now, could take advantage of the jet streams on a regular basis.

On 18th November last, Pan American flew its 'Boeing Stratocruiser' *Sovereign of the Skies*, with 47 paying passengers aboard, non-stop from Tokyo to Honolulu. It by-passed the usual refuelling stop at Wake Island and sliced seven hours of the usual 18-hour time for the flight. *It did it, of course, by riding the jet stream.*

Since then, this operation has become normal. Pan American's eastbound trans-Pacific Stratocruisers have been following the same general flight plan, turning the 3,900-mile Japan-Hawaii run into the longest non-stop commercial route in the world. Unfortunately, this operational speed-up is at present only a seasonal thing. The big wind above the Pacific moves away from PAA's flight path with the coming of spring.

Pan American knows, however, that in the winter months it can safely depend upon the trans-Pacific

jet stream to flow eastwards at speeds of 70 to 80 miles per hour in the neighbourhood of 23,000 feet altitude.

Pan American's planning has been based upon a great amount of jet-stream study, plus a series of exploratory flights dating back to January, 1950. Pan American's meteorologists have learned to forecast the location of the jet stream with accuracy. Its flight-operations people have developed an unusual technique for riding the terrific tail wind.

Not that Pan American is the only airline which rides the jet stream. North-west Airlines, whose Stratocruisers ply the northern route out of Tokyo along the Aleutian chain, takes advantage of the jet when it comes near. When practicable, North-west re-routes its flights a bit to pick up the big wind, either over the northern Pacific or on the Seattle-New York run. Military Air Transport Service, too, has made good use of the trans-Pacific stream with its 'Boeing C-97's' of the Pacific Airlift.

Despite aviation's growing utilisation of the jet stream, however, the swift flow of air remains in great part one of nature's mysteries. What causes it? No completely satisfactory explanation has yet been found, according to the U.S.A.F. Air Weather Service, which has done a great amount of research on the subject.

All wind flow, however, is based on temperature differences. One promising theory of the jet wind, stemming from this fact, is that the collision of warm and cold currents produces a transformation of energy. Potential energy in the air is turned into kinetic energy, the energy of motion. The greater the temperature difference, the greater the wind.

A second jet-stream theory is that cold, high-pressure areas are storehouses of potential energy. This energy is transformed to kinetic not by temperature differential but by the earth's rotation.

Regardless of cause, jet streams in general are narrow currents of tremendous wind which flow in an easterly direction around much of the northern hemisphere. In the Pacific, they form in the vicinity of Japan and tend to dissipate as they approach North America.

The most spectacular element of these currents, of course, is the speed at which they travel. Sometimes this speed verges on the incredible. The Air Weather Service reported last year that one of its crews in Oklahoma had tracked a weather balloon moving at 310 m.p.h.—and gaining speed as it vanished from sight.

The difficulty in forecasting—or even locating—jet streams stems partly from their narrowness, but primarily from the fact they meander like a drunken sailor. Horizontally, they wander from 20 to 70 degrees latitude. Vertically, their altitude varies from about 20,000 feet to 40,000.

At present it takes fairly complicated soundings of

the upper air to locate the skein of jet winds. Most experts say the best tools for it are high-level weather charts. Where the contour lines are packed and strong winds are shown reaching their maximum, there the jet stream should be found. Sometimes it can be found by locating a region of rapid temperature change across the wind flow as shown on a very-high-level chart; the jet stream often occurs 10,000 to 15,000 feet above this point.

Other theories for locating the 'jet' have been put forth in recent weeks. Dr. Vincent J. Schaefer, prominent weather scientist of the General Electric Company, believes four 'specific and rather spectacular cloud types' are visual keys to the whereabouts of the high-speed streams. Carefully co-ordinated observation of cloud formations, from weather stations across the country, thus could establish both the location and direction of 'domestic' jet winds. Dr. Schaefer's 'tell-tale' cloud formations are cirrus streamers, high cirro-cumulus, alto-cumulus, and the billowing type of alto-cumulus which often extends from horizon to horizon.

Another possible means of determining the whereabouts of a jet stream was suggested this month, following a study by the U.S. Weather Bureau and the Naval Observatory. Stars appear to twinkle faster when viewed through high, rapidly-moving air, according to this study. Measurement of the stars' scintillation, then, would provide evidence of both speed and altitude of winds.

Pan American World Airways, however, has applied its own methods through a long-range programme of training and research. And it instigated further independent studies of the Pacific jet stream based on what it calls the 'sound meteorological principles' used in formulating the original programme at the University of Chicago.

Upon completion of this work, 30th July of last year, Pan American's flight operations department was notified that 'serious consideration should be given to operating a series of 'B-377' flights (377 is Boeing's model designation for the Stratocruiser) Tokyo-Honolulu direct this winter when the 'jet stream' is favourable.'

Months later, in its summary of the first passenger-carrying jet-stream crossing, flight operations reported: 'Forecast techniques as developed for this operation proved satisfactory. All members of the Tokyo meteorological staff are qualified to provide such forecasts.'

The Pan American technique begins with a pre-flight forecast of the position, location and intensity of the jet stream. The second step is the forecasting of actual winds at flight altitudes along a pre-determined track.

But Pan American does not endeavour to send its Stratocruisers the entire 3,900 miles to Honolulu solely on the basis of pre-flight forecasts. In flight it maintains a continuous and exacting meteorological 'guard.' The airplane's reports are plotted, and verification and adjustments made as necessary. Crew members are well versed in the meteorology of the jet stream and the utilisation of pressure-pattern techniques, permitting them further to check their exact flight path and stay in the strongest part of

the stream as long as possible.

By radio, the Stratocruiser crew receives from the Tokyo meteorological office, at regular intervals, a reanalysis of the winds. Tokyo also relays from the weather ship *Victor* reports of 500-millobar (18,000-20,000 feet altitude) temperatures and winds from 15,000 to 24,000 feet.

From the Pan American dispatch office at Honolulu comes regular data on winds at 10,000 to 25,000 feet levels over certain islands of the Hawaiian chain, including Johnston Island. Honolulu also reports 400-millobar temperatures from radiosonde stations on Midway, Kauai and Johnston. In addition, hourly weather reports are sent from Honolulu and the alternate landing spot on Midway.

If such great care is taken to ensure that the Stratocruiser stays aboard the great tail wind, equal care is taken to make certain it rides the wind properly. Pan American's elaborate (but confidential) technique for this guarantees the optimum of speed and operational economy.

In early spring, the mighty wind goes into hibernation for the spring and summer, along the mid-Pacific route. On 31st March, Pan American's trans-Pacific Stratocruisers return to their 18-hour schedule from Tokyo to Hawaii, with a pause at Wake. Next November they will be flying higher and faster again.

Meanwhile the mysterious wind tunnel in the sky holds the promise, of greater speed and economy on others of the world's air routes.

It would have been helpful to Major Schroeder, back in 1920, if he had turned around and flown eastward instead of into the west. He might then have added a new speed record to his record for altitude.

HIGH PERFORMANCE WITH MEDIUM SPAN

Designed by Stephen Marton

A FEW years ago, in Germany, I started to design this aircraft, which is the 'M-7' type in my design series. In Germany, however, everything to do with flying was banned, so my ideas were put aside.

After I came to Australia it occurred to me that my design would be very suitable for this country.

My object was to produce a sailplane of good performance with a 12 metres (39.37 feet) wingspan.

The performance figures promise a speedy sailplane with a good gliding angle and acceptable rate of sink.

The performance graph is not only better than the 'Olympia,' but in the higher speed range—above 50 m.p.h.—it is between the 'Sky' and the 'Weihe' sailplane performances.

Before going any further with a discussion on the machine here is the essential data.

Span 12 metres (39.37 feet)
Length 5.8 metres (19.03 feet)
Wing Section N.A.C.A. 23,012

Wing Area ..	9.6 sq. m. (103.3 sq. ft.)
Aspect Ratio ..	15
Empty Weight ..	136 kg. (300 lbs.)
Total Weight ..	208 kg. (458.6 lbs.)
Wing loading ..	4.43 lbs./sq. ft.
Wash out ..	2 degrees
Best gliding angle ..	1:25 at 52 m.p.h.
Min. sink (no flaps) ..	2.92 fps. at 45.4 m.p.h. with G.A. 1:23.3
Min. sink (with flaps) ..	2.3 fps. at 29.8 m.p.h. with G.A. 1:19.5
Stalling speed ..	41.3 k./std. (25 m.p.h.)
Aero tow max. ..	90 m.p.h.
Max. diving speed ..	160 m.p.h.

A high speed sailplane with a high wing loading makes soaring a bit difficult.

To counter this disadvantage I made practically the whole trailing edge adjustable. It is really an aileron and landing flap, both adjustable, parallel and independent.

The 'M-7' was designed mainly for speed championships, high altitude flying and the 100 kms. (61 miles) triangular course contest. Of course it is also good for ordinary cross-country flying.

I hope that, in future, the 100 kilometres triangular contest will become common in Australia.

For altitude flying the plane is fully equipped with an oxygen storage unit, battery (24 volt), and a barograph (Peravia type BR 242, 40,000 ft. x 20 hours run).

You may ask: 'Why the swept back wings with the pilot sitting behind them?'

Well, I think the 'M-7' is half-way between the conventional design and the flying wing design.

The sweep back gives promise of good longitudinal stability and very light elevator control.

The trailing edge can be adjusted regularly for the existing flying conditions by means of either the landing flaps or the ailerons or both, whichever one wishes.

The landing flap has a movement of 15 degrees up and 45 degrees down.

The aileron has a movement of 10 degrees up and 15 degrees down, with plus or minus 20 degrees extra freedom for aileron operation.

The main spar is one piece from tip to tip, and the wing and fuselage are permanently glued together.

The fuselage is made in two parts which are joined just behind the trailing edge of the wing.

The two parts of the fuselage are held together with three tapered pins which, at the assembly, are inserted from the outside and screwed with a special tube spanner.

Barograph, battery and the oxygen unit are placed right to the front of the fuselage. This is a MUST for counterbalance. With my own weight, 10 stones, the plane has 4 ins. positive balance.

The tailplane is the half balanced type. The tailplane movement is plus and minus 10 degrees and the elevator movement is plus and minus 25 degrees.

The relation of the fuselage wetted areas, i.e. before and after the wing, indicates that the rear part with the larger wetted area gives better direction holding possibilities and probably minimises the spin danger.

I am considering making a second prototype with

WE WERE DECOMPRESSED

By C. A. Flood

AFTER many months of negotiation by Len Anderson with the R.A.A.F., Len, Reg Currell and myself finally paraded to the Senior Medical Officer, Wing Commander Leyland, at the Pearce R.A.A.F. Station, West Australia, for an anoxia run in the decompression chamber. Len brought along his new oxygen equipment for testing and by the antics he performed when he removed it at 22,000 feet, I'd hazard a guess it's functioning quite well.

With a complete lack of formality and shown every courtesy and consideration by all R.A.A.F. personnel concerned, we were introduced to the decompression chamber.

I was truly astounded at the elaborate set-up. The huge compressor, various ancillary equipment, and the decompression chamber proper occupy a whole building.

Through the open double-lock, $\frac{1}{2}$ in. thick steel doors, I could see that the chamber was appointed like the cabin of a luxury liner.

Deep upholstered seats for about ten persons lined the sides and arrayed along each wall were oxygen gauges and adjustments, plug-in points for couplings and microphones for each person.

Fifteen to twenty thousand quids worth, or I'm a Chinaman.

Years of terrific mental activity have established a very large muscle on my stomach, and the boys were a bit concerned I may not be able to control it at altitude. I assured them that I could handle it O.K.

Len, being built as one of those narrow bridged nose jobs, had to try on every mask in the outfit to get one to fit. Reg's rubber face fitted nicely into the first one he tried on, and as soon as they got one to fit under my second chin we were behind the locked chamber doors and all set for the 'ascent.'

We were each equipped with pencil and paper and kept notes throughout the ascent.

The M.O. was present, using oxygen, and Len wore his mask hooked up to his own twin-tank oxygen container.

We whizzed up to 18,000 feet in about 10 minutes, and held steady there for about five minutes.

The M.O. suggested that the boys take careful note of my bloated *fizzog*, drawing special attention to the bleary bloodshot eyes, and suggesting they be equal to the originals from the 'Lost Week-end.'

I took a quick look in the mirror and saw a horrible thing staring at me from it.

Reg was fooling about with his pencil, trying to write straight along the lines, and his face was taking on a putrid-looking blue hue.

Len, complacently leering from behind his oxygen mask, reminded me of a boss-eyed ant-eater!

Reg and I told the M.O. that we didn't feel much

(Continued from previous column)

a detachable nose section to make transportation of the machine much easier.

For launching, the sailplane uses a three wheeled jettisonable trolley.

The design is not yet complete, but when it is I intend to build a machine for myself

different, so up we went to 22,000 feet and held steady.

We compared finger-nails and eye-balls and agreed that we did feel a little different, as though we had had about three fingers of whisky. The M.O. was continually explaining the various symptoms, etc.

There must be something funny about ant-eaters, or Len's eyeballs gazing at me over an oxygen mask at 22,000 feet, because I just had to laugh. I laughed so much that my diaphragm hurt, and Reg was shaking about with the silliest leer I have ever seen him wear.

The M.O. apparently couldn't see the funny side of it, as he promptly clapped my mask on. The lights suddenly became brighter, so I thought, and in seconds I was quite normal.

The lights had, of course, remained steady—it was vision that had become impaired.

I looked at Reg fumbling like drunken Dan McGee to get his mask on and still laughing as if the whole thing was a big joke. The M.O. fixed it for him, but Reg doesn't remember this kind act.

I checked on my 'carefully' pencilled notes and wondered just what drunken sot had scribbled the last bit of drool. It was incredible to think that it was my effort of only a few minutes before.

Len removed his mask and we, now breathing oxygen, watched him.

He obviously looked as though he was short of something. His lips were dry and turning blue, his finger-nails almost purple.

He looked at me as though I owed him a couple of bob and didn't intend to pay it back.

Signs of very slight distress were evident and he began to shiver as though extremely cold. His face took on a ghostly pallor and he did not look as though he would burst out laughing.

With a coy quirk of the corner of his mouth, probably meant for one of his large, pleasant grins, he decided to re-adjust his mask.

The transformation of his eyes and colour in a few seconds was amazing. We descended at 3,000 feet a minute, suffering no ill-effects, and 'landed' safely after a 45 minute run.

The M.O. said there was insufficient time to carry out the 'bends' test, and we would have to do that on another day.

After a little general discussion and thanks and farewells to all concerned, we departed to carry out our own 'bend' tests, combining them with taste and temperature tests, and we all agreed unanimously that we had had a right good day's 'blowout.'

(Reprinted from 'Glidabout,' the Journal of the Gliding Club of West Australia.)

BOOKS

ON BEING A BIRD

By Philip Wills

(Publisher Max Parrish, Price 15s. 6d.)

THIS is a book well worth reading for its very fine descriptions of past flights. If it is intended for the general public it might have been a good idea to put the mathematical and meteorological chapters at

the end as an appendix, rather than to have them as an interruption of the story. People are inclined to skip anything they suspect is put in to educate them.

As a firm believer in the relative safety of gliding I would suggest mildly that the accent is too heavily on danger, and that therefore beginner sons and daughters would do well to keep the book out of reach of their aged parents. But it is an exciting and inspiring story. Most interesting is the section on the wartime gliding exploits of Philip Wills and some others. From the radar research station near Swanage a batch of sailplanes went out day after day miles over the Channel. It was essential to test whether our R.D.F. could pick up an approaching glider, since the Germans were likely to try an airborne invasion. Thanks to a gallant band of sailplane enthusiasts who were towed far out towards the enemy and swooped back forty miles across the sea, the day arrived when we were sure we could detect even wooden gliders.

There is also a fascinating chapter on bird flight and the habits of soaring birds, both albatrosses and vultures, together with a terrifying picture of an eagle sharing a thermal over the Pyrenees. The photographs throughout are first class and their reproduction of the highest standard. It is altogether a book that should be bought.

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THE FIRST BRITISH GLIDER PILOT

By Peter Brooks

LAST year an old gentleman who had been up to London to attend the funeral of King George VI died on a railway platform on his way home to Northamptonshire. The death of Lord Braye attracted little attention and yet, with his passing, was severed a final link with the earliest beginnings of successful human flight. Lord Braye had been a friend of Percy Pilcher, the first man to fly in a glider in this country and one who, but for his death in a gliding accident on Lord Braye's estate, might have become the first to achieve successful powered flight.

Percy Sinclair Pilcher was born in January 1866. He joined the *Britannia* at the age of thirteen to train for a life in the Navy but left that service in 1885 and turned his attention to engineering as a career. After studying at London University, he became an assistant lecturer in naval architecture and marine engineering at Glasgow University in 1893.

From early youth, Pilcher took a close interest in the flight of birds and in the possibilities of mechanical flight. In 1891 he first heard of the gliding experiments which the great pioneer Otto Lilienthal was then making in Germany but it was not until early in 1895 that he started constructing his first glider in his spare time, modelling it largely on photographs in the Press of Lilienthal's machine. This glider, which was called the 'Bat,' was without a tailplane and had wings with an area of 151 sq. ft. and pronounced dihedral. It weighed 55 lb. and was built of Riga pine covered with nainsook fabric. The 'Bat' was a 'hanging' glider in the Lilienthal pattern in which the pilot was suspended from the centre section and controlled the machine by swinging the weight of his body.

In June, 1895, Pilcher went to Germany to see Lilienthal and watch him fly his glider. On his return to England in July, he made a number of unsuccessful attempts to fly the 'Bat' in its original form before modifying it in the light of what he had learnt in Germany. After adding a tailplane and reducing the dihedral of the wings, Pilcher succeeded, on September 12th, 1895, in making the first controlled flight ever made in the British Isles. The flight lasted 20 seconds during which a little height was gained in the slope lift of the hill at Wallacetown Farm, near Cardross, on the north bank of the Clyde where Pilcher was making his experiments.

A second flight on the same day was started from a tow by a man with a rope and lasted nearly a minute from a release height of about twenty feet. This technique of towed launching was an innovation of Pilcher's which had not been previously attempted. Many successful flights followed these initial trials and later that summer Pilcher built a second glider which he called the 'Beetle.' It was also a 'hanging' glider but the wing was without dihedral and was mounted above the pilot so as to keep the wing tips off the ground in landing. Pilcher had had trouble from catching the 'Bat's' wing on the ground during landings. In flight, the 'Beetle' did not prove as successful as its predecessor because of too great a

weight and too low a centre of gravity. The 'Beetle' was made stronger than the 'Bat,' so as to be suitable for the installation of an engine and propeller which Pilcher was contemplating. This greater strength increased the weight to 79 lb. for an area of 172 sq. ft. and made the glider very difficult to handle. It was not a success.

Pilcher's third glider was the 'Gull' which had a greatly increased wing area of 300 sq. ft. but a weight cut back to that of the original 'Bat'—55 lb. This design was again not entirely satisfactory. The 'hanging' method of control proved inadequate for so large a machine in anything but a dead calm. The 'Gull' was completed in Glasgow early in 1896 and was tried out in the summer of that year only to be crashed several times during attempted flights in strong winds.

In the summer of 1896 Pilcher left Glasgow University and moved to Lysnford in Kent where he had got a job with Sir Hiram Maxim who was engaged nearby at Baldwins Park on a series of experiments aimed at solving the problems of powered flight. When he had settled down in his new home, Pilcher started work on his fourth glider, the 'Hawk,' which was a marked advance on his previous designs. Made largely of bamboo, covered with linen and braced with piano wire, this glider—which was again of the 'hanging' variety—weighed about 50 lb., had a span of 24 ft. 8 ins. and a wing area of 180 sq. ft. The wings could be folded for transport and two small wheels on sprung struts were provided as an undercarriage.

The 'Hawk' was most successful. It was usually launched either by towing with a 400 yard length of fishing line, pulled by several men, or by means of a cable and pulley system drawn by a horse. This latter form of launching was clearly the beginnings of winch launching as we know it today. The first engine-powered winch launches were later also made with a 'hanging' glider. This was during a gliding demonstration given by Captain William Avery of the U.S. Army on a 'Chanyte' glider at the St. Louis World's Fair in 1903. Power was derived from a 10 h.p. electric motor.

It is interesting that one of Pilcher's reasons for favouring winch launching was that it enabled him to reach greater heights above the ground than could be done while gliding down the slope of a hill. He believed that if he could get high enough, he would be able to make use of the up-currents which he could see soaring birds using. His favourite method of launching involved taking off from the top of one hill, towed by a cable which passed across a small valley to a pulley mounted on the summit of a neighbouring hill. After the cable had passed through this pulley, it ran to a party of several men who pulled on it as they ran down the hill. In this way considerable heights were attained over the intervening valley where Pilcher hoped to find up-currents. Unfortunately he never succeeded in contacting one.

Between 1896 and 1899, Pilcher made a large

GLIDING HOLIDAY

By Jack Coomber

On Saturday, March 28th, Russell Schneider, Col. Bailey and I loaded Col's Austin Utility to the hilt with goods and chattles and set off from Dubbo, in N.S.W., heading for South Australia.

OUR object was to be in Waikerie by the following evening, and contact some of the Waikerie Gliding Club members. We had already arranged with this club to do some gliding with them over the Easter week-end.

After travelling over dusty roads and what appeared to be desert country we eventually came to the very green Murray Valley and found ourselves within a few miles of Waikerie.

As we approached the town we noticed a number of gliders on our right and decided that this must be the Waikerie Aerodrome.

We made our way to the hangar and contacted Bob Rowe, who was expecting us. We also met other members of the club—just names at the time but later to become good friends and a source of gliding information.

We found that gliding was finished for the week-end but we would be on the spot when the gliding started at Easter, a week away.

All three of us had done some power flying. I was the only one who had done any gliding, but that was during the war when I had flown with the late Jack Munn at Wagga.

We had planned to camp out but decided to book into the Waikerie Hotel instead and exist on West

End beer for the balance of the week.

We visited Jock Barrett, the president of the club, who made us very welcome. We were beginning to feel very much at home at Waikerie.

Thursday came and a number of fellows decided to start flying for the week-end. That sobered us up, and we took part in the club's activities for five days over Easter.

We thoroughly enjoyed ourselves at Waikerie, so much so that we decided to go on to Adelaide for a few days and then return for more gliding the next week-end.

While in Adelaide we visited the Adelaide Soaring Club work-shop and had a yarn to a few of the fellows there. We then went out to the Schneider Works and saw the two-seater club trainer under construction.

We also said 'hello' to Harry Schneider who we met in Dubbo when the 'Kangaroo' passed through.

At Waikerie, most of our flying was done in the Slingsby 'Austral,' but we also had a flight each in the club-built 'Pelican.'

The weather was good for soaring. Col was in the front seat of the 'Austral' for 2½ hours and reached an altitude of just under 6,000 feet. Russ had a flight of about 1 hour 15 mins. and went to 4,500 feet while I was up for about one hour and went to cloud-base. At one time there were three gliders in the one thermal and all about the same altitude.

Anyway, it all had to end so after a lot more beer and a lot of talk we left Waikerie on the Monday morning, three very sorry fellows fully convinced that powered flying can't come up to gliding.

Australian Gliding.

THE FIRST BRITISH GLIDER PILOT—continued

number of successful glides on the 'Hawk' near Eynsford. His best effort was on June 19th, 1897, when, using the technique described above, he achieved a height of nearly 200 feet above the valley. The glider's minimum rate of descent was about five feet per second.

In June, 1896, Pilcher again visited Lilienthal and on this occasion was permitted to try out the latter's biplane glider. This was the machine on which the German was later killed at Rhinow on August 10th of that year.

On his return to England, Pilcher turned his attention to developing a small petrol engine driving a propeller which he planned to instal in a monoplane of similar construction to his gliders. He decided to use an engine of about four horse-power which was twice the power he calculated he needed for sustained flight after a towed launch had got the machine into the air.

In the event, Pilcher did not live to achieve the ultimate triumph of powered flight. This was to go to the American Wright brothers who were to make the first powered flight in history on December 17th, 1903, only four years after Pilcher's death.

In September, 1899, Pilcher was staying at Stanford Park near Market Harborough, Northants., on a visit to Lord Brayne when he was persuaded to give a gliding demonstration on a gusty day to some members of the Aeronautical Society who had come to see him. He made one successful winch-launched

flight but, on a second, one of the bracing wires to the tail broke under a gust load during the launch and Pilcher was seriously injured when the tail collapsed and the 'Hawk' dived into the ground from a height of about 30 feet. He died two days later, on October 2nd, 1899, without regaining consciousness, the first Briton to be killed in a gliding accident. The remains of the 'Hawk' were rebuilt early in 1909 by T. W. K. Clarke & Co., of Kingston for exhibition at the first British Aero Show which was held at Olympia in that year. The glider is now preserved in the Royal Scottish Museum in Edinburgh.

Reprinted from the "Lasham Newsletter."

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VIVE LE VOL A VOILE!

IN early July the 'Kite' syndicate set sail for France, complete with taxi, 'Kite' and borrowed trailer and full of dreams of Gold 'C's,' taxi breakdowns and good living. In fact the only one of these which actually occurred was the last.

Our goal was Beynes, a Centre Inter-Club somewhat to the West of Versailles. We arrived at Ostend (Laurie had a theory that it was cheaper to go that way) and then drove for what seemed several centuries over Belgian pave to the French frontier, where both groups of Customs men politely enquired whether our trailer concealed a 'bombe atomique.' Then further infinity of French pave, a few hours of sleep on the roadside, an increasing awareness that French signposting becomes unreliable in towns, and finally Beynes on a superb soaring day with a sort of haze of sailplanes under a beautiful cumulus to mark the site. We were welcomed with great friendliness, rigged the 'Kite' and longed to go to sleep. But first we had to meet the Chef, M. Heron, find our room, feed and talk about British gliding.

French gliding is run by the state and its structure is too complicated to explain here. But the effect is that gliding is very cheap, it is easy to pile up the hours and certificates, and equipment is provided on a lavish scale. The number of members at Beynes at a week-end seemed to be about the same as the Surrey and I.C. attendance at Lasham, but they had about twenty machines, including four 2-seaters (and a couple of 'Air 100's' temporarily at Pont St. Vincent for the Nationals), two tugs, two 2-drum winches (hardly ever used), sundry vehicles including a vast bus which ran between Beynes and Paris every day, excellent hangars and workshops, and a permanent staff of about five. The most striking feature was that by our standards, the aircraft were in a most alarming condition. Most of them had fairly fundamental holes in the fuselage or wing ply, which sometimes had fabric patches if they were really bad. Repairs were well carpentered, but beyond a coat of thick red dope, no attempt was made to finish them off. One 'Weihe' was an incredible patchwork. The machines were used hard and often, but minor breakages seem fairly common and the members did very little work on them beyond washing them down. Daily inspections were virtually non-existent, except after rigging, and aerobatics were strictly forbidden. On the other hand, the powered aircraft seemed to be very well maintained.

The two-seaters were mostly 'C.M. 800's,' a side-by-side device with a closed cockpit but otherwise rather like a cantilever 'Daisy.' For early solos, the 'Emouchet' was used, a sort of crude 'Grunau,' and one then progressed to the 'Nord 2000' ('Olympia'), 'Milan' ('Weihe'), and finally to the 'Air 100.' French sailplanes are vastly expensive: about £2,000 for the 'Nord 2000' and £4,000 for the 'Air 100.' There are therefore virtually no private owners, and the locals were quite astonished when we gave a few English prices, and were quite speechless at the cost of the 'Kite.'

The usual tug was a 'Stampe,' an excellent little

biplane not unlike a 'Tiger Moth,' but with 150 h.p., wheel brakes and a self-starter. When this went U/S, they produced an incredible 'Morane Saulnier MS 230' which had clearly been designed with a complete indifference to little things like drag. It was a two-seat parasol affair with an uncowed radial engine of 230 h.p., and was truly 'formidable.'

The weather during our fortnight was grimly English and we only did 12 launches and two cross countries. Their method of operation was quite simple. At the end of the morning forecast on the radio, the announcer gave the soaring hopes for the day which were usually received with derision. (Meteorology is quite international). All ranks gazed at the grey gloom outside and returned to *petit déjeuner*. About 10.30 the weather would begin to look hopeful, and with Gallic enthusiasm it would immediately be assumed that this was also the case for 300 km. around Beynes. At 10.45 the gliders would be lined up on the edge of the 'piste' in front of the hangar, facing along the length of the aerodrome (it was really a wide strip) usually at about 100° to the wind direction. At 11.15 it would have become apparent that the 'Stampe' was U/S for the day and by 11.45 the 'M.S 230' would have started with a fine clatter of external machinery. Once the towing started, the rate of launching was very good. We were given an almost embarrassing priority. The startling thing was that machines seemed to be whizzing in all directions. Taking off slightly down and very cross-wind didn't matter much, since the tugs were powerful and the run rather downhill, but the gliders landed in the opposite direction (about 80° cross-wind) whilst the tugs dropped the ropes in a smart downwind beat-up and landed into wind. Very confusing to the staid English.

Our cross countries were not very brilliant. I was given an 'Ordre de Mission' to make 'Un vol de Distance at Pont St. Vincent,' and set off round the south of Paris (see line-book) under very easy conditions. Had they stayed the same 300 kms. would just have been a matter of flying from one cloud to the next until Pont appeared, but after 3 hours both the thermals and variometer became unreliable and I fetched up in a stubble field at Pleurs, near Sezanne, some 150 km. out. The local hospitality was terrific, and the exhausted crew found a rather elated pilot. The gratifying thing was that the local Frenchmen in 'Weihe's' did about 20 km. less and took a day longer over the retrieves.

A couple of days later, Laurie was given a similar 'Ordre' under far less promising conditions, and arrived at Meaux, 50 km. out, due to cramp and air-sickness. Here was another Centre where the cuisine it seemed, was very good indeed. Ralph was rather frustrated by the weather, and only got a little local soaring.

We also paid a visit to Chavenay, another Centre about 5 km. from Beynes, which was a sort of gliding Boscombe Down, with all sorts of fascinating prototypes. We really went to look at the tailless 'Fauvel AV 36,' a little machine of 12 m. span and the

performance of an 'Olympia,' but also found the 'Arsenal 4001,' a vast device mostly of metal with complex flappery and dozens of knobs to twiddle—rather like Lawrence Wright's 'Mickimoo,' and a strange powered 2-pew sailplane.

A couple of evenings were spent in Paris. An account of the first would be out of place in what is, after all, a journal devoted to gliding. The second was at the invitation of Laurie's fiancée, Ruth, who produced the sort of dinner only possible in Paris, and incidentally gave Ralph some inkling of the Potentialities of Eau de Vie. On our last day there, she also gave us a rapid, but comprehensive tour of Paris. Our parting from Beynes was quite a gastronomic feat, and rapidly turned into a riotous evening in the local pub. You may have imagined that certain English gliding parties were rather noisy affairs, but they were quite eclipsed by this. At a late hour, the taxi chugged up the hill to the aerodrome with a total load of twelve people, including one, I regret English, sitting on the bonnet. French respect and admiration of the taxi then reached a point at which they enquired whether they could buy one in London and import it to Beynes.

The return journey was uneventful except for a dreadful explosion from the taxi, which turned out to be nothing worse than a slippage of the magneto drive. The journey across the Channel attained new heights of frustration, and we trust that Silver City will soon have aeroplanes big enough to take glider trailers.

In spite of the weather it was a very good trip indeed. The pilots at Beynes were excellent types, and the kindness of M. Heron and the hospitality of M. and Madame Bourdon, who ran the restaurant, were magnificent. Le vol a voile francais is highly recommended.

Acknowledgments "Lasham Newsletter"

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A.T.C. authorities have recently become interested in the 'Motor Tutor' and, with the co-operation of Mr. Slingsby who has offered to lend an aircraft to the A.T.C., they are considering making an investigation into the suitability of the 'Motor Tutor' for conversion of glider trained pilots to power flying. This may possibly develop into a new means of enabling A.T.C. cadets to obtain their pilots' licenses far more cheaply than the present scheme of scholarships permits.

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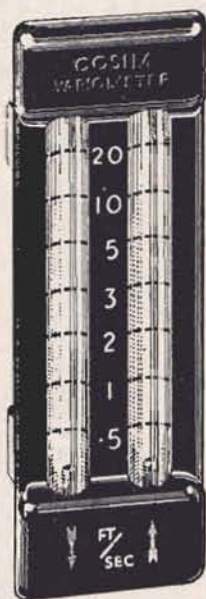
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NEWS IN BRIEF

Russia. A Tass News Agency message reported on June 9th that a Russian pilot had set a new International distance record for two-seaters by flying a distance of nearly 520 miles in nine hours. The pilot, Ilchenko, flew with a passenger.

South-West Africa. An out-and-return flight made in S.W. Africa on February 9th, 1952, has just been recognised by the F.A.I. as a new International two-seater record. It was made by E. Domisse and S. Barker in a 'Kranich.' The total distance covered was 270 miles, from Kietmanshoop to Marienthal and back. Time taken was five hours, making their average speed 54 m.p.h.

United States. The Schweizer has released news of the preliminary design of a new high performance two-seater sailplane to be known as the '2-25.' It is a tandem all-metal construction with a cantilever mid-wing. Wingspan will be 62 feet, length 29 feet, aspect ratio 17.35, empty weight 640 lbs., and all-up weight 1,160 lbs. With a normal operating load of 1,020 lbs. it will have a wing loading of 4.59 lbs. per square foot. Estimated performance figures are: Gliding angle 1:30, Minimum sinking speed 2 ft. per sec., and Cruising speed 86.5 m.p.h.

Austria. The Russian authorities have now agreed to allow gliding again in the Russian-occupied zone of Austria.

Mexico. The first Mexican Gliding Club has been founded by Juan Jorge Braun and the flying school will be opened on the 1st August.

Denmark. In July the Second National Soaring Contest was held in Jutland. The weather was unkind, giving only five soarable days out of the fourteen of the contest, but some good flights were made. Six machines were in use and the longest flight of the meeting was one of 99 miles by Feddersen, who also made a goal flight of 92 miles the day before, together with Harald Jensen, winner of the contest. His score was 3,869 points. Feddersen was second with 2,979, and Michaelson third with 2,879.

United States. In a paper read at the Aviation Writers' Association last month, Dr. August Raspet of the Aerophysics Department, Mississippi State College, said that he is conducting research with a sailplane on boundary layer control and the reduction of drag by sucking a portion of air near the surface of a wing or fuselage through small holes into the interior and exhausting it after accelerating it to the speed of flight.

United Kingdom. Colonial servants have their own Gliding Club—the Crown Agents' Gliding Club, which flies at Lasham, Hants.

THE Hinkler Soaring Club, Sydney, has no ab initio training gliders but has gained a number of new members from the ranks of the local power pilots.

Clive Martin, who joined the club in January, has qualified for 'A', 'B' and 'C' certificates in the 'G.B.2' and has made several good soaring flights.

Barrie Davies, who flies 'Convairs' for Trans-Australia Airlines, made an impressive first flight in the 'Grunau' by staying up for 8 minutes from a 900 feet winch launch.

Other power pilots who have joined the club recently are Ralph Snodgrass and Don Johnson.

Joe Kuusik, who learned to fly with the Adelaide Soaring Club, is now living in Sydney and intends to join the Hinkler Club soon.

He spent a day at Camden recently and met some of the members. 'AUSTRALIAN GLIDING'

HAVE YOU READ??

'ON BEING A BIRD'

By PHILIP WILLS

(PARRISH) - - 15/6

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JULY, 1953

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'B' .. 126

'C' .. 38

Silver 'C' .. 6

Gold 'C' .. —

'B' CERTIFICATES

No.	Name.	A.T.C. School or Gliding Club.	Date taken
3660	G. A. Pentelow	No. 44 G.S.	12. 6.53
8317	J. R. F. Diffey	No. 89 G.S.	28. 3.53
8788	P. J. Clear	No. 146 G.S.	25. 6.53
9165	T. A. F. Sheppard	Wessex R.A.P. G.C.	11. 6.53
9811	L. B. Duncan	R.A.P. G.S.A.	12. 7.53
5147	W. G. Brown	Avro G.C.	2. 7.53
5794	P. A. Reeve	R.A.P. G.S.A.	10. 6.53
12743	P. J. Haddon	No. 146 G.S.	25. 6.53
13068	G. L. Smith	No. 42 G.S.	28. 6.53
13667	T. Gilbertson	R.N. Gliding Camp	4. 9.51
13860	R. Smith	No. 26 G.S.	5. 7.53
16149	J. M. Alcock	Yorkshire Gliding Club	2. 7.53
16514	G. D. J. Boldy	Midland G.C.	27. 6.53
16515	G. Ling	No. 104 G.S.	25. 4.53
16516	C. Groom	No. 123 G.S.	3. 5.53
16517	A. J. R. Davis	No. 168 G.S.	31. 5.53
16518	A. Devlin	No. 2 G.S.	28. 6.53
16519	D. J. Mason	No. 45 G.S.	28. 6.53
16520	J. Peterson	No. 84 G.S.	31. 5.53
16521	D. J. Sharlot	No. 49 G.S.	14. 6.53
16522	P. J. Langford	London G.C.	22. 2.53
16523	R. W. Belcher	No. 123 G.S.	31. 5.53
16524	A. Jerams	R.A.P. Gutersloh G.C.	12. 4.53
16525	G. H. F. Palmer	R.A.P. Gutersloh G.C.	24. 5.53
16526	D. King	Haltom Apprentices G.C.	25. 6.53
16527	J. Taylor	H.C.G.I.S.	26. 3.53
16528	B. G. Mercer	Haltom Apprentices G.C.	27. 6.53
16529	H. J. Mayhew	No. 146 G.S.	25. 6.53
16530	J. E. Polleyn	No. 105 G.S.	7. 6.53
16531	A. W. McComb	Haltom Apprentices G.C.	9. 5.53
16532	D. C. Hunt	No. 143 G.S.	28. 6.53
16533	M. Revell	Midland G.C.	27. 6.53
16534	C. F. Yealand	No. 45 G.S.	14. 6.53
16535	J. K. Latta	Bristol G.C.	24. 6.53
16536	P. F. L. Clarke	No. 146 G.S.	26. 6.53
16537	P. B. Penn	No. 130 G.S.	10. 5.53
16538	R. Harvey	No. 130 G.S.	23. 5.53
16539	A. J. Hawkes	No. 105 G.S.	25. 4.53
16540	M. Lenane	No. 203 G.S.	21. 6.53
16541	A. Penny	No. 5 G.S.	24. 5.53
16542	D. L. James	No. 122 G.S.	10. 5.53
16543	D. C. Chessman	No. 161 G.S.	5. 7.53
16544	R. S. Stubbings	No. 49 G.S.	31. 5.53
16545	B. Smith	No. 22 G.S.	20. 7.52
16546	C. S. Hill	No. 146 G.S.	28. 6.53
16547	T. Stockdale	No. 122 G.S.	10. 4.53
16548	J. A. Wignall	Avro G.C.	13. 6.53
16549	J. Howard	R.E.G.C. (Chatham)	4. 7.53
16550	P. W. Brown	Bristol G.C.	4. 7.53
16551	P. W. Elder	Laneburg G.C.	2. 5.53
16552	M. A. Dodd	No. 31 G.S.	7. 7.53
16553	A. P. Haye	Handley Page G.C.	4. 7.53
16554	P. Cowling	No. 23 G.S.	21. 6.53
16555	A. N. Bratt	Coventry G.C.	5. 7.53
16556	S. J. M. Green	No. 42 G.S.	28. 6.53
16557	P. W. Mead	Scharfoldendorf G.C.	2. 7.53
16558	R. D. Swatton	No. 92 G.S.	7. 6.53
16559	P. R. Wellstead	Gutersloh G.C.	25. 5.53
16560	P. A. Wortley	No. 45 G.S.	5. 7.53
16561	B. T. Allen	No. 44 G.S.	11. 7.53
16562	P. M. Ferguson	Bristol G.C.	11. 7.53
16563	E. C. G. Morgan	Oxford G.C.	4. 7.53
16564	P. Sargent	No. 105 G.S.	21. 6.53
16565	D. A. Bowers	No. 104 G.S.	21. 6.53
16566	M. S. Cooke	No. 104 G.S.	5. 7.53
16567	J. D. Phillips	No. 168 G.S.	12. 7.53
16568	L. R. Richard	No. 168 G.S.	12. 7.53
16569	K. R. Wood	No. 168 G.S.	12. 7.53
16570	A. E. Clayton	No. 44 G.S.	12. 7.53
16571	E. C. Clegg	Bristol G.C.	10. 7.53
16572	J. N. Jones	No. 168 G.S.	12. 7.53
16573	R. G. P. Stevens	No. 123 G.S.	5. 7.53
16574	D. E. Davies	R.A.P. G.S.A.	12. 7.53
16575	M. S. Hall	S.G.U.	28. 6.53
16576	P. J. Hamer	No. 44 G.S.	12. 7.53
16578	B. D. Warner	No. 105 G.S.	3. 5.53
16579	A. C. R. Brown	No. 2 G.S.	7. 6.53
16580	P. McGovern	No. 2 G.S.	7. 6.53
16581	M. J. Jones	No. 82 G.S.	24. 5.53
16582	L. W. Taylor	No. 2 G.S.	12. 7.53
16583	D. B. R. Harris	East Midland R.A.P. G.S.A.	12. 7.53
16586	R. C. Ascot	No. 105 G.S.	25. 4.53
16587	R. J. Mason	No. 49 G.S.	24. 5.53

'B' CERTIFICATES—continued

No.	Name.	A.T.C. School or Gliding Club.	Date taken
16588	M. Copp	No. 130 G.S.	2. 5.53
16589	S. H. Peeling	No. 141 G.S.	31. 8.52
16590	C. Wilkinson	R.A.F. Fassberg	14. 3.53
16591	C. Carter	No. 130 G.S.	26. 4.53
16592	K. H. Bates	No. 48 G.S.	28. 6.53
16593	W. G. Williams	Midland G.C.	10. 7.53
16594	B. B. Bowles	No. 122 G.S.	1. 3.53
16595	J. Shaw	No. 203 G.S.	21.12.52
16596	P. M. Lucas	The Army G.C.	16. 3.52
16597	G. N. Price	No. 89 G.S.	9. 5.53
16598	A. R. Wigram	London G.C.	9. 7.53
16599	J. D. A. Davidson	No. 146 G.S.	19. 7.53
16600	J. H. B. Rushton	No. 146 G.S.	19. 7.53
16601	R. H. King	No. 146 G.S.	19. 7.53
16602	M. J. Venard	No. 123 G.S.	31. 5.53
16603	R. J. Golding	No. 87 G.S.	31. 5.53
16604	S. F. N. Moles	No. 48 G.S.	5. 7.53
16605	M. J. Hannam	Halton Apprentices G.C.	26. 5.53
16606	P. C. Gibbs	Portsmouth Grammar School	16. 4.53
16607	A. Richardson	No. 122 G.S.	10. 4.53
16608	B. Swingle	No. 49 G.S.	5. 7.53
16609	G. E. Thomas	No. 122 G.S.	19. 7.53
16610	G. J. Fitzgerald	No. 188 G.S.	12. 7.53
16611	E. A. Johnston	No. 104 G.S.	11. 7.53
16612	D. Brokenshire	No. 82 G.S.	28. 6.53
16613	J. D. Horne	No. 125 G.S.	21. 6.53
16615	K. V. Hammerton	No. 168 G.S.	25. 7.53
16614	P. M. Hoffman	No. 168 G.S.	25. 7.53
16616	D. N. Lloyd	Halton Apprentices G.C.	10. 5.53
16617	A. D. Corbett	Scharfoldendorf G.C.	9.11.52
16618	J. McLelland	No. 2 G.S.	3. 7.53
16619	R. Lillington	London G.C.	10. 7.53
16620	B. K. J. Haldow	No. 143 G.S.	19. 7.53
16621	T. J. Kenny	No. 168 G.S.	25. 7.53
16622	M. H. F. Skinner	No. 168 G.S.	12. 7.53
16623	D. A. Taylor	No. 168 G.S.	25. 7.53
16624	R. Seabrook	No. 141 G.S.	2. 8.53
16625	R. J. W. Lindie	No. 168 G.S.	25. 5.73
16626	B. Crowhurst	No. 44 G.S.	12. 7.53
16627	A. Thorpe	No. 22 G.S.	10. 5.53
16628	G. G. Stott	Scottish G.U.	11. 7.53
12619	W. George	No. 123 G.S.	23. 5.53
13697	A. R. C. Lennard	Southdown G.C.	4.10.52

'C' CERTIFICATES

2444	M. A. Boyce	Coventry G.C.	19. 6.53
4991	R. G. Turner	Oxford G.C.	7. 6.53
7071	A. G. Legg	No. 89 G.S.	19. 4.53
7943	J. M. Maples	No. 24 G.S.	15. 3.53
9366	P. W. Taylor	London G.C.	14. 7.53
9878	R. A. Laing	No. 130 G.S.	5. 7.53
11130	V. F. G. Bonnaud	London G.C.	9. 7.53
12602	H. E. Mills	Bristol G.C.	7. 6.53
12708	I. Bryant	No. 92 G.S.	18. 7.53
13077	J. Ellis	No. 42 G.S.	5. 7.53
13208	A. MacDonald	London G.C.	6. 7.53
13697	A. R. C. Lennard	Southdown G.C.	17. 4.53
13936	C. S. Fitzpatrick	Army G.C.	5. 7.53
14273	R. Jamieson	Derbyshire & Lancashire G.C.	12. 4.53
14299	D. B. Hales	No. 84 G.S.	5. 7.53
14533	D. G. T. Hyde	London G.C.	31. 5.53
14552	R. L. Shadbolt	No. 105 G.S.	31. 7.52
14743	A. J. R. Deacon	No. 126 G.S.	19. 7.53
15060	A. G. P. Vaughan	Midland G.C.	5. 7.53
15657	J. H. S. Howard	Southdown G.C.	22. 8.52
15990	J. J. Joss	Coventry G.C.	17. 6.53
16015	T. R. Inger	No. 45 G.S.	7. 4.53
16019	P. J. B. Wilby	No. 104 G.S.	6. 7.53
16063	L. S. Poulton	London G.C.	5. 7.53
16071	M. J. Bindon	Midland G.C.	8. 7.53
16072	E. N. Finch	No. 125 G.S.	5. 7.53
16149	J. H. Alcock	Yorkshire G.C.	6. 7.53
16260	T. R. K. Parkes	Bristol G.C.	27. 6.53
16317	R. H. McArthur	No. 183 G.S.	28. 6.53
16563	E. C. G. Morgan	Oxford G.C.	19. 7.53
16524	A. Jerams	Gutersloh G.C.	26. 4.53
16535	J. K. Latta	Bristol G.C.	28. 6.53
16557	P. W. Mead	Scharfoldendorf G.C.	3. 7.53
16590	G. Wilkinson	R.A.F. Fassberg G.C.	7. 7.53
16598	A. R. Wigram	London G.C.	14. 7.53
16611	E. A. Johnston	No. 104 G.S.	19. 7.53
16617	A. D. Corbett	Scharfoldendorf G.C.	18. 5.53
16627	A. Thorpe	No. 22 G.S.	28. 6.53

SILVER 'C'

425	Stuart Morison	Army G.C.	5. 7.53
426	R. P. Vickers	London, Midland, Derbyshire & Lancashire	8. 7.53
427	John Cochrane	Bristol G.C.	4. 7.53
428	R. Stafford Allen	Oxford G.C.	13. 7.53
429	John Gaskell	Cambridge University G.C.	8. 7.53
430	John Riddell	London G.C.	19. 7.53

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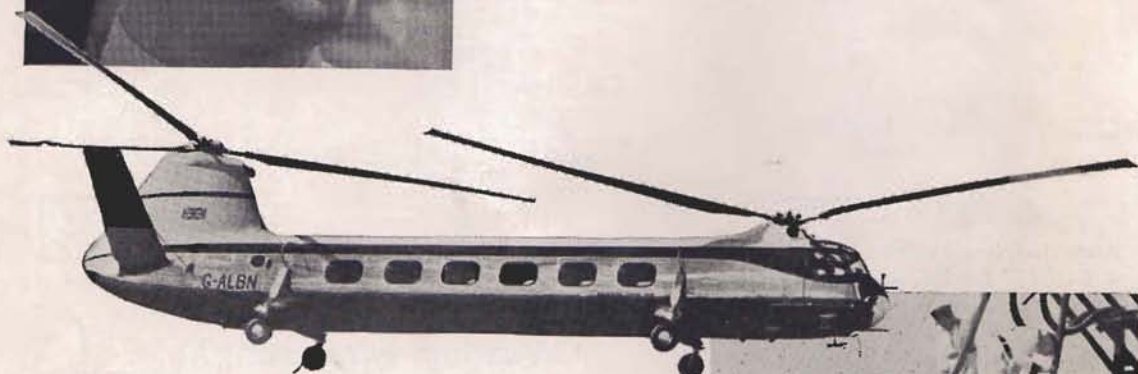
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