Sailplane and Glider

The First Journal devoted to Soaring and Gliding

JANUARY/FEBRUARY 1954

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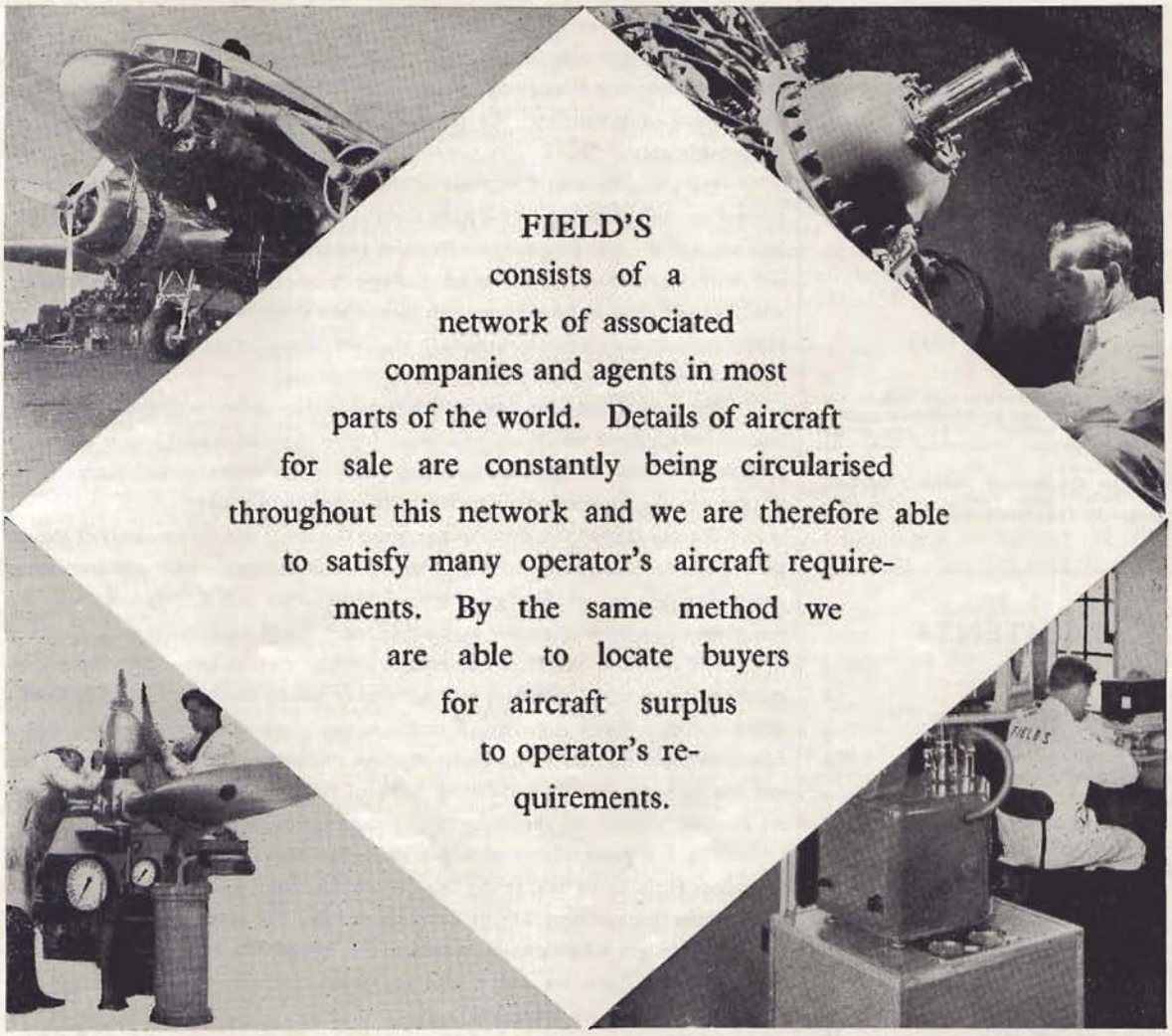

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THE FIRST JOURNAL DEVOTED TO SOARING AND GLIDING

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Editor :
VERONICA PLATT

Asst. Editor :
RONALD BISHOP

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

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Cover Photo :
One of the boys of the Helsinki Gliding Club, making an arch for the rudder of the PIK-36.

Editorial

WHAT is happening to *Sailplane* ? From Lands End to John O' Groats, from London to Sydney have come the enquiries, by letter, wire and telephone, what has happened to my copy ? Let us say here and now that *Sailplane and Glider* the world's first and leading journal devoted entirely to Soaring and Gliding is to continue publication whilst we have anything to do with it.

We deeply regret that it has been decided to continue publication as a bi-monthly but it is only for this year. Continued rises in the cost of production and distribution and a lessening in the support which we receive from those who manufacture equipment etc., for sailplanes and gliders, because business is small, has brought this about.

We are somewhat comforted by the knowledge that our journal has never enjoyed an easy existence. It has been controlled by many hands during its twenty-four years of life, but despite the difficulties and trials through which it has grown, —a world-war, when there was no gliding ; paper shortages and rises in costs which would virtually have seemed to have made publication of such a specialized periodical with only a small readership (but let us not forget an enthusiastic one) —impossible, it has gained strength.

We were faced with two alternatives—either to increase the cost of the journal (which is we would say now much higher than we would like it to be) or publish each other month thus spreading some of our expenses and guaranteeing us covering our expenses more or less for some months ahead.

We are indeed indebted to our good friends in the Power-Aircraft World for the wonderful support which they have given us during the past year and rather more especially to our very good friends SHELL-Mex and B.P. Limited who for many years now have taken our back cover and virtually kept us alive.

We are sure that all of our readers will be glad to know that we are to continue our publication. Many will ask if they can do anything to help us in our difficult times. There is plenty. If each and every one of our readers enrolled a new subscriber we would be able to improve the quality of our magazine and the number of pages besides publishing more of the wonderful photographs which we receive. (Please see the important announcement on page 22).

We are going ahead with our plans for our Exhibition of Gliding and Motorless Flight to be held at the Tea Centre, Piccadilly, London, W.1, during the week of the International Gliding Contests in July. We repeat our offer of prizes for poster designs which should be sent to our offices at 8, Lower Belgrave Street, London, S.W.1., and we would also appreciate any ideas and suggestions our readers might have on the subject.

R.G.B.

Would readers kindly note that for this year *Sailplane and Glider* will be published on the 1st day of every second month of issue, i.e., the MARCH/APRIL issue will be on sale on April 1st, the MAY/JUNE issue on June 1st, and so on. Copies are obtainable through newsagents and bookstalls but we would strongly advise readers to take out subscriptions 12/9 per annum or 6/6 for three issues.

ENGINES—

ARE THEY NECESSARY?

By KENNETH OWEN

Condensed from an Article in "FLIGHT"

SILENCE is a beautiful thing. Combine this beauty with the exhilaration of flight, and the result should be worthwhile indeed. Years ago, some such thought was vaguely responsible for my original desire to glide, a desire whose strength was matched only by my conspicuous failure to do anything at all about it—until August of this year. At that time the London Gliding Club expressed their willingness to try to teach me to glide; an optimistic gesture, and a sporting challenge which I accepted with alacrity and a small dry Martini.

My previous gliding experience was zero. All my aviation had been achieved with the aid of one or more noise-producing devices, known as engines, which caused fans to rotate at the front end of the flying machine. I had therefore become conditioned to the continual droning of these inventions; and, indeed, silence from one of them would normally be the signal for a descent to be made on to the ground. Thus a certain amount of reorientation was first needed before I could really believe in the new philosophy of being pulled at the end of a long string into the air, there to be cast off with no motive power other than gravity. The prospect of innumerable dead-stick landings, extending on into eternity, was an equally novel concept.

In the past I had, however, been aware of the existence of gliding. The sight of a skeleton-framed primary circling and descending rapidly, the exposed pilot seemingly suspended in space, had failed to inspire me. I had not taken up gliding at that time, and the sight of the primary caused merely a wish for things to stay that way. The recollection of polished work in 'Olympias' by Goodhart, Stephenson and Lee at various air displays since then, however, reminded me that sailplane flight could be an inspiring thing. This opinion was confirmed by my friend and one-time lecturer, Alan Yates (an experienced 'Olympia' pilot), and my mind was made up. I would follow in the footsteps—or the thermals—of Philip Wills, and try very hard to be a bird.

Attaching myself to the second half of one of the London Club's two-week training courses, I met my instructor, bad weather and a new philosophy on my first day at Dunstable. The philosophy is one of calm patience together with a willingness to push or pull gliders long distances from the point (A) where they land to the point (B) where they are launched. (It subsequently transpired that most glider pilots can in fact make (A) tend towards (B) on the majority of occasions, but pupils in the two-seater are inclined to make interesting, rather than accurate, approaches and landings). My instructor was to be John Simpson, a schoolteacher by profession and an experienced sailplane pilot who habitually spends many weeks of his Summer vacation teaching people to be birds.

First impressions from the ground of the gliders in the air were of the steep launching angle (as if lying on one's back in a lift going up) and the shallow angle of bank, compared with powered aircraft, as they turned—this latter, on reflection, being presumably due to their slower air speed. Occasionally, a pipe-smoking occupant of the starboard seat would be seen to lean out and knock out his pipe on a convenient strut . . . Indeed, power flying was never like this.

Another intriguing aspect of gliding, appreciated very early in the game, is that observers on the ground can hear quite distinctly what an instructor in the circling 'two-pew' is saying to his pupil—and, of course, equally distinctly any reply the pupil dares to make. This can prove acutely embarrassing to the airborne pupil, as precise details of his incompetency of pilotage are thrown to whichever of the four winds is not blowing in his face at the time, and carried with crystal clarity to the delighted ears of those below.

Soon came the time when I had to cease watching everyone else flying and actually to sample the real thing myself. Observation of the 'T.21's' activity since my arrival had pointed to the fact that it was, in spite of its appearance, airworthy, and capable of at least making a circuit and landing in the same general area from which it was launched. This knowledge did something to relieve the doubt occasioned by the sight of extremely primitive-looking stick and rudder pedals, a small wooden sphere attached to a wire (surely not for flapping the wings in an emergency?), a panel of only three instruments, and no seat—just a slightly raised portion of the floor. The central instrument, between the altimeter and the A.S.I., was intriguing, and apparently consisted of two thermometers vertically mounted. This, I was informed, was actually a variometer.

After I had been installed in the cockpit, and had carried out the 'scrubcat' check, our wish to ascend was conveyed via the batsman to the winch driver.

The wire tightened, and we began to move forward over the ground, rather more smoothly than I had expected. Then we were rising into the air, with an almighty rushing noise and the feeling of being pulled face-first through a howling gale. My streaming eyes just managed to perceive that the nose seemed very, very high, before my instructor pushed the stick

forward, released the cable, and handed over the controls to me.

I commenced the circuit with a turn to the right. Any belief I might have held that turning a glider was identical with turning a powered aircraft was quickly dispelled as slow-speed effects and aileron drag played their part. The application of moderate right bank immediately caused the nose to swing to the left—an interesting phenomenon, but not what was desired. Much and early rudder was obviously needed, at least to begin the turn. A general sloppiness of the controls was apparent, and so we slopped around the circuit, as if steering a barge sideways, forwards, allways across a many-current river.

My clumsiness at the controls was heightened by the lack of any indication (to me) of whether I was flying accurately or not : indeed, the machine did not seem to *fly*, but rather to slide and wallow erratically, though in the right general direction. Rather disconcerting at first was the impression that what one did with the controls bore little relation to the subsequent behaviour of the aircraft.

After a blundering sort of downwind leg (with one highly suspicious eye on the A.S.I. needle, apparently frozen rigid at 30 m.p.h.) I began to turn crosswind, but was too high for a straight-in approach. My instructor took over and, showing how it should be done, made a wide S-turn before coming in to a smooth landing. It seemed that landing judgment would be easier in gliders ; the ground did not rush up suddenly, as with powered aircraft, and one felt nearer to it and better able to judge one's precise height in the final stages just before touchdown.

This, then, was gliding. A bewildering, hectic three minutes spent slithering around a circuit with a howling gale blowing in one's face. If only because it *was* bewildering, and because one wanted more fully to understand it, there remained the desire for more—a desire that soon developed for me, as it has for many others over the years, into an answer to the peculiar, compelling fascination of the sport of gliding.

Sunday was an extremely busy day, and the ' T.21A,' being the only two-seater available at the time, was in great demand, so that I was unable to obtain a second circuit. Instead, I absorbed the atmosphere of a good-weather Dunstable Sunday : the colourful, high-performance machines questing and circling up from the hill in search of thermals ; the lowly beginners hesitantly lunging around an erratically flexible circuit in the barge ; and the outside audience changing from a lone early-morning equestrienne reining-in her mount at the foot of the ridge to the air-minded picnicking groups who covered the afternoon hillside.

The following day, on our first circuit, I was allowed to perform the take-off, dimly remembering the briefing ' Let her get a little way up from the ground, then gradually press back on the stick.' This I did. ' That's right, higher,' advised John Simpson, just as I was about to keep the nose where it was. Hesitantly, a little more back-pressure. ' Good. Higher.' *Higher* ? Oh, well, why not, the whole thing was ridiculous, anyway. Higher still, and then with the stick right back the nose eventually began to pull slowly yet firmly down—we had arrived at the top. Forward on the stick before release—but not enough, for there was a slight jerk as we came off the wire—and then a right turn into the circuit again.

As a preliminary to the landing approach, a startling and revolutionary procedure was then suggested (or rather ordered) by my instructor. One was not to decrease speed from what might be termed ' normal cruise ' for the landing, as on a respectable powered aircraft ; on the contrary, one *increased* speed. Pushing my mental reservations firmly aside and the stick firmly forward, I increased speed from about 30 m.p.h., to a relatively breath-taking 40. Subsequent thought on the matter approved the new concept.

My actual landing was no more than adequate. My powered aircraft training reared its ugly head—as indeed did the ' T.21 '—as I brought the machine in, very smoothly, on its tailskid. ' Hmm, yes,' commented J.S., ' Most power pilots seem to do that.'

Subsequent circuits indicated further faults to be cured : a tendency to fly too slowly, and with one wing low. Slowly the feel of the controls improved, though I still caught myself on occasion looking for the non-existent turn-and-slip indicator.

Landing on the grass-covered roller-coaster that is the Dunstable flying field, is indeed an alarming prospect at first. A deep, diagonal gully separates the two crests from which the launches are made, while along one side looms the soaring ridge. There are power cables, too, but as these have been specially diverted, one should not encounter them on a conventional approach, and one soon realizes the truth in the claim that, if one can fly and land at Dunstable, then one will have little difficulty elsewhere. Especially intriguing is the experience of missing the first crest and flying (at twelve inches above the ground) down and up the sides of the gully before finally touching down on the far slope.

After a number of further circuits, and a brief introduction to ridge-soaring, I was deemed safe for solo, and free to flap—metaphorically speaking—my own wings. Indeed a proud prospect for me, albeit possibly a risky one for the London Gliding Club's ' Tutor.'

The ' Tutor,' externally, appeared a pleasant and conventional machine. As I inserted myself in the cockpit, however, I realized that someone had disturbed its conventionality by removing the instruments. A gliding joke, intended to frighten would-be soloists—an uncompleted D.I.—panel removed for checking ? Slowly the further realisation dawned that this was no joke, no incomplete D.I., no panel removed. This was deadly serious. I was actually expected to fly the thing that way.

In solemn mood I tested the controls for movement ; that of the harmonium-type rudder pedals seeming quite appropriate to the dark mournful music I alone heard at that moment. In a last desperate attempt to reassure myself, I observed that neither birds nor the other pupils who had at that time soloed on the course carried instruments, either. But then, ' *Flight's* Gemini '—my usual mount—did . . .

(*Continued on page* 12)

Charles Fauvel *writes :—*

AT this moment I am putting in hand the construction in series of the ' Monobloc AV-36 ' at the Ets. Wassmer of Issoire (Puy de Dome). I am also hoping soon to make a prototype of a two-seater sailplane of the same class as the ' AV-36,' and to try out a model of a little flying wing of my own design with a ' Palas ' motor (jet ?).

The kind translation of M. Jacquemin is now a little out-of-date as it contains only the provisional performance, and the actual performance figures have proved better. You will see that the official performance figures of the Centre d'Essais en Vol give a maximum gliding ratio of 24.

The ' AV-36 Monobloc ' comes into Category IV of the Norme Air 2.104; relative to the requirements for static strength of gliders set up in October, 1951, its load factor is now 12, permitting not only cloud flight but also aerobatics.

So far, the prototype has 250 flying hours to its credit and over 300 successful flights with 83 different pilots (of all classes and nationalities) without the slightest mishap. Not a single pilot even among the specialists has been able to make it spin or stall, so you can imagine there has been quite a lot of competition among them.

The Service de l'Aviation Legere et Sportive as a result of these tests is about to order a series of 42 machines from the Ets. Wassmer of Issoire—2 machines ready to fly and the other 40 in prefabricated kit forms. The Ets. Wassmer will also execute individual orders, either for complete machines or for prefabricated parts.

Besides this, there are throughout the world more than 45 amateurs or Clubs who have acquired the plans to make their own machines, and many overseas licences for commercial construction are under discussion. 21 of these sets of plans are scattered throughout France and her dependencies; the rest are principally in the U.S.A., the Argentine, Germany, Australia, Switzerland, Canada, Brazil, South Africa, and Belgium.

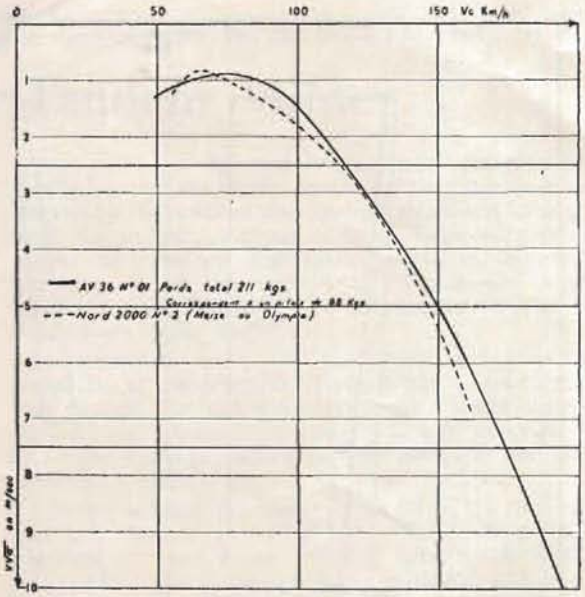
The construction plans will shortly be translated into German. The Soaring Society of America are doing a translation into English but keeping the measurements in metres. (The Americans who began with a plan in French solved this difficulty by buying a metric ruler !).

I have thought of fitting a motor to the ' AV-36 '—either a ' Snecma ' ' Escopette ' or an ' Ecrevisse.' I have heard also that there is a very light-weight ' Short ' motor, but this is not in my immediate future plans. A small engine of 10 h.p. weighing about 6 kg. is also under consideration for distance retrieves or motor-gliding.

How to get your Fauvel plans—

First, fill up and sign an application in the approved amateur-constructor agreement form and send it to : Mr. Charles Fauvel, 72 Bd. Carnot, Cannes (A.M.), France.

Secondly, send the price of the plans by cheque, Bankers' Order, or International Money Order to : Credit Lyonnais, Rue d' Antibes, Cannes (A.M.), France, payable to the account of M. Charles Fauvel, No. 263,446. The price is : France, 20,000 francs ; Switzerland, 250 Swiss francs ; England, £20 ; U.S.A. or Canada, $60.

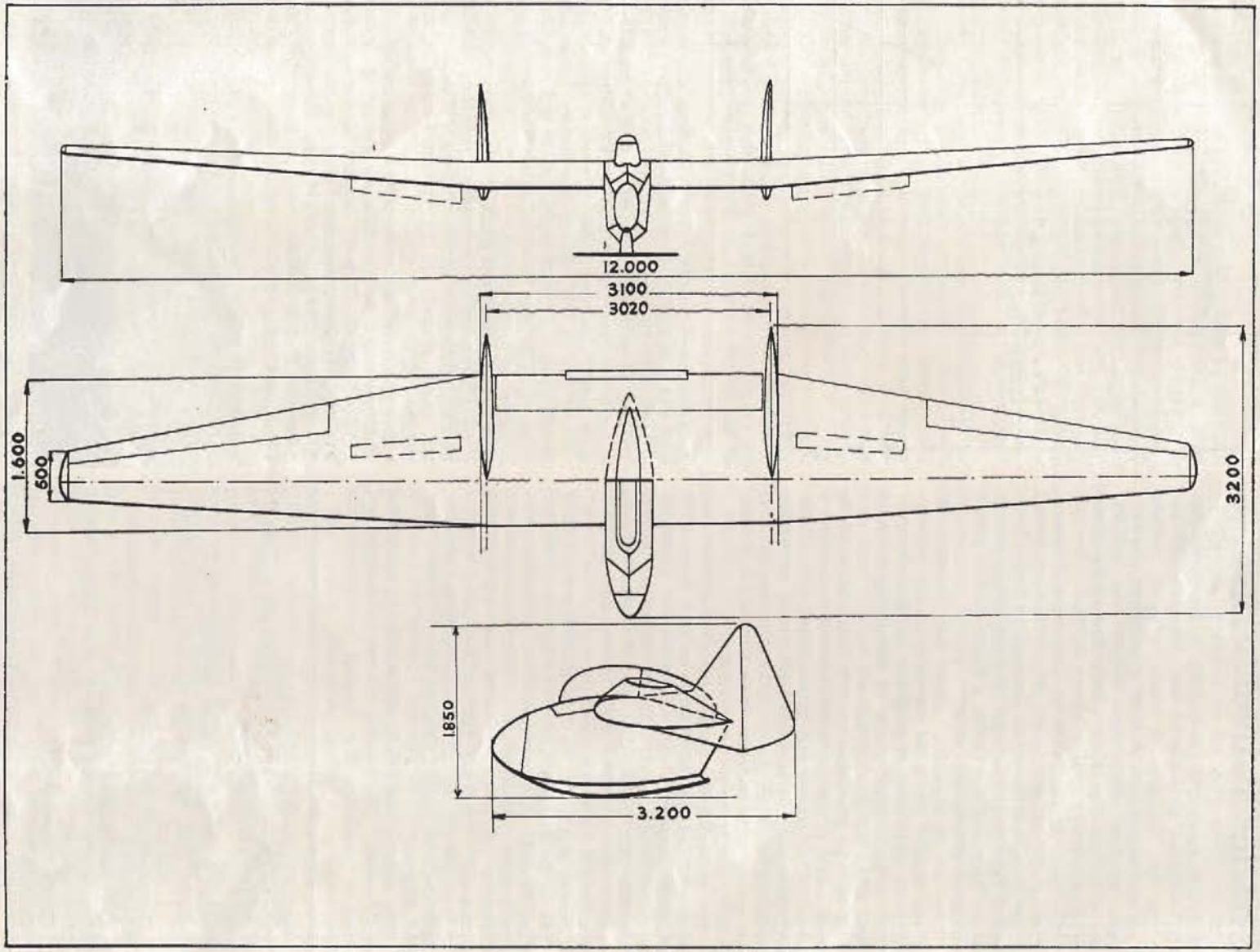


Speed polar compared with ' Nord 2000.' ' AV-36 ' No. 01. Total weight 211 kgs. (pilot's weight, 88 kg.). ' Nord 2000 ' No. 2 (' Meise ' or ' Olympia ').

Silent and solitary he sits aloft,
Under a towering cloud that draws him upward,
Into its darkening dome,
He flies.
What is the hidden power up there,
Under that towering cloud that draws him upward ?
Ten thousand silent horses,
In disguise.
Only the sailplane pilot knows,
Under the towering cloud that draws him upward,
This is Nature's gift,
In the skies.

Bill Gotch.

Form of Trailer designed specially for the ' AV-36' (see drawing overleaf).



Performance figures given by Flight Test Centre, June, 1953.
Weight empty, 115 kg. Weight of pilot, 75 kg. Maximum gliding ratio, 24 at 80 km./h. Minimum sinking speed, 0.82 m./s. at 67 km./h. Sinking speed at 100 km./h., 1.63 m./s.

THE 'LF-109 PIONYR' A Czech 2-Seat Tandem Glider

By R. A. G. STUART, M.A.

IN these days when the two-seat side-by-side glider is being widely adopted in preference to earlier training methods, it is interesting to consider the development of a new Czechoslovak tandem two-seater and the reasons for the choice of the tandem seating arrangement. The type in question, the 'LF-109 Pionyr' (Pioneer) originally aimed at satisfying the requirements formulated jointly by committees of the Ministry of National Defence, Ministry of Transport and Aeroclub of the Czechoslovak Republic at the end of 1948, when it was decided to standardise dual-control instruction. Some experience of dual-control gliding training had already been obtained with the 'Z-30 Kmotr' (Godfather) with side-by-side seating and with the 'Kranich II,' known in Czechoslovakia by the name of 'Jerab' (Crane) which is a translation of its German name, with tandem seating. On the basis of this experience it was decided to build a tandem two-seater which would also incorporate the chief advantages of the side-by-side layout. The new type was to be capable of being used up to Silver 'C' standard and thus facilitate a reduction in the number of glider types produced. Just as the 'Kmotr' was largely inspired by the 'Goevier,' the new design was partially inspired by a foreign type too, the Russian 'Stakhanovec,' but it also profited from experience gained with the 'LF-107 Lunák' (Kite) aerobatic sailplane which had just completed its flying trials.

To avoid the necessity of using ballast on solo flights, the rear cockpit was situated in front of the wing spar, i.e., approximately at the C.G. of the aircraft. To permit easy communication between pupil and instructor the two seats were in a single cabin and no inter-com. was necessary. The wing had a slight sweep forward and was of 15 m. span, this being considered the limit for a medium-performance sailplane. It was felt that with the pupil being seated on the axis of the fuselage he would find it easier to maintain direction and a correct attitude of flight, whereas the common cabin would provide the advantages normally associated with a side-by-side seating arrangement. This project was at first called '109A' but was later redesignated 'LF-106' for the sake of clarity. It was found that the gliding instructors preferred a more robust type if, as was the designer's intention, it was to be used for initial as well as intermediate training.

The whole project was therefore redesigned, though the general lines of the earlier project were retained. This project was named 'LF-109B' to distinguish it from the earlier 'LF-109A' project. Several design studies were made before construction was started, and a detailed investigation of the effect of the principal dimensions on performance parameters was carried out. Preliminary aerodynamic and weight calculations showed that for two alternatives with wings of different sizes the minimum rate of sink would be about 1 m./sec., and the influence of aspect ratio on the rate of sink was found to be negligible. It was finally concluded that it would be impossible to achieve the desired minimum rate of sink 0.9 m./sec., without a fairly large wingspan, whilst performance and manoeuvrability required the span to be about 13-14 m. The design team therefore reconciled itself to a calculated rate of sink 1.07 m./sec., fully loaded.

A rectangular wing plan was chosen owing to its simplicity of construction. To facilitate access to the rear cockpit the high-wing layout with slight sweep forward was adopted. In spite of lack of experience of welded fuselage construction the designers decided to use this method because of its advantages.

Having reached the construction stage, the project was now known as 'XLF-109,' the X signifying experimental and being dropped after trials were completed. The prototype was completed and test flown in spring 1950, being registered 'OK-2200.' The estimated weight was only exceeded by an insignificant margin and the C.G. remained within acceptable limits. The second prototype, known as the 'LF-109.2,' was flight-tested in summer 1951. The 'Pionyr' has been more extensively tested than any other Czechoslovak sailplane except the 'LF-107' Lunák. Special recording instruments were fitted and the polar was measured on 45 flights. There were also 15 flights to determine the flying qualities by instrument recordings as well as pilot's impressions. The flying qualities are the same whether there is only one person aboard or whether the 'Pionyr' is fully loaded. Owing to its simple and robust construction the 'Pionyr' is cheaply and easily produced. It has overcome initial scepticism caused by the success of the side-by-side seating of the 'Kmotr' and is now in production for the gliding training centres.

The all-wooden cantilever wing is in two parts. It has one main spar and an oblique auxiliary spar which transfers the torsional and drag loads of the wing to the fuselage. The torsion box is of plywood construction, but aft of the main spar the wing is fabric covered. Welded profiled tubes are used for the bracing struts. The ailerons are of modified Frise type and have all-wooden construction with plywood nose box and fabric covering. They are mounted on three hinges on ball bearings. The dive brakes are of dural sheet and open on both sides of the wing. They are effective over a wide speed range and act as air brakes to steepen the angle of descent when landing also.

The fuselage is of lattice construction with welded steel tubes. It is covered with fabric sewn on to a light wooden frame which maintains the correct fuselage lines. The common cabin housing both seats is covered with a plexiglass canopy which is hinged on the starboard side. There is only one instrument panel for both pilots, the rear seat being set higher than the front one, so that its occupant can see the

instrument panel without difficulty. This arrangement recalls that of the Polish ' SZD-9 Bocian ' (Stork) and is intended to overcome the difficulty of divergent instrument readings in the different cockpits, a fault occurring in the ' Kranich.' Both seats are for dorsal parachutes and there is full dual control, with the usual joystick and with adjustable rudder pedals for both pilots. The rear fuselage is of triangular cross-section. There are inspection panels in the fabric covering, and at the sides of the fuselage there are automatic releases for winch take-offs.

The tailplane has a three-point attachment to the fuselage, facilitating easy dismantling. It is of cantilever wooden construction. The elevators are statically balanced and have the usual construction with plywood nose box and fabric covered rear part. They are fitted with trim tabs adjustable in flight. The fin is welded integrally with the fuselage and is of steel-tube construction with a light plywood frame. The rudder is of all-wooden construction with fabric covering and has aerodynamic balancing.

The undercarriage consists of a single 350 x 135 mm. wheel just behind the C.G. It is mounted in a steel-tube frame hinged to the main bulkhead. High-absorption rubber cord shock-absorbers are fitted. There are no wheel brakes, so that the landing run must be shortened by pressing forward the stick, thus making use of the friction of the skid which is mounted under the front fuselage with rubber block shock-absorption. There is also an auxiliary leaf-spring tail skid to protect the rear end of the fuselage.

The elastically mounted instrument board contains the following instruments : A.S.I., electric turn indicator, variometer, longitudinal inclinometer and compass. The Venturi tube for the A.S.I., is mounted above the nose of the aircraft on the centre-line of the fuselage. During flight tests there was also a Pitot tube for the recording A.S.I., but this has now been removed. There is a useful pocket for tools, documents, etc., and there is a place for a barograph in the side of the fuselage. A.S.I. position error was determined by flights over a 5-km. base.

The ' Pionyr ' can be longitudinally trimmed over a wide speed range up to 110 km./h. With either one or two pilots it has a considerable degree of static longitudinal stability. In the dynamic stability trials quick jerks were dampened after five oscillations. When approaching the stall, the ' Pionyr ' gives warning by a softness of the stick control, followed by a marked twitching of the stick. This results from the break-away airflow reaching the elevator and causing it to quiver. The ' Pionyr ' can be kept in a stalled attitude for quite a long time till it gradually settles down and goes into a shallow dive or a spiral. With air brakes extended the warning is even more pronounced and there is no tendency to drop a wing. However, spins may be carried out with either one or two pilots. A slight touch of the controls is sufficient to stop the rotation and bring the ' Pionyr ' out of the spin. During manoeuvrability trials with the prototype it was found that the transition from circling at a 45° inclination to an opposite turn was not satisfactory. The aileron span was therefore increased and the improvement in lateral control thus effected was substantial and has cured this fault. The production ' Pionyr ' has greater aerodynamic balancing of the ailerons too, and the stick forces for lateral control are now well harmonised with the forces required for the other controls. A full circle can be executed in 15-18 sec., which speaks for the efficiency of the differential ailerons and the controllability of the ' Pionyr ' at low speeds. The air brakes are smaller on the production version than on the prototype and they do not affect the trim at low speeds. All controls work correctly at high speeds and there is no wing deformation. The prototype showed signs of spiral instability during tests but this has been cured by increasing the dihedral to 2.5°, the only alteration necessitated being a lengthening of the bracing struts. Sideslip approaches, which increase the rate of sink 2½ times, can be made with the air brakes either open or closed. Controllability during winch starts is good, the control column being at normal when the side attachments are used. For aero-towed take-off it is necessary to lighten the nose by pulling back the stick. After a run of 20 m. the elevator becomes effective and the take-off is then normal. Towing speed should be between 90 and 110 km./h., but it has been demonstrated that the ' Pionyr ' is still controllable when towed at only 65 km./h. When landing, the ailerons are effective up to the end of the landing run. The ' Pionyr ' looks like being a very useful and popular addition to Czechoslovakia's range of gliders and, by eliminating the need for different initial and intermediate training types, and even some of the more advanced training types since it can be used for instrument flying training with the cockpit blacked out, it will simplify training methods.

Dimensions. Wingspan 13.47 m. (43 ft. 4 ins.), wing area 20.2 m.^{2} (217.53 ft.^{2}), aspect ratio 9, overall length 7.77 m. (25 ft. 8 ins.), height on ground 1.62 m. (5ft. 3¾ ins.). Wing, of profile series 430A, has thickness/chord ratio 0.12, angle of sweep —1.5°, angle of incidence 5.1°. Braking flaps, of type SH, have total area 0.51 m.^{2} (5.49 sq. ft.). Aileron area 2.58 m.^{2} (27.77 sq. ft.), aileron movement —34°, +12°. Tailspan 3.28 m. (10 ft. 9 ins.), total horizontal tail area 3 m.^{2} (32.27 sq. ft.), elevator area 1.16 m.^{2} (12.486 sq. ft.), tailplane area 1.84 m.^{2} (19.784 sq. ft.), total vertical tail area 1.45 m.^{2} (15.6 sq. ft.), rudder area 1.15 sq. m. (12.38 sq. ft.), rudder movement ±30°.

Weights and Loadings. Weight empty, with equipment 236 kg. (520 lb.), AUW for solo flights 326 kg. (719 lb.), wing loading (solo) 16.1 kg./m.^{2} (3.3 lb./sq. ft.), max. AUW 416 kg. (917 lb.), max. wing loading 20.6 kg./m.^{2} (4.42 lb./sq. ft.).

Performance. At max. AUW at sea level min. rate of sink 1.06 m./sec. at 62 km./h. (3.447 ft./sec. at 38.4 m.p.h.), optimum gliding angle 1:18.5 at 80 km./h. (50 m.p.h.). For solo flights : min. rate of sink 0.94 m./sec. (3.083 ft./sec.), at 55 km./h. (34 m.p.h.), minimum speed 46 km./h. (28.5 m.p.h.).

GLIDING IN BELGIUM

The International Contests

By A. Van Ishoven

Belgian Participation at the International Championships.

IT has been decided by the ' Section Centrale du Vol à Voile ' of the Royal Belgian Aero-Club, that two Belgian glider pilots will compete in the International Championships in England this year. These will be : Willy Witter of A.Z.M. (Antwerp Gliding Club) and leading pilot of the ' Competition Nationale Permanente,' a yearly classification of the best Belgian glider pilots as to their performances of the current year. Cartigny of Verviers Aviation, holder of the Belgian distance record. Both pilots will fly their club's Czechoslovakian built ' Sohaj.'

Next Year's National Belgian Championships.

Will be held at the National Gliding Centre at Temploux (near Namur), from 31 May till 7 June, 1954. The tasks set will consist mainly of Out-and-Return flights and flights over triangular courses.

Sabena helping the Belgian Gliding Movement.

Sabena, the Belgian airline, has bought two German-built ' Spatz' gliders. They will be used first at the Gliding Centre at Temploux.

Sabena has also made available two prizes consisting of two return tickets to the Belgian Congo. They will probably be awarded for the best out-and-return and the best triangular course flight in 1954.

Activity at the National Gliding Centre at Temploux.

These are the results of 1953 : Number of flights, 4,360 ; Total flying time, 1,268 h. 36 m. ; Number of flyable days, 144 ; Average of each day, 30 flights, 8 h. 48 m. ; Total number of ' B's,' 94 ; ' C's,' 14 ; Silver ' C ' altitude, 3 ; duration, 1 ; distance, 1.

The centre will shortly receive its fifth two-seater, viz., a ' Goevier ' built by the firm of Wolf Hirt, president of the German Aero Club. Besides the ' Grunau Baby's ' the centre will then dispose of : 2 ' Goevier,' 1 ' Kranich,' 1 ' Caudron C 800,' 1 ' Schweizer SGU-2-22.'

Belgian Gliding Course in Southern France.

Like in 1952 and 1953, Mr. Pierre Charron, a French Golden ' C ' pilot, and Chief Instructor at the Belgian Gliding Centre at Temploux will organise during January, 1954, a gliding course exclusively for Belgian ' C ' pilots at the French gliding site at Fayence near the Mediterranean.

This year there will be from 12 to 14 participants with high hopes for wave soaring.

NOTES

Probable entries so far for the 1954 Contest are Austria, South Africa, Belgium, Denmark, Egypt, Finland, France, Germany, Holland, Iceland, Israel, Italy, New Zealand, Spain, Sweden, Switzerland, Yugoslavia and the U.S.A.

INDONESIA. In a Schweizer ' 1-23 ' of the Indonesian Air Force, Lt.-Col. C. I. Oyens gained his Silver ' C ' with a flight of 5 hr. 22 min., on 28 August, followed a month later by 89 kms. from near Soctang to near Djakarta, with a gain of height en route of 1,130 metres.

YUGOSLAVIA. A Dutch pilot, J. Hekking, took his Silver ' C ' at Vrsac in September. Flying an ' Olympia ' he did 57 km. 5 hr. 16 min., and 1,870 metres.

SULTAN GOES GLIDING

The Sultan of Perak (with glasses) all set for his first flight in a glider of the Perak Flying Club at Ipoh. The pilot is Mr. J. S. Wolstencroft, of Taiping, Perak. Standing beside the glider is Inche Osman bin Taib, Deputy to the Mentri Besar (Prime Minister) of Perak, who had the first flight after the Sultan had christened it ' Sultan Yussuf.' His Highness attended the Coronation of Her Majesty the Queen as a representative of the Rulers of the Federation of Malaya. Members of many races belong to the Perak Flying Club, which has pioneered gliding in Malaya.

DESIGN STUDY OF A

By J. A. I. REID
B.Sc., D.C.Ae.

IN your October issue a suggestion was made that gliders should be arranged in classes according to span, the smallest class to be of twenty-five feet. In this article an attempt has been made to find out what such a glider would look like and its expected performance.

The span is fixed so that the most important factor affecting performance is the wing area. The following table has been prepared showing the expected performance with various wing areas, the fuselage size remaining constant.

Wing area sq. ft.	*Aspect ratio*	*Wing loading lb./ft.*	*Stalling speed m.p.h.*	*Speed for best gliding angle m.p.h.*	*Best gliding angle*	*Speed for min. sink m.p.h.*	*Min. sinking speed ft./sec.*
100	6.25	2.8	27	48	20/1	36	3
90	7	3.1	28.5	49	21/1	37	2.86
80	7.8	3.5	30	50	22/1	38	2.67
70	8.9	4.0	33	51	23/1	39	2.7
60	10.4	4.7	37	52	24.5/1	40	2.85

The sinking speed is a minimum at a wing area of about 80 square feet but the best gliding angle improves steadily with decrease of wing area. This improvement however is obtained at the cost of a higher stalling speed. For a glider mainly used for pleasure flying a wing area of 80 square feet appears to give the best all-round qualities.

For competition work and long distance flying the better gliding angle obtained with a smaller area would be an advantage.

For the induced drag to be as low as possible the wing must be elliptical in plan. This will not be much more difficult to construct than a tapered wing and the additional work involved will give a definite improvement in performance, especially at the low aspect ratios which will be used on this type of glider.

The next item to consider is the fuselage and its shape is dictated by the position of the pilot. To get the centre of gravity in the right place the pilot's centre of gravity must be about six inches in front of the wing main spar.

If the glider is given a high wing the pilot's head must be underneath the wing and his view will be restricted. A shoulder wing with sweepback and the pilot's head coming out behind the mainspar would be an attractive layout, but again the pilot's view would be limited. Either of these layouts would be satisfactory for lone wolf flying, but for ridge soaring in company the lack of all-round view would be dangerous.

To give the pilot a better view he could be placed with his shoulders against the mainspar with the wings swept forward. A further alternative is to have the pilot lying prone with his legs beneath the wing. This layout has the advantage of requiring a fuselage of the smallest frontal area.

The cross section suggested is octagonal. Quite a good streamline shape can be obtained without the use of double curvature panels.

The tailplane could with advantage be set high to avoid contact with obstructions on the ground.

No difficulty is anticipated in providing controls for a prone pilot. The control forces will be very small owing to the small size of the control surfaces, and an orthodox control column about nine inches long could be operated by the pilot without difficulty. The rudder could be foot-operated by bar or pedals operating in the normal sense, i.e., a push with the left foot for left rudder and vice versa.

At the proposed tare weight of a hundred pounds it should be possible to build a fully aerobatic machine. If the weight allowed it, the fitting of a small landing wheel would be of advantage, especially in ground handling.

The proposed glider has an elliptical wing of 80 square feet area and apart from the prone position of the pilot is perfectly orthodox. Its performance is a minimum sinking speed of 2.67 ft./sec., and a best gliding angle of 1 in 22. The gliding angle can be improved by reducing the wing area, but it is difficult to see how the rate of sink can be decreased. One way would be to reduce the weight of the pilot. For the purpose of these calculations his weight has been taken as 180 lb. A lady weighing 8 stone would have a considerable advantage.

A tailless configuration would not have a lower sinking speed but would possess a better gliding angle. End plates fitted to the wing tips might produce a virtual increase in aspect ratio but the effect is doubtful.

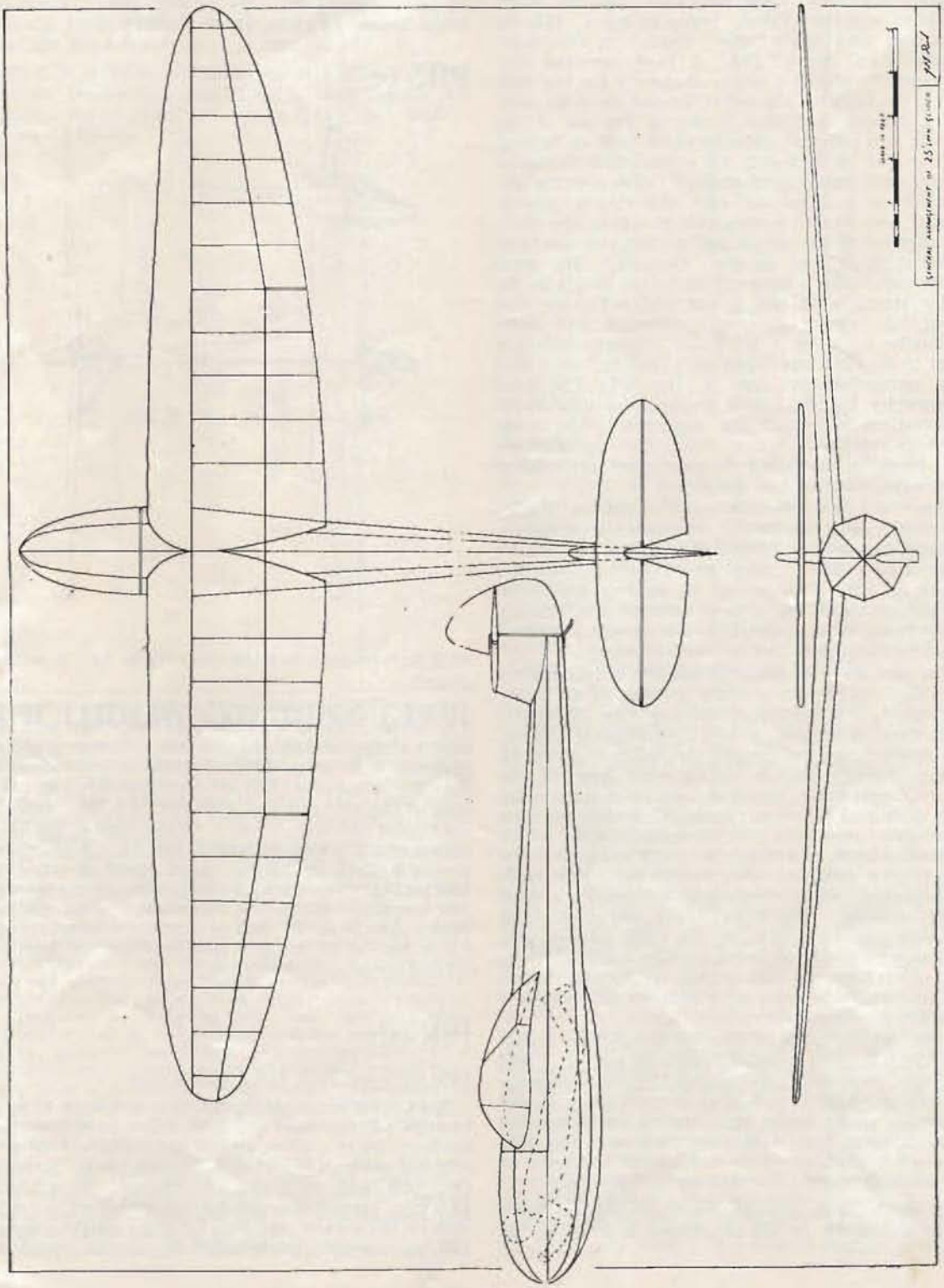
This machine could be built quite cheaply and although its performance is not in the 'Sky' and 'Olympia' class it should be possible to make reasonable cross-country flights in it.

TO commemorate the Company's 21st Anniversary, R. B. Pullin & Co. Ltd. have produced a 44 page Brochure describing in text and picture their growth from the 1st November, 1932.

The Company has adopted as the theme for this brochure the well known quotation 'Great oaks from little acorns grow.' They show the various stages of expansion from the acorn (16 employees) to the present lusty and vigorous young oak tree embracing nearly 800 employees at the main Great West Road factory alone.

R. B. Pullin & Co. Ltd. are now well established as a leading name in the Instrument Industry for the design and manufacture of gyroscopic, electronic and electro-mechanical scientific instruments, including some of those used by the record breaking 'Comet,' 'Canberra,' 'Hunter' and 'Swift' aircraft. The 'Viscount' and 'Ambassador' commercial airliners, as well as the famous Centurion tank, also use Pullin equipment.

TWENTY-FIVE FOOT SPAN GLIDER



ENGINES—ARE THEY NECESSARY?—

(continued from page 4)

Such reflections were cut short as the cable tightened and the ' Tutor ' began to move. Having been told that the ' Tutor ' tended to rise more steeply than the ' T.21A,' I over-corrected and consequently climbed rather shallowly for the first part of the launch. The feel of the new machine came easily, though, and then I was at the top of the launch, as if riding an airborne steed, holding its head high in the air and with an exhilarating feeling of power, anticipation and enquiry before putting the nose down and around into the circuit groove. Really, who wanted instruments at a time like this?

Judgment of the circuit and landing run was little different from that in the ' two-pew.' My main faults were again a tendency to fly too slowly in the rather strong wind and, I was told, with one wing down. As circuit practice continued, one came gradually to know the ' Tutor ' better, including what to do when one ' runs out of rudder ' on a final turn uncomfortably close to the hill. The local topography became better known, and instructors' exhortations to ' watch the lynchettes ' were recognised as references not to diminutive punishments for errant birdmen, but to prominent agricultural landmarks downwind of the field.

The wind was directly on the hill on Friday morning, a good sign for ' C ' aspirants. After twenty minutes dual on the hill and one ' Tutor ' circuit, we were in turn able to take the ' Tutor ' up into the strong hill-lift. This proved an exciting and satisfying experience and, even if we were not actually being birds, it was certainly the nearest approach to acting like a bird that we had yet made.

The proximity of other gliders and sailplanes over the ridge did require a sharp lookout at all times, particularly on the busy following day, Saturday, when there were often some 12 machines in the air. The slow relative motion and the ability to hover by turning directly into a strong wind lessened the hazard considerably, however, and indeed made the slow, close and sideways passing of another machine a pleasant novelty. The frequency with which another aircraft, seen from the corner of an eye to be approaching from the rear, turned out to be one's own tailplane, was embarrassing but (on the ground later) amusing. Also reported by one able-bodied ' C '-man was his alarm at the sight of his own shadow on the ground being steadily approached by that of another machine, which on feverish search was nowhere to be seen (but which actually appeared some 150 ft. above him).

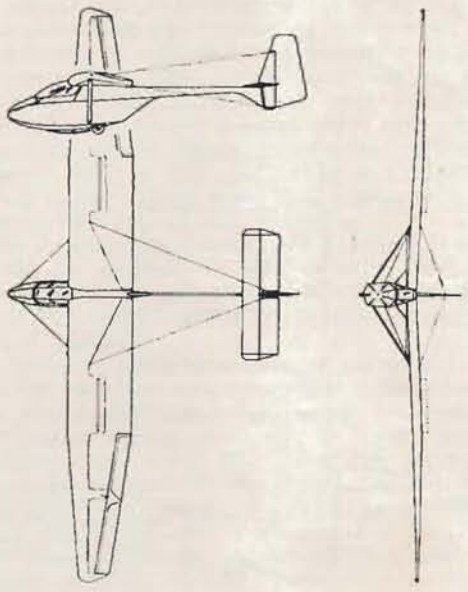
Thus, with a series of rewarding half-hour flights over the ridge, my week at Dunstable ended. I had enjoyed a good week's flying, and the companionship of experienced pilots and other learners alike; I had received a week's disgustingly healthy exercise in the open air, sore feet from retrieving, and my ' C.' What all this added up to was a brief first taste of the fascination—and satisfaction—of gliding.

For those whose thoughts are in the sky, there can be no finer sport. Given the wind, the sun and the sky, were engines necessary? I think not.

Details of Finnish Types

From Jussi Soini

PIK-5c



PIK-5c (very easy to build and easy to fly. Good for clubs.)

Span, 12.4 metres; length, 6.4 metres; height, 1.8 metres; breadth of the fuselage, 0.54 metres; height of the fuselage, 0.95 metres; cross area of the fuselage, 0.45 m²; dihedral angle of the wing, 3 degrees; wing area, 14.7 m²; wing profile, Gö 533; area of the elevator and stabilizer, 2.1 m²; area of the rudder and fin, 1.23 m²; weight empty, 120 kg.; (flying weight)—weight loaded, 210 kg.; max. speed at winch start, 90 km./t.; max. speed at aero-tow 120 km./t.; max. speed at dive (max. diving speed), 192 km./t.; obtained performances: best gliding angle, 1:18.5 at 57 km./t.; min. sinking speed, 0.8 m./sec. at 54 km./t.; stalling speed, 45 km./t.; normal speed area, 48-70 km./t.

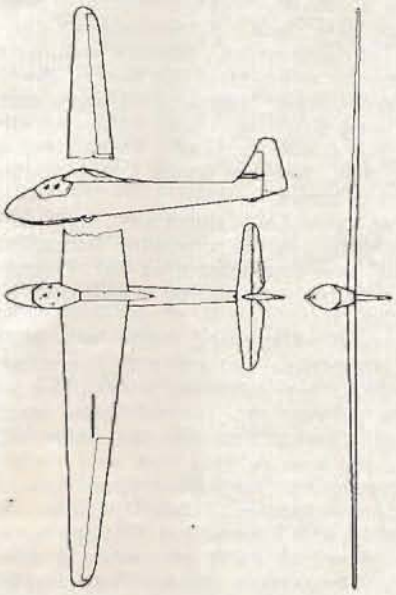
PIK-3b

PIK-3b (prototype being completed):

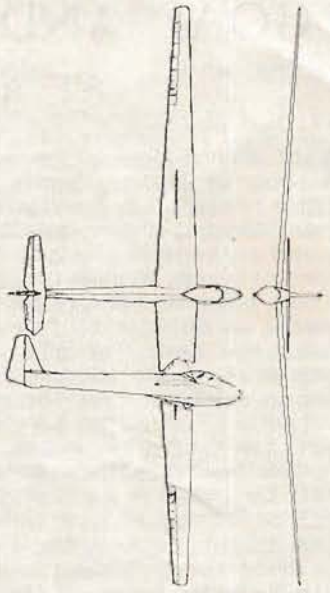
Span, 13.0 m.; length, 6.5 m.; height, 1.45 m.; breadth of the fuselage, 0.56 m.; height of the fuselage, 1.0 m.; cross area of the fuselage, 0.42 m²; dihedral angle of the wing, 2 degrees; angle between the wing and elevator, 4.5 degrees; wing area, 13.0 m²; area of the elevator and stabilizer, 1.5 m²; area of the rudder and fin, 1.0 m²; weight empty, 132 kg.; weight loaded, 232 kg.; max. speed at

winch start, 100 km./t.; max. speed at aero-tow, 130 km./t.; max. speed at dive, 230 km./t.; calculated performances: best gliding angle, 1:25 at 78 km./t.; min. sinking speed, 0.75 m./sec. at 65 km./t.; stalling speed, 55 km./t.; the normal speed area, 60-100 km./t.; wing profile, Gö 693.

PIK-3a is the second prototype and it has the flaps and air brakes but this plane is built mainly for distance flights and it is very much like the 'Weihe' at higher speeds.



PIK-13



PIK-13:

Span, 17.5 m.; wing area, 14.6 m²; aspect ratio, 21; trapeze of the wing, 1:3; wing profiles, Gö 549-693; span of the stabilizer, 3.5 m.; area of the stabilizer and elevator, 1.7 m²; weight empty, 180 kg.; max. flying weight, 290 kg.; calculated performances: a little better than 'Weihes,' for example gliding angle, 1:33.

The chief constructor of this plane is Diplom. Engineer, Mr. Anshelm Koskinen. He gained the Finnish altitude record last summer, 5,240 m. (5,840) without using oxygen in this plane.

SOUTHDOWN GLIDING CLUB

Despite restrictions on the use of our flying field we are glad to report 1953 was a very successful year. Our target of 500 flying hours was exceeded by a safe margin of 26, and our launches rose to 2,897, both of which are club records! Certificates were well up to average, a total of 40 being obtained.

Our two main sources of lift, the cliffs in a South-West wind and the South Downs in a northerly, again proved their worth. The number of trips across the Birling Gap to the bend on the far side of Beachy Head lighthouse and back were too numerous to keep count of, and several pilots returned from Beachy Head with sufficient height comfortably to bridge the Cuckmere gap on our opposite side and continue their soaring over Seaford Head. On days such as these we soared on a beat 7 miles in length.

Conditions for bungying from Firle were less often favourable than in the previous year, but this was offset by our discovery one Sunday over the wooded slopes of our North face of unexpectedly good lift which must have been part of a standing wave system. The expedient tried for the first time of taking a winch to Firle was highly successful and opened the door to wider exploitation of this nearby site.

Our old friend the 'evening thermal' again appeared faithfully on evenings which followed the combination of a hot sunny day and a North-Westerly wind, and on one occasion steady lift was obtained over the Cuckmere valley to as far North as the Downs.

Flying away from the home site was carried out more extensively than in previous years, and in addition to our regular expeditions to Lasham with the 'Olympia' we flew for the first time with the Oxford Club at Kidlington. This site held out great promise and we fully intend to exploit it this year. A small expedition to the Long Mynd at Easter was followed by a trip for a fortnight in force during July, when we took a spoilered 'Tutor' in addition to the 'Olympia.'

The latter fully justified the long hours of toil we had put in in fitting spoilers, and though we had a liberal share of bad weather the good days obliged by providing either wave conditions or both slope and thermal soaring. Both 'Tutor' and 'Olympia' pilots gained experience of flying in standing waves, and several 'Olympia' pilots had their first experiences of cloud flying. Three cross-country flights were made on this trip.

For the first time since the war we entered a team in the National Gliding Competition from which we emerged with an intact 'Olympia' and much experience, but no prizes! Other innovations tried out for the first time last year were a soaring course at Friston during August, which was hailed as an unqualified success both by the participants and by the club, and an autumn dance at the Hayworthe Hotel, Haywards Heath, which was also a great success noteworthy among other respects for the fact that our C.F.I. was seen successfully to complete several circuits on the dance floor. We have every intention of repeating this enjoyable evening!

Lastly, we are glad to report that on the financial side we anticipate a welcome surplus in our annual budget for 1953.

J.J.

GOAL AND RETURN

AT A CANADIAN NATIONAL SOARING MEET

By STAN RYS

THE Annual National Soaring Meet is held as a rule in Eastern Canada, since most of the gliding clubs are to be found in Montreal and Toronto areas. The host of this year's Meet was a flying Club located at the Wellington and Waterloo Airport near Kitchener, some 60 miles west of Toronto.

Both sailplanes operated by the Montreal Soaring Council, the club of which I am a member, were flown during this Meet. Two pilots were assigned to fly each sailplane, the selection being based on their soaring experience and the work they put into keeping the Club going. Except for tow charges the pilots flew their sailplanes free, provided they towed them themselves at their own expense. It was the ' MU 13e ' sailplane I was allotted to fly, sharing it with another pilot from our club.

On Thursday, August 6th, it was again my turn to fly the ' MU.' Earlier in the week we worked every morning in the hangar on the glider to improve its performance. Both skids, gaps at the wingroots and the tailplane were faired in. All other openings in the ship were sealed with masking tape, leaving just enough room for the controls to move. Finally the ship was hosed down and ' Simonized.'

The weather conditions did not indicate that records would be broken that day. Just another fair soaring day with a light easterly wind and a hazy sky. Had I gone downwind, I would have landed on the shore of Lake Huron as I did earlier in the week, instead, in order to gain more points, I declared a goal and return to Brampton Airport, 34 miles to the east.

While I was sweltering in the cockpit of ' MU,' Fred Bodek (formerly of the Cambridge Univ. G.C.) was taping up the canopy and any other gaps we had missed.

A few minutes later I dropped the tow rope and started to climb slowly. I was amazed at almost a completely silent flight, obviously the result of taping up the gaps. However small faults in circling would immediately come to my notice, as each time I skidded out or slipped in, a rambling noise would develop due to the airstream eddying over the side of the fuselage. The time was about 12.30, and the sky was filling up with small cumuli. The lift was weak but plentiful.

In the first hour, flying upwind, I made 10 miles' progress and had 3,000 feet climb to my credit. In spite of the unfamiliar countryside, navigation was not difficult, as a few small towns and villages were along my course nearly in a straight line.

After another half an hour or so of an uneventful flight I began climbing in a strong lift, watching a cloud forming overhead. The cloudbase was reached at 3,500 feet (altitudes given above the elevation of the base airport). I switched on the ' turn and bank,' and went inside, still circling and climbing at about 10 feet per sec. After a couple of minutes I straightened out in an attempt to fly out into the open. I flew straight, still inside, for much longer then I expected, climbing all the time. I tried to maintain a compass course, which I found by no means an easy task. A welcome gap in a cloud appeared through which I sneaked out into the open, to find myself sailing near the tops of the clouds, an unforgettable sight indeed. Obviously more clouds were forming at the same time. They joined together while I was inside, to form a much more extensive cumulus than that into which I had climbed only a few minutes before.

With no more clouds ahead some 3,000 feet altitude was quickly converted into some ten miles distance before lift was encountered again. I climbed in it about 1,000 feet, only to find myself drift back some three miles.

From now on I would circle only in the ' fat ' portion of thermals, but still only five miles progress was made in the following hour. The wind was, obviously picking up. According to my map the Brampton Airport was only six miles away. My patience was now running low, so I decided to fly straight, ignoring thermals, even if it would mean landing at Brampton. Visibility had deteriorated considerably, and I set out on a compass course.

I was down to 1,200 feet when I reached the airport, and after some clumsy efforts to take photographs of what appeared to be just a medium size grass field with one ' Tiger Moth ' abandoned at one corner of the field, I turned back with a loud sigh of relief, after having been flying for about 3½ hours.

Now I was on my downwind leg. Soon a dry thermal was contacted. I began circling, feeling quite relaxed, and idly watched cars passing on a highway below. A small twin-engined aircraft started buzzing around, its crew probably wondered whether the controls in my sailplane had got stuck, to see me spiralling for such a prolonged time . . .

A while later I was flying along a downwind edge of a long and comparatively narrow stretch of woodland, utilising intermittent lift obviously originating from the wood. There were similar stretches of forest to the right and to the left, separated by farmland, a typical feature of this part of the Province of Ontario. One had only to ' leap ' over from one line of woods to another, and then fly straight again, and a continuous lift would be always forthcoming. However, a strong thermal was entered, and I started climbing from 2,000 feet, which was the altitude I maintained while flying over the woods.

The clouds were back where I had left them some three hours before, but they had shrunk in size, and from 5,000 feet they still appeared to be as high as ever. The home airport was now only ten miles away. There was no sense in circling further, so a compass course was set again, stick pushed forward, and a few

(continued opposite)

'GULL I' FLIES AGAIN

THE Slingsby 'Gull' owned by the Adelaide Soaring Club was test-flown recently after extensive modifications by club members and Edmund Schneider Ltd.

Reports from pilots who have flown the 'new' machine state that it is quieter than previously, highly responsive and pleasant to fly.

One characteristic of the 'old' 'Gull' which still remains is the tendency to drop the left wing in a stall.

Ray Duke was conducting part of the tests in the re-built 'Gull' when, at about 900 feet, he stalled it.

The 'Gull' promptly flicked over into a spin.

Comment from a spectator, 'Huh; You can put a new harness on a horse, but it still kicks the same way.'

By the end of July the club had passed the total number of hours flown during the whole of last year.

The total for 1952 was 105 hours, but the club expects to pass the 200 hours mark by the end of this year.

Since June the club has been flying on Saturdays as well as Sundays, and efforts have been concentrated on the training aspect.

The latest member to gain his 'A' and 'B' certificates is Doug Cole.—*Australian Gliding.*

GOAL AND RETURN—*(Continued from previous column)*

minutes later I arrived over the airport with some 3,500 feet to spare. The return trip took 50 minutes to make.

Feeling quite hungry and thirsty after nearly five hours in the air, I put the 'MU' into a slipping spiral trying to land quickly. I also attempted to open the spoilers. They, however, refused to come out, although I nearly pulled the handle off. I leaned forward and looked out only to see that spoilers were taped up **** all along their edges with the masking tape. Fred had done an efficient job indeed . . .

I landed finally, stopping halfway down the runway. Now another struggle followed when I tried to open the canopy which was taped all round as well. I pondered what would have happened if I was forced to land on a small field, or if some other emergency arose.

There was no doubt that a few cents' worth of tape had improved performance of the 'MU' quite noticeably. This improvement had probably meant the difference between success and failure in this and other flights at the Meet, which were executed mostly under marginal soaring conditions. Later we were able to tape up the spoilers and the canopy without jeopardizing the safety of the pilot.

It was impossible to find out whether penetration of 'MU' has been bettered to any appreciable extent, but the minimum sinking speed was reduced substantially, which was quite evident from the indications of the variometer, and some improvement of the gliding angle was achieved as well.

Was that what some pilots call a 'raspetizing' job?

(Stan Rys, an old London Club member, won the Meeting and Contest.)—By courtesy *London Gliding Club Gazette.*

The Central Alberta Soaring Meet

By A. M. Scott.

WE had four gliders there, namely two 'TG's' and two '119's'. We used our 'T Moth' and the 'Cu Nim' winch for launching. The local merchants put up prizes and a trophy for 'Central Alberta Open Soaring Championship.' Locke Robertson won the cup with a flight which will also qualify him for his 'C' and Gordy Brown ran him a close second. These flights were both done in '119's.' Best flights were rewarded, that is the two best flights off aerotow as well as the best flight off the winch. Brem Murray got this when he topped 16 minutes off the winch. First and second were given in spot landing contests and were won by Norm Bruce and Al Foster respectively. We did a total of 64 flights and amassed a total time of 12:03:21 which is not very good but after all it was the last week-end in September and a pretty cold one at that. This meet was sponsored by the Cu Nim Gliding Club of Red Deer and we decided that since our little city is behind us so well that we would invite the public to come along for the show. The radio station plugged the show for a week and the paper put a fair blurb in for us. As well as all this the R.C.A.F. sent eight Harvards over to beat the joint up at a pre-determined time, and boy they sure did a job for us.

Well, to make a long story short, we had well over 1,000 people out and what with the silver collection we took at the gate and the concession we set up we now have a nice little nest egg in the bank to start the purchase of another machine.—*Free Flight.*

DELHI GLIDING CLUB

1. (a) Date of inauguration in India : Sometime in October 1950.
   (b) Date of inauguration in Delhi : October 9, 1950.
2. Names of Officials and Committee members :—
   i. President : Major-General J. N. Chowdhury.
   ii. Vice President : Group Capt. Chatterjee.
   iii. Honorary Secretary & Treasurer : S/Ldr. Chand.
   iv. Members : Mr. G. S. Subramaniam (of the D.G.C.A.).
   ,, J. W. Hotz.
   ,, T. S. Krishnamoorthy.
   ,, Suraj Singh.
   v. Honorary Chief Instructor : F/L Bhatnagar.
   vi. Assistant Instructor : Mr. C. S. Rangan.
3. Rules and Membership and Subscriptions, etc. :—
   Annual membership fee : Rs.20/-.
   Fee per flight : ,, 3/-.
   Fee for joy ride : ,, 5/- per head.
   The Club has a printed prospectus giving all information.
4. Number and Type of Gliders :—
   Two Seaters .. .. .. 2.
   Primary .. .. 2.
   'Grunau Baby' .. .. .. 1.
   'Olympia' .. .. .. 1.
5. Season in Delhi for gliding : All weather except winter.

GENERAL INFORMATION.

1951. Flying commenced on 21st October, 1951.

1952. i. First glider, 'Grunau Baby' type, was flown by Dr. Zypkes.
ii. All India altitude record of 13,800 ft. was set up by F/L Bhatnagar in a two-seater.

1953. i. All India altitude record bettered (14,503 ft.) by Baron de Rossee in a single-seater 'Olympia.'
ii. All India duration record (6 hrs. 3 mins.) set up by F/L Bhatnagar.
iii. All India duration record bettered (6 hrs. 13 mins.) by G/Capt. Chatterjee.
iv. All India cross-country record (15 miles) set up by F/L Bhatnagar in a single-seater 'Olympia.'

	1951	1952	1953 (up to Sept.)
No. of launches	14	188	566
No. of hours flown	4	64	223
No. of joy rides	—	45	154
No. of students trained up to 'C' stage ..	—	2	14

ARE WE TRYING TO MAKE GLIDING TOO CHEAP ?

By RIC NEW

WHAT are most Australian Gliding Clubs suffering from to-day? Yes, LACK OF CAPITAL, and this is a common fault whether it is the struggling business or club. The remedy is to go out and get this capital as any successful business does, and not try to struggle along without this most essential item, for it will be found that all successful enterprises have adequate capital.

The next question is HOW? I say that to put gliding on its feet in Australia firstly we must make it attractive to the men who can afford to buy gliders and equipment, and it will be found that these men will have the vision, energy and influence to further this grand sport. Study what is happening to-day in a futile effort to give cheap flying to many members who will not supply finance or even work.

The few club stalwarts slave at instructing, building gliders etc., during all their spare time, while most members appear on flying days only. I say this is undemocratic and unfair and is certainly not making for much progress. This same lazy club member will calmly spend pounds on other forms of entertainment, horse racing for example, yet feels that gliding should be handed to him at cheap rates without work. (Perhaps some of this is our own fault because in the past much emphasis has been placed on cheap flying).

In any case it is the responsibility of the Government if it wishes to keep a ready reserve of your pilots to supply cheap flying for all because it is quite beyond the power of the clubs.

The present feeble Government assistance granted to Gliding in Australia does not do justice to the many years of hard work and hours of spare time sacrificed by many of our keen club workers, and I feel that this meagre subsidy is not worth the effort expended to gain it. I feel that we would do better to proceed under our own steam, and cater for the financial member as is being done in the U.S.A.

In the U.S.A. progress is made by individuals and small groups, and not by large clubs.

Any Government support we get will best be won by much publicity on Distance and Altitude records as these capture the imagination and emphasise the fact that gliders really fly, whereas unfortunately our week-end club flying leaves spectators with the impression that gliders launched with much delay and effort are soon back on the ground.

Politicians hear and read this record-breaking publicity, and the day will come when officials cannot ignore this phase of flying training.

Instead of working on club machines I am sure that staunch club members would be best employed selling gliding to the right men and it would be more pleasant and productive work. I am certain that one hour spent selling gliding will earn more capital invested than 20 hours of club glider building.

I mean go out with photos etc., and interview likely prospects because at present we only get members who drift in and not the ones who will advance gliding. It is suggested that these new members be formed into small groups of about 6-8, and purchase, not build, a dual-control machine of their own, and this is not club property.

The club can then supply instructors, and charge for this service.

A fee can also be charged for the use of hangar space, field use, yearly membership etc., but this fee must be kept low initially, and can be increased as the club becomes stronger and supplies more facilities.

All this money will be profit to the club, because it has not the liability of gliders, as glider repair is the responsibility of the owners. Later the club perhaps can provide a repair service for which it will be paid. No free work. At present the running costs of most clubs equal the income and there is no profit.

The two-seat machine *must* have a low sinking speed so that it can stay in the air and be soared, and on no account should an inferior high sinking speed be considered. The machine does not need any high speed performance, because time in the air is the all important point.

The better class Schneider machine or something of this nature would be ideal. I would like to see Mr. Schneider distribute some large photos to clubs as people want to see something good when they are being sold.

Also I advocate Aero-towing only, as it certainly looks safer and more impressive and gives the member a real ride even if thermals are not available. Perhaps something could be done at special rates through our Aero clubs with perhaps Government assistance on this score. In any case Aero Club rates at present make Aero-tow worthwhile.

Winching or car towing will not attract the type of pilot we need. In the case of the W.A. Club a very expensive and high running cost tow car could be dispensed with.

Unfortunately once again many clubs have adopted winch and car tow because it seemed to be the cheapest form of launching. But is it? In the first place Winch or Auto-Tow does not attract any thinking person to gliding because it looks dangerous and usually in a matter of minutes the glider is back on the ground. When two-seater instruction is attempted from Winch or Auto Tow about two minutes of instruction is all that can be given and then quite half-heartedly, because the instructor has one eye on the landing point all the time.

When aero-tow is used the instruction can start from about 300 feet altitude, and continue right through the tow to 2,000 feet and then only when the glider is down to about 600 feet does the instructor start planning his approach.

Also the chances of soaring flight are good from a 2,000 feet tow, while the chances of soaring from other launching methods are poor.

It is possible to average about 45 minutes in the air, including time on tow, from aero launches and when all things are taken into account it will be found that what appears to be the expensive method is the best and cheapest method when results are taken into account.

I am sure that a pilot will learn more in one average aero tow flight, than in six winch or auto tows, plus the fact that the aero tow has a hundred times more appeal to the pilot we need at present.

When clubs have established these groups it will be

(Continued opposite)

LETTER FROM AUSTRALIA—By Fred Hoinville

ABOUT the next world championship. Having noticed that total entries are to be limited to forty, I would like to comment thus :

Eighteen nations competed last time. I think there will be more, not less, this time. Do the organisers realize what that means ? I think it means that there will be no two-seater event. With total entries obviously limited to two per nation, who will waste an entry on the two-seater event, which carries little prestige and prevents pilots claiming Gold or Diamond awards ? Personally, although the small field will help the nation running the event, I consider it a grave mistake, and one which will keep many of the world's best pilots out of the test.

The Silver ' C ' requirement is no test for pilots. In a country like Australia, or France or South Africa or U.S.A., any raw novice can get a Silver ' C ' with ridiculous ease. It wasn't so when the Silver ' C ' was first thought of, but with today's vastly superior sailplanes, the award is meaningless. I would not suggest that all entrants should have a Gold ' C,' but I would like to see an absolute minimum of one 150 mile flight as a qualification. The present system allows backward nations to enter two no-hoper novices who will certainly gain experience, but only by keeping out of the contest some Three-Diamond pilots of other nations. That is far too high a price to pay.

This unwholesome development arises solely out of the use of big expensive sailplanes, the very evil which I and others have been warning against for years. If tiny midgets were used, it wouldn't matter how low the performance, large numbers could be handled, good pilots need not be unjustly excluded, the result would be a truer reflection of pilot skill, and designers would be encouraged to improve the breed of the midgets, thereby giving gliding in general a great fillip.

The German plan for using all out-and-back events of various types should also be adopted for all contests. Straight distance flights belong to record attempts, not contests.

Australia will probably send at least one entrant this year. At present, the present Australian Champion, Bob Krick, seems likely to be chosen.

Today and yesterday, a two-day Glider Pageant is being held at Camden to raise funds for the N.S.W.G.A. Seven gliders are taking part, including one ' TG-3 ' and a couple of primaries.

I have been designing a 25 feet span ' Minimidget ' sailplane from which I expected to get better than ' Grunau ' performance, but have had to suspend work on it temporarily. Many power pilots are keen to get into gliding here owing to the excessive cost of power flying, and an earlier announcement that the ' Minimidget ' was under way resulted in a flood of eager enquiries from pilots wishing to build one. I am absolutely certain that an enormous market exists for such a midget glider, complete or in kit form.

Ron Sharp of the Hinkler Club has designed and is building a 35 feet span midget of promising appearance. It will be watched with interest.

Waiherie Club's new home-designed and built side-by-side two-seater, with very thin wings, and struts, appears to be giving very good performance, and is claimed to be better than their ' Olympia,' particularly at high speeds.

Merv Hall of Toowoomba has almost finished his new improved ' Zanonia ' and we expect him to fly it in the National Championships this Xmas. Bob Krick will probably fly the ' TG-3.' These two will be very hard to beat. Ric New appears to be rather handicapped by bad terrain in Western Australia. The Sydney Soaring Club ' Olympia ' will be flying in greatly improved form, having been well ' Raspetised.' Waikerie has the men and the sailplanes but has dangerous terrain. It should be a very interesting contest.

ARE WE TRYING TO MAKE GLIDING TOO CHEAP ?—*continued from previous page*

possible to absorb some good working enthusiastic young members, because at times a two-seater machine will be available and arrangements can be made with the owners to use the machine for instruction. Once again with a good and sure financial return to the Club.

We have tried long enough by begging and on the cheap, and as usual it does not work.

I say let us try and sell gliding as a top line sport and not a cheap one. Most glider pilots who have progressed have spent a great deal of time and money on the sport and I repeat real gliding is not a cheap sport, and the cost will only be reduced when we have good equipment and plenty of it.

This is my suggestion to advance gliding and I feel sure it will work. However, the first thing to do is cover up or get rid of all primary and other unattractive and dangerous looking machines and right after some publicity on records or competition flying advertise in the local papers that a dual instruction gliding group is being formed, and then sign up and get the cash from a group while they are enthusiastic. Also have some good photos of the proposed machine available and be able to demonstrate an aero-tow if necessary.

We must get away from the idea that gliding is 90% work on gliders and 10% flying.

In all other sports the equipment is purchased and not built by club members, and participants always find the money when they are interested.

When a speed-boat, yacht, car or motor-cycle club is formed the club does not supply the equipment. It would be impossible for these clubs to do so and remain healthy, because it is a well-known fact that very little enthusiasm can be raised to repair and maintain any property owned by any large community group like a club.

Large scale community efforts are seldom progressive unless there is an outstanding energetic leader who is prepared to devote his all to the task of organising, driving etc., and these are few.

I feel that our present idea of clubs and building machines has originated from the day when factory built machines were not readily available, and I would like to see some club try the method I suggest, because I am confident it would then progress and do some flying.

I must apologise for the length of this article, however, I still feel that I have only outlined the advantages of my suggestions.—(*Australian Gliding*).

Swedish Gliding Statistics for 1953

By Bengt Micrander.

As could be expected from the large number of ex-Air Force gliders given to the civil clubs last year there was a considerable increase in diplomas taken and hours flown.

The following figures have been drawn from the annual report of the Royal Swedish Aero Club, which was issued recently.

Diplomas in 1952 and 1953 :—

	'A'	'B'	'C'	Silver 'C'	Gold 'C'
1952	440	299	219	17	5
1953	449	344	261	21	5

Launches and Flying Hours :—

	Launches	Flying hours
1952		
Primary gliders	17,512	252
Sailplanes	19,614	3,646
	37,126	3,898
1953		
Primary gliders	14,474	242
Sailplanes	24,781	4,663
	39,255	4,905

The total number of diplomas now issued by the Royal Swedish Aero Club is as follows : 6,858 'A,' 4,206 'B,' 2,666 'C,' 313 Silver 'C' and 33 Gold 'C' diplomas. Nearly a quarter of launches in 1953 were by aero-tow (5,925 tows). Most of the 39 clubs are using the dual-control method as there are a large number of two-seater machines in the country. At the beginning of 1953 the Royal Swedish Air Force gave 18 'Kranichs' to civil clubs as well as 27 primary gliders (S.G.-38 '), 16 'Grunau Babies,' 7 'Weihes' and 24 tug-planes (21 'F.W. Stieglitz' and 3 'Tiger Moths').

This will solve the flying equipment problem but only temporarily as these planes are old and many will not fly for very long.

There are 268 planes in the country, 30 being two-seaters, 31 high-performance planes, 94 intermediates and 113 primary gliders.

As there are still so many primaries at hand many clubs are using both methods of instruction, but the dual control method is gaining ground rapidly. However, the great shortage of dual instructors forces some clubs to stick to the old method even though they are in possession of a two-seater.

The all-year-round gliding competition Guldvingen (The Golden Wing) for 1953 was won in the distance as well as in the altitude gain class by the Eskilstuna club with its two Gold 'C' pilots Ake Andersson and Claes Eklind finishing up as winner and runner-up respectively in both classes. They have both made about 12,000 metres each in altitude gain in three flights and they have also made goal flights of over 300 kms.

The speed class over a triangular course was won by Sigurd Larsson of the Stockholm club, who is a very keen and special gliding type. Some years ago he lost a leg in a gliding accident. As soon as he was able to stand on his new wooden leg he began to build his own glider. After two years his machine—an 'Olympia'—was ready, and it was a very fine job indeed. He made a number of outstanding flights with it and finally finished up as winner of the speed class. Hats off for such feats !

GLIDING IN JAPAN

By Miguel Tauler.

According to Japanese legend, gliding has a history there of no less than three and a half centuries ! In the 16th century a poor workman making paper doors discovered sadly that they were flying away from him, to come to earth a little further away. But what at first seemed a disaster changed into a brilliant idea, when he decided to make a pair of wings like a bird, and so became the first Japanese glider pilot.

However, we have no further news of Japanese gliding for another three hundred and fifty years. Back in 1930 Lieut. Isobe built himself a simple glider with which he was able to make a few short flights, but this *second* attempt really gave birth to gliding in Japan, to be followed a few years later by the Imperial Society of Aerial Navigation, run on a German model.

Even in these far off years there existed a periodical dedicated exclusively to gliding with the title *Sailplane and Glider*. There was great activity among designers and builders of gliders, and among other successful machines of that day we must include the 'Yamazaki.' Most gliding was done on the slopes of Mt. Fujiyama.

In 1935 interest in gliding took an upward surge, due to the arrival of a group of German pilots headed by Wolf Hirth. These came to give instruction at the invitation of the Japanese Government, who were interested in gliding as a means of training power pilots and who were prepared to help financially in no small measure. The Japanese War Office introduced the sport of gliding into both medium and advanced flying schools, and had it not been for the war it is probable that gliding in Japan would have become a national sport.

By 1940 they had set up a distance record of 71 km. This was done in an 'Olympia' by Isamu Oda who took off from one of the slopes of Mt. Fujiyama with an altitude of 2,600 metres. In 1941 a national duration record was set up in Kyushu with a flight of 13 h. 41 sec.

When Japan entered the war she already had 80,000 people interested in gliding. During the war and later during the occupation, gliding was not carried out, but when the occupation ended in April of last year, the clubs began to rise again and with the aid of 150 veteran flyers there are already about 40 clubs in existence. These are grouped together as the Japanese Gliding Federation, and their President is Professor Chicao Honda of Hiroshima University.

In spite of economic difficulties the construction of gliders is going on again. Right now they have 5 high performance sailplanes, 9 intermediate sailplanes, and 25 primary gliders, type 'SG.38,' all these having been built in Japan. There are as well several locally designed variations, of which I will describe three.

(*Continued on page* 20)

LETTERS

THE EDITOR,
SAILPLANE AND GLIDER.

In the Editorial of your December issue you say a few things about German gliding, which are not correct. It is true that our gliding clubs receive some money from local authorities, but this is just as little as every other sports club gets. Your conclusions from that fact, however, are definitely wrong. No one is proud of handing over funds freely to form the nucleus of a new Luftwaffe. (Much more money is still needed to clear the rubble in our bombed cities). On the contrary, very often money is refused, because many people think today's glider pilots could become tomorrow's bomber pilots, our small gliding sites could become air bases for jet fighters. It takes a lot of trouble to convince them, that we just want to soar a bit and have some fun. If you are astonished about the development of gliding in Germany, the simple reason is we just work a bit harder and sacrifice a bit more for our beloved sport.—**Hans Deutsch, Editor of** *Thermik*.

THE EDITOR,
SAILPLANE AND GLIDER.

I am always reading articles about the rut gliding in Gt. Britain has got into and that if something is not done quickly it may never recover. You even suggested in your Editorial for the Nov./Dec. *Sailplane and Glider* that a complete overhaul was necessary. The suggestion I want to put forward has nothing to do with overhauling gliding in Gt. Britain but should be of great service to gliding in a large way.

It is this. Why could not someone ask one of the many small film companies that specialize in documentary or 'short' films to make a semi-educational film about gliding as a *sport*. All the gliding association need do would be to supply the necessary facilities for making the film. I think gliding is not only an original subject but an economical one for the film people. The film could never be quite as bad as some I have seen and not half as stale!

I am convinced that this will bring the much needed publicity to gliding and turn the public eye to this fascinating sport.

I hope that my idea will be taken seriously.—**Brian Wane, Shoot-up-Hill, London, N.W.2.**

THE EDITOR,
SAILPLANE AND GLIDER.

Peter Fletcher's remarks on Gliding Club membership wastage, is probably right, but his statements as to the causes, are, to use his own words, 'Utter Clap Trap.'

The time alleged to be wasted on two-seater training of ab-initios, would be, to a great extent, wasted anyhow, as very few pilots wish to fly on a circuit day.

The reason our competition pilots average 40 years of age, is that gliding is a pleasant sedate sport requiring very little energy, therefore most suitable for the middle-aged and elderly.

Of course, if you help with the ground organisation it could be a little more strenuous.

The old croak of new members being the life blood of the clubs (not soaring) is very true, for sordid economic reasons.

Having been an instructor for so many years, it surely must have occurred to you that the members are frustrated because of the inefficient training methods, that leaves them twiddling their fingers waiting 6 or 7 hours, for a 5-minute flight, and by the time they get another flight, they have forgotten the first one.

If you cannot do anything without special training, you will never be a champion, nor will you ever make progress.

Just imagine for a moment, if our ancestors had waited to be instructed at every stage, we would still be using stone axes (Sorry, my mistake!). Some other type of animal life would be ruling the world.

To waste the two-seaters in advanced training is really the height of foolishness. Far better to take the public for a ride and restore the Club finances.

The only thing necessary to improve your flying, is to have a plan on every flight, not just sit in the hill lift and dream.

If yon take the trouble to look at the competition results over the years, you will find the most unexpected people making fantastic flights and then becoming Pundits in their own right.

That, my dear sir, is because, in competition flying, you have a plan given to you by the organisers at briefing.

So if you are unable to formulate a plan for yourself, insist on more competitions, not necessarily National, they could be inter-club, or just task flying within the Club.

Yours sincerely,
HUBERT WHEATCROFT,
Well Head, Tring Road,
Dunstable.

THE EDITOR,
SAILPLANE AND GLIDER.

Sir,—With reference to Hugh Wheatcroft's letter regarding my article on heresy. First, I would like to thank him for taking the trouble to write about it, so many people talk endlessly but never take the trouble to write down their ideas, and now I will try to reply to him.

At all the clubs I know of, two-seater instruction goes on every possible flying day whether it is soarable or not, it has to, to cope with the numbers of ab-initio pupils.

The reason our competition standard pilots are 40 or over is nothing whatever to do with the physical demands of advancing years making gliding an attractive sport, it is simply the fact that it takes about 20 years of amateur weekend activity in gliding to reach this competition standard unless you can have advanced instruction from a first-class soaring instructor in a two-seater.

New ab-initio members are not nearly such an attractive financial gain as some people seem to believe; it is later on when they are a trained and regular club supporter that they are a real asset. The present two-seater method of training is quite efficient, it is the numbers demanding training that causes the frustrations and delays. The only solution is more two-seaters and more instructors, or few ab-initios—you cannot have it both ways.

With regard to 'special training.' I never said a good soaring pilot could not be produced without it, many have been, but it takes half a lifetime and so advanced instruction in two-seaters could not be termed a waste of time if it improves a soaring pilot's skill over a shorter period than the present system.

Joyriding for the public seems to me at any rate something which should only be offered after all training has been completed, but as I said I am a heretic!

With regard to plans, here I agree, even though plans seldom come off they can at least be used to see where one went wrong. None of mine have ever come off but then I am not a Pundit, just a keen amateur, and I think that club task flying, etc., can be used far more.

Yours, etc.,
P. FLETCHER,
London Gliding Club.

ROYAL AERO CLUB CERTIFICATES

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

CERTIFICATES 'A' .. 191 (17068-17257)
'B' .. 194
'C' .. 17
Silver 'C' 2
Gold 'C' —

'B' CERTIFICATES

No.	Name.	A.T.C. School or Gliding Club.	Date taken.
17068	K. Coutts	No. 2 G.S.	17. 7.53
17069	R. W. Ford	Oxford G.C.	7. 3.53
17070	C. R. Thomas	No. 42 G.S.	10. 9.53
17071	I. P. R. Joyce	No. 2 G.S.	31. 7.53
17072	I. F. B. Simpson	No. 2 G.S.	1. 8.52
17073	R. W. Gill	No. 146 G.S.	3.10.53
17074	R. Hunt	No. 82 G.S.	3. 5.53
17075	H. H. P. Thomas	No. 104 G.S.	5. 8.53
17076	J. A. Hepworth	Dartmouth Cadet	15. 9.53
17078	R. H. David	No. 68 G.S.	19. 6.53
17079	H. T. Dace	No. 42 G.S.	20. 9.53
17080	R. H. Horton	No. 24 G.S.	18. 1.53
17081	F. A. S. Pratt	No. 106 G.S.	6. 9.53
17082	S. W. Clark	Bristol G.C.	4. 9.53
17083	R. D. Commander	No. 92 G.S.	20. 9.53
17084	G. Jenkinson	Moonrakers G.C.	5. 9.53
17085	R. H. Newman	No. 42 G.S.	20. 9.53
17086	C. Payne	Surrey G.C.	19. 9.53
17087	A. R. R. Rodwell	No. 123 G.S.	27. 9.53
17088	A. Palmer	No. 1 G.S.	28. 5.53
17089	W. McMaster	No. 1 G.S.	6. 9.53
17090	S. Hardy	No. 1 G.S.	6. 9.53
17091	R. E. Dowsing	No. 104 G.S.	28. 7.53
17092	R. E. P. Herbert	No. 130 G.S.	25. 7.53
17093	N. G. Rose	No. 130 G.S.	19. 7.53
17094	W. V. Wood	Wessex G.C.	26. 9.53
17095	R. A. J. Malcolmson	No. 1 G.S.	6. 9.53
17096	V. R. Webb	No. 125 G.S.	27. 9.53
17097	B. D. Batchelor	No. 126 G.S.	26. 9.53
17098	A. G. Hook	No. 82 G.S.	27. 9.53
17099	A. Horton	No. 42 G.S.	27. 9.53
17100	E. Hunter	No. 5 G.S.	20. 9.53
17101	D. C. R. Pope	No. 126 G.S.	4.10.53
17102	A. Stevens	No. 166 G.S.	18. 7.53
17103	M. G. Tyler	No. 130 G.S.	24. 5.53
17104	T. P. Ward	No. 141 G.S.	4.10.53
17105	R. B. O. Richards	R.N.G.S.A.	4.10.53
17106	J. Wild	No. 260 G.S.	27. 9.53
17107	W. C. Duff	No. 2 G.S.	2. 7.53
17108	J. D. Angles	Scottish G.U.	4.10.53
17109	J. Bain	No. 2 G.S.	12. 7.53
17110	A. Blundell	No 186 G.S.	6. 9.53
17111	W. H. Brown	No. 22 G.S.	4.10.53
17112	J. S. Gurnow	No. 104 G.S.	5. 8.53
17113	L. G. Daniell	Coventry G.C.	3.10.53
17114	P. C. Davies	R.N.G.S.A.	26. 9.53
17115	A. C. Gosling	No. 89 G.S.	16. 8.53
17116	A. Maryon	No. 186 G.S.	20. 9.53
17117	C. J. Shore	No. 186 G.S.	4.10.53
17118	P. Lucas	No. 22 G.S.	4.10.53
17119	J. Walker	No. 5 G.S.	9. 8.53
17120	G. L. M. Daniels	Dartmouth Cadets	4. 9.53
17122	M. S. Kennard	Dartmouth Cadets	13. 9.53
17123	P. A. Bullenthorpe	No. 130 G.S.	26. 7.53
17124	P. J. Ackerman	No. 130 G.S.	20. 7.53
17125	J. N. Elliott	No. 105 G.S.	29. 6.52
17126	R. C. Thorne	No. 130 G.S.	5. 7.53
17127	R. V. Webb	No. 43 G.S.	4.10.53
17128	W. B. Farmer	Wessex G.C.	20. 9.53
17129	Y. C. Low	Perak F.C.	14. 9.52
17130	J. J. Buddle	No. 82 G.S.	27. 9.52
17131	B. F. Barrow	Southdown G.C.	9. 8.53
17132	A. F. McKenzie-Hill	Dartmouth Cadets	25. 8.53
17134	B. D. Jaffrey	No. 130 G.S.	23. 7.53
17135	J. Bredley	No. 89 G.S.	3.10.53
17136	G. Smallwood	No. 130 G.S.	20. 9.53
17137	I. J. Kraven	No. 166 G.S.	28. 8.53
17138	A. J. Sliney	Heron G.C.	9. 7.53
17139	W. Stevenson	No. 203 G.S.	24. 6.53
17140	P. E. Kear	No. 130 G.S.	16. 9.53
17141	A. W. J. Lamb	No. 5 G.S.	23. 8.53
17142	J. F. Muir	No. 2 G.S.	6. 9.53
17143	J. B. Deas	No. 2 G.S.	9. 8.53
17144	M. J. Goodard	No. 123 G.S.	3.10.53
17145	K. A. McLenuan	No. 2. G.S.	30. 7.53
17146	A. T. Mallett	No. 130 G.S.	19. 7.53
17147	J. N. W. Moss	2nd T.A.F. G.C.	4. 5.53
17148	P. R. Wild	Halton G.C.	10. 5.53
17149	R. A. H. White	No. 123 G.S.	4.10.53
17150	T. M. Boardman	No. 84 G.S.	3. 8.53
17151	L. G. Frakes	Moonrakers G.C.	10. 9.53
17152	T. W. J. Perchard	No. 146 G.S.	11.10.53
17153	R. H. Gibbs	No. 125 G.S.	11.10.53
17154	R. C. H. Barber	Army G.C.	3.10.53
17155	J. K. Davies	No. 186 G.S.	11.10.53
17156	K. W. Hughes	No. 43 G.S.	4.10.53
17157	P. Jordan	No. 168 G.S.	1. 9.53

GLIDING IN JAPAN

(*Continued from page* 18.)

In the first place they have the 'Tohi-Sa.' This is a high-performance single-seater sailplane, reminiscent of the American Schweizer 'SG5-1.21.' It was built by the famous Japanese constructor, Mr. Kei So Yo in 1952; it has a span of 14 metres and a weight of 160 kg. Its gliding ratio is 1 in 23 at a speed of 62 km./h. At this stage it holds the national duration record.

Secondly, they have a midget sailplane which is really striking both for its originality and for its cheapness; if its performance is worthwhile it could cause a revolution in design. This is the 'Tondo Kuro III' which already has several years of flying to its credit. It has a span of only 9 metres and a fuselage of 3.5 metres. The wing area is 9 sq. m., the weight empty 23 kg. and in flight 83 kg. The wing loading is 9.25 kg./m² (the average wing loading of birds is about 8). The minimum sinking speed is 0.63 m./s. at 43 km./h. with a gliding ratio of 1:19. The best ratio is 1:21, with a sinking speed of 0.73 m./s. at 56.5 km./h.

But the most important detail—and the one we like best—is that for take-off and landing the pilot must use his own legs as an 'undercarriage'; once in the air he tucks them up into the cockpit and closes the gap beneath, and to land he reverses the procedure. It must be very interesting—but only to watch!

Then, since necessity is the mother of invention, and as Japan is poor in gliding materials, they have adapted a 60 c.c. motor-cycle engine of 3,000 revolutions to fit a primary. By this means they can get soaring training equivalent to that of a 'Grunau Baby,' since thanks to the little motor the gliding ratio of the primary is transformed from 1:10 with a sinking speed of 1.60 m./s. to 1:25 at 0.80 m./s.

One recent feat of a Japanese pilot was the flight by the well known Isamü Oda, who took off in a 'Tohi' at 13 h. 2 m. on February 7, and landed at 17 h. 10 m. the next day at the same field. He had flown steadily for 28 h. 8 m. over the slopes of Mt. Ikoma and the

surrounding districts of Osaka. The best height attained was 3,300 metres. The wind during the greater part of the flight was from 10-13 m./s., but after four in the afternoon it decreased and by 5 p.m. it was a flat calm, so that Oda had to land. It was enough however to give him the national record. The flight was under the auspices of the Japanese Gliding Federation and backed by the newspaper *Mainichi*.

Finally, we hear that the Japanese are hoping to send a team to next year's International Contest in Great Britain.—*Avion*.

'WINGS FOR PAULINE'

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

'B' CERTIFICATES—*continued*

No.	*Name.*	*A.T.C. School or Gliding Club.*	*Date taken.*
17158	D. I. Bird	No. 142 G.S.	4.10.53
17159	R. D. Brew	No. 186 G.S.	11.10.53
17160	C. H. B. Grimley	No. 166 G.S.	28. 8.53
17161	M. W. Lecky-Thompson	Surrey G.C.	19. 9.53
17162	P. J. Hill	No. 104 G.S.	11.10.53
17163	T. G. Twentyman	No. 1 G.S.	3.10.53
17164	M. E. Baylis	No. 122 G.S.	4.10.53
17165	C. H. Fisher	No. 142 G.S.	4.10.53
17166	H. Bunnage	No. 22 G.S.	13. 9.53
17167	D. J. Streeter	Surrey G.C.	13. 6.53
17168	C. C. Gold	No. 146 G.S.	11.10.53
17169	B. D. Cross	No. 105 G.S.	9. 8.53
17170	S. A. Jahangir	Halton G.C.	26. 8.53
17171	D. R. Cowan	No. 2 G.S.	13. 9.53
17172	J. F. G. Hill	H.C.G.I.S.	9.10.53
17173	K. J. Hall	No. 146 G.S.	11 10.53
17174	H. J. Garland	No. 125 G.S.	4.10.53
17175	W. H. Pettit	No. 105 G.S.	15. 8.53
17176	K. R. Alderson	No. 105 G.S.	3.10.53
17177	E. E. Jones	No. 89 G.S.	20. 9.53
17178	B. I. Mason	No. 146 G.S.	10.10.53
17179	C. D. Metcalf	No. 45 G.S.	6. 9.53
17180	L. Morse	No. 142 G.S.	4.10.53
17181	R. G. Osborne	No. 123 G.S.	10.10.53
17182	J. E. L. Reddick	No. 142 G.S.	11.10.53
17183	M. Roberts	Bristol G.C.	24. 9.53
17184	W. A. Tomlinson	No. 45 G.S.	14. 8.53
17185	A. P. Dunlop	No. 26 G.S.	2. 8.53
17186	B. F. Nelson	No. 188 G.S.	28. 6.53
17187	R. S. Allen	No. 186 G.S.	11.10.53
17188	K. Asheley	No. 92 G.S.	14. 8.53
17189	P. N. Dunstan	No. 68 G.S.	11.10.53
17190	A. R. C. Jardine	No. 68 G.S.	4.10.53
17191	E. G. Strong	No. 87 G.S.	6. 6.53
17193	D. Eyre	Bristol G.C.	25. 9.53
17194	J. M. L. Cassels	No. 2 G.S.	1. 8.53
17195	I. T. Kay	No. 84 G.S.	4.10.53
17196	R. L. Peach	No. 48 G.S.	4.10.53
17197	M. Warner	No. 146 G.S.	18. 8.53
17198	A. H. Mann	Oxford G.C.	26. 9.53
17199	B. E. Lastowski	Surrey G.C.	Pre-War
17200	J. E. Bowey	No. 141 G.S.	16. 8.53
17201	M. J. Barrett	No. 125 G.S.	11.10.53
17202	B. Saunders	No. 122 G.S.	4.10.53
17203	H. W. Turner	Empire Test Pilots S.	25. 5.53
17204	R. J. Newell	No. 48 G.S.	4.10.53
17205	D. B. Clark	SurreyG.C.	18.10.53
17206	B. H. Woodlands	No. 166 G.S.	26. 4.53
17207	J. F. Adams	No. 104 G.S.	12. 8.53
17208	K. Dierolf	London G.C.	27. 9.53
17209	R. E. Heap	No. 45 G.S.	14. 8.53
17210	A. Henderson	No. 186 G.S.	18.10.53
17211	R. F. Jones	No. 126 G.S.	18.10.53
17212	R. Cubin	No. 2 G.S.	2. 8.53
17213	C. Wright	Army G.C.	26. 6.52
17214	T. R. C. Turnbull	No. 203 G.S.	17. 5.53
17215	J. Mercer	No. 203 G.S.	17. 5.53
17216	B. Fuller	No. 84 G.S.	6. 9.53
17217	C. A. H. Fryer	No. 126 G.S.	25.10.53
17218	J. E. New	London G.C.	8. 9.53
17219	D. L. McQuillan	Yorkshire G.C.	25. 9.53
17220	S. Britton	No. 23 G.S.	11.10.53
17221	K. H. German	No. 48 G.S.	11.10.53
17222	G. D. Stevenson	No. 168 G.S.	5.10.53
17223	J. W. Sword	No. 2 G.S.	5. 9.53
17224	J. Craig	No. 2 G.S.	6.10.53
17225	F. R. Walker	No. 22 G.S.	18.10.53
17226	J. G. D. Cook	No. 48 G.S.	18.10.53
17227	L. J. Fender	No. 45 G.S.	27. 9.53
17228	J. C. Hickman	No. 45 G.S.	27. 9.53
17229	D. R. Pinder	No. 45 G.S.	7. 8.53
17230	M. N. Ramsey	No. 168 G.S.	3. 8.53
17231	K. H. Rapkin	No. 44 G.S.	11.10.53
17232	J. Reynolds	Bristol G.C.	25. 9.53
17233	C. G. Rutter	No. 45 G.S.	11.10.53
17234	L. Walker	No. 31 G.S.	13. 9.53
17235	D. Fraser	No. 1 G.S.	24. 7.53
17236	A. E. Baskill	No. 49 G.S.	4.10.53
17237	A. J. R. Kipling	No. 186 G.S.	25.10.53
17238	H. C. C. Cartwright-Taylor	R.E.G.C. (Chatham)	24.10.53
17239	R. B. Christir	No. 68 G.S.	5.8.53
17240	M. C. F. Gibbs	No. 68 G.S.	5. 8.53
17241	R. L. Hudson	No. 68 G.S.	5. 8.53
17242	C. D. Keen	No. 68 G.S.	5. 8.53
17243	J. P. W. B. McAuslan	No. 68 G.S.	5. 8.53
17244	R. A. W. Pilcher	No. 68 G.S.	5. 8.53
17245	C. D. Raikes	No. 68 G.S.	5. 8.53
17246	J. R. Shaw	No. 42 G.S.	6. 8.51
17247	J. S. Smith	No. 68 G.S.	5. 8.53
17248	G. E. Love	London G.C.	18.10.53
17249	E. G. Lanchbery	No. 166 G.S.	26. 9.53
17250	G. F. Morgan	No. 166 G.S.	26. 9.53
17251	D. B. Hillier	No. 125 G.S.	18.10.53
17252	D. W. S. Gordon	No. 89 G.S.	20. 9.53
17253	R. R. F. Meyrick	No. 45 G.S.	8. 8.53
17254	M. J. J. Miller	No. 84 G.S.	25.10.53

'B' CERTIFICATES—*continued*

No.	Name.	A.T.C. School or Gliding Club.	Date taken
17256	A. A. Band	No. 2 G.S.	27. 9.53
17257	E. E. Elliott	Celle G.C.	23.11.52
2822	M. N. Choules	No. 87 G.S.	4.10.53
4643	S. Ewart	No. 31 G.S.	12. 9.53
7740	M. T. Stickland	No. 7 G.S.	12. 7.53
11773	M. R. Mayes	Moonrakers G.C.	13.10.53
15163	K. J. Whittaker	No. 102 G.S.	3.10.53
15721	G. A. Clayton	Wessex G.C.	11. 6.53
16417	May H. Lawson	Yorkshire G.C.	26. 9.53
16577	A. D. Spicer	Midland G.C.	6. 9.53
16970	F. Adams	London G.C.	8.10.53

'C' CERTIFICATES

9057	D. R. Lowe	No. 89 G.S.	3. 8.53
15721	G. A. Clayton	Wessex G.C.	3. 9.53
15839	R. Kerr	Scottish G.U.	19. 7.53
16077	L. E. Fletcher	Coventry G.C.	18. 6.53
16559	P. R. Wellstead	R.A.F., Gutersloh G.C.	9. 8.53
16566	M. S. Cooke	No. 104 G.S.	6. 9.53
16577	A. D. Spicer	Midland G.C.	20. 9.53
16967	W. J. Jallands	London G.C.	1.10.53
17069	R. W. Ford	Oxford G.C.	2. 8.53
17094	W. V. Wood	Wessex G.C.	2.10.53
17147	J. N. W. Moss	2nd T.A.F., G.C.	2. 8.53
17167	D. J. Streeter	Surrey G.C.	3.10.53
17199	B. E. Lastowski	Surrey G.C.	10.10 53
17203	H. W. Turner	Empire Test Pilots S.	14. 6.53
17213	C. Wright	Army G.C.	19. 7.52
17218	J. E. New	London G.C.	20. 9.53
17257	E. E. Elliott	Celle G.C.	19. 4.53

SILVER 'C'

440	Cyril Atkins	R.A.F. Celle G.C.	4. 4.53
441	Hugh Turner	Empire Test Pilots S.	26. 8.53

CERTIFICATES 'A' .. 128 (17258-17387) NOVEMBER, 1953
'B' .. 133
'C' .. 20
Silver 'C' 1
Gold 'C' —

'B' CERTIFICATES

No.	Name.	A.T.C. School or Gliding Club	Date taken.
17258	A. H. Greig	London G.C.	9. 9.53
17259	D. W. Coates	No. 142 G.S.	28. 8.53
17260	P. Holroyd	No. 104 G.S.	11.10.53
17261	S. Peat	No. 31 G.S.	11.10.53
17263	W. C. Harris	Luneburg G.C.	1. 6.52
17264	G. H. Dunn	No. 42 G.S.	18.10.53
17265	A. Osborne	No. 125 G.S.	25.10.53
17266	C. A. Meir	No. 45 G.S.	11.10.53
17267	J. Roach	No. 84 G.S.	25.10.53
17268	A. Laird-Philip	Scottish G.C.	25.10.53
17269	A. G. Russell	No. 45 G.S.	6. 8.53
17270	T. F. Smith	Avro G.C.	31.10.53
17271	Z. Bar	No. 7 Area M. St. George	26. 9.53
17272	J. L. Weatherley	Moonrakers G.C.	5. 9.53
17273	R. W. V. Pearson	R.A.F., G.S.A.	25.10.53
17274	A. C. Lawes	No. 105 G.S.	26. 9.53
17275	B. H. Masters	No. 122 G.S.	25.10.53
17276	B. B. C. Clibborn	Moonrakers G.C.	6.11.53
17277	R. J. Almond	No. 92 G.S.	25.10.53
17278	G. S. Foster	No. 48 G.S.	30. 7.53
17279	A. I. Millar	No. 2 (C) G.S.	11.10.53
17280	J. E. Varley	No. 45 G.S.	13. 9.53
17281	G. K. Horner	H.C.G.I.S.	29.10.53
17282	D. Slater	No 183 G.S.	13. 9.53
17283	G. J. Rogers	No 105 G.S.	3.10.53
17284	B. A. Welch	No. 141 G.S.	4.10.53
17285	J. Thornber	R.E., G.C. (Chatham)	25.10.53
17286	I. Curtis	No. 126 G.S.	27. 9.53
17287	E. R. Cushing	No. 104 G.S.	25.10.53
17288	J. Snarr	No. 31 G.S.	8.11.53
17289	D. G. Thompson	No. 31 G.S.	8.11.53
17290	B. T. Green	No. 82 G.S.	27. 9.53
17291	D. R. Christmas	Dartmouth College	13. 9.53
17292	D. A. Peter	No. 5 G.S.	18.10.53
17293	J. G. Metcalfe	No. 1 G.S.	20. 9.53
17294	E. C. Jones	No. 5 G.S.	25.10.53
17295	G. W. Holland	No. 102 G.S.	8.11.53
17296	G. Hagon	No. 102 G.S.	8.11.53
17297	R. Bains	No. 24 G.S.	18. 1.53
17298	J. F. Godden	No. 166 G.S.	11.10.53
17299	M. J. Sargent	No. 24 G.S.	27. 9.53
17300	M. G. Miller	Scharfoldendorf G.C.	29. 7.53
17301	E. Holmes	Luneburg	22.11.53
17302	J. Mullin	No. 89 G.S.	5. 7.53
17303	B. E. Simmonds	No. 130 G.S.	25. 7.53
17304	B. G. Gray	No. 104 G.S.	15.11.53
17305	K. G. Brookman	No. 141 G.S.	15.11.53
17306	K. Jones	No. 89 G.S.	10.10.53
17307	M. T. Elston	No. 84 G.S.	9. 8.53
17308	B. J. Harper	No. 89 G.S.	20. 8.53
17309	R. J. M. Hart	No. 126 G.S.	15.11.53
17310	B. J. Nicholson	No. 168 G.S.	15.11.53
17311	M. J. Ridgard	No. 105 G.S.	3.10.53
17312	B. E. Smith	No. 104 G.S.	15.11.53
17313	A. T. Wright	No. 42 G.S.	8.11.53
17314	P. E. Wormall	No. 102 G.S.	15.11.53
17315	J. Pearson	Coventry G.C.	18.10.53

IMPORTANT ANNOUNCEMENTS

As *Sailplane and Glider* is to be published only as a bi-monthly for this year many of our readers who have subscriptions will be wondering what will happen where they have paid for twelve issues. We would point out that all subscriptions will automatically be extended. Thus anyone who sent 25/6 in January for issues Jan.-Dec., will besides receiving the six issues to be published this year, will also receive the first six issues in 1955 Jan.-June, when we will again be publishing monthly.

Likewise all subscriptions will be extended for one month in lieu of the December issue which was amalgamated with the November issue.

We would be most grateful for introduction to new subscribers by existing readers and a subscription form can be found on the inside back cover.

SMALL ADVERTISEMENTS

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

SOARING

Your Emblem

Have you earned a gliding or soaring certificate? Then you have something which very few people in the country, and even in the world, possess.

The A GLIDING BADGE

The B GLIDING BADGE

The C SOARING BADGE

Silver C and Golden C

SOARING BADGES

The A, B, C, Silver C and Golden C badge you received is different from the usual emblem you see people wearing. In most cases the buttons in people's lapels signify that their subscriptions are paid up. In your case it means more than payment of dues. It means you've done something. It means that, without a motor, you are striving to outdo the flight of birds. Wear your badge—and wear it proudly!

'B' CERTIFICATES—*continued*

No.	*Name*	*A.T.C. School or Gliding Club.*	*Date taken*
17316	P. P. Walker	No. 2 G.S.	6.10.53
17317	A. S. Noble	No. 2 G.S.	27. 9.53
17318	E. F. Mitchell	No. 5 G.S.	18.10.53
17319	A. A. Young	No. 125 G.S.	11.10.53
17320	K. Bradshaw	No. 122 G.S.	15.11.53
17321	G. H. Jackson	No. 186 G.S.	15.11.53
17322	Patricia D. Preston	No. 168 G.S.	15.11.53
17323	M. J. Woods	No. 143 G.S.	15.11.53
17324	I. H. Khan	Coll. of Aeronautics	4.10.53
17325	R. W. Ambrose	No. 105 G.S.	8.11.53
17326	T. J. C. Dennis	No. 82 G.S.	15.11.53
17327	D. Brinkworth	No. 82 G.S.	15.11.53
17328	R. Foster	No. 1 G.S.	20. 9.53
17329	J. Maule	No. 2 G.S.	1.11.53
17330	P. P. Meaghan	No. 89 G.S.	2.11.53
17331	M. Stephenson	No. 31 G.S.	15.11.53
17332	I. W. Stone	No. 106 G.S.	18.10.53
17333	P. G. Kelly	No. 31 G.S.	15.11.53
17334	R. H. Marples	No. 24 G.S.	6. 9.53
17335	J. E. H. Braybon	Wessex G.C.	22. 8.53
17336	B. F. Hurst	No. 89 G.S.	26. 7.53
17337	P. Kearney	No. 1 G.S.	9. 8.53
17338	D. Smallwood	No. 188 G.S.	16. 8.53
17339	L. K. Chick	No. 68 G.S.	25.10.53
17340	I. Corkell	No. 82 G.S.	7. 6.53
17341	A. C. Ewer	No. 106 G.S.	4.10.53
17342	D. C. Hipkiss	No. 45 G.S.	27. 9.53
17343	D. D. Jevons	No. 166 G.S.	15.11.53
17344	A. L. P. Jones	No. 2 G.S.	6. 9.53
17345	D. S. Paris	No. 141 G.S.	15.11.53
17346	D. L. Smith	Fassberg G.C.	26. 9.53
17347	D. Allen	No. 2 G.S.	24. 7.53
17348	M. R. F. Negus	No. 143 G.S.	15.11.53
17349	K. C. Tillsley	No. 42 G.S.	15.11.53
17350	B. Green	No. 168 G.S.	15.11.53
17351	D. J. Lines	No. 168 G.S.	15.11.53
17352	M. G. Mandefield	Yorkshire G.C.	25. 9.53
17353	J. F. Randall	No. 123 G.S.	22.11.53
17354	C. A. Runton	No. 123 G.S.	15.11.53
17355	F. O. C. Hardy	R.A.F., G.S.A.	18.11.53
17356	P. G. Pirow	Oxford G.C.	15.11.53
17357	F. M. Rigby	R.A.F., G.S.A.	14.11.53
17358	M Riggs	Gannet G.C.	24. 7.53
17359	G. R. Bonner	No. 106 G.S.	22.11.53
17360	M. Berry	Scottish G.U.	22.11.53
17361	P. Carruthers	No. 188 G.S.	16. 8.53
17362	M. A. Carson	No. 125 G.S.	22.11.53
17363	T. A. Pocock	No. 168 G.S.	22.11.53
17364	J. H. Hodge	Bristol G.C.	22.11.53
17365	J. E. Torode	Army G.C.	15. 8.53
17366	J. E. Cull	No. 42 G.S.	16. 8.53
17367	G. Sinclair	No. 168 G.S.	22.11.53
17368	D. M. Waller	No. 84 G.S.	21.11.53
17369	G. M. L. Terdre	Dartmouth College	4. 9.53
17370	M. Burford	No. 42 G.S.	4.10.53
17371	R. J. Underwood	No. 42 G.S.	4.10.53
17372	D. T. S. Ware	No. 92 G.S.	22.11.53
17373	B. A. Coles	No. 44 G.S.	22.11.53
17374	K. Burton	Avro G.C.	11.22.53
17375	S. G. Smith	Southdown G.C.	4. 7.53
17376	J. E. Buttenshaw	No. 168 G.S.	22.11.53
17377	J. W. Batchelor	Midland G.C.	29. 7.53
17379	L. A. Dunn	No. 48 G.S.	18.10.53
17379	C. A. Jones	No. 125 G.S.	2. 8.53
17380	W. A. Hayday	R.A.F., G.S.A.	25.10.53
17381	P. J. Hollick	No. 122 G.S.	15.11.53
17382	J. B. Lowe	Avro G.C.	22.11.53
17383	F. J. Smyth	Wahn G.C.	11. 4.52
17384	J. A. Henderson	No. 203 G.S.	21.11.53
17385	S. J. James	Bristol G.C.	28.11.53
17386	E. W. Strawson	No. 186 G.S.	29.11.53
17387	R. H. Hall	No. 106 G.S.	29.11.53
5406	J. J. Macklin	No. 89 G.S.	11.10.53
11566	G. P. Jarvis	No. 143 G.S.	15.11.53
12425	R. J. Drummond	R.A.F., G.S.A.	6. 8.53
14175	D. J. Price	No. 42 G.S.	24. 5.53

'C' CERTIFICATES

9166	L. W. Arnold	No. 186 G.S.	15.11.53
9710	R. W. Terry	No. 186 G.S.	15.11.53
10307	D. S. Driver	Newcastle G.C.	15. 4.51
10819	A. J. McLelland-Brown	Cranwell Coll. G.C.	17. 8.53
12152	Hazel A. Dewer	Newcastle G.C.	8. 4.51
13526	G. C. Davies	Scottish G.U.	16. 8.53
13788	D. W. Gibbs	No. 80 G.S.	27. 7.53
13906	P. E. Bull	No. 80 G.S.	26. 7.53
15500	J. A. Halfpenny	No. 80 G.S.	30. 8.53
16280	G. F. Fisher	Bristol G.C.	19. 7.53
16872	P. F. Pentreath	Army G.C.	28. 8.53
Canadian	J. Hebert	Southdown G.C.	18. 8.53
17258	A. H. Greig	London G.C.	20. 9.53
17263	O. C. Harris	Luneberg G.C.	6. 9.52
17300	M. G. Miller	Scharfoldendorf G.C.	1. 8.53
17301	E. Holmes	Luneberg G.C.	18. 4.53
17335	J. E. H. Braybon	Wessex G.C.	3.10.53
17375	S. G. Smith	Southdown G.C.	14. 7.53
17377	J. W. Batchelor	Midland G.C.	29. 7.53
17383	F. J. Smyth	Wahn G.C.	10. 5.53

SILVER 'C'

No.	Name	A.T.C. School or Gliding Club.	Date taken
442	Richard Perkins	Scharfoldendorf G.C.	30. 8.53

CERTIFICATES 'A' .. 67 'B' .. 69 'C' .. 16 Silver 'C' — Gold 'C' — **DECEMBER, 1953**

'B' CERTIFICATES

No.	Name.	A.T.C. School or Gliding Club.	Date taken
17388	K. Brown	N.A.E. Aero Club	22.11.53
17389	D. A. Collings	Avro G.C.	29.11.53
17390	C. F. J. Harmer	No. 84 G.S.	21.11.53
17391	R. M. Slack	No. 104 G.S.	6. 8.53
17392	A. G. Rogers	No. 22 G.S.	4.10.53
17393	J. A. Lockie	London G.C.	22.11.53
17394	J. R. Mackenzie	No. 1 G.S.	22.11.53
17395	J. B. G. Maclennan	No. 7 G.S.	22.11.53
17396	W. C. McWalter	No. 7 G.S.	15.11.53
17397	W. Barwick	No. 68 G.S.	15.11.53
17398	R. J. Goult	No. 102 G.S.	29.11.53
17399	E. V. Lacon	No. 104 G.S.	15.11.53
17400	B. G. Dix	No. 104 G.S.	29.11.53
17401	J. P. Nesbitt-Dufort	No. 104 G.S.	29.11.53
17402	R. J. Butler	No. 68 G.S.	22.11.53
17403	R. E. Foyle	No. 89 G.S.	25.10.53
17404	J. C. E. Harvey	R.A.F., G.S.A.	18.11.53
17405	R. B. Hill	No. 141 G.S.	13. 9.53
17406	F. D. Thompson	No. 125 G.S.	15.11.53
17407	G. M. Storry	No. 23 G.S.	22.11.53
17408	J. W. Courchee	No. 89 G.S.	12. 9.53
17409	D. G. Falconer	No. 2 G.S.	2. 8.53
17410	G. P. J. Harvey	No. 102 G.S.	29.11.53
17411	B. Blake	No. 24 G.S.	30.11.52
17412	K. B. Smith	R.A.F., G.S.A.	21.11.53
17413	A. R. Turnbull	No. 2 G.S.	27. 9.53
17414	D. W. Powell	No. 42 G.S.	29.11.53
17415	N. T. Whitham	No. 89 G.S.	13. 9.53
17416	E. B. Allen	No. 82 G.S.	6.12.53
17417	G. E. A. Brooks	Midland G.C.	27. 9.53
17418	D. Gade	No. 42 G.S.	29.11.53
17419	D. H. Seviour	No. 92 G.S.	15.11.53
17420	J. C. Waterworth	R.A.F., G.S.A.	15.11.53
17421	G. Scrather	No. 1 G.S.	4.10.53
17423	W. J. Esler	No. 203 G.S.	21.11.53
17424	C. Quigley	No. 203 G.S.	29.11.53
17425	R. L. Taylor	No. 89 G.S.	22.11.53
17426	S. A. Goold	No. 89 G.S.	15.11.53
17427	H. G. Purchase	No. 122 G.S.	20.12.53
17428	R. C. D. Hemsley	No. 106 G.S.	22.11.53
17429	I. E. B. Banting	No. 89 G.S.	19.11.53
17430	R. J. Steele	No. 5 G.S.	22.11.53
17431	V. K. Webster	Hamburg Aero Club	2. 7.53
17432	J. V. Ilett	Avro G.C.	28.11.53
17433	D. R. Agness	No. 125 G.S.	8. 8.53
17434	I. D. Campbell	No. 82 G.S.	13.12.53
17435	C. C. Marston	No. 89 G.S.	14.11.53
17436	M. R. Elkins	No. 87 G.S.	15.11.53
17437	J. L. Perrin	No. 141 G.S.	20.12.53
17438	J. E. S. Rolfe	R.A.F., Halton	28.11.53
17439	A. R. McIntyre	No. 5 G.S.	22.11.53
17440	G. Tyson	No. 188 G.S.	28. 6.53
17442	C. Knaggs	No. 31 G.S.	20.12.53
17443	E. R. Mills	No. 31 G.S.	20.12.53
17444	D. Wooley	Dartmouth Cadets	3. 9.53
17445	N. W. Hancox	No. 48 G.S.	7. 6.53
17446	P. Trist	No. 84 G.S.	28.10.53
17447	B. G. Avery	No. 87 G.S.	20.12.53
17448	P. A. Barker	No. 42 G.S.	7. 9.53
17449	R. M. Barker	No. 146 G.S.	27.12.53
17450	R. Edwards	No. 186 G.S.	20.12.53
17451	T. K. Peters	No. 143 G.S.	5. 9.53
17452	E. J. Steward	No. 104 G.S.	25.10.53
17453	R. H. Saunders	No. 106 G.S.	29.11.53
17454	G. M. C. Macfarlane	R.A.F., Celle G.C.	17. 4.52
5002	D. W. Green	Bristol G.C.	28. 8.52
11700	M. J. Goodman	No. 89 G.S.	15.11.53
12457	M. J. Adams	Army G.C.	25. 4.53
17422	P. Poserskis	Kettering G. Syndicate	20.12.53

'C' CERTIFICATES

11053	D. A. Cree	R.A.F., Coll. Cranwell	16. 8.53
13286	T. Walls	No. 64 G.S.	20. 8.53
15429	S. Barcroft	Army G.C.	30. 8.53
15693	G. D. Braham	No. 64 G.S.	30. 8.53
16190	P. Burt	No. 64 G.S.	10. 8.53
16215	B. R. Armitage	No. 64 G.S.	18. 8.53
16234	F. J. Sharpe	No. 64 G.S.	30. 8.53
16344	C. Christianson	Avro G.C.	5.12.53
16376	D. S. Crossley	No. 64 G.S.	18. 8.53
16435	S. R. Coning	No. 64 G.S.	10. 8.53
16436	R. S. Plane	No. 64 G.S.	10. 8.53
16826	F. J. Leek	Midland G.C.	27.12.53
17248	G. E. Love	London G.C.	14.11.53
17411	B. Blake	No. 24 G.S.	9. 8.53
17417	G. E. A. Brooks	Midland G.C.	15.11.53
17454	G. M. C. Macfarlane	R.A.F. Celle G.C.	25. 5.53

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