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FEBRUARY 1948

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Sailplane and Glider

and ULTRA LIGHT AIRCRAFT

THE FIRST JOURNAL DEVOTED TO SOARING AND GLIDING

FEBRUARY 1948 ★ Vol XVI No 2

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Front Cover: *Louis Slater in his "EON" Olympia (Derby and Lancs), photograph by P. Derek Roper, 185, Rustlings Road, Sheffield.*

Editorial

FLYING accidents are almost always tragedies. Sometimes the tragedy, however, is of so much wider a significance as to constitute a blow to the whole body of aviation. Sir Sefton Branckner's loss was such a blow. That of Robert Kronfeld is such another, though at a different level. Perhaps now we are much too close to events to see clearly how much the whole field of Soaring and how much British Gliding and Soaring owes to him. That is leaving out of account the great work he did in the War in the development of British military gliders, and in the further work he was doing in tailless aircraft research when he met his death.

An appreciation will appear in our next issue.

An interesting suggestion has been made in regard to the proposed (and delayed) subsidy. Power pilots, as well as Air Line and Charter operators, who have to pay the same petrol tax (9d. per gallon) as motor car users, to which they object in principle, have indicated that they might feel less badly about it if the sum of which they complain they are unjustly mulcted could be set aside as a subsidy for light aeroplane flying and gliding.

This is certainly a sensible idea and one which we hope will not only be pressed with considerable force by those "on our side" in the negotiations with the Treasury, but which will receive sympathetic consideration. Even a portion of the money raised of this unjust tax would be manna to the very large number of would-be pilots both power and motorless, who are unable to gratify their ambitions because of the high cost and the paucity of facilities. It appears to be about the only hope of outside help.

This year's International Competitions are scheduled for the 19th—31st July at Samaden in Switzerland. If the economic situation permits it, the competitors and spectators alike may be able to take advantage of the Swiss Holidays fund set aside by the Government this year. But anyone interested had better make early application for the Swiss currency required. It won't last long.

SAILPLANE hopes to make an announcement about the costs and accommodation available in the March issue.

At the moment, the Slingsby Gull IV, of which more than one will be made for the competitions, appear to be the most likely official British contender. If the R.A.F. send a team, they will presumably use the German machines (rapidly growing fewer) in which they have had so much experience.

The news that H.M. the Queen has graciously given a prize for the Aeromodelling Contests is a welcome sign of Royal (and human) interest in what may well be described as the most useful youthful hobby. Aeromodelling, like toy trains, has now become 'big business'. Surveying the extremely advanced mathematics which have to be mastered by anyone who aims at being master of his craft, anything which can sugar the pill is to be welcomed. As someone remarked the other day, "Gliding used to be fun till the mathematicians started on thermals. Now these confounded tephigrams have come in we've had to go to school again."

"CENTRE OF GRAVITY-LAUNCH"

By HEINZ FUNK

Technical Supervisor R.A.F. Gliding Club, Oerlinghausen.

(*Continued*)

Whilst the normal C. of G. launch proceeds already at fairly high cable angles, we can state, without exaggeration, that by excessive launching speeds, by gusts or by faulty operation of the elevator, an angle of 90 degrees can be approached considerably close. Due to the fact that lift affects rectangular to the flying path, in this case the whole cable pull, inclusive the weight of the glider, must be carried by the lift. Although the winch generally has only an Endurance-Output of 60 to 80 h.p., it can develop far more power when running with its inertia in cases of sudden loads as Inertia Output.

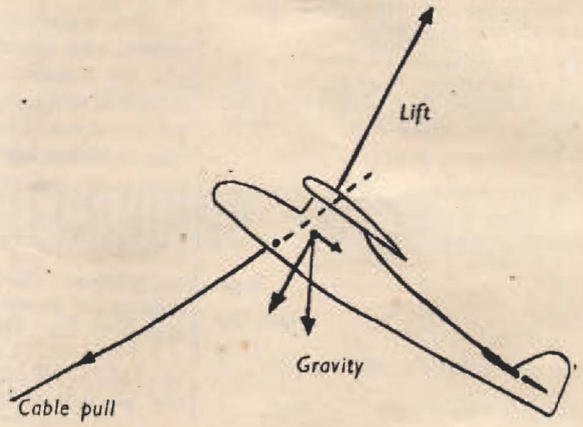
By the resultant increase of forces something must break, and it should always be the cable. Therefore it is important to know the limits at which the cable should break, if not the bending momentum of the wings will exceed the given limits. To work out the permissible bending momentum on the wings, the designer assumes the pull out of a dive with 4 g as the maximum strain on the glider. In this case by pulling out of a dive in a small radius the centrifugal forces effect, that four times the gravity force pulls on each part of the glider and must be counterbalanced by a four times greater lift. However, only the " no lift producing parts " are the ones, the additional weight of which causes an extra bending of the wings, whilst for instance any part of the wing, becoming " heavier " by the pull out of the dive, is carried by the increasing lift without bending the wing additionally.

Let us, for example, consider a light glider, for instance the " Mu.13," with a flying weight of 250 kg. and a weight of the wings of approximately 100 kg. Thus the wings on a pull out of a dive with 4 g have to carry four times the weight of the rest-parts including pilot (= about 600 kg.), safely without the bending momentum increasing to an unsafe extent. If this strain is exceeded, the glider will not break yet (providing timber, glue, mountings, etc., are in a perfect condition) as every part of the glider is built with a safety factor 1, 8 or 12 or even more, dependent on the purpose of the aircraft. But these stressing conditions up to the real breaking point at about 8 g are considered as " unsafe strain."

It takes a considerable self-control to apply this strain to a glider by pulling it out of the dive, as the pilot himself is under the influence of this accleration, which causes the so-called " black out " at about 5 g.

On the C. of G. launch, however, it is easy to appreciate, but not often realised when, on pulling stick slightly back or entering a gust strains are caused, which are far beyond the limits of safety. Where the pilot is sitting more or less inside the join between the cable pull and the lift he does not realise these strains are taking place, as they are always in balance to each other, and thus not causing any acceleration to the glider. Even very little alterations of speed (by gusts or by speeding up the winch) or of the angle of attack (by pulling stick back) will cause considerable change in lift, flying path and cable angle. As the winch and the glider are in motion and possess considerable cinetic energy, the cable force will ascend steeply on angles near 90 degrees.

In the worst case the breaking strain of the cable plus the single weight of the glider without the wings will be attached to the roots of the wings and cause a bending momentum against the lift, which is distributed over the wings equally. If this figure



exceeds the strain, which is applied to the wings on a pull out of a dive with 4 g, conditions will become unsafe.

This means for the above-mentioned example of the " Mu.13," that the limits of safety are reached, when a vertical force of 600 kg. is affecting on the roots of the wings. As in the upper part of the launch the mentioned weight of 150 kg. is to be carried by the lift as well, an additional cable pull of 450 kg. is sufficient to put this strain on to the wings. With a cable force of 1,050 kg., however, the breaking strain of the glider is detinitely reached.

Similar conditions may occur on a nose launch as well, especially on aircraft with very effective elevators or less distance between nose attachment and Centre of Pressure. At first sight conditions may appear even worse for the nose launch, as here

cable pull *and* elevator force are working together on bending the wing against the lift. However, there is less danger because both the mentioned down-forces keep in balance to each other like a pair of scales. If the cable pull increases on a sudden, the elevator force will give way like a spring, the slip-stream at the elevator will break away, and the glider will show the familiar pitching. This pitching, taken as a warning by the pilot and the winch operator to decrease speed, is a fairly safe prevention from excessive strains on the glider.

In this respect we find completely new problems in the C. of G. launch, which have hardly been taken into consideration during the last years of hunted development. Fortunately there has been no accident reported yet, but one should lock the stable *before* the horse has been stolen.

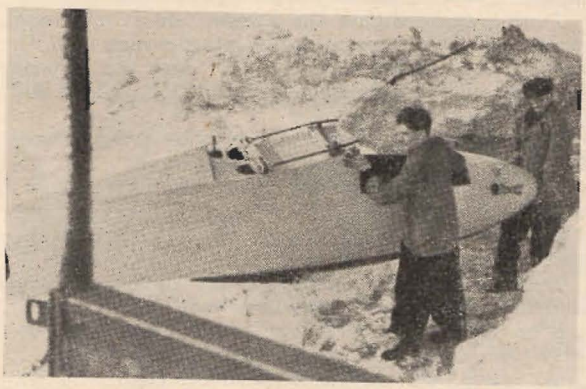
The aim is to avoid by all means the unsafe strains, to be found out separately for every type of glider. The rules, as far as the winch operator, the instructor and the pilot are concerned, should be generally known :—

Do not glide under too gusty weather conditions.
Do not exceed the permitted launching speed.
Do not move the stick too far back.

But the knowledge and even the careful obeyance of these rules is no guarantee for the prevention of accidents.

It is only *after* the launch that the winch operator can learn whether his winch speed was correct. The pilot will experience the bumpiness of the air only after the first gust, which might be his last one. And even with a careful observation of the ASI a sudden gust can put excessive strain to the glider, without the pilot being able to react quickly enough. Finally there will be always pupils who try to squeeze out still a bit more height, unconscious of the risk they are taking.

There is only one safe way of banning all these dangers, by limiting the breaking strain of the cable to the maximum permissible strain of the glider.



B. Puzej (Golden 'C') and one of the most experienced Polish pilots unloading his "Weihe" at Balice for a day's soaring—in spite of heavy snow.

The normal winch cables with a diameter of 3.6 mm. have a breaking strain of about 1,000 kg., but there are even cables delivered to Gliding Clubs in the British zone with breaking strains up to 1,700 kg.

These figures, once applied to the glider by advent of one of the mentioned circumstances, will by far exceed the safety limits, so the cable force should be limited by the use of a weak link at the end. As these limits are different for different types of gliders, and as it will be too difficult to exchange weak links every time another glider is being launched, the weak link should be determined according to the weakest type of glider in use. It is easy to realise that in respect of our considerations the light gliders are in danger the most, because less force is applied to the wings in the case of a pull out of a dive. The proportion between the weights of the wings and the rest-parts is coming into consideration as well. A flying wing, for instance, is hardly subjected to any additional bending forces, when pulled out of a dive, because nearly every part of the glider is carried by the part of lift above it. Launched on a winch, however, even small cable forces will produce bending forces at the wings, which the glider is not intended to stand.

It is recommended to consider all these points before the conversion of a glider to C. of G. attachment is carried out and to decide then, whether condition and construction of the glider make the conversion appear advisable. The conversion of a "Mu.13," for instance, does not seem recommendable, as the safety-strain of 450 kg. requires a weak link of 450 kg., which will hardly stand the longitudinal pull on take-off from a rough ground. Weak links of less than 500 kg. breaking strain should not be used as they are likely to break on the take-off or near the ground, so causing severe danger to the glider. For this reason the conversion of gliders, which require such weak links, should not be carried out.

As it was considered most interesting to find out the true figures of the cable pull during the whole launch, a device has been designed by the writer and fixed into a "Baby," which during the climb is measuring and indicating the vertical component of the cable pull. This figure has been found highest on the top of the launches and averagely going up to about 450 kg. Although the total pull in the cable may be higher, this figure gives the correct part of load, which works against the lift, thus proving that inclusive the affecting weight, this strain on the launch means the same to the glider, as a pull out of a dive with roughly 4 g.

From all these mentioned points the final conclusion can be drawn, that the C. of G. launching method is leading us closer to the limits of safety than any other method before. However, by careful obeyance to all the fixed rules, with gliders being in a perfect condition and by a skilful winch-operation chances of accidents should be diminished considerably. This conclusion should result in the admonition to utilize the advantages of the C. of G. launch thoughtfully within the limits of safety and to the benefit of every gliding enthusiast, rather than spoiling them by careless exaggeration to the dangerous extreme.

GLIDING IN FRANCE

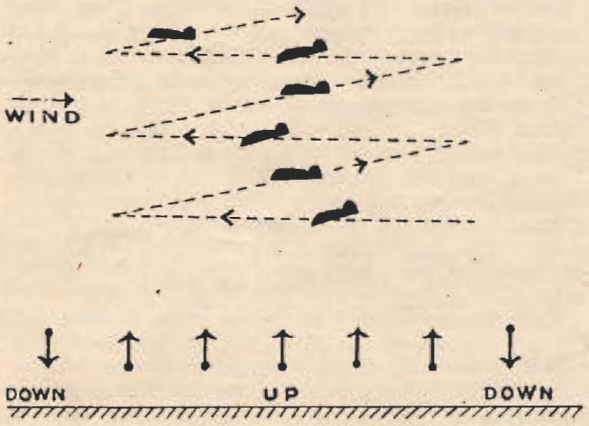
By
GUY BORGÉ

Mistral Stationary Waves above Provence.

FORMED by the Mistral wind, stationary waves are common phenomena in South-East France, from the Autumn to Spring. This north wind crosses the Provence Mountains, 2,600 feet to 5,300 feet high, and creates waves in their lee. These waves are indicated by lenticular clouds that the inhabitants call " rabbit-belly clouds."

Before the war, many Soaring performances were probably due to these currents, but at that time no one knew how to explain them.

At Saint Auban sur Durance (Basses-Alpes), on May, 1935, Roger climbed to 6,300 feet above the airfield in a " Vuilleminot " nacelled primary, and broke the French Altitude Record with a height of 5,700 feet.



Saint Auban being a very good site, the Air Sports Service established a Soaring Centre there in 1942. On the 9th and 16th October, 1942, the French two-seaters' altitude and duration record were broken in a " Castel 242 " with 10,000 feet and 11 Hours 39 Minutes.

But it was not until 1945, when the National Centre at Saint Auban re-opened, that it was possible to study thoroughly Wave Soaring. This began on the 25th September, 1945, when Rousselet climbed to 9,600 feet. On the following day, Regnier reached 13,600 feet, a height at which the climbing speed still was 11 feet/second.

Waves are normally found during an 8 months' period, from October to May. But their presence is very intermittent and varies considerably. For instance, as late as June 9th, 1947, a climb to 12,600 feet was recorded.

The Saint Auban pilots need heating and oxygen equipment, and that is why it has not been possible to climb above the 21,381 feet-above the 1,660 high airfield, which was recorded on the 18th November, 1947. With sufficient preparation, all duration and altitude records might be broken here.

The story of an 18 years' old pilot, who took off in a " Castel 301 " on the 6th December, 1946, for gaining his " C " badge is worth retelling. He climbed to a height of 13,300 feet, got and obtained not only his " C," but also his Silver and Golden " C " Altitudes. His biggest problem was to come down !

On good days, there are 18 sailplanes airborne between the 10,000 feet and 20,000 feet levels. After the wind-launch, the pilot beats along the Penitents Slope before contacting the wave. He knows when he flies into it, because it is absolutely smooth. The usual lift varies between 2 feet/second and 14 feet/second, but one pilot found lift at 26 feet/second. The precise locality of these up-currents often changes with the meteorological situation, but 3 waves are known to have remained in almost the same place over a period of years.

The wave is seldom found when wind-speed is weak, and the pilot must then circle for climbing. The common Mistral is very strong and can easily top 60 miles/hour, or more. Certain pilots in these cases have adopted the following upwind pilotage: they dive against the wind to make headway until they reach the forward edge of the rising air. They then straighten up and return, climbing until they arrive at the other edge. And so on, as the sketch illustrates.

Some other pilots prefer to take advantage of the great width of the wave, which can exceed 25 miles, and make long beats like in Slope-Soaring.

During these flights the atmosphere is naturally stable, by a temperature lapse rate between 0° 6. C. and 0° 9. C. per 100 metres. It does not appear that an inversion surface occurs above the 3,000 or 6,500 feet level.

Existence of lenticular clouds gives us a certain indication of the existence of the wave. But the wave can also be present when the sky remains clear. These lenticular clouds are stationery, and one was once observed to remain for 36 hours at the same place.

Because of the great length of each wave, up to 9 miles, and the numerous successive undulations (up to 10), it has been possible to record for the first time tailwind distances during the winter, at great speed. On the 9th November, 1945, and the 31st January, 1946, Vaulot and Leboucher have come to Saint Raphaël (56 miles) on the Côte d'Azur, by using 3 successive undulations.



On the 16th November, 1947, other outstanding altitude and distance flights have been recorded above the Fayence airfield, used by the Nice and Cannes Aero-Clubs. On that day, the " C.800 " two-seater of Cannes, after the cast off at 09.50, found a 20 feet/second lift at a height of 450 feet, and could have flown over the Fayence-Saint Raphaël Grasse-Fayence circuit (60 miles). It climbed to 12,600 feet.

Also winch-launched, a second " C.800 " two-seater, belonging to the Nice Aero-Club, reached the 20,300 feet height. At this altitude, the climbing-speed was still 7 feet/second, but the crew who would have broken the world record with a barograph, endured the lack of oxygen and heating. This " C.800" flew on another 60 miles' trip along the coast and landed in Nice.

All Provence country should be prospected,

because the famous lenticular clouds have been noticed in many places under mistral conditions, including in the lee of the Ventoux Mount (6,350 feet), with several undulations on 30 miles. Lenticular clouds have also been observed at Lezignan, that is 160 miles distance from Saint Auban, in South-West.

At Aix en Provence, in the lee of the Luberon Mountains, similar waves exist. On November 10th, 1945, the Fromage pilot has climbed to 13,300 feet here, when a 50 miles/hour blew. The up-currents had a 10 feet/second value.

All these flights make us very optimistic of the future of winter Soaring in Provence. One now knows that the lift still spreads above the Mediterranean Sea. Perhaps, on future days, it will be possible to cross it and to go on to the Corsica Isle.

A mere 200 miles' trip from Saint Auban when the mistral blows . . .

By Frank Kelsey

STOCKTON TO TURLOCK CALIFORNIA

THE place was at Art. McCarty's Soaring School in Stockton.

Art. had invited me to bring my ship to Stockton to fly, and as some of the Northern California group were to be there it would be quite an outing.

I arrived in Stockton with my friend Jimmie Wells, of Burbank, California, and was disappointed when arriving there, as there was a strong cross-wind at the airport.

We set up the " Super Albatross," and with Art. McCarty flying his " Boeing " towship, made a flight to 3,500 feet and released in the vicinity of the down town Stockton area and made an uneventful glide to the ground. The group from San Francisco had arrived, and we promptly went in to town for lunch with the hope that the strong cross-wind would lessen in velocity.

After lunch, Art. noticed that there was a few cumulus forming up the valley about ten miles away and by the time we arrived at the airport there was another group forming over the airport.

Art. launched his " TG-3 " with a student in the rear seat and himself in front, and after releasing did not lose altitude and so the " Super Albatross " was towed up.

Release was made at 2,300 feet, as lift was encountered, and after a few minutes of spiralling the ship was at 8,100 feet at the cloud fringe.

Because of the strong wind I had drifted south-west of the field, and as far as I could see was the usual haze that marks the San Joaquin valley at this time of year. After flying around enjoying the sights and trying to find the correct map, which necessitated folding and unfolding three separate ones, I found myself over Modesto in very smooth air and 5,500 feet altitude. To the right I again noticed another group of clouds forming, and upon gliding under them I again picked up lift and left the vicinity after gaining up to 6,100 feet, which was at the cloud fringe and an attempt to fly into the clouds was tried but without success.

As the wind direction was north-west and Fresno was to the south, I continued on towards Fresno until I arrived at Turlock, which is 40 miles airline from Stockton, and noted the altitude now of around 4,000 feet, when I noticed clouds again forming far to the right. As I had not felt lift since leaving the last clouds I altered course and attempted to reach them. The clouds proved to be about fifteen miles away, and after gliding rapidly at high speed I arrived under them, but was unable to get any lift with altitude at about 2,800 feet.

As I was out over the San Joaquin river bottoms and Los Banos or Crows Landing as the nearest airports, I did what the man did that swam the river until almost to the other side, and figuring that he couldn't make it, turned around and swam back to the other side.

I was afraid that I couldn't make these fields, so that a glide back across wind to the last airport I had passed was attempted.

With a certain amount of sweating I arrived at the field with enough altitude to entire the flight pattern with a BT and a Luscomb and land at the Turlock Airport located six and a-half miles south-west of Turlock and operated by Larry Atwood.

A check of distance by Larry Atwood showed 42 miles airline distance and time in the air of a little over an hour.

It was quite a kick to watch the eyes bug out when I landed and rolled up to the line of parked ships. They asked if it was everything from a new army rocket job to a ship that had lost its propeller and landed on its belly with the gear folded up.

When I told them that I took off from Stockton they just snickered.

Most of the flight was at a speed of around 75 to 80 miles per hour, and with the tail wind I figured that I was crossing the ground at around a hundred after checking the course I flew against the time elapsed.

The flight was started around three o'clock and landing just after four, and with the short days I knew that I didn't want to land except at an airport or I would be all night retrieving the ship. Otherwise I believe that properly flown a person could have made the coast range and followed on down the valley as long as time would permit.

(*With acknowledgment to " The Thermal "*).

ULTRA LIGHT AIRCRAFT ASSOCIATION

UNDER the terms of the proposed new ultra light Category C. of A. future construction of ultra light aircraft by amateurs in this country will be governed by two major requirements which must be met before the aircraft will be allowed to fly. The first of these is that the design used shall have been approved by the Air Registration Board and the second, that aircraft built to such approved designs shall be inspected during construction to ensure that no unauthorised deviations or modifications take place, whether of material used, interpretation of detail or standard of workmanship employed.

When one realises that the purpose of approval of designs by the A.R.B. is to ensure that an aircraft will be suitable, both from an aerodynamic as well as from a strength point of view, for the purpose for which it is designed, the need for insistence on the second requirement mentioned above will be obvious. It would clearly be a complete waste of time for a designer to spend a great deal of time and effort making certain that his aircraft would have adequate strength if every Tom, Dick, or Harry of an amateur could come along and interpret the design in his own way, using, say, ½-inch square box wood because it is ready to hand although the specification calls for 1-inch square aircraft grade spruce. Equally, it would be absurd to insist on strict compliance with the specification if the design itself was unsound, as might well be the case if A.R.B. did not insist on checking a designer's work before giving their approval for aircraft to be built. The truth of the matter is that the two main requirements which will govern amateur construction, approval of design and inspection during construction, are complementary and that one is worthless without the other.

While the construction of an ultra light aircraft is a job which almost anybody capable of using tools can undertake under suitable guidance, designing an aeroplane is quite a different matter. Study of books on aerodynamics may enable an enthusiast to gain sufficient knowledge to produce an aircraft design which is satisfactory from an aerodynamic point of view but that is only half the battle. Of every hundred amateur designers who got so far, it is doubtful whether more than one or two would be capable of producing a satisfactory detailed design, much less making the necessary stress calculations and it is because of this that we cannot see a big future in the ultra light movement for individual designs. Only disappointment will come to those of our members, who, due to lack of knowledge or experience, produce designs which cannot secure A.R.B. approval.

Quite apart from these difficulties, however, approval of a design by an unknown designer is an expensive business and it would clearly be most uneconomic if, say, each Group produced its own design, thus being put to the trouble and expense of getting type approval for an aircraft which might, in fact, differ very little from designs produced by neighbouring Groups.

As we see it, the requirements of members will best be met if approved designs are made available for their use by the Association and this can be done with minimum expense and delay by concentrating for the present on a limited number of designs. The immediate need is to get Groups building so that their members can get airborne with a mimimum of delay and to judge by the number of enquiries we have had for designs, most members agree with us on this point. But, as we have stated, designs used must be approved by the A.R.B. and until the requirements of the new ultra light category C. of A. have been finalised, we cannot distribute blue prints nor can they be obtained from other sources. We must, therefore, ask our members to be patient for just a little longer. Everything that can be done is being done to hasten the time when active construction and flying can be started and members can rest assured that once designs are available, we shall not keep that knowledge to ourselves one minute longer than is absolutely necessary.

We have been conscious for some time that there are many points of interest common to both the exponents of gliding and those who believe in ultra light aircraft flying and this belief has been further strengthened by letters we have received from members of gliding clubs as well as by unofficial approaches from gliding clubs themselves suggesting that such clubs be permitted to affiliate to U.L.A.A.

Since the gliding clubs are already catered for by the British Gliding Association any attempt on our part to enter the gliding field by duplicating facilities already provided by B.G.A. would be unthinkable, but at the same time we believe that a useful purpose would be served by providing means whereby gliding clubs could keep in close touch with our activities. However, we considered that no decision on this question should be taken until the B.G.A. had been consulted. This has now been done and we are glad to be able to inform those concerned that the Council of the B.G.A. has now advised us that any affiliation between U.L.A.A. and individual gliding clubs is purely a private matter between us and the clubs concerned and one which the B.G.A. regard as being outside their normal sphere of control. The way is clear, therefore, for those gliding clubs whose members are interested in our work—particularly in so far as it is concerned with auxiliary-powered sailplanes and powered gliders—to join U.L.A.A. However, since full affiliation to U.L.A.A. can only be offered to clubs and groups formed for the specific purpose of operating ultra light aircraft, we can only offer Associate Membership to gliding clubs. The fee for Associate Membership is £5. 5s. 0d. per annum and gliding clubs interested in joining in this way are invited to apply to the Hon. Secretary, U.L.A.A., for further details.

Ultra light aircraft have, up to now, invariably been single-seaters and opinion is sharply divided as to the feasibility of designing a satisfactory two-seater within the weight limitations of our class. Assuming that such a two-seater could be produced, there is still a large measure of opinion against the desirability of encouraging amateurs to build passenger-carrying aircraft and we ourselves believe that it will be necessary for us to prove that safe ultra light single-seaters can be constructed before we embark on more ambitious two-seater projects.

While a number of our members are qualified pilots and therefore in a position to enjoy the use of the present single-seat types, the greatest proportion of our membership consists of people who have, at best, only a few hours' dual training to their credit and in the absence of suitable ultra light two-seaters, the question of providing facilities for flying training for members of Groups which build their own single-seaters presents a difficult problem.

Actually, there are two solutions, namely for Group members to receive instruction in conventional club two-seaters up to solo standard or, alternatively, to go through a complete course of solo training. So far as the first is concerned, high charges will normally be against many of our members being able to learn to fly in this way although a club with a large membership operating on the lines of the Gloucester Flying Club (or, on a smaller scale, the Community Flying group at Reading) can reduce the cost of dual instruction to a figure just over £1 per hour. Nevertheless, for a construction Group to obtain its own " light " two-seater trainer will normally be out of the question if only because the average size of such Groups will be so small that outright purchase of such an aircraft will not be a feasible proposition and to buy it by easy payments would put an extremely heavy financial load on the Group.

The alternative system of solo training seems, therefore, to be the logical answer. In actual fact, solo training is nothing more than extension to the powered flying world of training principles already well tried in gliding clubs. Instead of ground slides in a primary glider, however, solo training for powered aircraft makes use of a Ground Trainer. This may be described broadly as a clipped wing aircraft incapable of flight, but able to run along the ground under its own power and which is able to execute banked turns without leaving the ground. The purpose of the Ground Trainer is to give practice in handling normal aircraft controls and to make the pupil " throttle conscious " while running along the ground at speed which may be in excess of the normal take-off speed of a conventional ultra light.

The controls of the Ground Trainer are designed to have the same " feel " as those of a powered-glider type of ultra light to which a pupil can graduate with confidence (after a suitable period on the Ground Trainer) for a phase of training equivalent to the " low hop " stage of glider training. However, the pupil is not allowed to enter this stage of training until he is thoroughly " throttle conscious " in order that, after a further period of slow and fast taxi-ing in the motor glider with restricted throttle setting, he can be sent off on his first low hop without danger of him freezing on to the throttle. To obviate any danger here, a simple device can be added to the aircraft so that the motor is cut as soon as the machine leaves the ground and cannot be re-started until the aircraft has come to rest again.

From low hops the student can progress gradually to high hops by well regulated stages, all flying during this phase being carried out down the length of the aerodrome, until eventually sufficient experience has been gained to enable the student to make his first single circuit.

A number of people have written suggesting that this system of training would be highly dangerous although it is interesting to note that invariably those who make this criticism have little, if any, flying experience themselves and certainly none of solo training. The system was, in fact, tried out with great success before the war by the late Sqn. Ldr. Kronfeld (of ultra light and gliding fame) and many experienced flying instructors we have approached are confident that it is a thoroughly practical and certainly the cheapest, method of learning to fly. Construction of a Ground Trainer can, too, provide a useful preliminary exercise in aircraft construction and, although it has been suggested that such a Trainer would be a dead loss once all members of a Group have learned to fly, we are confident that new Groups would be only too ready to buy or hire a suitable Trainer from such Groups as had no further use for it. There seems scope here, too, for the construction by joint effort of a Ground Trainer for use by a number of Groups in the same area, but in any case we would suggest that the idea of solo training should not be dismissed by our members without giving the system a really good trial.

Before finalising and publishing our " Solo Training Syllabus " for study, we wish to collect all available evidence and any Members who have themselves built and used a Ground Trainer and learned to fly by " solo training " are invited to let us have their comments as soon as possible.

Design Supplement

Contributed by G/Capt. E. L. Mole—Chairman, Design Sub-Committee.

As members know, we are negotiating with the A.R.B. to obtain a new category C. of A. for ultra light aircraft with concessions to cheapen their cost and to permit home construction from approved designs by suitably qualified Groups. During the past month we attended a meeting at A.R.B. to discuss our proposals in detail. The A.R.B. staff could not have been more sympathetic with our aims, and were most co-operative in meeting most of our demands. The U.L.A.C. of A. requirements are now being drafted by A.R.B. and it is hoped that we shall be able to publish full details before long so that Groups will be in a position to start building aircraft which can be granted a C. of A. on completion.

Sqn. Ldr. P. Stanbury, D.F.C., well-known as a jet plane test pilot, has written to us describing a design project in which he is interested. He suggests

fitting a motor-cycle engine developing about 20 b.h.p. to a primary type of glider to give the cheapest possible form of powered aircraft. He proposes that the engine, propeller and fuel tank should form one unit and be fitted as a pusher just behind the pilot's seat. The propeller would be belt driven to obtain a suitable reduction gear and a smooth drive. The power unit would be made easily detachable so that without the motor, the aircraft could be used for " ab initio " glider training in the normal way. Later, with the power unit fitted training could be extended to power flying. He admits that the machine would not be everybody's dream but claims that it would enable pupils to be trained very easily, and when trained they would have available a powered aircraft capable of short cross-country flights in good weather.

Presumably Sqn. Ldr. Stanbury is visualising the simplest possible airframe with a cockpit nacelle, strut-braced wings, steel tube tail booms and with a single wheel-cum-skid undercarriage. The primary principles behind such a design would be robustness, cheapness and extreme simplicity, while aerodynamic refinements, efficiency and performance would be of secondary importance. The writer considers such an aircraft to be perfectly practicable and recollects the pre-war Dart "Flittermouse," designed by Mr. A. R. Weyl, which was of similar conception but without the detachable engine. Although the prototype flew satisfactorily, its flight trials were not completed owing to the lack of a suitable engine. We would like to have the views of members interested in such a project, and would be glad to put enthusiasts in touch with Sqn. Ldr. Stanbury so that ideas can be exchanged.

We previously discussed the uses of the auxiliary powered sailplane and have since received a number of opinions on their merits, both for and against. From some of these it appears necessary that we should define clearly the difference between auxiliary-powered sailplanes (U.L.A.A. Class IV) and motor-gliders (U.L.A.A. Class III).

Auxiliary-powered sailplanes are essentially sailplanes of high aerodynamic efficiency which are fitted with a small auxiliary motor (about 10 b.h.p.) to enable them to take-off and climb to the height required for soaring. Whilst soaring, power is shut off and the engine is retracted into the aircraft (or the propeller feathered) in order to achieve maximum gliding performance.

Motor-gliders on the other hand, operate as normal-powered aircraft, but, having a glider type of wing loading, can be flown cheaply and safely with engines of low power (about 25 b.h.p.). Although their cruising speeds are low, their take-off and landing runs are extremely short. As they are not intended for soaring flight they do not require the aerodynamic refinement of a sailplane (their aspect ratios are unlikely to exceed 12:1), and they are consequently cheaper and easier to construct than auxiliary-powered sailplanes.

Mr. A. R. Weyl, designer of the Dart " Kitten " and other U.L.A. types, considers the auxiliary-powered sailplane to be a potentially dangerous hybrid. He quotes instances of failure due to flutter induced by engine vibration into the necessarily flexible sailplane wing of high aspect ratio. This is a serious consideration which calls for great care in design and construction. Mr. Weyl prefers the rocket system of propulsion to enable a sailplane to climb to soaring height—but this system, of course, puts the aircraft outside the U.L.A. classification.

Mr. J. A. Allan has written an interesting paper on this subject in which he admits that the auxiliary-powered sailplane offers unlimited flying on suitable days without the necessity of a crew and at very low cost. He thinks that powered flying around an aerodrome would soon become monotonous and suggests that soaring flight would keep a trained pilot interested. Such aircraft, he claims, would offer possibilities for valuable research work into the structure of the atmosphere which might greatly increase the range of conditions in which soaring is possible. He considers that a small engine of about 10 b.h.p. would be adequate since take-off could easily be assisted in normal glider fashion and a low rate of climb would suffice since height could be gained by soaring. Mr. Allan thinks, however, that an i/c engine is really unsuitable and prefers a system giving a short period of high thrust, such as a rocket or V.1 reaction motor, if this could be provided without too much expense.

Mr. Allan also points out some snags to the auxiliary-powered sailplane. No suitable engine nor airframe design (other than the " Scud III ") exists in this country. He thinks that the weight of the power plant plus the additional weight of airframe due to increased strengthening would reduce the sailplane's performance considerably—and no simple sailplane can have such a good performance that it can afford to sacrifice anything to a compromise. In addition, he points out that an efficient sailplane must have a large span which makes it inherently expensive to build.

A solution to the problem is, however, put forward by Mr. Allan who suggests that a two-seater sailplane can be used. This need not be constructed with an eye to ease of dismantling for transport by road and could therefore be cheaper and easier to build. Instead, it could be fitted with a detachable power unit (Mr. Ince's scheme again) for transport by air to suitable soaring sites and for retrieval after cross-country flights. With the engine fitted it would be flown as single seater and would, therefore, have adequate load factors to carry the weight of the power plant without additional strengthening. Mr. Allan considers that this suggestion would be the greatest boon to the gliding movement by eliminating the need for transporting 2-seat sailplanes by road, which otherwise is made extremely difficult since they are too heavy to be towed by the average club member's car.

Mr. Allan thinks that such an aircraft might be accepted by the A.R.B. as a glider and would not, therefore, require to obtain a C. of A., thus reducing its development cost. Here we must disagree with Mr. Allan since the fitting of a power plant introduces vibration effects and fire risks which must be covered by A.R.B. airworthiness requirements. In any case gliders will shortly be required to obtain C's. of A.

We have discussed the snags outlined by Mr. Allan with Mr. L. E. Baynes, designer of the successful Carden-Baynes auxiliary-powered sailplane. The engine used in that aircraft was a specially converted 250 c.c. Villiers motor-cycle engine, which Mr. Baynes thinks might be revived if an adequate demand exists. Unfortunately, he said the drawings of the airframe (" Scud III ") were largely destroyed by enemy action during the war but he considers that practically any sailplane of 45 ft. span or over could be converted providing it had a suitable fuselage neck on which the power plant could be mounted.

Mr. Baynes disagrees with Mr. Allan about the loss of performance of the sailplane due to the weight of engine, etc. On his design, the weight of the complete power plant, including retracting mechanism and airframe conversion, was under 50 lb. When the power plant was retracted, it did not affect the sailplane's optimum gliding angle but its weight merely increased the relevant gliding speed (and consequently the sinking speed) by about 5 per cent. This, in Mr. Baynes' view, was negligible, being less than the order of difference between one good sailplane and another.

Mr. Baynes is an enthusiast for the auxiliary-powered sailplane, which he considers to be the logical answer to cheap flying and which provides the pleasures of soaring without the disadvantages of the sailplane's immobility on the ground. He stresses the safety aspect in that engine failure is not so serious as with normal aircraft merely meaning that the aircraft reverts to its sailplane role. Consequently, a cheaper grade of engine would suffice.

We have also received a letter from Mr. D. C. Armstrong, who is interested in the auxiliary-powered sailplane but visualises some difficulty in providing a means of starting the engine from the cockpit whilst in flight which he considers to be essential. In the Carden-Baynes Auxiliary, this problem was overcome by means of a cable-operated ratchet round the engine drive shaft, the ratchet being worked by a lever in the cockpit. This device was also used to centralise the propeller before retracting the engine into the fuselage. An alternative scheme is suggested, however, in designs where a feathering propeller is fitted, as the engine could be rotated simply by driving the aircraft whilst unfeathering.

" Drone " Crash.

Following on the report of the Ministry of Civil Aviation on the " Drone " crash which recently occurred at Gerrard's Cross, an official of the Ultra Light Aircraft Association has commented :

" The U.L.A.A.—of which Mr. Conry was not a member—desires to point out that the Association was formed to control the use of ultra-light planes in such a way as to prevent accidents of this kind.

" This object will be achieved by strict rules for the proper maintenance of ultra-light planes and for the control of all flying activities.

" The Association deplores the ' Drone ' accident at Gerrards Cross, as irregular flights of this kind can bring the whole ultra-light movement into disrepute.

" At the same time, it should be pointed out that if the Civil Aviation Ministry had come to an earlier decision to re-issue permits to fly the accident might never have happened, as Mr. Conry's application for a permit would have led to an official inspection of his aircraft."

BRITISH GLIDING ASSOCIATION.

ANNUAL GENERAL MEETING

THE Annual General Meeting of the British Gliding Association Ltd. (No. 422605) will be called for Friday, 27th February, at 5.30 p.m. in the Conference Room, Londonderry House, 19, Park Lane, London, W.1.

The Agenda will include :

(a) Appointment of Chairman and Vice-Chairman for 1948.
(b) Appointment of Honorary Officers.
(c) Election of Council for 1948.
(d) Financial Statement for the year 1947. Budget for 1948.
(e) Decision on Entrance Fees and Subscriptions for 1948.
(f) Report from the Council.
(g) Report from the Sub-Committees.
(h) Appointment of Auditors for the year 1948.
(j) Report on the aircraft and equipment position, and growth and activities of the Association during 1947.
(k) Report on the preliminary arrangements for the British Entry in the 1948 International Gliding Competitions.

The retiring Chairman will take the Chair at the Meeting until the new Chairman is elected.

In accordance with the Memorandum and Articles of Association and the decision of the Council on the 28th November, 1947, lots have been drawn and the following Members of the Council, who are eligible for re-election, will retire at 5.30 p.m. on 27th February, 1948: G. A. Hinchliffe; P. A. Wills, C.B.E.; L. Wright.

Mr. S. G. Stevens will, at his own request, also retire at the same time, and he does not wish to offer himself for re-election.

Functions and Duties of the Council.

The attention of Full Member Clubs is drawn to the resolution of the Council, which reads as follows :

" The Council wishes to stress that it acts for all the Clubs of the Association, once it is elected by the Clubs at a General Meeting, in accordance with Articles 28 and 33 of the Memorandum and Articles of Association ; and that Members of the Council are elected in their personal capacity and not as direct Club Representatives on the Council.

" Article 32 is intended to insure an even distribution of Club nominees on the Council, and does not imply that individual Clubs as such are directly represented on the Council."



TO be able to start with an aerotow is a great advantage when looking for thermals. On the winch or on a car tow the chance of releasing in a good upcurrent is very small, and even a high launch will give relatively little time to search the heavens for that elusive lift, though the experienced pilot will have noticed that there is usually something to be found over one particular spot in the field, and will at once make for that on release. (There is a theory that ground thermals start up at intervals of from ten to fifteen minutes from roughly the same spot, and it is worth watching for the psychological moment if you are able to choose the time of your tow.)

With an aerotow the amount of sky you can search is limited only by the amount of cash you can afford to spend—and if the tug pilot is also a soaring pilot he can economise for you by going direct for the most likely places and seeing that he gains height where it can do you most good. On a day of violent contrasts it is easy enough to see where the uplifts thrive and an experienced tug pilot can make sure that even a beginner releases in the best possible zone. He waves his hand, you drop the cable and circle—and there you are, bang in the centre of a beautiful thermal and steadily rising! Wonderful.

The take-off behind an aeroplane is quite different from any other type of take-off, but it is very easy to master. The thing to remember is that the sailplane will leave the ground appreciably before the aeroplane. The sailplane should then be flown only a couple of feet off the ground until the towing plane is well up, or there is a danger that the glider might lift the tail of the aeroplane and cause it to bury its propeller in the ground.

Once well in the air the sailplane takes up its position straight behind the towing plane and a few feet above it. (Some schools advocate towing below the tug, but this means possible trouble with the slipstream and is a much harder position to hold). If the tug-pilot is experienced he will now hold a steady speed, gain height in a series of wide circles or else directly upwind, and all you have to do is follow quietly along behind him. On a calm day this is simplicity itself. Bank when you see him bank, and keep a little inside the turn rather than outside, but not too much or your cable will slacken and hang below you. If it does this, slide out a little bit and take up the slack gently. The idea is to follow as smoothly as possible, not to advance in a series of jerks. Jerks strain the cable and cables are expensive. Try to anticipate what the tug pilot will do next and fly steadily.

It is easier to follow if the aeroplane is flying fairly fast. A slow tow is acute misery; the cable drags slackly, the sailplane wallows all over the sky, and you finally release in some quite unsuitable spot because you are just too exasperated to hang on any longer. A fast tow is very much easier, but too much speed is a strain on the glider.

In bumpy weather an aerotow is sometimes very difficult. Violent thermals will send the aeroplane shooting up above your head and it will need your stick pulled hard back to catch up before the cable breaks. Then a sudden downcurrent will find you far too high, and you will have to slip off height as quickly as possible—only perhaps to see the aeroplane shooting up past you again as it enters another thermal. Flying on such days as these is very interesting indeed, but very exhausting if you have to stay long on the tow—as you may do if you are being retrieved after a distance flight. But you will find that with experience you can follow tranquilly in almost any weather, and it is pleasant after a period of concentrated hanging-on to have the pilot of the tug tell you that you followed lightly as a feather.

Finding thermals in these conditions is relatively easy. The aeroplane indicates by a sudden rise that it is entering an upcurrent. If you judge the lift sufficient to be worth while, release at once and start circling as soon as you have settled down from the speed of the tow. Some machines have a tendency to stall at this moment. Never mind. Keep your stick steady and let her drop. She will recover immediately. It is really that you have misjudged the difference between towing and flying free and probably kept your nose a trifle too high. Settle down quietly, look around you, glance at your instruments. If your variometer shows lift begin to circle fairly tightly. If you have miscalculated and released where there is nothing, fly gently upwind and use the time to fix the position of the airfield and the features of the surrounding countryside firmly in your mind. Then, if there is still absolutely nothing doing, you can use your tow to practise co-ordination. Fix on some point ahead and try by using rudder and stick to keep your machine steadily rolling from side to side without changing the direction of flight. It is a very good exercise. Practise steep turns, too. And if you have a specially strengthened machine, practise aerobatics while you still have plenty of height. Sailplanes can be made to loop, spin, and stall-turn and they re-act beautifully. But remember—PLENTY of height always, a machine that is strong enough to stand it, and a parachute just in case . . .

GLIDING IN NEW ZEALAND

By Fl./Lt. J. H. DAVIES.

GLIDING in New Zealand promises to be a very real thing in the near future. I have just returned from two months' leave there, and during my travels up and down the country contacted quite a number of enthusiasts. Before the war no gliding or soaring of real importance was carried out, except for Primary flying in machines such as " Dixons," mostly backyard built. On return to New Zealand after nearly seven years' absence I began to look at the country's contours with more of a gliding and soaring eye. I was amazed at the number of potential soaring sites in both islands. New Zealanders who contemplate taking up the sport should have no difficulty in this respect. Two I have in mind close to cities are the Rougotai and Taieri Airports near Wellington and Dunedin. Apart from being surrounded by good soaring slopes, light aeroplane clubs are functioning there which could be available for aero-towing at fairly cheap rates. The light power clubs in New Zealand being subsidized by the Government result in a very cheap solo flying rate of £2. 10s. per hour—much cheaper than in England. In fact, New Zealanders have much better conditions for the sport than a lot of clubs in England have been able to find.

Some clubs have been formed in the main towns and cities, but so far the acquisition of machines is the main problem. Dunedin, Christchurch, Wellington, Wanganiu and Auckland have either formed clubs or are in the process of doing so. The members I met have the type of keenness and enthusiasm which will overcome the difficulties which always beset newly-formed clubs. They follow closely gliding activities in Australia and if one can judge by the Australian clubs' interesting articles in recent editions of SAILPLANE they are certainly not lagging behind in the gliding and soaring world. The EAGLE, Australian equivalent of the SAILPLANE, has found its way to New Zealand too.

On the 20th September a meeting of all enthusiasts and members of the Civil Aviation Branch (equivalent of the English Ministry of Civil Aviation) was held at Air Dept., Wellington. The Director of Civil Aviation, Mr. A. E. Gibson and Mr. E. F. Carpenter, Civil Aeronautical Engineers to the department, were present. They both outlined the government regulations and answered queries put forward by club members and enthusiasts, and gave valuable advice. A New Zealand Gliding Association and a Technical Committee, headed by Professor Leach of Auckland University, were formed. Some enthusiasts thought that there were rather too many restrictions by the Civil Aviation Branch on the import and construction of gliders and sailplanes. But on studying the Civil Aviation Publication No. 1 on the requirements for the importation and construction of approved types in New Zealand by approved firms were certainly all-embracing, but were not in any way " restrictions." On the contrary they appeared to be extremely sensible regulations imposed for the overall safety of flying in New Zealand. In fact all they amounted to were this :—

To import a machine—

1. Make an application to the Civil Aviation Branch to import a machine.
2. A C. of A. issued by the country of export.
3. A certified copy of the history of each machine.
4. A copy of the manufacturers' service and instruction manual and as such information as necessary for the assembly, safe operation, and maintenance of *each type* imported.
5. A " Type Record " for *each type* imported (which is a good point in favour of standardization of types imported). For instance only one " Type Record " would be required for use at Civil Aviation Branch Headquarters of each glider or sailplane irrespective of the number imported.

As a point of interest a " Type Record " consists of the following :—

1. A 3-view general arrangement drawing of the aircraft.
2. A complete list of all drawings (with issue numbers) covering the aircraft.
3. Maximum weight or weights, and a range of movement of centre of gravity at which compliance with the requirements is claimed.
4. A summary of the design calculations.
5. A report on the flight characteristics of the aircraft, which shall be specified in a manner convenient for calculating the aircraft's performance over a reasonable range of weights, altitudes and atmospheric conditions.
6. All performance figures quoted above shall have been corrected to standard conditions.
7. All addenda to the " Type Record."
8. A Certificate stating that the " Type Record " completely covers the aircraft and that it complies with the Civil Airworthiness requirements.

It should be noted that only a *list* of drawings is required ; this obviates expensive and bulky sets of drawings.

This " Type Record " seems a very sensible requirement on the part of the Civil Aviation Branch. The same applies to regulations or " requirements " as they should be called—for the manufacture of machines in New Zealand by approved firms.

The days of backyard building are past ; so much progress has been made in recent years the machines to-day are a highly-finished product of experience, materials and workmanship. There are two alternatives remaining to New Zealand Clubs—importation of machines and local construction by approved firms ; either of approved British and American types or of types of their own design approved by the Civil Aviation Branch. Obviously clubs will have to wait a long time for their flying if they wait for locally-constructed machines. Admittedly, importation of machines is an expensive business partly due to New Zealand's distance from the main manu-

facturing countries. But to obtain a start and maintain interest in the sport some machines of a proved type could be obtained in kit-sets at fairly moderate prices, the freightage would not be too high on a kit-set. Again, New Zealand Clubs would have to agree on types to be used and standardize them. The advantages of standardization are obvious :—

1. Only *one* " Type Record " for each type would be required by the Civil Aviation Branch.

2. As experience is gained by the operation and maintenance of a type, mutual assistance between clubs can be effected.

3. Interchangeability of spares between clubs.

4. Standard types for inter-club and club competitions in the separate grades.

To make an order worth while to an overseas manufacturer the New Zealand Gliding Association could have clubs agree on standard types for Primary and Intermediate training and soaring. Then place a collective order with a manufacturer. With an approved firm in New Zealand carrying out repairs and overhauls under licence from the manufacturer, valuable experience would be gained for the full construction of machines at a later date.

Unity of thought and concerted action by all clubs through their association should see rapid progress in the sport in New Zealand. I am sure the British Gliding Association are only too willing to help the New Zealand Gliding Association in their selection of types and importation of gliders and sailplanes, and in major difficulties they may encounter.

I visited the Director of Civil Aviation and Mr. Carpenter at the Air Department in Wellington. Mr. Gibson hopes that gliding and soaring will become a national sport in the country. Mr. Carpenter is also extremely keen to see the sport progress and explained the New Zealand requirements for the sport. I was very grateful for their interesting information.

In my talks to enthusiasts, I rather gathered the impression the clubs in New Zealand are trying to do too much as individuals. To make any real progress at all, it is essential that they get together and become organized with a truly representative New Zealand Gliding Association. The sooner this is done the sooner they will be flying.

With New Zealand's entry into the Gliding and Soaring World the Dominions of the Empire are complete. We hope soon to see competitive flying between Australia and New Zealand and perhaps other countries in the future. So " Press On " New Zealand and let us hear of your progress in SAILPLANE from time to time.

MORE ADVICE ON LANDINGS

FOR "C" PILOTS

High Wind Approaches

" During a display before a large crowd at which his father was present a pilot gave an exhibition of gliding in a high wind. He failed to judge the wind force and turned almost too late over the high tension power lines at the edge of the field, prior to landing near the crowd. He hung almost motionless over the power lines, but managed to just scrape over the top safely and land short of the exhibition ground. He had simply overlooked the strength of the wind, and failed to allow a margin of safety for a high wind approach and involuntarily drifted in the glider over extreme danger.

" His father appreciated his skill as a pilot, but this time he became voluble in his remarks concerning his son's lack of judgment and proceeded with some really ' high tension ' advice on pilotage."

This incident although related with a humorous touch illustrates the necessity for making allowances for the increased drifting in a turn or when flying against a high wind. The turn must be nicely timed and allowance made for the wind so as to permit the glider to be within reach of the landing field. In the above illustration the turn should have been completed above the bounds of the field and not outside its perimeter—where stretched the power lines.

Ground Friction Effect

During high winds it is quite usual to encounter decreasing velocities near the ground. The pilot may observe this condition during his approach and at 100 feet he may have very slight forward speed or at times may be forced backwards. He must exercise extreme care when approaching his last few feet above the ground for there will be an area of air very turbulent and less in velocity due to ground friction. The sharp buffets of gustiness will warn him to keep a little extra speed in reserve, and he must not be deceived by the glider " appearing " to gain on the wind as it nears the ground. This is a warning that the ground effect has been reached and he must hold his glide with reserve speed rather than ease it off. Severe turbulence will call for every bit of reserve pilotage that the pilot has at his command to bring his glider safely down. To do so, he must conserve his speed in the glide and not permit his gain over the ground to lead him to believe flying speed is increasing.

High Wind Turns

Often when flying in strong winds, the pilot is confronted with a last minute turn into wind. When possible he should begin his turn somewhat higher than in milder conditions. This will be quite evident owing to the fact that the drift in high wind turns causes the glider to traverse a greater distance and

by doing so loses more units of height for each degree of turn. The drift may be alarming to new pilots and the sensation of skidding outwards often tempts the pilot to apply more rudder into his turn. This only adds to the difficulties, particularly if he has lost considerable height and finds the ground uncomfortably close. The skidding outwards will stop abruptly if full opposite or top rudder is applied while in the banked turn. Applying opposite rudder permits the glider to side-slip into the drift and the amount of rudder applied depends largely on the wind and the turn. If the slip produced is sufficient to bring the glider into wind the rudder must be straightened out and the wings levelled up before landing in the normal manner. If this is not possible, the pilot may still land his machine safely in the cross wind as illustrated below.

Cross Wind Landings

The cross wind landing is not so difficult if the air is free from severe gustiness. The drift is offset by simply side slipping into the drift until the ground assumes its head on approach, remembering at the same time to maintain a good margin of speed for controlling and levelling out. The approach will be made by holding down the wing nearest the windward side and applying opposite rudder. The amount of aileron and rudder applied will entirely depend on the strength of the wind and the amount of slip required to offset the drifting.

Down Wind Landings

Deliberate down wind landings in a high wind certainly has its element of risk. Overshooting the landing ground is the gravest danger but providing the landing strip is free from bumps and of good length, the landing should be quite simple and spectacular. In 1935 the writer landed downwind at an estimated speed of 75 miles per hour. This was done on a mile long airport with a 40 m.p.h. wind blowing, the wind speed reading having later been confirmed by the weather man. Great difficulty was experienced in holding the glider earthbound at the start and owing to the rough air, the tow rope was cast off at about 200 feet. The 180 degree turn was most hair-raising and the glider appeared to slide down a greased chute as it turned away from the wind. It passed over the centre marker on the field at about 10 or 15 feet travelling at very high speed; slid several hundred feet on its skid and in slowing down was turned about vane fashion until the nose pointed up-wind. When the wind caught up on the glider from behind as it slowed down, great difficulty was experienced in preventing it getting under the wind and overturning it. Even with the stick kept fully forward the glider was blown backwards until the rudder came into contact with the boundary fence where it remained until the crew arrived and removed the glider into the hangar then a mile across the airport. This is certainly an extreme example but will serve the purpose of illustrating the danger to be expected if a forced landing is a necessity over tricky landing grounds.

Such landings in high winds should never be attempted and the pilot can certainly expect to break his glider up if the ground is uneven, causing the skid to be torn off and consequently overturning. Landing downwind in light winds over smooth ground with a suitable field ahead is approached in the normal way, the pilot having only to land lightly on the skid and keep the slide as straight as possible.

Landing Uphill

Cross country flights present many hazardous landings. Among these is the possibility of having to make a landing up a slope. Landing on steep slopes are more difficult than landing on a gentle rise of land. The approach must be steeper than usual for it is necessary to dive at the slope, succeeded with a sharp pull up to climb parallel with the hill side until the glider loses momentum and settles down. It is evident that speed is essential to effect a landing—the steeper slopes necessitating the faster approach.

Obstacles

" I caught some very good lift at about 300 feet. It suddenly petered out leaving me a considerable distance from the landing field with barely sufficient height for a safe return. However, when about 60 feet high I realized it was to be touch and go whether I cleared the barbed wire fence. Putting the nose down, I dived just short of its base, and when almost at ground level, pulled the stick and hurdled over—pushed the nose down to prevent a possible stall and glided rather steeply to regain speed before levelling out and landed smoothly, with the barbed wire behind me.

Another time I tried to land in a " two-by-four " field and overshot. Again, I tried the hurdling technique over a second wire fence but failed to begin the dive soon enough, and without having gained sufficient speed pulled the nose up only to sink back neatly between two strands of barbed wire. I was rescued only just in time for the two strands stretched taut across my chest and slowly and painfully pressed all the wind out of me."

These two illustrations are self explanatory and should leave the pilot with no apprehensions regarding the requirements and difficulties of surmounting obstacles.

POLISH GLIDING NEWS

DURING 1947 a number of flights of over 100 miles were made, including two of more than 218 miles.

One pilot in the Aeronautical section of the Polytechnic of Cracow obtained the category " E " (British Golden " C "), and two others fulfilled one condition for this certificate.

The two Polish pilots who took part in this year's International Contest at Samedan are members of the gliding-centre at Balice near Cracow, which is a training ground for the pilots of the city, and for those who are members of the students' Aeronautical Section of the Polytechnic of Cracow. Balice is one of the most active centres in Poland.

VICTORIAN MOTORLESS FLIGHT GROUP

IN this, the first of a series of monthly newsletters, there is not much in the way of flying to report. It is only recently that the members have emerged, round-shouldered from hours of stooping over wings, bleary-eyed from doping, nerves a little shattered from patriotically attending the parties by means of which the Social Sub-Committee (a tower of strength, bless 'em) kept the old wolf from our door, emerged blinking at the sunshine and those luscious cu. nb. which have lately made us scream with frustration.

Training re-commenced on Saturday, 28th September, and continued—spasmodically, due to the weather—until 22nd November. Looking back over those week-ends, your correspondent, in addition to reporting that Rhon trainees Nance Iggulden, Jack Scully, Bon Vicary, Alan Beaton, made very pleasing progress, must also report that, come the Depression, the aforementioned, together with instructors and helpers, could get jobs anywhere as Honourable Ditchdiggers or Roadbuilders. A lot of time was spent in pulling winch and tow-car out of great deep glumches of black, sticky, oozing, foul-smelling mud and slush. One occasion sticks in the mind . . . tow-car was stuck by the fence near the road. After digging out the mobile winch (located by the lucky chance that Ron Roberts's head was still visible on the surface of the bog), the winch was then got out of the paddock on to the road, where it parked ready to winch out the tow-car. Cable was run over the fence, Ron on the winch, Les Williams in the tow-car, Jack Scully, Nance and your correspondent prepared to push from behind; winch roars into action; tow-car, like the Whippet it is, leaps madly forward, Nancy and your correspondent are hurled face-first into the mire, while Jack, being made of stronger stuff, retains his hold and streams out from the back of the Whippet like a banner. One momentarily expected to see the Whippet plough through the fence and disappear, with beastly crunching noises, into the rollers, but Les and Ron, wily veteran types, had the situation under control.

Incidentally, this little pastoral scene was watched openmouthed, by a considerable gaggle of spectators who, having come to the field for a motorcycle meet decided that we were by far the better circus.

Christmas Camp was to have been held at Mordialloc. On the 22nd November, however, a further blow was struck, distinctly below the belt . . . we lost our field . . . the new lessee demanded astronomical (to us) figures for the use of it, so, stunned and shaken, we have been forced to retreat, though not before strenuous attempts had been made to convert the old er—to convert the lessee to a more generous frame of mind. However, there was no use going into a tantrum over it so we at once concentrated on obtaining an alternative field. At the moment, I'm glad to say that things look rather hopeful. You'll receive advice as soon as the location is settled.

Looking back over the past hectic months I feel, strangely enough, rather happy about things; because it seems to me that our Group has shown itself able to meet and ride blows which might well have disintegrated us. Members have shown themselves able to take the bad with the good. The winter was, of necessity, spent repairing and overhauling gliders and equipment. The workers on these projects, the members in whose homes they worked, the wives who provided warm hospitality, the Social Committee and those whose homes were thrown open for parties, the people who ran the parties and made them so successful—both financially and socially—these are the people who held the Group together, and, glancing through the list of members, I find that there are very very few who did not contribute in some way to these activities. That is something of which we can all be proud. That, and the fact that throughout this period of hard yacca, tempers remained even and a sense of humour was overwhelmingly to the fore.

Yes, girls and boys, we didn't get much flying but we had a lot of fun. Next month, I hope to be able to tell you about a successful Camp.

GRACE ROBERTS,
Assistant Secretary, V.M.F.G.

ARGENTINE NOTES

By
LEO FOLLMANN

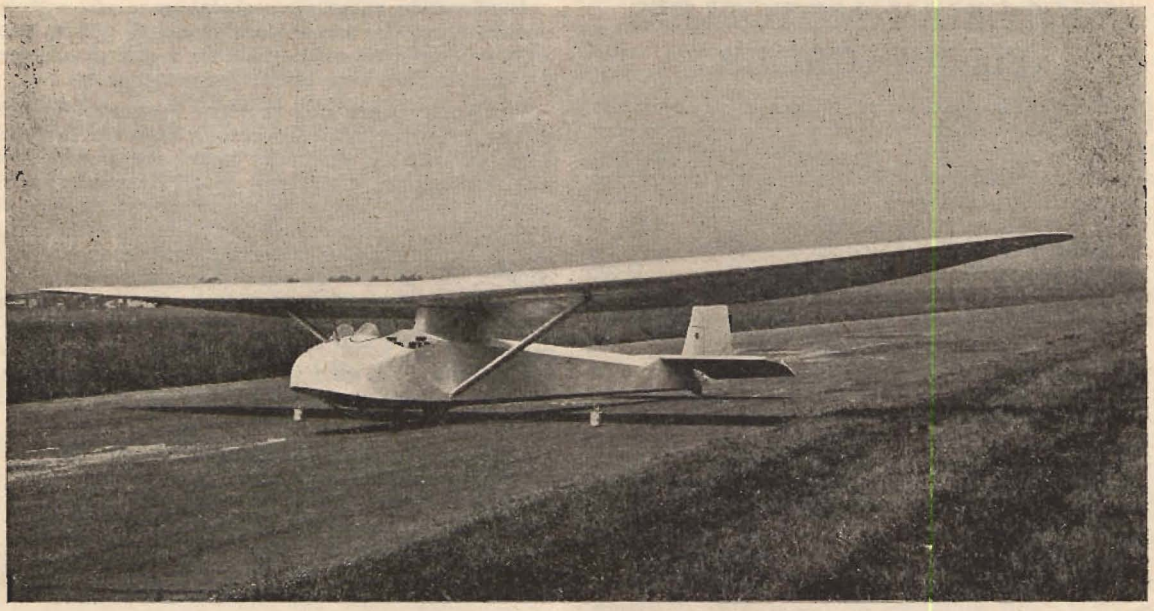
THOUGH good thermal conditions seem to prevail here from Monday to Friday only—rain at weekends—the boys somehow managed to make quite a few nice distance flights. During the last two months the following good performances were made:

Chourrout	Las Flores	150	km.
Murchio	,,	,,	,,
Dori	9 de Julio	200	,,
Chourrout	25 de Mayo	145	,,
Hereter			
Chourrour	Los Indios	180	,,
Rosmarin	Chas	132	,,
Ortner	Chivilcoy	125	,,

Sunday 28th, showed up with heavy Cu from 10 a.m. Results:

Laplace (" Spalinger S 18 ")	to Las Totoras	332 km.
Chourrout (" Viking ")	near Gualeguay	185 ,,
Conde (" Buzzard ")	San Nicolas	200 ,,
Montechiarini (" Buzzard ")	Ramallo	165 ,,
Riedler (" Buzzard ")	Ramallo	165 ,,

The three last mentioned were fetched back in triple tow. Good training for 3d Argentine Soaring Contests which will begin on February 15th at Merlo, organized by D.G.A.C. (Civil Aeronautics Department).



The "SLINGSBY T.21 B" Side-by-Side Two Seater Sailplane.

DESIGNED from sixteen years' experience in development, construction and pilotage of all types of sailplanes, the "T.21 B" is the latest general purpose two-seater trainer for all stages of gliding and soaring instruction. A structure low in weight and of great strength, ensuring economical launching and maintenance costs.

Controls are as light and effective as a single-seater sailplane. Cockpit is roomy and comfortable with maximum vision.

Fitted for catapult or winch launch, and aero-tow up to 73 m.p.h.

The "T.21 B" is now used by the three leading gliding clubs of Great Britain.

Span	54 feet	Empty weight (equipped)	592 lbs.
Wing Area	260 sq. feet	Overall length	27 feet

PERFORMANCE WITH FULL LOAD.

Gliding angle at 42 m.p.h. ..	1 in 21	Minimum sinking	2.7 ft. sec.
" " " 52 " ..	1 in 18	Stalling speed	28 m.p.h.

Designers, Manufacturers and Sole Distributors :—

SLINGSBY SAILPLANES LIMITED

KIRBYMOORSIDE, YORK.

PIONEERS OF BRITISH GLIDING.

NEWS FROM THE CLUBS

LONDON GLIDING CLUB

December. This month started poorly, with only 2 hours 2 minutes of flying up to the 19th, when the wind suddenly went round to the West and remained there for the rest of the month. The result was that we soared every day from the 19th to the 29th, excluding Xmas Day, averaging just over 10 hours per day for this period and making a total of 103 hours 30 minutes for the month.

These figures would undoubtedly have been exceeded but for the fact that this period included those few days in the year when members' allegiance to the West wind is liable to be challenged by the family circle with some prospect of success. As it was, we flew 15 hours on Boxing Day before packing up at 3.30 p.m., much to the chagrin of " Johnny " Walker, who can't abide West winds going to waste.

Russell took a steady " A " on the 21st, the same day that Dearden, a temporary member from the Handley-Page Club, took his " C." Another temporary member who made good use of the conditions, was Free, of the Cambridge Club. Arriving on the 19th, a recently qualified " C," he stayed until the 23rd, by which time he had acquired the duration " leg " of his Silver " C " and added another 10½ hours to his log book. Nice going.

This month's figures enable us to complete our records for 1947, showing that we have flown a total of 1,101 hours 44 minutes, from 4,653 launches and to have acquired 39—" A," 28—" B," and 37—" C " certificates. In addition some 21 " legs " of all types have been accumulated towards the big crop of Silver "C's " which we hope to harvest next year.

By comparison with 1946 the hours flown have increased by 550 per cent. although membership has increased by only 35 per cent. No serious accident has marred this year's activities and the crash rate has declined throughout the year; noticeably so after the introduction of stricter flying discipline and an inflexible graduation system. Maintenance and serviceability of aircraft and ground equipment now carried out on a 100 per cent. professional footing, have been of an extremely high order. Whether we can afford this and such luxuries as A.R.B. inspections, will only be known after an attempt has been made to balance the books at the end of our financial year, which is next month.

Social Spotlight. We are happy to learn that the marriage will shortly take place of Geoffrey Stephenson and Beryl Withall (nee Simon). Stephenson is, of course, the tapered end of the famous " Greig and Steve " partnership. Beryl has her own claim to fame as the original and genuine Hiscox's niece.

BRISTOL GLIDING CLUB

A slope-soaring site, operated in parallel with Lulsgate, has from the beginning been one of our aims, but although a suitable locale has been found, all hopes of its development died with the freedom of the motorist. However, it was patently necessary that hill experience should not be denied our pilots altogether, and so after some discussion it was decided to divert the " Grunau," for the winter months, to an established hill-site where it would be available to parties from Bristol. The Midland Club were approached and proved extremely helpful, so the " Grunau Baby " was aero-towed to the Mynd, where it now lives. The day after its arrival, Cochrane missed his Silver " C " duration requirement by half an hour owing to darkness, and he has had some more since. Subsequent visitors Chantrill and Lance were kept on the ground by a south wind.

A remarkable " C " flight was made over Lulsgate at Christmas by Barbara Brice in the " Tutor," apparently making use of the weak lift in advance of a small front. Strong southerly winds have on occasion made really high launches possible, the " Tutor " being allowed to " kite," taking cable off the winch drum at the end of the launch. 2,000 feet is the best height obtained with this type so far, leaving the record of 2,300 feet with the " Grunau Baby." Unfortunately, of course, such conditions are not associated with any other means of support once off the wire, and in fact the pilot can do little but keep heading into wind if he wishes to land on the aerodrome.

An expansion of the flying membership is expected in the near future when we welcome members of the Bristol Aeroplane Company's newly - formed Flying Club to Lulsgate, where they will train with us, effectively as Gliding Members. As power-flying will be available to these pilots after they have reached a certain standard in gliders, it will be an interesting experiment in the value of gliding as an introduction to flight. Of course, as a Gliding Club, we are confident that the powered aeroplane will not seduce these people permanently.

A series of courses for non-members is to form an important part of our life this year. These courses will be run by Mr. Bunny Wheatley, who had very successful experience with this type of operation at Bridgwater last Summer. Conducted on extensive lines, backed by a full range of modern equipment, we hope that these short courses will enable many newcomers to the sport to progress as far as their " B " Certificates while enjoying an ideal holiday.

SCOTTISH GLIDING UNION

Standing Wave at Balado ! The soaring conditions of Sunday, December 21st, reported elsewhere in the *Sailplane and Glider*, somewhat eclipsed the minor events of the December week-ends with the Scottish Gliding Union—the foggy week-end ; Sunday the 14th, when one of our St. Andrews' members, Marion Smith, did some of the smoothest wire-hops in the " Dagling " we have yet seen ; the 28th, and " Richard " Rozycki's

"A" and "B" Certificates. But it's the scenes of the 21st that crop up most often in our mind's eye, the gulls circling with steady wings, the stop-watch hands clocking Tom Davidson's "C" Certificate, the "Tutor" suddenly climbing vertically on the launch, and Andrew Thorburn peacefully soaring the gold and blue evening sky above Loch Leven. A Standing Wave is the nicest present for Christmas the S.G.U. could have had, and is a good omen for the New Year.

DERBYSHIRE AND LANCASHIRE GLIDING CLUB

December 7th. The new Slingsby two-seater "T. 21 B" was delivered during the week. The weather was not fit for flying so that we had to wait until the following week to try it out.

14th. The "T. 21 B" was brought out and instructors in turn took members for long circuits. The machine climbs well on the wire and high launches can be obtained without difficulty. As far as it was possible to judge, the handling qualities are excellent and instructors had no qualms about handing the control to relatively inexperienced pilots. The machine is likely to be popular with members, who will be able to get more flying experience than in a machine which is more difficult to handle. The "Tutor" and "G.B." also did a few circuits. Totals, 23 circuits.

21st. We nearly caught a great big standing wave, but it got away. At 10 a.m. the wind was W.N.W. 40 m.p.h. cloudbase 5/10ths at 700 feet (2,000 A.S.L.). An "Olympia" was launched but scuttled back after 5 minutes, having had more than enough. Shortly afterwards, a large stationery cloud was observed directly over the site. It remained there all day, during which the wind increased somewhat. Gerry Smith was anxious to have a try, as it was fairly obvious that something was working. Unfortunately no tephigram had been prepared, but Doc Slater sent all the necessary information and some comments a week later from which a lapse rate of 14 degrees at 3,000 to 4,000 feet was disclosed. The general opinion seems to be that we missed the boat, but at least we didn't have to take any wreckage back to the makers.

The idea of any lift over 1,000 feet being due to anything else but a standing wave is liable to be ridiculed at the Club at the moment. Last year, evening thermals were all the rage and were confidently expected every day any time after 11 a.m.

26th/28th. A large crowd assembled on Boxing Day and Mrs. Smith and Mrs. Kaye, assisted by the other ladies, provided a really first class Christmas Dinner. After dinner the party retired to the bar and played Charades, Twenty Questions and, of course, Shooting the Line.

On Saturday afternoon we had a new innovation—a party for the younger members of the Club, ages from two to twelve. Unexpected talent was discovered amongst the older members. Eric Taylor in particular entertained the children much the same as he entertains the Committee (this may be a reflection on Eric, or the Committee, but not both). On Saturday evening there was another party on similar lines to that of the previous night.

Sunday brought the first good weather of the holiday. There was a westerly wind of 30 m.p.h. Stan Armstrong was first off in his "Olympia" followed by Gerry Smith and Terence Horsley. Most of the "Olympia's" managed to reach cloud base at 1,500 feet. The Club "G.B." was also out, and later in the afternoon the wind dropped a little and Gerry brought out the "T. 21" for two short flights of 20 minutes each. Totals, 16 launches, 13 hours.

The outstanding features of the past year are that although the weather has been fine and warm, good soaring days have been few and far between.

The possibility that Camphill may be in an area influenced by occasional standing waves off the South and North-West slopes has stimulated interest in meteorology and invested the site with further possibilities of research and exploration.

In spite of reasonable care, we have had five accidents to training machines and the cost of repairs is providing food for thought. On the other hand, the damage to the "Tutor" and more advanced machines has been practically negligible.

The House Committee has operated with singular success in spite of increasing difficulties with rationing. Charles Axelby is effecting improvement to the premises by painting and repairing it as a full time job. Cyril Kaye is persevering with winch and retrieving vehicles and we have been free from mechanical breakdowns. The Drains Trust under Prof. Coleman has carried out an ambitious and successful scheme in front of the hangar.

The various Committees of the British Gliding Association have had a difficult and thankless task this year and although we may sometimes find it difficult to reconcile ourselves to some of decisions reached, at least we should try and appreciate how impossible it is to please everyone in rational circles or anyone in gliding circles!

LUNEBURG, GLIDING CLUB B.A.F.O.

Since the formation of the club (formerly known as 151 R.U. (A)) in August 1946 it has completed over 4,000 launches, and without the assistance of a ridge of any description 250 flying hours have been put in with an average membership of 25. The maximum membership of the club is limited to 35 but with frequent postings the number of active members is often suddenly and drastically reduced, and therefore training from the ab-initio stage has to be continually carried out to its full capacity.

3 Silver "C's", 27 "C" certificates and numerous "A" and "B" certificates have been gained this season.

F/Lt. Bolt was the first member of the club to gain his Silver "C." He completed all the requirements in one flight by flying the "Rhonsbussard" to Wunstorf on the 10th August, 1947. He covered a distance of 71 miles, stayed airborne for 6 hours and reached a height of 5,000 feet. On August 17th, he obtained his

height again in the "Rhonsbussard," thereby qualifying for the badge. The best trip of the season was made by A/C. McAndrews, who flew a "Grunau Baby" to Bremerhaven on August 17th, a distance of 80 miles. He was airborne 6 hours, and climbed up well above his Silver "C" height. He had however obtained his height in a "Grunau Baby" on August 4th, so he qualified for the second Silver "C" of the club.

Sgt. Walker made four attempts at his distance before he was successful. His first attempt on June 18th, was just 52 kilometres, but unfortunately he carried no barograph. On his fourth attempt. He flew a "Grunau Baby" to Sottrum a distance of 54 miles, he obtained his height also on the same trip, he finished the third leg at Salzgitter on 16th October, by soaring 5 hours on the ridge.

G/Capt. Walker, Sgt. Boddington, and A/C. Geal also completed their distance and height with cross country flights of 35 miles, 45 miles and 35 miles respectively.

The most difficult leg to obtain here is naturally the duration, and if a ridge had been available, no doubt we should have had a few more Silver "C" badges credited to us this season.

The club ceased flying on the 1st January, 1948, and hope to open again on April 3rd, with all the equipment and gliders on top line. The members are spending as much of their spare time as they can in overhauling the gliders and equipment in preparation for a bumper programme next season. A small retrieving winch is being rigged up, and if it proves successful in operation, much of our transport difficulty will be solved. A new feeding gear and drum is being fitted to the Balloon winch, which should greatly improve its performance.

We were sorry to lose our Commanding Officer, G/Capt. Walker, due to posting. We shall miss very much his ever ready assistance and active interest in the club. His ability at splicing broken cable was the envy of us all.

We also regret the closing down of "Salzgitter Gliding School" which supplied our members with the opportunity of ridge soaring during short leaves. Good accommodation, excellent food, the ever welcoming company of Jock Forbes, Jerry Winter and all the other members, together with the facilities to fly at practically any time, made it a really first class gliding club. We wish all its members the best of luck in their future gliding wherever they may be.

OERLINGHAUSEN GLIDING CLUB

The first two days of gliding in the New Year have started us off well. So far we have been lucky with the weather. At the beginning of October we wrote depressing things about winter being upon us once more, with its attendant snow and ice, and also something about prevention of damage to gliders through careless flying and handling on the ground in icy conditions. Well, so far we haven't had the snow and ice on gliding days, but the lecture holds good; so, for the benefit of those members who have joined us since then, and also to refresh the memories of those who were here but may have forgotten, let us repeat them.

Two "Babies" were slightly damaged during the week-end, and the cause seems to be careless handling when taking it out of the hangar in one case; and in the other, the cockpit cover was left off and was standing on end under the wing. A gust of wind came along at that moment and tipped the glider over on to its other wing-tip; as this happened, the end of the cockpit cover went through the wing, making a hole in it behind the main spar. This means that both these gliders will have to be partly dismantled so that repairs can be effected in the workshops, it being impossible to make glue stick down at the hangar in this weather. We have several more pressing jobs on at the moment, so these two aircraft will have to wait their turn. So, because of carelessness on someone's part, these two aircraft will be out of action for the best part of a week, and as usual in such cases the majority will have to suffer for the sins of the few. If we have another hill wind, the "Baby" merchants will feel the pinch, so beware, brothers, beware!

Leaving the cockpit cover off may seem to be a harmless sort of thing to do, but this was an example of what can happen in such a case. Cockpit covers must be secured in the proper position on the glider at all times, except when the pilot is getting in or out. This also applies to hinged covers such as those on the "Kranich," "Weihe" and "Minimoa," for damage can be caused to these by the wind.

Another thing which cropped up on Sunday was the old tale of a cable break, followed by failure on the part of the pilot to release immediately. We have brought up this fact time and time again, both in this News Letter and verbally. This particular case was the more dangerous because the pilot did not see the Verey Lights from the winch, and he trailed about 400 metres of cable through the trees, bushes, fences and other objects, all of which could have caught up the cable and caused a messy accident. We repeat the instructions for the benefit of the ignorant:—

If the cable breaks, nose down and pick up your flying speed. Release the cable IMMEDIATELY. Then, estimate your height and, if there is enough room, do a circuit and come in. If you are too low, fly straight ahead and land using spoilers if necessary. Keep pulling the release all round the circuit, and watch the winch and Flying Control for signals. If you see reds going up, *keep inside the airfield perimeter*. Finally, on *every* launch, make a turn and look at the winch and Flying Control for signals before proceeding further. Remember, when the cable breaks, or if in any doubt on the launch, RELEASE! And then we shall be able to keep what few hairs we have left on our heads.

So much for that. To be more cheerful, in about seven weeks we expect to be getting the first thermals of the year. In order that we can use them to the fullest advantage it is necessary that we keep every glider absolutely on the top line. We have to inspect and repair all the sailplanes for this reason, and unless all this petty damage is kept down to a minimum we shall not be able to do this.

We are trying to get some more " Primaries " serviceable, as we have only one in reserve at the moment, but if we keep getting " Babies " up with holes in wings and fuselages, we shall not be able to do this. It is in everyone's interest to take a little more care ; even if it takes twice as long to get the gliders out and put them away, it is worth it in the long run if no damage is caused.

Jan. 3rd. The New Year started with a swing, after some doubt as to whether the weather would be suitable. The wind was varying between W and WSW, about 15 m.p.h., and the clouds were low, at about 250 metres. After an air-test in the Boat it was found to be too rough for the " Primaries," so they had to be content with " Kranich " trips. Capt. Woodhouse and 2nd/Lt. Wells were the first to arrive. A contingent from the 1st Tanks, also arrived.

AQMS Harris and Lt. Wells were given dual in the " Kranich," and the others flew " Babies." Capt. Woodhouse, P/O. Grice and F/Lt. Wright flew the " Meise " efficiently, after which Peter Wright went down to do some winching. Later in the afternoon Lt. Mays was converted to the " Meise," and flew it quite well, although he was rather uncertain of his height above the ground on landing.

25 launches were carried out, the longest trip being 6 minutes by S/L. Wells, who found some slight patches of lift in the base of the S. cu. clouds.

Jan. 4th. We have certainly started off well ; to-day was again a very good day, with a strong wind from the South West. At 09.47 Capt. Woodhouse was launched in the " Meise " to attempt his five hours ; he was followed by Sgt. Bremner and Cpl. Brown (visiting us from the 4th Armoured Brigade Club at Soltau), who only needs the duration condition to complete his Silver " C." Brown was the first back, and the other two followed him in, the story being that there was not sufficient lift. We sent them off to try again, all in " Babies " this time, but only Capt. Woodhouse was able to stay up for any length of time ; he landed after 2 hours 43 minutes.

The other advanced types went down to the hangar and hauled out the " Minimoa " and " Weihe "; these were flown by F/Lt. Wright and P/O. Grice ; F/O. Archbold also managed to sneak a crafty half-hour in the " Weihe " between " Kranich " trips.

Two " C's " were gained to-day, the lucky men being Lt. Lewis and A/C. French, who were airborne for 20 and 30 minutes respectively. Bill Lewis has been trying to get his " C " for months now, and we are pleased to record his success at last. Congratulations to both.

Only four beginners were present, so they were given " Kranich " trips as the weather was too rough for the " Boat " and " Open."

At 16.30 we began flying the aircraft back to the hangar, and had them all stowed away by 17.00. It had been an excellent day, and no incidents occurred, apart from one by Lt. Lewis, whose cable broke at 200 metres ; he was guilty of the heinous crime of failing to release, and trailed about the whole length of the cable through the woods, luckily without it catching in anything. We feel that Lt. Lewis now realises how lucky he was to get away with a whole skin, so we will not elaborate on this subject. Strangely enough, no-one landed up by the Clubhouse—the first time this has not happened for many moons !

Jan. 7th. After a morning's rain we went down to the airfield, to find it extremely wet. It was doubtful whether the winch would be able to pull glider and cable, as under these conditions the cable sinks deep into the ground when being towed up by the Jeep. However, we towed two " Babies " and the " Kranich " up to the grass patch and started about 2.30. The surface wind was light SSW, but when the ridge was tried on the air-test it was found that there was sufficient lift there to remain airborne at 300 metres ; the wind gradient was very steep, and must have been about 25—30 m.p.h. at 400 metres.

Capt. Woodhouse and Sgt. Bremner were quick to take advantage of this, and they were up for 41 minutes and 1 hour 2 minutes respectively. Owing to the bad state of the airfield, cable retrieving was very slow and we were only able to make 14 launches during the afternoon. The surface wind was light enough for us to give S/Sgt. Mellor a hop in the " Boat " ; he progressed to S-turns by the end of the day. Other people flying " Babies " were Lt. Mays, Lt. Lewis and A/C. French. F/Lt. Wright arrived and flew the " Kranich " from the front seat for a change.

Jan. 9th. It was a sunny day, though cold, and there was a light wind blowing from the South West. Two old members arrived who have not paid us a visit for some length of time, namely Mr. Tillyer and Capt. Haywood. They " got their hands in " again by flying a " Baby." Mr. Tillyer was unfortunate in having two cable breaks. However, it is all good experience ! AQMS Harris carried out two " Boat " hops.

The day's big event was the conversion to the " Meise " of Sgt. Bremner. He had two trips in it, and flew it in a highly professional manner, both his landings being very good. He should soon be completely at home in it.

Two passenger trips were given in the " Kranich " by F/O. Archbold. We had some trouble with cable breaks, four occurring in all, and this held up the number of launches, so that we were only able to make 14 altogether. It was surprising to find that we were able to fly up to 5 o'clock without much trouble from the light, we shall soon be having " tea on the field " again !

THE MIDLAND GLIDING CLUB

Before the War the Long Mynd had acquired a reputation as an excellent hill soaring site, but " one that it was difficult to get away from." This suggested shortcoming was entirely disproved by a series of cross country flights made during the Cambridge Club Camp of 1946, and by other notable flights of that year, such as the one on which Philip Wills raised the British Single Seater altitude record to its present figure. Due to a variety of circumstances 1947 did not, unfortunately, show a repetition of these performances,

but it did produce ample evidence that the Mynd provides first class thermal soaring and interesting standing wave conditions in addition to its undeniable excellence as a simple ridge soaring site in all westerly winds.

Last Year's Activities.

At the beginning of the year a late start was made owing to the unusually severe weather conditions. All roads leading to the Club site were blocked by snow, but a party of stalwarts, on March 23rd, left their cars at the bottom of the hill and made the ascent on foot, to discover how aircraft and equipment had fared, and so far as possible to put things ship-shape. Their efforts were rewarded by the wind swinging round to south-west, and some useful hill soaring was put in to start the year's programme. Between then and the end of the year soaring flights were made on sixty-two days, and nearly six hundred hours of soaring flight were completed, the exact figure being 593 hours 15 minutes. The single day on which the greatest number of flying hours were put in was 21st September, when the figure was 71 hours in a combination of hill lift and thermal conditions. Whenever the wind direction did not oblige with conditions suitable for bungy launching, the converted Chrysler winch lent to the club by Mr. Nyborg rendered sterling service, giving launches up to 800 feet.

Training Programme and Certificates Issued.

During 1947 the club had no *ab initio* training facilities, but a number of airplane pilots were converted to sailplane flying, beginning with low hops in the "Tutor." Including these 28 pilots qualified for the issue of "C" Certificates, 20 being hill soaring flights and 8 in purely thermal conditions. Recently a Slingsby "T. 21" two-seater has been acquired for *ab initio* and advanced soaring instruction.

Heights and Distances Achieved.

During 1947 cross country flights were limited to private owners, owing first to the shortage of club aircraft, which prevented other members from setting out on such flights, and secondly to the petrol restrictions, which rendered retrieving difficult or impossible. The longest cross country flight of the year was made by D. F. Greig, a country member, who flew his "Olympia" home to Redhill, a distance of 147 miles, at the end of the September Camp. The most remarkable was probably that of C. J. Wingfield, who remembered an appointment whilst in the course of a little practice cloud flying. It was a question of either returning to the Mynd and landing at once or flying directly to the place of the appointment some 20 miles away. He did the latter! The greatest height achieved during the year was by G. H. Stephenson, who reached 8,000 feet in cloud and then returned to the site.

Silver "C" Flights.

No Silver "C's" were completed, but numerous members qualified for one or two legs, and there was the inevitable quota of pilots who were able to reach Silver "C" height when not encumbered with the additional weight of a barograph.

Golden "C."

The best individual performance by a member of the Club was undoubtedly by C. J. Wingfield, who took part in the American National Gliding Contests, qualifying for his Golden "C," netting tenth place in the contests, the British National Distance Record (216 miles), and the British Goal-and-Return Record (73 miles).

Club Aircraft and Plans for the Future.

The Club fleet at the end of 1947 comprised an "Olympia," a "Kite," a Slingsby "T. 21" two-seater and two "Tutors." Mr. Hardwick's "Petrel" is available for a short list of experienced pilots. A "Grunau Baby IIB" is on order. Considering the substantial amount of flying put in during the past year the amount of crashery has been very small, three aircraft suffering minor damage only. The only person injured was a spectator who failed to get out of the way of a bungy launch and received a sharp rap on the head.

Training policy in future will be to use the two-seater for *ab initio* instruction, and the C.F.I. is confident that a higher standard of airmanship will be achieved in six hours of training by this method than has, in the past, been reached after 20 hours' flying starting with solo hops. This decision means that new members with only slight soaring experience, or even no flying experience at all, can now visit the Mynd confident that they will be able to put in some flying on any day that provides reasonable soaring weather.

ZEPHYRUS.

LETTERS TO THE EDITOR

May I refer to your December issue where you state under "News from the Clubs" that no cross country flights have been recorded from Dunstable in January or February?

On the 19th February, 1939, the late F/Lt. L. C. Withall flew 21 miles from the Club grounds at Dunstable to Barnet. On the *20th February of the same year*, I flew 38 miles from Dunstable to Chigwell Aerodrome.

R. PASOLD.

AUXILIARY POWERED SAILPLANES

I noted in your December number a repetition of the fallacy that the Carden-Baynes was only 50 lb. heavier than a normal sailplane. This was not so as it was necessary to put almost an equal weight in the nose to keep the C.G. in the right place. I bought one of the only two machines made, without the engine, and had to remove this weight before using it as a sailplane. I flew some dozens of hours on this sailplane, doing the Silver "C" height and distance four times in about 10 days during

one summer vacation, and can safely say that its performance with an extra 100 lb. aboard would have been very modest.

The good qualities of this machine, which is still flying, were very easy handling, excellent fittings, and great simplicity in erection. If its span had been 50 feet instead of just over 45 feet it would have been very good indeed.

What evidence is there that this machine had any real success with its power unit? Only one was made with an engine and this only made a few flights. When I purchased my machine both of the only two machines made were lying idle for sale with no one apparently very interested.

I was interested to see also in the December number the statement that a rocket launch with a sailplane would cost about £3. I should think this not entirely unreasonable for a one man launch. The real cost of most aero tows would hardly be much less if travelling were taken into account.

L. H. BARKER,
C.F.I.
Yorkshire Gliding Club.

During a recent visit to the London Gliding Club at Dunstable, a chance remark was made to me, which, if representing the beliefs of the British Gliding Clubs as a whole, needs a word or two in comment.

It is apparently thought by many gliding enthusiasts in this country that the B.A.F.O. Clubs in Germany have no financial worries whatsoever, everything being found for them by the Service. This expression of opinion came as a considerable shock to one who has had many headaches about subscription rates, balance sheets, auditors, etc., not to mention the embarrasing and unpleasant occasions when it has been necessary to squeeze comparatively small amounts of money out of people in order that the books shall show a slight balance on the right side.

The facts are these: The different clubs which together form the Association of B.A.F.O. Gliding Clubs are entirely self-supporting and are not subsidised in the slightest degree by the R.A.F. or any other Service body. Moreover, they have to pay their way, and unless they can do so, they will be closed down. In this connection I should point out that receipts from such sidelines as catering, accommodation, and bar are not allowed to be included in the Gliding accounts, the aim being to make Gliding pure and simple pay its way.

It is true that in one or two special cases, Clubs have been alloted a lump sum of money to make them solvent, but this must not be confused with the grant that the Association had been hoping to obtain from Air Ministry, and it is highly improbable that any further such donation will be made.

Petrol, labour, and sundry items of equipment are heavy items on a Club's debit side, and in many cases rent for hangars and workshops, as well as clubhouses, must be taken into consideration.

It has always been the policy of the Association to keep gliding charges down to a bare minimum, so that the sport can be within the reach of all ranks, and in all cases this is so, but only because of the various economies effected in the running of the Clubs. It would be quite easy to allow the expenditure to rise to a level which would necessitate charges similar to those existing at British Clubs to be made.

From the above it is hoped to convey that the B.A.F.O. Clubs are not great state-owned monopolies, but small individual concerns having to keep themselves going through their own initiative and enterprise.

R. M. WILLIAMS.
(late *Sec.* and *C.F.I.* of Oerlinghausen Gliding Club, B.A.F.O.)

Mr. Louis Leith has recently launched "The Shoreditch Training College Gliding Club," which he says is at present purely a theory club, with a modest membership of 25.

In his letter Mr. Leith raises certain questions, which we are publishing with the answers as we consider they may be of assistance to anyone else who may be thinking about forming their own club.

Q. What must be done and what are the qualifications of an official observer to the B.G.A.?

A. The qualifications for approval as an Official Observer are too long for publication here. The necessary form can be obtained from the Secretary of the B.G.A.

Q. As an instructor on a B.A.F.O. Club am I qualified to run such a club as I propose?

A. There are no governmental or B.G.A. qualifications necessary to "run" a Gliding Club, but the B.G.A. does recommend certain standards and qualifications for instructors at Clubs wishing to become members or associate members of the B.G.A. Details of these standards and qualifications are obtainable from the B.G.A. The Basic Syllabus handbook on glider instruction is also available at 3s. 6d.

Q. As a holder of the "DAILY INSPECTION" certificate am I qualified to declare an machine airworthy?

A. In this country at present no qualifications are required to give a glider a daily inspection, but note paragraph 7 of copy of B.G.A. "Bye-laws" which reads: "Each club shall employ or have amongst its members at least one licensed aircraft or glider engineer, who shall be finally responsible for the airworthiness of the Club aircraft."

Pending the institution of licenses for Glider Engineers, each Club will submit to the British Gliding Association for approval the name of the person undertaking responsibility for the airworthiness of the Club aircraft.

Q. Can we be affiliated at the moment to the B.G.A.? And what is the procedure?

A. There are two forms of Membership of the B.G.A., full member Clubs and associate member Clubs. Details of the conditions of membership are available from the Secretary of the B.G.A.

Q. Will a "C of A" be difficult to obtain for an old machine? And how often must it be renewed?

A. A "C of A" for a glider is not at the moment obligatory but the B.G.A. strongly recommends that all Club aircraft

should have one. A "C of A" is issued by the Air Registration Board on behalf of this Association. Application should be made to them before any repair work is commenced on the machine. "C's of A" are renewable annually.

At the moment I am concentrating on an auxiliary power unit for Sailplanes. I have one complete unit finished and tested. This unit is only intended for flying a Sailplane from the owner's place to the nearest Gliding Club or suitable hill site, it would then be detached from the Sailplane by means of four bolts and thumb wing nuts. This unit is complete and has had a flying test which was most successful.

My second unit (and the one that is giving most trouble) is a retracting unit. The propeller is under construction at the moment by a leading firm. The modified propeller boss has been promised for tomorrow. Two engines have so far been purchased and tested, but at the moment I have not had the required results from either, they are both two strokes, and Villiers have been most helpful with each (and Mr. Clear too). It looks as though the present engine will have to be scrapped too—I could do a bit of private cursing about this, as I have done much work on it. However, I have my fingers crossed for Villiers' opinion.

By the way, if any of your readers have information on the "Scud III" retracting unit would they please pass it on (although my retracting unit is not worked on their lines as with the "Scud" the C.G. moves about too much in retracting, etc. I hope I have overcome this difficulty. The engine, however, the 350 c.c., not the original 250 c.c., would be welcomed with open arms.

R. SWINN.
76, Central Drive, Blackpool.

THE NEW SLINGSBY TWO-SEATER

THE Derby and Lancs Gliding Club have recently taken delivery of the latest Slingsby two-seater—"Type 21B"—and from their remarks in this month's "News From The Clubs" it is evident that they are very impressed with its qualities.

This machine, a strutted high wing monoplane of wooden construction, was specially designed to meet the requirements for a simple type of dual instruction sailplane of medium performance and low price. It possesses many features which make it most suitable for gliding clubs and other gliding training organisations.

All controls are duplicated, and readily accessible to instructor and pupil. Access to the cockpit can be achieved from either side without disturbing the other occupant. Safety harness is provided for both pilots, whose view forwards, downwards and upwards is exceptional. Lift spoilers are provided to increase sinking speed for approach and landing. A simple form of tail trim can be provided if required.

Rigging has been reduced to a mimimum—an important consideration in view of the limited facilities usually available to gliding clubs.

The manufacturers have also reduced maintenance to a minimum of time and labour, and have produced a design which, without detracting from the performance necessary for the role for which the machine is intended, fully maintains a simple but robust construction of all components.

The fuselage is of wooden stressed skin construction over that portion forward and including the two main wing attachment frames. This portion is ply covered. The aft part of the fuselage is of fabric covered girder construction with the addition of frames suitably placed for the attachment of the tailplane and elevator, thus achieving a considerable saving in weight and material cost.

The two pilots are seated forward of the main bulkhead: small windscreen providing adequate protection during the course of aero tow. Provision is also made for back type parachute.

A well for the feet of each occupant is provided in the floor so that a passenger who is not flying the machine can rest comfortably without interfering with the rudder pedals. The quick-release control and lift spoiler are placed centrally in the cockpit within easy reach of both pilots. The towing attachment mechanism is of the well known "Ottfur" type.

The wing is of wooden construction and fabric covered from the rear of the main spar to the trailing edge. It is of single-spar torsion-resisting nose box type and has a light secondary spar which carries the aileron and assists in general rigidity. There are single struts attaching to the main spar.

Description	Ex Works Cost (England)	Crated For Export
Type 21B (Full Kit)	£604	£626
Type 21B (Wings made, Fuselage Kit)	£750	£782 Provisional
Type 21B (Completely made up)	£780	£818

General Data.

Span, 54 feet. Wing Area, 260 square feet. Standard Mean Chord, 4.82 feet. Aspect Ratio, 11.2. Tare weight, 590 lb. Best Gliding Angle: 1 in 21 at 42 m.p.h. Minimum sinking speed: 2.8 feet/second at 38 m.p.h. Stalling speed: 28 m.p.h.

The performance over a speed range of 36 to 50 m.p.h. is reasonable since the gliding angle is above 1 in 18 and the sinking speed below 3.75 feet/second *throughout the whole range.*

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THE London Gliding Club offer: Wheeled "Cadet" Glider, current A.R.B., C of A, valid to November, 1948, £250.

"Tutor Mark 1," B.G.A., 346, C of A just expired, excellent condition, £250.

Both at Dunstable, seen any day. Phone: Walker, Dunstable 419.

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EX-R.A.F. Bubble Sextants, good condition, ideal yachtsmen and students of navigation. Mk. IXa, £6. 10s.; Mk. IX, £4.—Peter Mitchell, 18, Cumberland Mansions, London, W.1. PADdington 9388.

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Full details may be obtained from:—THE SECRETARY, Oerlinghausen Gliding Club, c/o R.A.F. Station, Gütersloh, B.A.F.O., B.A.O.R. 15.

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3403	John Nigel Armstrong	Martin Hearn G.C.	6. 9.47
3408	Thomas Nigel Malcolm Bayne	Ditto	6. 9.47
5383	Paul Sydney Ragen Warwick	106 G.S.	7. 9.47
6514	M. M. Dalton	144 G.S.	16.11.47
7258	Rossall Percy Vickers	181 G.S.	30.11.47
7292	Roy Derek Roper	Derby & Lancs. G.C.	29.11.47
7502	David Dalgety Bruce	140 Wing G.C.	31. 8.47
7504	John Llewellyn Batcheler	139 Wing G.C.	20. 9.47
7505	Denis Vincent Cashman	85 Wing G.C.	16.11.47
7506	Thomas John Wallis	4th Arm'd Bde.	22. 1.47
7512	Donald Henry Morly	Lubeck G.C.	22.10.47
7525	Sidney George Brighty	R.A. A.C.	1. 7.47
7548	Rees Lewis Davies	84 GP. G.C.	20. 8.47
7545	Arthur Gough	B.A.F.O. G.C.	7. 9.47
7546	Eric Evans	Ditto	12.10.47
7556	Ivan John William Pothecary	R.E. F.C.	16.11.47
7558	Derek Richard Prime	B.A.F.O. G.C.	3. 9.47
7559	Norman Raymond Sprankling	R.E. G.C.	30.11.47
7573	St. Elmo Alfred Michael Muller	151 R.U. (A) G.C.	26. 7.47
7575	Jack Clark	B.A.F.O. G.C.	29.11.47
7578	Claude Robert Tanner	151 R.U. (A) G.C.	21. 9.47
7585	John Dickie	B.A.F.O. G.C.	4.10.47
7591	Mervyn Williams	Condor G.C.	7.12.47
7596	Percival James Williams	R.E. F.C.	16.11.47
7598	Charles Nieto Hearn	Martin Hearn G.C.	21. 5.47
7599	Norman Edwards	Scottish G.U.	30.11.47
7600	Eric Gillett	181 G.S.	30.11.47
		"C" CERTIFICATES.	
7502	David Dalgety	140 Wing G.C.	19.10.47
7504	John Llewellyn Batcheler	139 Wing G.C.	19.10.47
7525	Sidney George Brighty	R.A. A.C.	26. 7.47
7538	Rees Lewis Davies	84 Gp. G.C.	8.11.47
7573	St. Elmo Alfred Michael Muller	151 R.U. (A) G.C.	10. 8.47
7578	Claude Robert Tanner	151 R.U. (A) G.C.	19.10.47
7598	Charles Nieto Hearn	Martin Hearn G.C.	28. 8.47

SILVER BADGES.

None.

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