Sailplane and Gliding

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SAILPLANE AND GLIDING

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Cover Photograph.—*Slingsby T-49: a sunset view, with the landscape in darkness.—Photo by Charles Brown.*

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"Pioneers of British Gliding"

Caley's Man-carrying Gliders—A New Discovery

by Charles H. Gibbs-Smith

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Since Mr. Gibbs-Smith, the eminent aeronautical historian, wrote the article on "The First Man-carrying Glider" published in our October, 1961, issue (p. 306), he has discovered further details not only of this 1853 machine, but also of an earlier glider which lifted a boy in 1849.

THE prosaic pursuit of aeronautical history should not by rights be a hunting ground for psychical research; but when a single historian is blessed—pursued would be a better word—by preposterous good fortune concerning one dead man, that historian may perhaps be forgiven for wondering what on earth (or in the air) has been happening to him.

Sir George Cayley, Bt. (1773-1857), is now internationally accepted as the true inventor of the modern aeroplane "de toutes pieces", as the most cautious French authority puts it: "le plus grand genie de l'aviation" and "le veritable inventeur de l'aeroplane" are two of Charles Dollfus's many tributes. As Napoleon was overrunning Europe, Cayley—in the peaceful surroundings of his family seat at Brompton (near Scarborough)—was laying the foundations of the science of aerodynamics (1799-1809); building and flying modern-configuration gliders, both model and large-size (1804-09); and publishing his findings (1809-10), on which all modern flying is based. Incidentally, when Napoleon was planning to invade Britain, Cayley took time off and designed some of the most advanced finned projectiles with which to repel him (1804-05). In 1849 Cayley tested a full-size aeroplane both in ballast and (for brief distances) with a boy on board; and in 1853 sent his unwilling coachman across a small valley at Brompton in the first proper manned gliding flight of history.

It recently fell to the present writer to carry out a detailed survey of all Cayley's aeronautical activities for the Science Museum, a work which has resulted in the locating, recording, dating and assessing of more than a hundred projects and achievements in aviation and aerostation. But there are still some exasperating gaps in our knowledge of Cayley's machines; in particular his man-carrying aeroplanes, which we know from his own and other contemporary sources to have been built and tested.

Any research worker may expect a fair balance of ups and downs along the way, and over some 15 years in the business I have had just such fair and average luck. But not with Cayley. With him the mathematics of chance have been outrageously flouted for my benefit and for the posthumous benefit of the great man concerned. Leaving aside the many small arrivals of luck, there has been a quartet of occasions whose arrival has been uncanny.

The first windfall was stumbling across the only known contemporary reference to Cayley's sending a man off in gliding flight. The second was the "rediscovery" (described last year) of Cayley's 1852 paper on gliders, which contained a detailed account, with illustrations, of his design for a man-carrier which anticipated the modern aeroplane by a full 50 years: this find was a prime example of serendipity, as I was seeking something quite unconnected with Cayley, and arrived at the glider by the collision of some half-dozen highly improbable circumstances. The third depended upon electrical repairs at the R.Ae.S. obliging the librarian, Mr. Frank Smith, to clear and move a cupboard; and his finding in it a packet of drawings by Cayley of his hot-air engine (with which I was not concerned) which Hodgson must have mislaid there over 30 years ago, far away from the other Cayley papers; Mr. Smith told me of the find, and said he knew it was not my pigeon, but that I might find some titbit to interest me. I did. On the back of the last sheet but one was the complete wing-plan, dimensions, and other details of Cayley's last aircraft design, of which we had known nothing.

The last—but perhaps not the final—incident, and by far the most important, has just happened. I was bringing my museum monograph to a close, and was clearing up various details, among which were the identities of Cayley's two grandsons, both confusingly called George. I appealed to Lady Cayley and asked for certain dates in their lives; she quickly put me right, and in her answering letter remarked that in

searching for my dates she had noticed some aeronautical items among Cayley's private papers (these have always remained with the family) which have lain in a muniment chest for over a century. Again thinking I might find a titbit which I could add to my manuscript at the last minute, I asked whether I might have the papers down in London to sort, to save her the trouble. This letter, by the way, almost never reached Lady Cayley; after I had addressed and sealed it, it fell out of sight behind some stacked books in my very untidy office, and I only found it by mistake when—on hands and knees—I was looking for a book some days later. Anyway, Lady Cayley generously and promptly agreed, and the parcel duly arrived on my desk. I cannot pretend that I felt the spirit of the sixth baronet hovering over me—in any case it would probably be one of the young Georges if it were anyone's—but I certainly experienced some acute form of psychosomatic shock. For I found in my hands some of the most valuable documents in the history of aviation, brought there by heaven knows what chance. Some of my manuscript was of course immediately wrecked by this revelation; but never was destruction more masochistically welcomed.

Most of the treasures lie in two leather-bound notebooks which Cayley must once have intended for his reading notes; across the fore-edge of one is written the word "Passions", and of the other "Egypt", names by which they must now be known. Strewn among a variety of notes ranging from technical data on the crops at Brompton to his butler's recipe for ginger beer, are the following principal aeronautica each with drawings and detailed descriptions: no fewer than three whirling arms for aerofoil testing (1818-50), one of them to take surfaces of 10 square feet (Cayley was the first in history to use this device for aeronautical research); the first device in history for testing aeronautical streamlining, also in the form of a whirling arm (1850); another gunpowder motor and a propulsive "flapper" used in a test rig for small-scale experiments in aircraft propulsion (1850); the first design in history for a tandem wing aeroplane (1815); his most sophisticated model glider, of which scantier details were sent to France in 1853, but never published; and of a swinging-plate anemometer (1849) which may prove to be the first of its kind.

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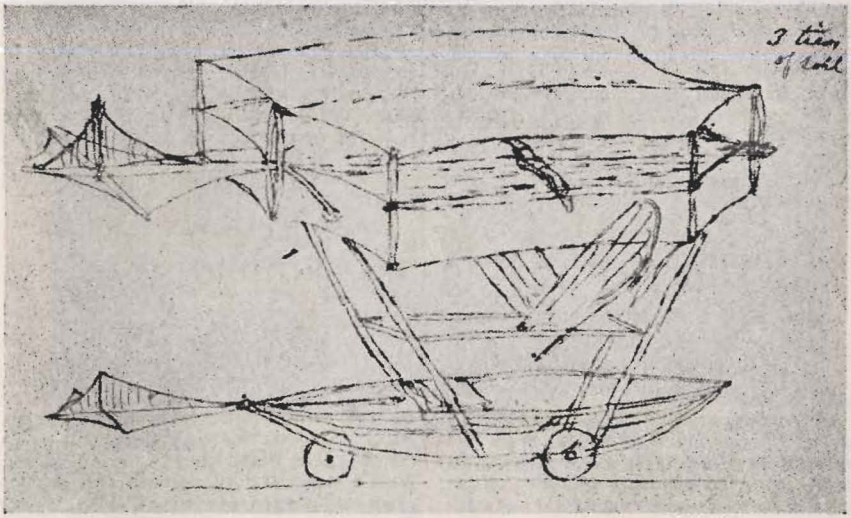
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Windfall of windfalls is a rough but complete sketch of the full-size glider which was flown in ballast in 1849, and in which a boy was floated off the ground as recorded by Cayley in his so-called French paper of 1853. This is the first drawing (reproduced here) of a full-scale aeroplane actually built and tested which has survived in history. It is a triplane with the wings set at a dihedral angle for lateral stability (shown in another, end-on, sketch), with the same controls as shown in the drawings published last year; that is to say, a fixed but adjustable tail-unit to provide longitudinal stability, and a pilot-operated elevator-cum-rudder. The wing area is given in a note as 338 square feet. The two flappers (or propulsive winglets) figure often in the Cayley papers, and he wanted to see how much the gliding angle could be reduced by their action. Not only are these sketches given in the "Egypt" notebook, but a list of the parts of the machine and their individual weights, as well as the machine's name: Cayley calls it "the old flyer" (to distinguish it from the carrier of the famous coachman, which is referred to nearby as "the new flyer"). Except for a detailed drawing of the car, we have never had any idea until now what this historic machine looked like.

The glider design unearthed last year was published by Cayley in 1852, and shows the same basic machine except for the wing structure. I then guessed we had there the form of the famous "coachman-carrier", which—by the way—a note in this newly found notebook establishes as being built in 1853. From clues now available, and one definite statement in a short note, the coachman-carrier was not a monoplane like the 1852 design, but either a biplane or a triplane—probably the latter. The wing-plan is still in doubt, but it was probably something between the boy-carrier now discovered, and the 1852 design: this is suggested by a rapidly done sketch diagram in the "Egypt" notebook showing what Cayley hoped to gain with the flight of the coachman-carrier. The rest of the coachman-carrier would almost certainly be on the general lines of the other machines.



Sir George Caley's own rough sketch of his triplane of 1849.

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Since the publication of the foregoing article in *The Times*, some writers have doubted the ability of such an aircraft to fly successfully as a glider, and to lift the boy for even the few yards Cayley claimed

for it. Particular criticism in this connection has been aimed at the narrowness of the wing gaps, and the resulting impairment of lift. I asked Mr. J. L. NAYLER what he felt about these doubts, and he writes as follows:—

"I see no reason why the machine could not have glided successfully in still air conditions, and perform as Cayley records, including the lifting of the boy for a few yards. Although the wing gaps appear small in view of his recommendations elsewhere, he would have achieved sufficient lift for the three surfaces in triplane form, although—if the gap was as narrow as appears in the sketch—the lift for a given area would have been less than if the gap had been greater. It will be noted that the wing area was large (338 sq. ft.) and the unloaded weight of the machine about 130 lbs. The wing section in flight is not known; but even if it was nearly a flat plane—and despite the narrow wing gaps—the wings would have been more than adequate to support the machine in successful gliding flight without the boy, and adequate to lift him for the few yards Cayley claimed. The chief defect of the machine lay in the complete lack of voluntary lateral control, an achievement that had to wait for the Wright brothers' gliders of 1900-02, and their subsequent powered machines. But Cayley's 1849 glider was undoubtedly capable of the successful though limited flying he reported of it."

Flying in the Italian Championships

by Philip Wills

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(Continued from December, 1961 issue, p.366)

Assisi to Castel Baronia

The surface wind was light and northwesterly, the usual hot, blue day. A surface temperature of nearly 80°F. was needed to break down the inversion and give us lift to 4,000 ft., and our ceiling would rise with the sun, eventually over the mountains reaching perhaps 10,000 ft. under and within the mountain cumulus.

It was useless to take off too early, so it was 1.15 before I was released over Assisi, to circle and climb with my friends and competitors over and above the slopes of Monte Subasio. At first below the tree-line we dodged into and out of the bays and crannies of the lower slopes; then we climbed onto the grass-covered heights, Assisi became a cluster of white spots on its spur far below then the mountain itself was overtopped and we set course east of south for the high mountains and our goal.

By now I had become accustomed to the look and lay-out of the country below, and had no hesitation on leaving the safe wide valley running south from Perugia to Spoleto on my right and setting course over the tumbled hills and valleys leading to the main high wall of the Apennines. The first fifty miles went by, a perpetual feast and wonder to the eyes, but without difficulty, for as the ground below rose, so did the height of the thermals, and high flat cumulus forming overhead made easy the location of the upcurrents beneath them. By 2.30 I was running down the wide central valley in the heart of the Apennines, from L'Aquila to Sulmona, on my left the giant wall of the Gran Sasso d'Italia, Monte Corvo, Corno, Paganica, 9,000 and 10,000 ft. giants, on my right, and almost as high the chain including Monte d'Ocre and Monte Sirente. My own height was 10,000 ft., plenty of lift, no worries in the world. As I flew south the valley wall of the Montaga del Masure on my left coalesced into the most gigantic soaring slope I have ever seen. From the valley the mountainside sprang up in a 45° slope for some 6,000 ft., running on ahead of me for miles; and since this slope faced not only the wind but also the sun, I flew eagerly towards it, certain of finding miles of strong and friendly lift.

One of the rather surprising features of soaring on steep mountain slopes is that the upcurrent, though often strong, is only to be found very close indeed to the face of the mountain, so that, until one gets used to it, it is quite alarming to be flying along with one wing practically scraping a rock wall some thousands of feet high. But on this occasion I suffered one of the rudest shocks of my gliding career. Never have I been so certain of finding lift, and I had expected



Mountain village, 2,000 ft. up.

a climb of up to 1,000 ft. a minute. Instead, as the trees and rocks ahead swung into close focus, the air beneath me seemed to open up, and I found myself plummeting down at the fantastic rate of 1,200 feet a minute. The mountains ahead and above seemed to leap into the sky, the trees and cliff in front swept up like a rising theatre curtain, and I put the Skylark into a vertical bank, turned back to the valley, and rushed away from the invisible Niagara as fast as I could.

Clearly I had been caught out by the Adriatic sea-breeze, which must have been penetrating inland and cataracting over and down the mountain range into my valley. By the time I had escaped from its clutches, I was down to a mere 3,000 ft. over the valley north of Sulmona, with mountains ahead and right and left towering far above me. Unless I could find lift somehow, somewhere, I must land with only around 100 miles in the bag, which would almost certainly put me out of the running.

If the air was cataracting down the eastern valley walls, it was at least likely that the compensating upcurrents were to be found to the west; so I flew in that direction and soon found myself flying up a steep and narrowing side valley with a small stream running up it, round a right angle and then south up to the little Lago di Scano. I was down to 2,500 ft. To the north was the 3,000-ft. Monte Prezza, the valley got narrower and I got lower, we came to the right-angle bend and I got a whiff of rising air. I circled tightly and looked back. If all went well I could just get back and out to the main valley. If I hung to my lift and it turned bad on me, it might be doubtful. A single-line railway had twisted up the little valley to just below, then it saw what it was facing, did a 180° turn, gave a gasp of horror at what it saw behind, turned a further 90° and dived straight into the mountainside, from which, as far as I could see, it never emerged. I wished I could follow suit. But slowly the tumbled air sorted itself out, slowly I climbed, and at last the air solidified into a coherent thermal, the valley below diminished, hope became certainty, and I was up and away again on my course, little daunted by the sight of another white sailplane, the Skylark of Brennig James, sailing overhead fast and free.

After this there were no more troubles for a long time, and as I flew on south-east

past Campobasso the mountains became lower and less imperious. As the sun set, a strong sea breeze from the W.N.W. came to help me on my way, but at the same time increasingly to cut down the thermals. At last, around 6 p.m., I was flying over a country of wide valleys and low hills with large stubble fields, and every now and then a grimmer, higher ridge with the inevitable town perched on top of each. This was bound to lead to one final balancing decision, and in due course I got so low that it just was or was not possible to surmount one final rough and unlandable ridge ahead, to reach the next wide valley beyond. On top was the town of Ariano. I took it on and cleared its roofs with perhaps 200 ft. in hand. Ahead in the next valley lay my inevitable landing. I swept on down the slopes, over the valley, over a road, along the banks of a small river, and a ploughed field offered a good landing place; I turned and approached it. Two feet above it I realised with horror that a ploughed field in Italy bore no relation to its featherbed counterpart in England, for this one was comprised of enormous chunks of earth, the size of paving-stones, baked as hard as rock. I prolonged my glide as well as I could to its far edge, but it got if anything worse, and we subsided onto it with a series of shattering jolts. I scrambled out and took a too-brief look at her; she seemed all right, and turned to meet the Italians pouring at me through the maize field between me and the road.

Twenty-five Years from Now

An extract from a future issue of the London Gliding Club Gazette

THE 1986 Annual General Meeting of the Club was held in the new Conference Hall which towers over No. 3 Hangar, with a record attendance of 400 delegates representing 7,000 members.

The Chairman summed up the year's activities as successful in every way. Over 90,000 rocket launches were a record and it was gratifying that only a handful of pilots had failed to return. The fact that London was now built up as far as Northampton had introduced certain hazards into cross-country flying, particularly on out-and-returns in marginal conditions. However, Ellingsby Corporation had risen to the occasion splendidly with the new Streaklark XXII, which helped to make final glides a little less exciting. The astute business men on the Club Committee had years before bought up small concrete plots distributed at 20-mile intervals through the urban wastes, on which less fortunate pilots could land if need be. True, they had not been rich enough to buy up the surrounding plots on which very tall buildings were growing, creating yet another headache for Ellingsby at the low-speed end. (Laughter).

Airways had not brought the problems which were anticipated at one time. Credit for this went to the brilliant series of take-over bids which shook Throgmorton Street and put Ellingsby Corporation in full control of the Aircraft Industry with a mere 1 per cent holding (deafening applause). Only V.T.O. aircraft operating at 100,000 ft. were constructed, and incidents were very rare.

The growth of the private-owner fleet had continued; with the trailer-rack extending half-way up the hill; was it not time that a halt was called? (Cries of "never!" from the back of the hall were quickly suppressed.)

The Club's prosperity resulted from the bold stroke which brought about EUROSOAR with its headquarters at the Common Market Soaring Centre in Totternhoe; this had led to the eclipse of the once-famed C-mm-nw-lth Gl-d-ng C-ntr-. (An ovation.)

There were no questions from the floor, though delegates fought to be allowed to propose the first vote of thanks. The election formalities over, the delegates and their ladies trooped out to watch the march-past of the instructing staff. A highlight of the evening was a spotlit aerobatic display and a comic turn with ancient 1964 towing-planes actually pulling gliders *on the end of a rope*—to the general hilarity of all. The squat 18-metre craft were made even more quaint by the pilots wearing the traditional top-hats which were doffed to the glittering crowd below . . .

(Reproduced with acknowledgements from the London Gliding Club Gazette, Dec., 1961.)

Oxygen Equipment in Sailplanes

by Flight Lieut. R. P. Saundby

IN recent years the standards of sailplane flying and the potentialities of the aircraft available have been rapidly increasing. As a result great altitudes have been attained, and the present world height record stands at an altitude which is beyond the range of most powered aircraft.

Consequently many clubs and private owners are fitting oxygen systems to their aircraft, but in many cases with very little idea of the physiological requirements or limitations of their equipment.

The body requires a constant supply of oxygen so that it can oxidise organic substances to obtain energy. For this it must have a minimum quantity, or partial pressure, of oxygen at all times in the lungs. Now, as we ascend through the atmosphere, the total pressure falls, and as the composition of the air is constant, with about 1/5 oxygen at all heights, the quantity of oxygen in the lungs will also fall with height. Up to a certain degree a healthy human body can accept a lower oxygen quantity, but above 10,000 ft. there is a definite deterioration, and above 15,000 ft. it becomes essential to enrich the inspired air with oxygen. If this is not done and we continue to ascend without oxygen, there will be a rapid deterioration of performance and consciousness will probably be lost just above 20,000 ft.

Diamond heights have been attained without oxygen from a low launch, but it must be emphasised that this is a dangerous practice because the lowered pilot performance could easily lead to a loss of control in turbulent cloud, and loss of consciousness could well result in structural failure of the aircraft and a fatal accident.

The symptoms of anoxia are very similar to the effects of alcohol, and include deterioration in the ability to perform skilled tasks, coupled with a spurious over-confidence. These are the features of anoxia which make it so dangerous because the over-confidence might tempt a pilot without oxygen to remain in good lift while his deterioration of skill could lead to a loss of control, with the ever-present possibility of his airbrakes being iced up.

Other symptoms of anoxia are nausea, trembling or twitching and a blue colouration of the lips and fingers. Ultimately the pilot will become unconscious. The time taken to unconsciousness depends on the altitude, but if the anoxia has been caused by a failure of the oxygen system the time of consciousness is short, being only 3 minutes at 25,000 ft., falling to 1 minute at 30,000 ft.

Up to this stage I have been referring to normal healthy adults; now, one does not need to be at a high pitch of athletic training in order to fly at altitude, but anyone who gets breathless on going upstairs or during the normal exertions of dragging gliders out of the hangar, would be well advised to consult their own doctor before making ambitious sorties towards the stratosphere.

For the purpose of using oxygen, the atmosphere can be divided into four regions:

GROUND LEVEL—15,000 FEET.—In this region no oxygen is required, although the effects of anoxia may be noticed if a long period of time is spent over 10,000 ft.

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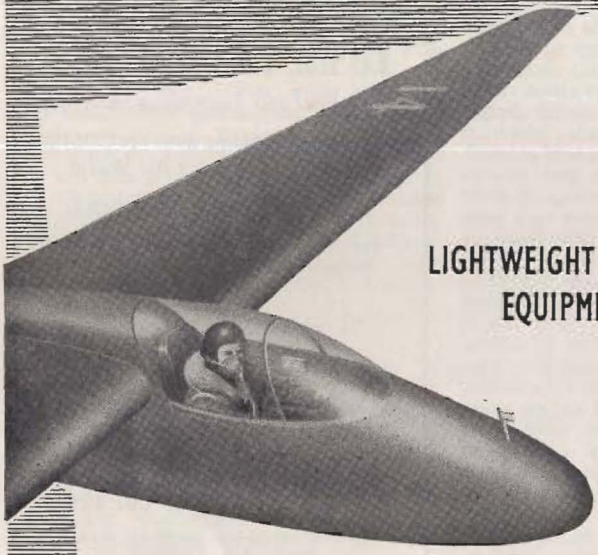
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In addition to the above, Normalair also manufacture a range of lightweight breathing equipment for use in executive and light aircraft; component design allowing in all cases a wide variation of layout to suit individual requirements.

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15,000 FT.-33,000 FT.—In this region oxygen must be added to the inspired air to bring the actual quantity of oxygen which enters the body up to acceptable levels. The quantity of oxygen required will increase with altitude, and flows used are usually between 2½ and 5 litres per minute.

33,000 FT.-40,000 FT.—In this height band it is essential to breathe 100% oxygen; this means that the equipment must not only deliver enough oxygen, but the mask must seal well on the face to prevent inward leakage of air.

40,000 FT. PLUS.—40,000 ft. represents the upper limit of using 100% oxygen. The ambient pressure is so low that even 100% oxygen will not provide the body with a sufficient mass of oxygen to sustain life. To those who think that because they are breathing 100% oxygen they must be all right at any height, I would say that in outer space the pressure is zero, and 100% of zero is zero! If we wish to fly over 40,000 ft. it is essential to use some form of pressure-breathing equipment. These systems become more elaborate the greater the altitude required, culminating in a full pressure "space suit". However, the simpler forms have been used in military aircraft for many years, and there is no reason, apart from weight and cost, why they should not be fitted into a sailplane.

The world altitude record now stands at well over 46,000 ft., and to beat it pressure-breathing oxygen equipment is essential. In this country, flights over 40,000 ft. are unlikely, but there are standing waves which have been observed up to this altitude.

Oxygen systems are fundamentally one of two systems.

In the economiser system, a regulator produces a set flow, which can be varied according to the altitude. The oxygen then flows into an economiser which in its simplest form is just a balloon. The function of the economiser is to convert the constant flow of the regulator to the intermittent flow of respiration during which we only inhale for about a third of the cycle. The oxygen is led by a wide-bore tube, which can accept high peak respiratory rates of flow, to the mask. In aircraft systems it is essential that a non-return valve is incorporated in this tube, because otherwise exhaled gas will pass from the mask back in to the economiser, and under low temperature conditions ice will form and interfere with the efficient working of the system. The essential components of an economiser system are shown below.

The oxygen is normally gaseous oxygen stored in high-pressure cylinders at 1,800 p.s.i. The regulator may be mounted on the cylinder or as a separate item. The economiser in its simplest form is just a balloon attached to the mask, or it can be in a box on its own; the non-return valve is usually incorporated in the economiser or the mask. The mask itself must be light and comfortable; it must be fitted with provision for admitting atmospheric air to "top up" after the economiser has been emptied; this is important when using lower flows of oxygen at medium altitude so that an inhalation does not come to a sudden stop as the economiser bag is emptied. The

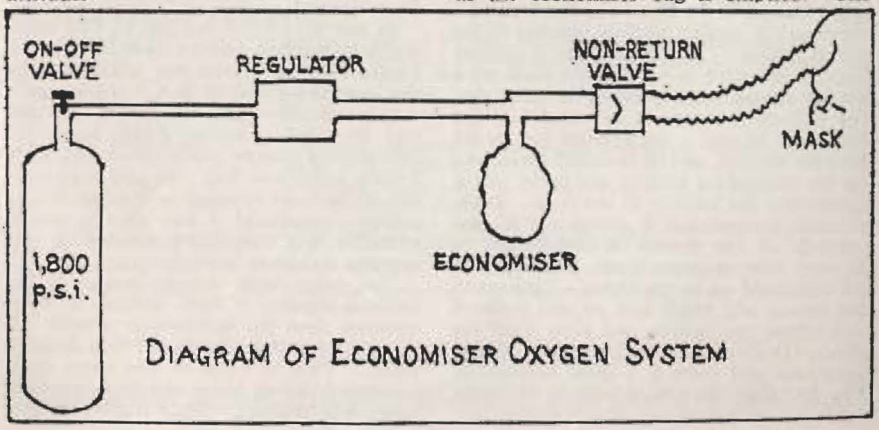


DIAGRAM OF ECONOMISER OXYGEN SYSTEM

expiratory valves of the mask are situated at the bottom lowest part of the mask to facilitate drainage, and are shielded to reduce the chance of freezing. For use at the higher altitudes the mask must make a good seal on the face to prevent excessive dilution with atmospheric air.

Current oxygen systems fitted in gliders are usually the R.A.F. economiser system, using ex-service components, or the Walter Kidde system. The R.A.F. system is a well tried and safe system, although the installed weight is rather high.

When an oxygen system is installed, it must be remembered that the pipe and connections between the cylinder and regulator have to withstand 1,800 p.s.i. and so must be of special copper pipe; also, on no account must high-pressure oxygen be allowed to come into contact with oil or grease, because it will explode, so all fitting must be done "dry".

The other common oxygen system in use is the Walter Kidde system. This is a very good combination of cylinder and regulator. The regulator has two settings, "Medium" and "High". The medium setting is suitable for altitudes between 15,000 ft. and 25,000 ft., while the high flow is adequate up to 35,000 ft. The high flow is not sufficient to give 100% oxygen, and I would not recommend the use of this system over 35,000 ft., and even this accepts a considerable degree of anoxia. Unfortunately Walter Kidde only make the cylinder and regulator, and the system is being commonly used with a most unsuitable mask. This is the light disposable plastic mask known in the R.A.F. as the type "L" mask and in civilian medical practice as the B.L.B. Mask. This mask has a rubber balloon mounted in front of the mask with no non-return valve between the mask and the balloon. Oxygen is delivered into the balloon. In use, some exhaled air passes into the balloon, and its moisture condenses on the walls of the balloon and in the throat connecting the balloon to the mask. If the external temperature is below —5°C, the warmth of the breath is insufficient to prevent this mositure from freezing, and ice will build up in the throat. Ultimately the throat will block and oxygen pressure will inflate the balloon and blow it off the mask. This has in fact happened on several occasions and there is a good account in Flt. Lt. Carroll's "Dice with a Cumulonimbus" in SAILPLANE AND GLIDING for December, 1960.

As in this country the —5°C isotherm is almost always below 15,000 ft., it can be seen that this mask is not suitable for use in unheated aircraft and *should not be used.*

It is of interest to note that when the U.S. Army Air Corps used a similar mask some 20 years ago they had over 50 deaths from anoxia!

In the R.A.F.G.S.A., use of this mask has been stopped, and we have developed a simple balloon economiser which fits on the front of a standard R.A.F. mask with a non-return valve between the economiser and the mask. Walter Kidde have also produced a simple mask consisting of a double polythene bag, but although it is said to be more resistant to freezing, it is so lightly constructed I fear that it would probably get torn lying around in the average sailplane cockpit.

The other basic oxygen system is the demand system. This system is more complex than the economiser system. It consists of stored oxygen led to a demand valve. This is basically the same as a pressure-reducing valve set to a pressure just below ambient. When a pilot inhales,

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he reduces the pressure in the mask and delivery tube; this moves a diaphragm in the demand valve. Movement of this diaphragm opens a valve and allows oxygen to flow into the delivery tube. Thus oxygen only flows from the storage cylinder when the pilot is inhaling. Provision is made for diluting the oxygen with air at the lower altitudes so as to produce maximum economy of oxygen; this is done automatically by means of barometric capsules. Also provision can be made for delivery of oxygen under pressure above 40,000 ft.

The mask for a demand system must seal well to prevent air being drawn in around the sides of the mask during inspiration. Also, unlike the economiser system mask, there must be no way in which air from outside can enter the mask except through the "Air Mix" of the regulator. The mask has to have a compensated expiratory valve if the system is to be used over 40,000 ft.; this means that the lower surface of the mask expiratory valve is loaded by inlet pressure, so that increasing delivery pressure will pressurise the mask and that the oxygen will not just escape through the outlet valves.

Systems of this nature are used in all military aircraft operating over 40,000 ft., and would have to be used for any attempt on the world altitude record.

Demand systems are rather complex, but they are in common use in sailplanes on the Continent, and simple demand valves of a very similar type are also mass-produced for the compressed-air breathing equipment used by skin divers.

When an oxygen system is put in an aircraft, it should be properly installed; the carriage of loose portable oxygen systems in the cockpit is to be condemned because in severe turbulence it can be not only unpleasant but it is possible it might strike the canopy with sufficient violence to fracture the perspex. It must also be remembered that the installation of an oxygen system may affect the aircraft's centre of gravity, and so the aircraft should be re-weighed.

Oxygen storage cylinders should never be allowed to become completely emptied, because, if they do, they will have to be purged, which involves heating the cylinders to remove all possible traces of moisture.

There are other hazards of high-altitude flying than anoxia. Owing to the reduced pressure at height, nitrogen tends to come out of solution in the blood and body fluids. This can cause pain in the joints, skin and

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chest symptoms. In routine R.A.F. decompression chamber tests for 2 hours at 28,000 ft., 10% of normal pilots in the age group 28-30 suffer from this condition to an extent that they have to descend. Decompression Sickness is much influenced by age, the older pilots being more vulnerable, and also overweight pilots are at a great disadvantage because fat dissolves nitrogen in relatively large amounts.

The lesson of decompression sickness is that time spent over 25,000 ft. must be restricted to a short period, and any altitude attempts should be a rapid climb followed by a rapid descent. Anyone becoming ill after a flight of over 25,000 ft. is well advised to seek medical advice as soon as possible.

The other major problem at altitude is cold; the average temperature at 30,000 ft. is about —50°C. This means that the pilot will not only be very cold but he will also suffer from canopy icing. In the U.S.A. high-altitude gliders have been fitted with double canopies, insulated walls and a pipe from the expiratory valve of the oxygen mask which leads the saturated exhaled gas out of the cockpit; this reduces internal canopy icing.

These other limitations of high-altitude flying mean that there is very little point in fitting large storage capacity of oxygen in a sailplane, and I would suggest that a 400-litre cylinder in a single-seater aircraft and a 750-litre cylinder in a two-seater would provide adequate oxygen for most purposes, giving about 2 hours below 25,000 ft. Larger capacity cylinders could lead to troubles from decompression sickness or frostbite, but on the other hand the 240-litre bottle at present quite commonly used is really too small for anything beyond Diamond height.

Hyperventilation

by Flt. Lieut. D. M. Holliday

A STUDY of the two overseas contributions dealing with high-altitude gliding in SAILPLANE AND GLIDING of June, 1961, gives rise to thoughts about the best use of oxygen at height and the dangers inherent in its misuse.

Paul Bikle, speaking of a height of 46,267 ft., says: "Although it is not desirable to try to fly at these heights without a pressure suit or cabin, I did not detect any particular difficulty from this source." Stanislaw Jozefczek, on the other hand, with a maximum height almost 10,000 ft. lower, says: "I am feeling well, only my breathing rate has increased considerably . . . After a few deep breaths I perceived the symptoms of approaching loss of consciousness."

It would appear from the two articles that the oxygen systems used were basically similar. The answer to the apparent anomaly must lie in the breathing technique employed. "After a few deep breaths" is the key phrase.

It is probably not widely realised that too much oxygen can be as great a danger as too little. This condition arises from over-breathing (hyperventilation), which means respiratory effort out of proportion to the amount of work being done. The condition occurs readily at altitude as a result of apprehension or great concentration, and its symptoms are essentially similar to those of anoxia.

Normal breathing maintains a constant pressure of carbon dioxide in the lungs, and it is this carbon dioxide which ordinarily provides the stimulus to breathing. Over-breathing may reduce the level of carbon dioxide in the lungs and blood to the stage where the proper uptake of oxygen is reduced. The delivery of oxygen to the body cells is also impaired. A lack of carbon dioxide also reduces the supply of blood to the brain. Feelings of dizziness, trembling and detachment may result, together with impaired judgment.

It is rare for over-breathing to be serious at low altitude because the lowering of carbon dioxide content reduces the stimulus to breathing and the condition becomes self-stabilising. When, however, a pilot is already suffering from oxygen lack, the slightest degree of over-breathing is dangerous. This is because the effects of the two conditions are cumulative.

Although some increase in the breathing rate at altitude is a normal symptom of oxygen lack, *no attempt to fight anoxia by voluntary over-breathing should be made.*

Air Traffic Control in the U.K. in the Eyes of a Glider Pilot

The following is a copy of the address by Philip Wills at the 1961 Annual Dinner of the London Lodge of the Guild of Air Traffic Controllers, with some elaborations in an endeavour to make clearer the case presented. It is reproduced from the Journal of the Guild.

I MUST confess I was pretty startled when I, of all people, was invited this evening to come and make a speech, and I don't know who is the braver of us. But I have been assured I can say what I like, and need not bring my bullet-proof waistcoat, so here goes. The trouble is that after-dinner speeches should by rights be full of fun, and Air Traffic Control is a subject on which I find it singularly difficult to be amusing.

You no doubt know my own position in this complicated and maddening business, as fighting for the glider pilot's share of the air. But you may not know my history, so I will start off by boring you with a bit of that.

During the war I was Second in Command of Air Transport Auxiliary, and in four years we ferried over 400,000 aircraft of all shapes and sizes, in all weathers, without radio or navigational aids of any kind, and without collisions. At one time, with everyone else round London, night after night we would hear 1,000 aircraft over London alone, half trying to find the other half and shoot it down, with earnest chaps on the ground indiscriminately pumping 30,000 shells a night up into the lot. No collisions, either with aircraft or shells. Then indeed our skies were "overcrowded". Nowadays we use this damnably maligned word if we have more than four aircraft in the whole corridor between London and Manchester.

After A.T.A. I followed my boss, Gerard d'Erlanger, to the newly-formed B.E.A., which for a short time consisted of him and me and our two secretaries, peering over the top of a pile of 30,000 unopened letters in two rooms in Berkeley Square.

At one of the first meetings I went to at the Ministry of Aircraft Production, I was presented with the broad outlines of the Viscount, and asked if B.E.A. wanted it. At that time we were unencumbered with anything like a Board, and I gave instructions to proceed. Over the subsequent two years, one of my vivid memories is of a two-man department in the Ministry responsible for—shall we say?—the fire-fighting equipment to be installed in the aeroplane. The two men concerned were splendid chaps in nearly every way—honest, hard-working and technically competent. But it became evident that to them the Viscount was simply a vehicle designed to carry the last word in fire prevention and extinguishing gear, and when we pointed out that to carry all they required would leave no room for any passengers, they were profoundly disinterested. A suspicion crept in that perhaps they couldn't see the wood for the trees.

I have told this story because, over the last few years, as I have plodded my way along the labyrinthine Ministerial corridors from A.T.C. meeting to A.T.C. meeting, a suspicion has in turn crept in that these two chaps may have come to rest in your department. Several times, at the far end of a long corridor, I have seen two backs turning the corner very like theirs. I have come in at a door at one end of a room to see another closing at the other end, with the same two backs seen through the diminishing crack of the door. Could it be . . .?

If I am right, they have this time triumphed, because the radio equipment necessary to anyone wishing to fly around freely in our small island to-day costs more than a light aeroplane itself, and can't be got in anyway. So there are virtually no privately-owned light aircraft in this country.

I must confess I feel sorry for you folk, and I hope you feel sorry for us. You are expected to bear the responsibility for the prevention of collisions in the air but, with the possible exception of the London Zone, are given stone-age equipment which only makes it possible to do so by imposing restrictions which have kept the air so empty that, in fact, if your duties were tomorrow reversed, and you had to try to *create* collisions, the commonest expletive coming out of control towers would be: "Damn! Missed again!"

As you are no doubt told *ad nauseam*, London Airport has recently descended from 41st in the list of busiest airports, after Little Rock, Arkansas, to the undistinguished place of 83rd, after Charleston, Carolina. All the traffic handled by all airports together in the U.K. is less than that handled by Chicago, where the restrictions are less severe than those imposed in London, and even less, God help us, than those imposed in that aerial Sahara, the Manchester Control Zone.

Unfortunately the equipment used presents an absolutely false impression of the risk. On the radio, you and the pilots hear a jumble of voices which sounds absolutely frightful unless someone peers out of the window and can't see an aeroplane in the sky from horizon to horizon. On your screens you see two blips, immensely exaggerated in scale, apparently about to collide, but in fact the two real aircraft never get within miles of each other. Whilst your radio and your radar screens are indeed overcrowded, the actual sky remains as vast and as empty as ever. So please don't come to believe your absurdly inadequate instruments, and ignore the hard *fact*—the only thing that matters—that in the 16 years since the war there have been only two collisions involving airliners, although we have had aircraft under different and unco-ordinated controls flying through each other's systems in a nearly random way; and it is hard to believe that even the most sophisticated system could have bettered that record. What a sophisticated system *could* have done would have been to equal it with ten, twenty, or even fifty times the volume of traffic.

What you have lacked in equipment, our joint masters have tried to replace by restrictions on the use of the air, and look what we have lost! In the United States we see over 100,000 small aircraft flying happily around. France is dotted with airfields stiff with small aeroplanes; whilst here we have about 500 all told, mostly completely obsolete. A movement which we pioneered in the late 'twenties has been entirely lost to other nations, the industry, the pilots, the enthusiasm and all that goes with it.

I don't want to exaggerate my case. We do admit that in the London Control Zone there *is* a perceptible dribble of traffic, amongst which gliders would be out of place, and although up to last March we flew around in it in V.F.R. in perfect safety, we have willingly accepted our exclusion from it. But we do not believe for one moment that this applies anywhere else in the U.K. airspace with the present pathetic traffic densities.

For years we were told that we couldn't have the facilities for small aircraft until the aeroplanes were there to show that they were needed. This is exactly like saying you can't have roads until you have the motorcars needing them. If we are to drag ourselves screaming into the second half of the twentieth century in aviation, we *must* instal modern A.T.C. equipment, and until we do we *must* be left freedom to fly, so long as we show by the *facts* that we are hazarding no one else.

There is a curious law of Nature called Wills's Law. This states that *the severity of Air Traffic Control varies in inverse proportion to traffic density.* At an airfield in Outer Uist, on Tuesday before the weekly aeroplane arrives the Controller gets up early, bolts his breakfast, tears out to the airfield, and grounds all the seagulls two hours before its E.T.A. In New Zealand, where there is one airway and a handful of aircraft, cloud-flying is forbidden without radio throughout the length and breadth of both Islands. The restricted area round Salisbury, Rhodesia, is vast, so is the Manchester Control Zone, which has permanent I.F.R. to boot. London, with perhaps twenty times the traffic, has at least a smaller Zone than Manchester. When we come to busy places like Little Rock, you can (or could, when last heard of) arrive unannounced and land on a green light from the control tower.

Of course there *could* be a collision between a glider and an airliner—there

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could be one between a meteorite and an airliner—but the *fact* is that there never *has* been one, or even nearly one, anywhere in the world. When traffic drops below a certain density, it seems almost certainly true that control must *increase* collision risk—i.e. the risk of human error is greater than the random one, and here we come to one of the nubs of the problem. Would people prefer, say, two accidents for which they can afterwards blame someone, to one for which they could blame only God?

But if the picture regarding light powered flying is dark, with only a dim light ahead at the end of a long tunnel, in Gliding it is so far the reverse. Because we are a band of fanatical enthusiasts, but with a strong sense of responsibility and self-discipline, we have battled away over the past 15 years and managed so far to retain a degree of freedom which has enabled us to become the leading gliding nation in the world. In every World Championship since 1952 a British pilot or a British sailplane, or both, have won first or second place. Without government subsidy or support for prototype expenses or the like, British sailplanes have been exported to over 30 countries, and 30% of our production is exported. Two British sailplanes are the only British aircraft ever to have been sold to the Soviet Union.

This, therefore, is an outline of our case—and I have reason to believe that many of you agree with much of it: indeed some of you are gliding fanatics yourselves—our case to be left alone, so that we can go on being one of the fields of aviation in which Britain leads the world.

An Alpine Diamond

by Wing Cmdr. Joe Croshaw

ZELL-AM-SEE is a well known summer and winter sports resort; but for the height-seeking glider pilot, the autumn "between season" time holds the great attraction—"Foehntime."

Zell-am-See airfield is situated about 5 kms. south of the town in the long, broad Salzach valley which marks the northern border of the Middle Alps. To the south of the valley rises steeply the long chain of the Middle Alps punctuated locally by the Gross-Glockner, 3,797 metres above sea level. This chain of mountains provides the natural barrier to a south or south-west wind required for wave formation.

As summer turns to winter, the Azores "High" slowly retreats and allows the Atlantic depressions to take a more southerly route, the centres passing over the British Isles or even farther south. If a deep



Over the Salzach Valley



On tow behind Hansi Resch.

depression over the British Isles or the Biscay is the contemporary of a "High" over the Balkans or South-East Europe, then the wind over the Alps will be southerly —across the Alps—Foehn!

As the weather chart showed, the synoptic situation on Friday, 27th October, 1961, was, though not ideal, "Foehnic".

I was at Zell-am-See that day, and Skylark 3F (Competition No. 146) was also there. I was prepared for a cold ride, and the Skylark was equipped with 870 litres of oxygen carried in two separate systems: a portable 120-litre system and a built-in 750-litre system. By 10.15 hrs. (Greenwich Time) I and the Skylark were ready for flight.

We were airborne at 10.25 hrs. behind the reigning Austrian gliding champion Hansi Resch, who was flying the Alpine Segelflugschule Piper. High in the heavens and covering the Salzach valley was a thin but distinct Lenticular, and over the Stubachtal was a high turbulent cloud marking the rotor. The ground wind at the airfield was very light and from the south-west.

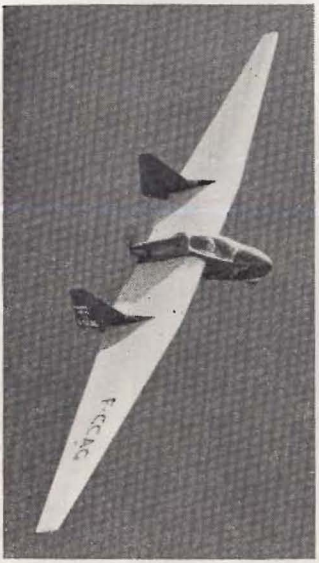
After one circuit, we climbed westerly along the slopes on the north side of the Salzach Valley until we reached the village of Uttendorf and a height of 2,250 metres a.s.l. Here we turned first south and then progressively south-east along the ever narrowing and increasingly rugged Stubachtal. To Uttendorf the flight had been smooth, but as we progressed up the valley the turbulence increased; at times my variometer was showing variations over its full scale (±10 metres/sec.). We gained height to 2,650 metres a.s.l. Suddenly we were in very strong lift; the variometer needle was hard against the up-stop. I released. We were about two kilometres N.E. of Enzinger Boden. I had been on tow for 25 minutes.

A hard left turn; a giant tossed me violently out of the lift into off-the-clock "down". I put the nose down and into wind with 80 knots on the clock, and found the rotor lift again. This time I held it. The altimeter needle raced round in an estimated 15 to 20 metres per sec. express lift. In a very short time I was 4,000 metres a.s.l. I went on to oxygen, using the small bottle.

At 4,000 metres I rolled out on a heading of 215° (C) and was almost immediately in the smooth lift of the wave. The rate of climb was in the order of 7 metres/sec. After a little experimenting I settled down to fly a track between Brustinger Kogel and the Grosser Bärenkopf. The rate of climb fell gently, but a gain of 5,000 metres seemed certain. At 7,000 metres a.s.l. I changed to the high-capacity oxygen system.

I immediately began to feel the effects of anoxia—dare I stay to gain the 600 metres I needed for that Diamond? My years of R.A.F. flying and living with and by oxygen gave me the answer. I dived to live and climb again.

Back to the lower levels and the airfield as quickly as possible. The trouble was a disconnected pipe under the instrument panel, kicked off when getting into the cockpit or during the turbulent pre-wave



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Photograph "Air-Meditarranee"

flight.

In 56 minutes I had re-connected the pipe, re-charged the oxygen systems and was again airborne behind Hansi. The second flight was rather more rough, but almost identical to the first. This time the oxygen system was in order and I watched with pleasure as the altimeter needle passed the 8,000-metre point to give me the "Height Jewel".

The rate of climb steadily decreased until at 9,500 metres I was in the Lenticular and zero lift. For a short time I admired the wonderful scenery to the west, east and north—the south was almost completely obscured by the "Foehnmauer". Now I began to feel the cold; the temperature was —45°C. After taking a few photographs I turned for home, put out the airbrakes and descended rapidly, landing at 14.30 hrs. It took some time for the Skylark and me to thaw out, but I like to believe she was as happy as I when I tucked her into the hangar that evening.

The same afternoon Franz Diessner, a German, and Kurt Bernaudt, an Austrian, were up at or near the 10,000-metre height also. We three had broken Hansi Resch's Austrian record. We had participated, as the Austrian newspapers put it, in "An International Summit Meeting of the finest and happiest type."

Gliding Certificates

In the last list published (December, 1961) J. S. Williamson, who had earned a Diamond for Distance and completed his Diamond Badge, was shown as a member of the Army Gliding Club. The Secretary of the R.A.F. Gliding and Soaring Association writes that "John Williamson is not and has never been a member of the 'Army Gliding Club' ", and adds that he is a member and chief instructor of the Moonrakers R.A.F. Gliding Club. Mr. Williamson, however, confirms that he was in the Army Club until 1956, and we are further informed from Lasham that he flew his Gold C height as an Army Club member in an Army Club machine, and his Diamond Height as a Surrey Club member in a Surrey Club machine. His Diamond Distance (500 km.) was flown as a member of the Moonrakers Club and the flight was described in our October 1961 issue, pp. 274-5.

DIAMONDS FOR ALTITUDE

No.	*Name*	*Club or Association*	*Date*
3/27	D. B. James	Surrey Gliding Club	10.8.61
3/28	J. G. Croshaw	R.A.F. Gliding & Soaring Association	27.10.61

DIAMONDS FOR GOAL FLIGHT

No.	*Name*	*Club*	*Date*
2/97	J. B. Ramsden	Army Gliding Club	28.6.61
2/98	D. W. Corrick	Surrey Gliding Club	27.8.61

GOLD C CERTIFICATES

No.	*Name*	*Club*	*Completed*
92	H. R. Dimock	Portsmouth Naval Gliding Club	11.6.61
93	J. B. Ramsden	Army Gliding Club	28.6.61
94	T. A. M. Bradbury	Bristol Gliding Club	7.8.61

SILVER C CERTIFICATES

No.	*Name*	*Club*	*Complete*
1095	N. W. Smith	Wessex R.A.F. Gliding Club	7.8.61
1096	M. L. Aspinal	Coventry Gliding Club	15.8.61
1097	J. Argent	London Gliding Club	27.8.61
1098	A. S. Morris	Moonrakers R.A.F. Gliding Club	24.9.61
1099	J. B. Carruthers	Wessex R.A.F. Gliding Club	2.10.61
1100	P. D. Kevan	Fenland R.A.F. Gliding Club	18.6.61
1101	A. F. W. Tarnow	London Gliding Club	11.9.61
1102	F. E. Phelps	London Gliding Club	5.6.57
1103	V. R. Wright	Derbyshire & Lancashire Gliding Club	25.6.61

C CERTIFICATES

Name	*Gliding Club or School*
W. J. Smart	Midland
K. V. Bullock	Silver Wing
F. R. Stevens	E. Anglian
S. Matthews	RAF Henlow
D. E. Edwards	Fulmar
J. F. Lawn	Norfolk & Norwich
P. Duncombe	RAF Halton
G. T. W. Doyle	Home Counties
D. Scott	Scottish
R. H. Buzza	Halesland, Nr. Cheddar
D. R. Harris	Coventry
I. S. Palmer	Cambridge
J. D. D. Argent	RAF Hawarden
R. Owens	Suffolk
P. W. Horner	Halesland, Nr. Cheddar
R. J. Limmer	Norfolk
J. S. Waring	Cambridge
G. F. Haysmore	RAF Laarbruch
J. T. Davies	Oxford
D. J. Shields	Halesland
C. G. Clarke	622 G.S.
B. T. Mantle	Midland
K. P. Brissenden	Kent
J. C. Habgood	Halesland
P. D. Crowe	Halesland
D. W. Findon	Coventry
C. W. Perry	Wessex
E. R. MacFarlane	Chilterns
M. G. Coley	Coventry
W. W. Coatesworth	RAF Lindholme
M. S. Dawson	Halesland
K. M. Fielding	Bannerdown
M. J. Anderton	RAF Laarbruch
H. A. Blomiley	Derbyshire & Lancashire
I. B. Robertson	Scottish
G. R. Storey	Newcastle
A. E. Jones	Midland
G. F. Sharp	Lasham
D. M. Dixon	Devon & Somerset
J. H. Taylor	Bannerdown
J. M. Tristem	Halesland, Nr. Cheddar
G. E. Airey	Derbyshire & Lancashire
B. I. L. Hamilton	East Midlands RAF
A. E. Moss	E. Anglian
P. A. H. Clothier	London
D. J. Toye	Midland
J. Isaac	Newcastle
T. Stevens	Oxford
R. Cawthorn	Newcastle
C. J. Earnshaw	Windrushers
C. E. J. Gaze	Norfolk
W. J. Boarman	E. Anglian
B. K. Austin	643 G.S.
R. H. Patterson	Bannerdown
P. V. Harris	Midland
D. M. Kidd	662 G.S.
J. W. N. Stephenson	Bannerdown
G. W. Davies	Midland
M. B. Webster	Bristol
G. A. Ross	Moonrakers
W. Watret	East Midlands RAF
K. R. S. Bone	Phoenix
R. D. Morrell	Surrey
C. F. Whitbread	London
I. G. Williams	Derbyshire & Lancashire
M. A. Butler	RAF Laarbruch
A. S. Pritchard	Derbyshire & Lancashire
W. Alexander	London
K. Cumings	Surrey
W. R. Kruger	Derbyshire & Lancashire
A. Thornton	Phoenix
J. W. A. Webster	Bristol
K. A. Lillywhite	London
B. J. W. Wise	Yorkshire
D. W. B. Chippington	E. Anglian

Pilot Rating for National Championships

(*See* SAILPLANE & GLIDING, *Dec., 1961, p. 352*)]

Explanation of Table

1ST COLUMN:—Numerical order.

2ND COLUMN:—Pilot's name and, in brackets, number of days available for rating, if less than 6.

5 days have had addition of 10%
4 days have had addition of 25%
3 days have had addition of 33%

3RD COLUMN:—Code letters of Competitions used for rating.

4TH COLUMN:—Rating figure; figures in brackets *after* rating figure denote 7th best day for giving priority in ties.

CODE LETTERS for the various Competitions used for rating purposes:—

A.	Nationals League 1, 1959	80%
B.	Nationals League 2, 1959	64%
C.	Inter-Services, 1960	70%
D.	Dunstable, 1960	70%
E.	Nationals League 1, 1961	100%
G.	Nationals League 2, 1961	80%
H.	Northern Competitions, 1961	60%
I.	Perranporth, 1960	70%
K.	R.A.F. Inter-Command, 1960	70%
L.	Coventry, 1960	50%
M.	Bicester, 1961	70%

Rating List

1	Williamson, J. S.	E	599
2	Burton, G. E.	E	568
3	Wills, P. A.	E	567
4	Scott, P. M.	DE	541
5	Deane-Drummond, A. J.	AE	528
6	Piggott, A. D.	AE	527
7	Stephenson, G. H.	AE	510
8	Stone, A. J.	E	508
9	Burns, Anne	E	496
10	Kaye, D. M.	ADE	490
11	Ince, D. H. G.	AE	486
12	Stark, E.	CE	485(64)
13	Mann, R. A.	DE	485(63)
14	James, B. D.	AE	482
15	Smith, D. A.	ADE	479(64)
16	Bentson, C. W.	DE	479(61)
17	Cretney, D.	KCE	474
18	Croshaw, J.	BKE	471
19	Burgess, P. G.	E	470
20	Shephard, E. G.	CBE	468
21	Irving, F. G.	AE	461
22	Tonkyn, W. N.	AE	456
23	Carrow, D. D.	ADE	446
24	Dimock, H. R.	EH	445
25	Kearon, N. W.	AME	430
26	Ellis, C. A. P.	ADE	423
27	Fairman, M. C.	EH	422
28	Kahn, W. A. H.	AKME	420
29	Coatesworth, G. A.	BE	418
30	Gough, A.	ACKME	413
31	Jones, J. D.	E	408
32	Warminger, A. H.	ADEH	399
33	Mettam, H. S.	DE	389
34	Green, C.	AEI	388
35	Davey, B. J.	LG	385(50)
36	Corbett, D. J.	BE	385(24)
37	Goodhart, H. C. N.	A	380
38	Coulson, A.	AE	363
39	Bailey, J. L.	AE	358
40	Fielden, J. S. (5)	G	356
41	Aldridge, K. R.	BGI	354
42	Bird, M.	DGH	345
43	Gregg, H. N.	GI	344
44	Rutherford, R.	AE	341
45	Paul, I.	BE	335
46	Ware, E.	BGM	333(39)
47	Snodgrass, D. S.	BEH	333(38)
48	Dunn, R. E.	BCE	328
49	Newholme, K.	BG	321
50	Purnell, A. D. (4)	G	319
51	Kerridge, D. C.	BG	317
52	Wills, C. (4)	E	310
53	Goldney, L. P.	CGH	308
54	Doughty, A. W.	BE	304(23)
55	Mackworth-Young, G. W.	GH	304(10)
56	Gaze, F. A. O.	E	302
57	Goodhart, G. A. J.	AC	301
58	Loveland, A.	CG	287
59	Minton, P.	AG	284
60	Jeffries, J. R.	AE	281
61	Corrick, D. W.	BEH	279
62	Carr, V. C.	BG	278
63	Collier, P.	AE	272
64	Dickson, R.	G	270(-)
65	Greenway, H. J.	GL	270(0)
66	McMullin, T. A.	DG	268(18)
67	Stafford-Allen, R. C.	BG	268(14)
68	Welch, L.	A	267
69	Morison, S. M.	BHI	264
70	Martlew, D. (3)	A	263
71	Harwood, Rika	BDE	261
72	Riddell, J. C.	GH	259(1)
73	Fitzroy, K. C.	A	259(-)
74	Blake, K. W.	BGHL	253
75	Tarver, R. T.	BGI	246(19)

76	Thomas, B.	AE	246(4)	112	Evans, J. A.	B	167
77	Russell, M. C. (4)	G	239	113	Findon, J. A. (4)	G	167
78	Hands, J. M.	ADG	238	114	Hunt, M. S. (3)	G	161
79	Sutcliffe, H. O.	BE	230	115	Willbie, R. T. (4)	E	159
80	Bacon, G. McA.	GKM	229	116	Kurylowicz, L.	GM	156
81	Procter, R. (5)	DG	228	117	Cunningham, D.	BGL	154
82	Masters, B. (3)	B	225	118	Riddell, D. M. R.	BDG	151
83	Whitfield, G. R.	IBG	224	119	Midwood, H. I. (4)	B	149
84	Neumann, G. S.	BG	219	120	Bignell, K. J. (3)	G	145
85	Dorman, C.	BCG	218	121	Brett-Knowles, R. (3)	B	145 =
86	Alexander, A. L. L. (5)	GI	217	122	Goddard, D. G. (4)	B	145
87	Jefferson, B. J. (5)	BG	215	123	Hanneman, P. (3)	H	144
88	Stowe, D. W.	AG	213	124	Philpott, P. R. (4)	G	142
89	Welsh, J. H.	CG	211	125	Ibberson, P. (3)	H	139
90	Collins, G. T.	BG	210	126	Eldridge, A.	GK	138
91	Inglesby, J. V.	BE	209	127	Torode, J. (5)	DG	128
92	White, J. K.	BH	208	128	Ramsden, P. (4)	D	124
93	Perrott, R. H. (3)	G	207	129	Thomson, G. A. (3)	B	119
94	Spottiswood, D.	MG	204	130	Berriman, P. (3)	G	119 =
95	Jeffrey, C. P. A.	BD	200	131	Harwood, J. E. G. (5)	BGI	117
96	Delafield, J. (4)	GM	200 =	132	Pick, R. C. (3)	H	117 =
97	Chandler, J. T. (5)	GK	198	133	Rondel, G. (5)	G	116
98	Dodd, S. R.	BDG	197	134	Docherty, T. P.	L	112
99	Lee, G. H.	BD	196	135	Robinson, C. T. (4)	CH	105
100	Pickles, A. (4)	G	196 =	136	Parkinson, R.	BL	103
101	Hiscox, D. G. O.	D	187	137	Lastowski, B. (4)	B	101
102	Redshaw, L. S.	L	186	138	Fursman, S. (3)	D	92
103	Marshall, R.	B	185	139	Barrell, G. (3)	K	92 =
104	Browning, H. (4)	G	185	140	Holding, D. F.	BH	91
105	Neilson, P. J.	A	184	141	Brown, K. R. (5)	BH	81
106	Hilditch, H. P. (4)	E	179	142	Morgan, A. J. (3)	A	80
107	Fisher, B.	GH	178	143	Pozerski, P.	D	77
108	Swift, R. B.	DE	177	144	Williams, P. (4)	B	77 =
109	Baynes, A. H.	BGL	173	145	Gee, M. (5)	G	76
110	Tweedy, J.	AE	169	146	Erskine, A. W. F. (3)	B	75
111	Smith, R. E. F. (3)	G	168	147	Chubb, E. J. (4)	BH	65

Chastity, Poverty and Obedience

Some thoughts on instrument flying

by W. B. Reekie

My first introduction to the combined hell and heaven of instrument flying was in an elementary aircraft called a Fleet Finch over the sombre forests of Nova Scotia. The aircraft was less fleet than a Tiger Moth and certainly less beautiful than some of our native finches. But that has nothing to do with instrument flying.

The instructor was a Canuck sergeant whose approach to the subject was dominated by the phrase "Needle, ball, airspeed" repeated at intervals of ten seconds—or less sometimes!

Locked in the stygian gloom under the hood, peering at the instruments and trying, with one's oh, so limited flying experience, to translate the readings of the dials into the actual attitude of the aircraft in terms of pitch, roll and yaw, I sat, with every muscle tensed, feet hard on the rudder bar and stick held in a vice-like grip. "Needle, ball, airspeed", "Needle, ball, airspeed", "Needle, ball, airspeed". There goes the needle to the left! Correct it quickly! Over it goes to the right, and now I am convinced I am still in a left turn, so no amount of

urging from my brain will make my concrete arm move the stick (which I can't feel anyway) to the left. In the meantime the ball yaws wildly to the left, and the airspeed increases alarmingly, "Needle, ball, airspeed" intones the voice on a slightly higher pitch of the Gregorian Chant, and I pull back on the stick. Heavens! The needle is still farther over to the right, the ball to the left and the A.S.I. needle looks quite unnatural. Thank Goodness I don't even know what terminal velocity means.

Thus is born my first instrument hell. The instructor takes over and I am temporarily released from torment. It soon starts again, however, and in the succeeding weeks the needle, ball, airspeed curse is ever present. Fortunately, in our instructor's group of four students, there is a lad named Beadle, and we lighten our apprehension of instrument flying by coining the phrase "Beadle, ball, bairspeed", and sing it wildly in our showers. Gradually, as with everything else, the darkness lightens, and soon I am becoming more relaxed on the controls and am learning not to believe my senses, but to rely on the instruments, and after some hours I can maintain straight and level flight after a fashion and climb and descend and make rate one turns. There are only occasional losses of control of the aircraft and my instructor's temper.

One day, he says "Let's do compass turns!" and now fresh tortures are unleashed. At school I had been taught that the lodestone always pointed to the north, and so it seemed during clear hood flying, but under the instrument hood, what happens to this so-called magic pointer? One minute she is skittish, another sluggish and sometimes she shows no turn at all, although my needle (ball, airspeed) very definitely indicates a rate one turn. This takes a lot of sorting out, but eventually even compass turns improve with practice, until, at the end of the course, I pass an instrument test. Written in my log book I see in red letters: D.C.O. Instrument Test, and for the life of me cannot remember what D.C.O. means, now.

As the I.F. hours build up, including Link trainer practice, slowly the picture changes, and I begin to see instrument flying, not only from the practical view of it being a useful device to use in bad weather flying, but also as a most wonderful exercise in flying and self-discipline combined.

I begin to enjoy the thrill of turning the long way round from 090° to 360° and coming out dead on North, and even in the Link, when the rough air is suddenly switched on, am not unduly perturbed. Incidentally, I reckon that this must have helped my subsequent cloud flying in gliders quite a lot!

I.F. has now become a pleasure, but the sheer delight has still to be realised in the shape of sailplane cloud-flying.

I think one of the pleasures in flying of any kind is to feel oneself up in the air and free from the earth and its associated cares. How much more intense the pleasure is when piloting a glider in a cumulus cloud! There are, firstly, the minutes of anticipation underneath the cloud, when there is the uncertainty that the thermal is going to feed you into the swirling mass above, when the instruments are switched on and commence their comforting hum, when one's eyes start to flick from outside objects to the inside of the cockpit, when the straps are given a final tug and one settles down on the seat, when eventually the instruments become the focus of attention, the first wisps of mist lick the wings, and there is the realisation that you are in! The first period is spent in superconcentration, trying to obey the instruments and at the same time to shut out any intrusive recollections of the clear hood flying that have just been left behind. After a time one's hands and feet are relaying instinctively the information provided by the instruments, and a wonderful feeling of solitude, if not peace, grows and grows and grows. It is then that I get the feeling of being locked in a monk's cell and believing in the vows of chastity, poverty and obedience. The chastity is certainly enforced, the poverty is shown by the lack of a horizon and visual references, and finally, how obedient one must be to those instruments! As the glider soars upwards, so also does one's thoughts, and the final burst out into the sunshine seems a fitting climax and beginning to the next part of the flight. Whither next?

ANOTHER WORLD RECORD

ON 4th January S. H. Georgeson broke the world's record for out-and-return, subject to confirmation, by flying from Omarama to Hanmer, N.Z., and back, 400 miles, in a Skylark 3F. Denis Burns held the previous record, 353 miles.

Instruction at an Australian Club

by Max Howland

In Australia, because of the vast distances involved, clubs, to a large extent, are thrown on their own devices. It was interesting to note that the training scheme, developed by the North Coast Soaring Club, a club based about 140 miles north of Brisbane, Queensland, is almost identical with that described in "It's All Yours" in June SAILPLANE AND GLIDING. The Gliding Federation of Australia, of course, lays down general principles, but the detail must be filled in by the Club C.F.I.'s. We note also that many recommendations of Ann Welch are standard practice in lots of Australian clubs.

A few details of how a club is formed and operates here may be of interest. At our inaugural meeting, out of about twenty prospective members, only one had seen a glider. He had had an hour or so dual. It took two years to raise the necessary finance to purchase a Kookaburra which was road-towed the 1,500 miles from Adelaide.

The Kookaburra is a high-wing two-seater with the Instructor beside but about a foot behind the pupil—an ideal set-up. The plane, even though it has an empty weight of only 400 lbs., is very sturdy. It has to be on some of our strips. The minimum sink is given as 3.1 f.p.s. at 45 m.p.h., and best L./D. as 21 at 52 m.p.h. It stalls at 36 m.p.h. For trailering, the 13-metre one-piece wing fits high on two supports so that it covers the fuselage beneath and overhangs the tow car in front. The main disadvantage of this system is that the set-up is not weatherproof.

A burst of activity got our narrow-drum V8 trailer winch ready, but the strip—that was the headache. It may seem strange that in this country, often referred to as the land of wide open spaces, we could find no site within 30 miles except a stretch of wallum country, swampy and sandy, just inland from the Pacific Ocean. This wallum country in its natural state is covered with bush (forest). By acquiring an area already partly cleared, we carved out a 2,900-ft. strip, 100 feet wide, and there erected our hangar. To call it a strip is really to pay it a compliment. It was surrounded on all sides by high trees. The approach at each end was over 50-ft. trees. The landing area consisted of three wider sections connected by a 9-ft. sandy roadway. These roadways had to be used for part of the landing run. In wet weather most of the field was under water. Gradually, by judicious drain-digging, by hiring the grader from the local Council, and by cutting down trees, a 3,000-ft. by 100-ft. all-weather strip was constructed. We couldn't do anything about the sandflies, though. Morning and evening these almost invisible insects would attack in force, and it was common to see winch drivers rubbing themselves with kerosene, petrol, oil and other horrible-smelling concoctions. The lumps the sandflies raised one week-end would just about disappear in time for a new lot next week-end. With absolutely nowhere else to land but on the strip, cable breaks were initially a worry to instructors and pupils alike, but it is surprising what standards can be trained to when necessary.

Our initial instructor set-up would probably give older clubs the horrors. When the aircraft was due, a couple of ex-Air

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Force Instructors travelled 380 miles to the nearest club and, over the Easter, with no previous gliding experience, had a dozen or so circuits and soloed. They then took up their duties with their own club. Not a set-up with much to recommend it, especially in view of the field. Their difficulties were further increased by the fact that, with no other clubs as a guide, many members looked on gliding as a type of flying offering an escape from the restrictions applied to power flying, and raised hell when they couldn't carry passengers and generally fly as they wished after their first solo. Wisdom prevailed, however. A training scheme was evolved as training progressed, and rules formulated to suit. In the first year six ab-initios and six power conversions were soloed. With one aircraft, generally only one instructor was present; and because of distances involved, the one instructor did 40-50 dual flights in a 12-13-hour day.

At our original strip Air Control put a 1,500-ft. limit on us. What with this and the fact that being close to the sea gave us few thermals, we eventually moved inland 120 miles to Kingaroy. Here height restrictions are removed. We operate from a Department of Civil Aviation drome—have free hangarage, a hut supplied for club room purposes, and have maintained for us, free of charge, a special glider strip of our own parallel to the main grass runways. We have equal rights with light aircraft, but must be on the ground, or three miles away, half-an-hour before the arrival of an airliner, and remain on the ground for half-an-hour after its departure. At Kingaroy there is only one service per week-end. The amount of airline traffic obviously determines whether gliding is possible and would be permitted from a D.C.A. 'drome, but basically the above conditions apply to all 'dromes with a light traffic density. There are no landing charges of fees of any kind. We are covered by the same conditions regarding met. forecasts as power aircraft. D.C.A. pay for trunk line calls to the nearest Met. Office. In some cases this may involve a trunk call of over 300 miles. At Kingaroy it is 145 miles to Brisbane. Cloud flying is absolutely forbidden, and for cross-country work, restrictions in large wide control areas between main cities are severe. Fortunately, in many cases, these zones are over "tiger" country and leave the open inland relatively clear. We find D.C.A. officials co-operative and helpful.

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After operating for about eighteen months we were financial enough to feel we could borrow sufficient to buy a single-seater—a Kingfisher (price about £750 Sterling) which was also road-towed from Adelaide. It is a 12-metre plane with an empty weight of 240 lbs., minimum sink 2.8 f.p.s. at 45 m.p.h., best L./D. of 22 at 52 m.p.h. Its performance is such that the Club's first Diamond Goal flight was made in it—200 miles.

After our permanent move to Kingaroy, we gathered members from near and far. Club strength remains at the 20-30 level and members come to Kingaroy from places up to 150 miles away. We have made a number of trips away, road-towing our sailplane, the Kookaburra, to Glen Innis in New South Wales, 320 miles, to attend an Easter Meet; Kookaburra and winch to Evans Head in N.S.W., 310 miles, to give an impetus to a Club there that was in the formative stage; Kookaburra and Kingfisher twice to Oakey, the site of a new club, our nearest neighbour. The Kingfisher also went inland to Longreach, 830 miles, to do cross-country flying last Christmas. Silver distance is just possible at Kingaroy, but for Golds we must go elsewhere. Although there is plenty of plain land in Australia, there are also many miles of scrub-covered inaccessible ranges.

A training scheme, summarised, seems very impersonal, but applied by a competent instructor it need not be so in practice. At the end of three years our training set-up is as follows. A medical is compulsory on joining, and an oral test on rules of the air must be satisfactorily answered before solo. As well as the usual exercises such as air experience, straight

glide, turning, stalling, spinning, launch, circuit and landing, we give incidentally slow flying (to accustom pupil to feel near stall, etc.), manoeuvring (climbing turns, diving towards objects, to give confidence in ability to handle other than normal attitudes, etc.). Secondary effects are shown when the instructor feels the pupil is ready for them. Cable breaks are actually taught as an exercise. Our standard cockpit check is "chaotic": C, controls; H, harness in both seats; A, airbrakes; O, outside crew; T, trim and ballast; I, instruments; C, canopy. Before solo we give what we call our check on undershoot procedure. The pupil, having been taught of the danger of inaccurate turns and raising the nose to stretch the glide, has marked for him an imaginary threshold about half-way along the strip. The instructor hands over to the pupil at about 300 ft., very low, very slow, and in a position that needs a turn. The pupil then tries to make the designated landing spot. It is surprising how many, in spite of all that has been said, raise that nose. Of course, there is considerable pre- and post-flight briefing that goes with the above test, but the essence of it is to see what the pupil will do if caught low.

No soaring is permitted on the first five solo flights. For the first twenty solo flights a dual check is obligatory each flying day—thereafter at the discretion of the instructor. No new exercises are taught during this period. It is used (a) to bring the pupil gradually into more difficult flying conditions, (b) to practise solo such exercises as stalling and spinning, (c) to improve accuracy of flying, particularly turning and landing at a spot, (d) to give further dual cable brakes, (e) and we hope to qualify for a C certificate. A pupil may only try solo what he has been authorised to do—in other words, his solo flying at this stage is briefed.

Following this period, assuming he has progressed, a start is made on the advanced exercises—steep turns, including spinning off, cross-wind landings, side-slipping, handling near the ground, flying in difficult conditions; and eventually, for those that desire, aerobatics, instrument flying, and night flying. These advanced exercises as well may only be performed solo on an Instructor's authorisation—firstly a flight-by-flight O.K., and finally, when competence is attained, a general O.K. is given.

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ground sequence is perhaps of interest. We find competence at landing does not presuppose safe handling low down in an emergency or on a cross-country. Our sequence consists of: (1) an explanation and demonstration of wind effect near the ground—apparent slip and skid, groundspeed and airspeed, gradient, etc. (2) a long straight glide just above the ground as preparation for (3) flying up and over an obstacle, again as a lead up to (4) manoeuvring in a turn close to an obstacle. Characteristics of a downwind landing and clearing obstructions to closer limits are covered also. Club rules stipulate that all flying below 500 ft. must be circuit-flying, not thermalling. Our low flying sequences are dual only, taken by the senior Instructors, and must be nominated before take-off as low flying.

This night flying? To some, at least, flying at night has a fascination all of its own—not only on a moonlight night with its faint, soft earth below, but on a dark night when the earth is invisible. It is a real pleasure to be moving almost silently through the soft blackness, with the patterned lights of the town away to the side and with the flarepath, straight and severe, below. Then shortly to touch the ground that cannot be seen as the flares flash by at the side. That is why we night-fly. For those that ask, we can give other answers, too. There are places in Australia that have lift, even thermal lift, at night. Thirty years ago sailplanes were chained to a ridge. Who knows what the future may unfold?—and to be nibbling a little at present bzrriers makes the sport more enticing. With the approval of the Gliding Federation of Australia and the co-operation of the Department of Civil Aviation, who supplied their night-flying facilities (both kerosene and electric flarepaths), we investigated the practicability of providing night-flying training in sailplanes. The winch launch and the landing were the critical factors. Suffice it to say that our planning—and there was quite a bit—worked well in practice; so much so that we have had no trouble at night, no cable tangles, and our night turn-round is faster than our day. We have soloed ab-initios at night and, strange to say, it was the power conversions that had most trouble with the flarepath landings. We teach night techniques, not day techniques flown in conditions of poor visibility. We would be interested in exchanging experiences with any others that have night-flown in gliders.

The G.F.A. stipulate a minimum of 25 hours on gliders before passengers may be carried. We require that the compulsory advanced sequences must have been covered and the pupil is tested by the C.F.I. The member is then really a qualified pilot as far as the Club is concerned, and may fly the Club sailplanes without an Instructor being present.

Cross-country flying is in a different category. Cross-countries in the two-seater are dual only (it's the only one we have). Conversion to the single-seater takes place on completion of the advanced sequences, usually after 60-80 solo launches. The conversion consists of three non-soaring flights on which the member tries stalls, steep turns and spins as briefed and under the ground supervision of the Instructor. We do dual spinning and aerobatics above 800 ft. and solo above 1,000 ft. The dual cross-country consists of an introduction to map-reading and cross-country technique. Obviously it cannot be taught on one check; but the Instructor ensures before clearing the member for solo cross-countries that (a) he is familiar

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with Air Navigation Orders and Club requirements, (b) his thermalling is of a standard to ensure a reasonable chance, (c) his map-reading and paddock lore is at least safe, (d) his advanced flying has been completed satisfactorily. Only full Silver C pilots may cross-country without an instructor's direct permission. All other cross-countries are under the supervision of an instructor. The first solo cross-country is a Silver C attempt. The supervising instructor ensures that A.N.O. requirements are met, retrieve arrangements are adequate, the route is safe, and he offers advice generally. By this stage, as is commonly stated in books on gliding instruction, "Orders have become advice". We actively encourage cross-countries.

On the field, the senior instructor present is pilot in charge, but generally he is relieved of much of the organisation by the appointment of a duty pilot from amongst the Club members. In the first eighteen months we sought power pilots as our instructors, particularly ex-R.A.F. instructors. After that we obtained our instructor trainees from among our own ranks. They were given an intensive course involving flying, night lectures and discussions, and did their first instruction while training under the direct supervision of the C.F.I.

Two private owner groups have grown out of the Club and recently another group acquired a Tiger Moth, primarily for flying to Kingaroy, but this has enabled aerotowing to be commenced. Our Club set-up is representative of many in Australia—one or two sailplanes, private groups forming, no paid staff, and flying at week-ends only. The training schemes vary from club to club, however.

To some, our Club's scheme may seem strict. The proof of the pudding in in the eating, however. In the three years we have been operating there have been about 10,000 launches. Damage has been confined to one "bent" skid (a cross-wind landing on the original strip) and a ply split in the nose of the Kingfisher on a cross-country landing (and that on an unauthorised flight —yes, we do have our discipline troubles.) Our damage cost per launch works out at about one-twelfth of a penny. We are rather proud of this, considering the strip we began flying from and the lack of sailplane experience of the instructors initially. We have been lucky at times, admittedly, but there is only really one reason for it—a sound instruction set-up. We feel the bloke that gets the greatest



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enjoyment out of flying is not the one that does as he likes as soon as he likes but the one that has been taught to handle his craft, so that he can more safely and efficiently use what the air provides. This latter pilot is enjoying his flying while the former is in the hangar repairing his sailplane.

Finally, a few facts on the trip we made to Longreach. About 300 of the 800-odd miles to Longreach is a narrow strip of bitumen known locally as "the crystal highway". Stones on the shoulders, thrown up as cars pass, shatter windscreens. It has been known for a traveller to break three windscreens on one trip, and it is not an exaggeration to say that there are the remains of a windscreen every few hundred yards for the complete length of the bitumen. In our party there was one windscreen casualty—cost, £20 Sterling. At night, travel must be slow or one is likely to have a seven-foot kangaroo in one's lap. These beasts seem to dash across at the last moment, at night, and can cause a considerable indentation in the front end of a car. Some parts of this West are rather lonely. One place, admittedly not on the main road mentioned above, when asked whether there was much traffic, replied: "Yes, there was another car through here last week." An Australian poem has one line that reads:

"And the rains are heavy on roads like these".

Twenty points of rain can make some roads untrafficable. Our party struck the break of a three-year drought half way through their holiday. We were confined to the shearers' quarters (kindly made available to us by the owner of the station from whose strip we flew) for eight days. Our cars could not have been moved one yard in that time. Eventually, when we did get out, the first 17 miles took 13 hours. Many yards of our winching cable saw service as a tow rope. The driving technique is to go flat out in low gear—get moving and keep moving. Cars would swing and sway and the wheels would spin madly on the softer sections. To stop in places would mean sinking to the axles, and there the car would have stayed for two or three days. As the roads dried further, second gear could be engaged at times, but even with the surface dry the whole area moved under the car as though it were a thin crust on treacle. It was a case of travelling like this, not for five or ten miles but for hundreds of miles. Winton and Longreach in the area where we flew are 110 miles apart. With much traffic the wheel tracks become deeper and then, every now and again, the car scrapes over the high spots.

Flying in the area has real problems, especially of navigation. The rivers, generally dry, spread out into hundreds of channels, a veritable maze, many miles wide. To force-land carries with it a very real danger of death from thirst—or actually, dehydration. The inland still claims its victims, but rarely now amongst the fliers. Each aircraft pilot, flying cross-country, before he leaves and when he lands, is obliged to notify D.C.A. by radio or reverse-charge telephone. If overdue, D.C.A.'s Search and Rescue Organisation calls in airlines, charter planes, private planes, flying doctor, police and outback radio. While much is done voluntarily, even a small search can cost many thousands of pounds. An S.A.R. watch is not applied automatically to glider cross-countries, but the facilities are there for the asking. It is rather comforting to know, when flying in a sailplane over some of the desolate and lonely inland, that all the S.A.R. facilities are ready to swing into action on your behalf, should your ground crew so request. It also gives one a sense of responsibility.

LONG MYND EASTER COMPETITIONS

Friday, 20th April 1961 to Tuesday, 24th April 1962

THE Midland Gliding Club is, as usual, holding competitions over Easter. B.G.A. rules for competition marking will apply. Entries will be limited to fifteen (15) visiting aircraft. Entries will be accepted strictly in order of receipt of completed entry forms. Entrance fee will be £3 per aircraft, which will cover the cost of launching by winch or catapult.

B.G.A. approval has been obtained to have the competition recognised as qualifying for Pilot Rating.

Entry forms may be obtained from Lieut.-Col. G. Benson, Marston, Pembridge, Leominster, Herefordshire. (Tel.: Pembridge 203.)

LADIES ONLY

It is proposed to hold a Women Glider Pilots' Rally at a conveniently situated site over the August Bank Holiday week-end. This would be a task-flying competition with Prizes, and the minimum pilot qualification suggested is the completion of the Distance leg of the Silver C.

In order to enable preliminary planning to be undertaken, those interested are requested to write at once to Rika Harwood, c/o the British Gliding Association, stating whether they would compete or help with the organisation. Husbands or boy friends would be welcomed as helpers.

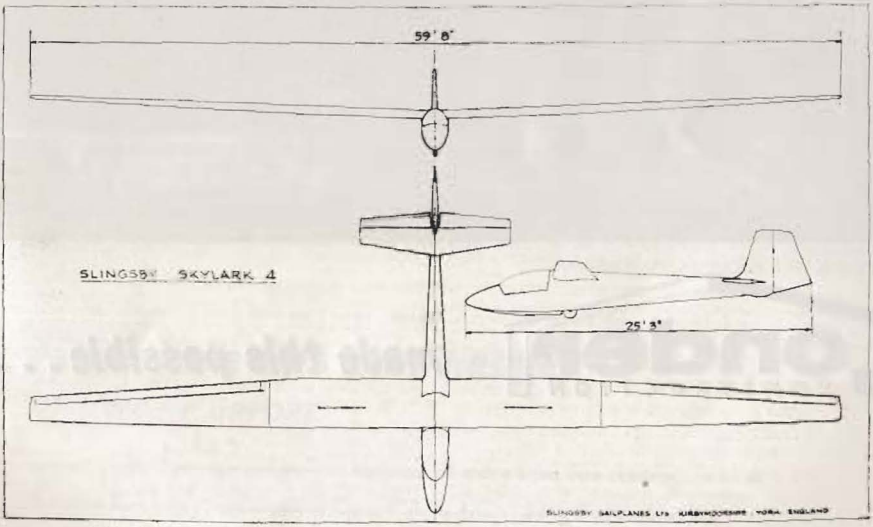
CROSS-COUNTRIES AT THE AEROBATIC CONTEST

At the National Aerobatic Competition described in our December issue on page 349, little information could be obtained about the cross-country contest which, as usual, was organised on the same day, and the pilot who reached the furthest landing-place, whom we mentioned, did not in fact cover the longest distance.

Low clouds delayed the start of the aerobatic contest, so that it had to be carried through without an interval, and the cross-country competition, in which several visiting pilots had been invited to take part, could not start till the aerobatics were over.

The competition was an out-and-return race from the London Gliding Club to Henlow and back. Owing to the poor weather and late hour, no one completed the course, but George Burton nearly did, and got back as far as Dunstable town, from which he walked to the Club. Geoffrey Stephenson also rounded the turning point and got back as far as Luton, while Mike Fairman rounded Hendon and landed just the other side of Luton.

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P.6326

GLIDING SITES IN

Club	Name of Site	Tel. No.	Position	Height ft a.s.l.	Lat. and Long.
ABERDEEN	Aberdeen Airport	—	Dyce, 6 m. N.W. Aberdeen	340	57.13 N., 02.11 W.
AVRO	Woodford	Bramhall 1291	5 m. N. Macclesfield	300	53.20 N., 02.09 W.
B.E.A. SILVER WING	Booker	High Wycombe 1494	3 m. S.W. High Wycombe	520	51.37 N., 00.48 W.
BLACKMORE VALE	N. half Henstridge Aerodrome	—	5 m. E. Sherborne	180	50.58 N., 02.23 W.
BLACKPOOL & FYLDE	Squires Gate	Blackpool 41526	Boundary of Blackpool	34	53.46 N., 03.02 W.
BLACKPOOL & FYLDE	Samlesbury Aerodrome	—	Mid between Preston & Blackburn	250	53.46 N., 02.34 W.
BRISTOL	Nympsfield	Uley 342	3½ m. S.W. Stroud	700	51.43 N., 02.17 W.
CAMBRIDGE UNIVERSITY	Cambridge Airport	Cambridge 56291	3 m. N.E. City Centre	50	52.12 N., 00.11 E.
COLLEGE OF AERONAUTICS	Cranfield	—	8 m. S.W. Bedford	360	50.04 N., 00.37 W.
CORNISH	Perranporth	Perranporth 3177	¾ m. S.W. of Town	320	50.20 N., 05.10 W.
COVENTRY	Baginton Aerodrome	Toll Bar 3377	3 m. S.S.E Coventry	270	52.22 N., 01.28 W.
DERBYSHIRE & LANCASHIRE	Camphill	Tideswell 207	8 m. N.E. Buxton	1,350	53.18 N., 01.43 W.
DEVON & SOMERSET	Dunkeswell Aerodrome	—	5 m. N. Honiton	800	50.52 N., 03.14 W.
DONCASTER & DISTRICT	Doncaster Aerodrome	Doncaster 56066	1½ m. S. of Town	20	53.30 N., 01.10 W.
DUMFRIES & DISTRICT	Thornhill	—	19 m. N. Dumfries		55.15 N., 03.50 W.
EAST MIDLANDS	Rearsby Aerodrome	Osgathorpe 260	8 m., N.E. Leicester	220	52.43 N., 01.02 W.
ESSEX	North Weald Aerodrome	North Weald	2½ m. N.E. Epping	329	51.44 N., 00.20 E.
GLASGOW & W. OF SCOTLAND	Bankhead Farm, Carnwath	—	7 m. E. by N. Lanark	300	55.44 N., 03.35 W.
HALIFAX	Ringstone Edge	Ripponden 3289	5 m. S.W. Halifax	1,050	53.40 N., 01.56 W.
HANDLEY PAGE	Radlett Aerodrome	Park Street 2266	2 m. S. St. Albans	260	51.41 N., 00.11 W.
KENT	West Malling	—	2 m. S.W. Malling village	300	51.11 N., 00.24 E.
ROYAL ENGINEERS	West Malling	—	2 m. S.W. Malling village	300	51.11 N., 00.24 E.
LAKES	Tebay Gyhll	Orton 280	Fell Top E. Tebay	1,000	54.27 N., 02.35 W.
LASHAM GLIDING SOCIETY: ARMY; BOY SCOUTS; CROWN AGENTS; IMPERIAL COLLEGE; LEIGHTON PARK SCHOOL; POLISH A.F.A.; SURREY; LONDON UNIV.	Lasham Aerodrome	Herriard 270	Between Alton & Basingstoke	600	51.11 N., 01.02 W.
LONDON	Dunstable Downs	Dunstable 63419	1 m. W. Dunstable	500	51.52 N., 00.33 W.
MIDLAND	Long Mynd	Linley 206	4 m. S.W. Church Stretton	1,500	52.31 N., 02.53 W.
NEWCASTLE	Carlton	—	10 m. S. Middlesbrough	1,200	54.25 N., 01.12 W.
NORFOLK	Tibbenham Aerodrome	Tivershall 207	15 n. S.W. Norwich		52.28 N., 01.05 E.
NORFOLK & NORWICH	Swanton Morley	Swanton Morley 274	15 m. W. Norwich		52.45 N., 00.55 E.
NORTHAMPTONSHIRE	Podington Aerodrome	Sharnbrook 474	Nr. Wollaston	330	52.13 N., 00.36 W.

THE UNITED KINGDOM

Description	*Aero-tows*	*Service or Civil*	*Days operating*	*Slopes*
Grass and runways	No	Civil	Weekends	None
Used for testing		Civil	Weekends	None
R.A.F. active aerodrome	Yes	Civil	Weekends and some weekdays	None
Flat grass E.-W. and N.E.-S.W. runways	No	Civil	Weekends	None
4-runway aerodrome	Yes	Civil	Weekends: Thursday evngs. in spring and summer	Nicky Fell closed
3-runway aerodrome	awaiting permission	Civil	Saturday afternoon spring & summer, most Sundays	None
Field ¾ m. long running E.W. edge Cotswolds				
Grass aerodrome, one runway; heavy powered traffic	Yes	Civil	Weekends; summer daily; winter by arrangement	N. & W.
Runway aerodrome, training flying			Weekends	None
3 runways; plateau on top of cliffs	Yes	Civil	Winter: Thursdays & weekends, May-Sept. daily	W. & N.N.W.
Coventry City airport	Yes	Civil	Weekends	None
Grass strip N.S.		Civil	Weekends & summer weekdays	W. & S.
Disused aerodrome	No	Civil	Weekends, midweek by arrangement	S. & N.W.
Grass aerodrome	No	Civil	Weekends, evngs. and most days in summer	None
Rough heather land	No	Civil	Weekends	Yes
Grass	Yes	Civil	Weekends, public holidays	None
R.A.F. emergency aerodrome	No	Civil	Weekends	None
Pasture	No	Civil	Sundays	None
Smooth moorland	No	Civil	Weekends	S.W. to N.W.
Firm's aerodrome, runways	No	Civil	Weekends	None
R.A.F. aerodrome	Yes	Civil	Weekends, public holidays	None
R.A.F. aerodrome	Yes	Civil	Weekends	None
Hillside moorland	No	Civil	Weekends	S.S.W.
3 runways, some aeroplanes, land on grass	Yes	Civil	Every day	None
Hill site, grass	Yes	Civil	Every day	W. & S.W.
Heather-covered hill top	Yes	Civil	Every day	W. & E.
Large hill-top site	No	Civil	Weekends	N.W. to N.E.
Runway aerodrome	Yes	Civil	Weekends	None
Runday aerodrome, active flying club	Yes	Civil	Weekends, some weekdays	None
Runways	Yes	Civil	Weekends	None

GLIDING SITES IN THE

Club	Name of Site	Tel. No.	Position	Height ft. a.s.l.	Lat. and Long.
THE OUSE	Rufforth Aerodrome	—	4 m. W. York	65	
OXFORD	Weston on the Green	—	7 m. N. Oxford	300	51.53 N., 01.14 W.
PERKINS SPORTS ASS.	Westwood Aerodrome	—	W. of Peterborough	34	52.35 N., 00.17 W.
ROYAL AIRCRAFT ESTABLISHMENT	R.A.E.	Aldershot 24461	Farnborough	233	51.16 N., 00.46 W.
SCOTTISH GLIDING UNION	Portmoak	Scotlandwell 243	1 m. S.E. Loch Leven	400	56.12 N., 03.20 W.
SHORTS, N. IRELAND	Newtownards	Newtownards 3327	½ m. S. Newtownards		54.35 N., 05.41 W.
SOUTHDOWN	Bo-peep, Firle	—	4 m. N.E. Newhaven	700	50.50 N., 00.07 E.
SOUTH WALES	Mynyod Mayo	—	3 m. E. Caerphilly	1,056	51.35 N., 03.15 W.
SWANSEA	Fairwood Airport	—	5 m. W. Swansea	250	51.36 N., 04.05 W.
SWINDON	South Marston	Swindon 2684	Nr. Swindon		54.35 N., 01.45 W.
WEST WALES	Whithy Bush	—		250	51.45 N., 04.45 W.
YORKSHIRE	Sutton Bank	Sutton Thirsk 237	5 m. E. Thirsk	1,000	54.15 N., 01.12 W.

ROYAL AIR FORCE GLIDING & SOARING ASSOCIATION CLUBS

Every one of these is based on an R.A.F. Station. All operate at weekends, and aero-tows are laid on

Club	Name of Site	Tel. No.	Position	Lat. and Long.
BANNERDOWN	R.A.F. Colerne	Hawthorn 283	7 m. W. Chippenham	51.26 N., 02.14 W.
CHILTERNS	R.A.F. Benson	Wollingford 2292	3 m. E.N.E. Wallingford	51.37 N., 01.05 W.
CLEVELANDS				
EAST ANGLIAN	R.A.F. Duxford	Royston 2291	5 m. S. Cambridge	52.15 N., 00.15 E.
EAST MIDLANDS	R.A.F. Swinderby	Swinderby 241	7 m. S. Lincoln	53.09 N., 00.41 W.
EAST YORKSHIRE	R.A.F. Driffield	Driffield 2274, Extn. 491	3 m. S.W. Great Driffield	54.00 N., 00.28 W.
FENLAND	R.A.F. Swanton Morley	Swanton Morley 261	15 m. W. Norwich	52.43 N., 00.58 E.
FOUR COUNTIES	R.A.F. Wittering	Grantham 850	1 m. E. Grantham	52.54 N., 00.36 W.
HOME COUNTIES	R.A.F. Hornchurch	Rainham 3344	6 m. E. London	51.36 N., 00.20 E.
MOONRAKERS	R.A.F. Upavon	Upavon 7	8 m. N. Amesbury	51.18 N., 01.47 W.
RED HAND	R.A.F. Ballykelly	Limavady 2201, Extn. 210	15 m. E. Londonderry	55.03 N., 07.01 W.
SUFFOLK	R.A.F. Wattisham	Needham Mkt. 234	5 m. S.W. Stowmarket	52.08 N., 01.25 E.
WESSEX	R.A.F. Andover	Andover 2381, Extn. 505	2 m. W. Andover on A303	51.13 N., 01.32 W.
WINDRUSHERS	R.A.F. Bicester	Bicester 501, Extn. 36	1½ m. N.N.E. Bicester	51.55 N., 01.08 W.

ROYAL NAVAL GLIDING & SOARING ASSOCIATION CLUBS

Every one of these is based on an R.N.A. Station. All operate at weekends, and aero-tows are laid on

Club	Name of Site	Tel. No.	Position	Height	Lat. and Long.
CONDOR	R.N.A.S. Arbroath	Arbroath 2201	Arbroath Angus	160	56.35 N., 02.37 W.
FULMAR	R.N.A.S. Lossiemouth	Lossiemouth 2121	Elgin, Moraysh.	39	57.43 N., 03.20 W.
HERON	R.N.A.S. Yeovilton	Ilchester 333	Ilchester, Somerset	75	51.01 N., 02.38 W.
PORTSMOUTH	H.M.S. Ariel	Lee-on-Solent 79143	Lee-on-Solent, Hants.	30	50.49 N., 01.02 W.

UNITED KINGDOM (contd.)

Description	*Aero-tows*	*Service or Civil*	*Days operating*	*Slopes*
Grass aerodrome, R.A.F. dropping zone	by arrangement	Civil	Weekends, public holidays	None
2 grass runways	No	Civil	Weekends, occasional summer evngs.	None
Large aerodrome	Yes	Works	Weekends, summer evngs.	None
2 grass strips	Yes	Civil	Weekends, some weekdays	W., N., S.
Active aerodrome	Yes			
Top of downs	No	Civil	Weekends, public holidays	N.E.
Rough mountain grass	No	Civil	Weekends	S.W.,
Civil aerodrome	Yes	Civil	Weekends, Wednesday evngs. in summer	N., N.E.
Active aerodrome, test flying		Civil	Weekends	None
3 runways	Yes	Civil	Weekends	None
Unpaved runway on heather moor	No	Civil	Weekends, daily except Mondays	S., S.W., W.

Meeting of Commission du Vol Sans Moteur

Paris, November 1961

Standard Class

In our August issue we reported a possibility that the *Fédération Aéronautique Internationale* would in future require that only aircraft types of which at least ten had been built and sold would in future be permitted to fly in the Standard Class in future World Championships. At their November meeting the C.V.S.M. rejected this proposal, so the Standard Class rules remain unaltered.

1963 World Championships

By the time these notes appear, most readers will, no doubt, have heard that the Argentinian offer to hold the next Championships at Junin, in February 1963, has been accepted.

Junin is about 120 miles west of Buenos Aires, in the pampas country. This is an immense flat grass-covered plain almost at sea-level. The Argentinian offer is a most generous one. There will be no entrance fee, and a proportion of the freight for the aircraft and the passage-money for the teams will be borne by the organisers. Up to 30 Ka-6's, 2 Skylark 3's and a Skylark 2 will be available, for only the cost of insurance, to competitors who cannot bring their own aircraft.

All retrieving will be by air, so cars and trailers will not be necessary, and there seems no need for each pilot to bring more than one team member with him. A pilot landing away simply awaits a searching aircraft and heliographs to it with a hand-mirror. This sounds a somewhat hit-or-miss method, but apparently has worked satisfactorily over the past years.

In addition to the 30 Ka-6's, the Government has ordered 30 tugs, a number of (probably German) two-seaters, and for their own team two Fokas and two Zefirs. So Hossinger's victory in 1960—on a Skylark 3—has certainly set up the Argentine gliding movement for some years to come.

National entries are limited to 3 aircraft, which may be split between the classes as desired.

Correspondence from interested Aero Clubs should be addressed to Señor Chourrout, Carlos Pellegrini 1352, Buenos Aires, Rep. Argentina.

The 1962 Gliding Ball

The 11th Annual B.G.A. Ball will be held at Londonderry House, 19, Park Lane, London, W.1, on Friday, 9th March from 8.30 p.m. to 2 a.m. Music for dancing will be played by Bill Savill and his Mayfair Orchestra.

The energetic Committee organising this year's celebrations are planning many surprises to make this the best gliding ball yet held, which incidentally may be the last one to take place in Londonderry House. So do make a note of the date and come along with your friends.

Tickets are 25/- each including Buffet and are obtainable from your gliding club, the B.G.A., or any of the following Committee Members:—Yvonne Bonham (chairman), Lionel and Barbara Alexander, Rika Harwood, Margaret Kahn, John Phillips, Mike Riddell, Cliff Tippett.

Y.C.B.

Prize Offer for a Wave Cross-Country

We hope that well-deserved support will be forthcoming for the scheme outlined in the following communication from Miss Betsy Woodward, who has spent some years in England doing meteorological research, and holds the World's feminine absolute altitude record with 39,994 ft. in a wave.

For years the British glider pilot has had the habit of going to other countries, notably New Zealand, South Africa and the U.S.A. (including Texas), and breaking other people's records. This is fine for everyone—including those whose records are broken—but it has always amazed me that they have never sufficiently investigated their own back yard. I am referring to Scotland. Not only should Diamond C height be obtained without difficulty, but a wave cross-country flight, such as that suggested below, should be both easier and more enjoyable than the Lasham-Perranporth "milk run".

I do not know why something has not been done. People have either not thought about it or are broke. To bring attention to the possibilities and to help with the expense of initial attempts, I would like to suggest a Scotland Wave Fund. This would consist of an award of about £50, and a small cup, to be divided as follows: 50% of the fund to be given to the pilot who first exceeds 300 km. from Scotland; 50% of the fund and the cup to the pilot who makes the longest flight during the first year; the same cup will be awarded for the longest flight in subsequent years.

To qualify for the awards all flights must fulfil the following conditions:

(1) flight must meet B.G.A. requirements for Gold C distance;
(2) start, i.e. point of release, must be in Scotland and at least 100 km. from the England-Scotland border (from every point on the border);
(3) waves must be utilised, at least at the start of the flight.
(4) In addition the pilot must submit an

B.G.A. BALL

Friday, 9th March

8.30 p.m. – 2 a.m. at

LONDONDERRY HOUSE

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Bill Savill's Band

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19 Park Lane, London, W.1

account of the flight to SAILPLANE AND GLIDING.

Verification of (2) can be given by the tug pilot in the case of an aero-tow. Regarding (3): thermals may be used, but it must be certified by at least two people in the starting area that wave conditions were present. If this cannot be certified (e.g. two people with sufficient knowledge not present), then the met. conditions will be subsequently analysed by at least two competent meteorologists to see if wave soaring was possible. (Mind you, this is no absolute guarantee that waves were, or were not, present, so I suggest the applicant take a camera.)

Ideally, I would like to see the flight originate in the Highlands, but one cannot have everything. A suggested flight is shown on the map. Assume N.W. wind. Release



Map showing the take-off region for Betsy Woodward's proposed Scotland Wave prize, and a suggested route.

could be made over valley (good landing fields) running roughly from Perth to Aberdeen in the lee wave from the Grampians. Dog-leg of 100 km. could be made in this wave, which should be more or less unbroken down the valley. Turn, head S.E., catch wave in the lee of the Ochils—which should be a good one, especially if in phase with Grampian wave. If it is, the remaining 200 km. can be made with a straight glide (remember average wind speed will probably exceed 20 knots); however, reasonable waves should be found over the Southern Uplands and the Cheviot Hills. If the Pennines are working, 500 km. would be on.

I do not have £50, so am trying to collect donations from all interested in promoting more activity north of the Border. The following amounts are requested from the following groups:

10s. from University people (with the exception of unmarried lecturers who are in group 2);

£1 from others (married couples may count as one);

£2 plus from Chief Executives.

I am giving £5—but that is because I want to see something done.

Suggestions from those who contribute will be welcomed. The above rules are a composite of ideas from those who have already contributed. It has been suggested that the awards be available after 1st March, 1962. All B.G.A. clubs will receive final notice of the award, including total amount and names of contributors, by mid-February.

Please make cheques payable to me, marking "Scotland Wave" in corner, and mail to me at the address below.

BETSY WOODWARD.

3, Manor Court, Gunnersbury Avenue, London, W.3.

The following very nice people have already contributed:—

Ken Bignell
Yvonne Bonham
Charles Brown
John Brownlow
Boris Cijan
Joe Croshaw
John Furlong
Bob Gavins
Mike Gee
Nick Goodhart
Rika & Godfrey Harwood
Gordon Hookings
Paddy Kearon
"Lefty" Kurylowicz
Dorothy & Bill Lawson
John Leach
Roger Mann
Hugh Mettam
Paul Minton
Alex Orde
Dr. John Rusforth
Beverley Shenstone
Prof. P. A. Sheppard
"Doc" Slater
Ian Sproul
Beryl & Geoffrey Stephenson
Charles Sutherland
Andrew Thorburn
Jill Walker
"Wally" Wallington
Ken Wilkinson
Philip Wills

For the Assistance of Contributors

by the Editor

CONTRIBUTORS who would like to assist our campaign against the growing illiteracy among technical journals, and in technical and scientific writing generally, may be interested in the following notes, which are followed by useful information about submitting illustrations and articles.

NUMERALS.—The different "marks" of glider types are usually distinguished by a number following the name; some use Roman numerals made up of letters of the alphabet, others use ordinary figures (which are sometimes called "Arabic" though there is not much resemblance nowadays to the original Arabic numerals); but many people don't seem sure which is which, so should study this table of equivalents:—

Arabic	1	2	3	6	11	111
Roman	I	II	III	VI	XI	CXI

It follows from this that "Scud 11" means Scud eleven, not Scud two, which should be written Scud 2 or Scud II; and "Skylark 111" means Skylark one-hundred-and-eleven, not Skylark three, which should be written Skylark 3 or Skylark III (there are not 111 marks of Skylark—yet). Likewise, V1 does not mean six; it means *Vergeltungswaffe eins*, otherwise known as the flying bomb.

Incidentally, the use of one tick for feet and two ticks for inches is permissible in drawings and in tables, but not in the text of articles.

FRACTIONS.—The expression 5/8 means five-eights; it does *not* mean "from 5 to 8", which may be written 5-8. A contributor once sent an article on sailplanes of "30/40 ft. span"; this works out at 9 inches, yet he meant man-lifting sailplanes, not models.

HYPHENS.—Only when a figure and a unit of measurement together serve as one adjective is a hyphen put between them; thus: "a 3,000-ft. climb", *but* "a climb of 3,000 ft.". Some writers, having caught sight of the hyphen once, seem to think it has got to be there every time.

When typing, there should be *no* space on either side of a hyphen, otherwise it means a dash.

LATIN AND GREEK PLURALS.—Here is a list of some in common technical use:—

Singular	*Plural*
Datum	Data
Stratum	Strata
Phenomenon	Phenomena
Stimulus	Stimuli

It follows that the expressions "this data" and "data is" are ungrammatical and illiterate, and will still be ungrammatical and illiterate even if they are used by every English-speaking technician in the world, instead of by only 95 per cent as at present.

The Latin plural of "apparatus" is *not* "apparati" but "apparatus" with the "u" pronounced long. The English plural "apparatuses" is less ambiguous.

Cumulus, Nimbus and Cirrus all take "-i" for the plural, but there is no such word as "Stratus" in Latin; Luke Howard, who introduced these cloud names in 1803, changed the "-um" into "-us" to make it conform to the other three. But not to worry, as Stratus is hardly the sort of cloud anyone would want to put into the plural.

TWO DOTS.—It is not a sign of German scholarship to jab two dots over every vowel in sight. They are absent as often as present. Thus: Brüggen, Gütersloh, Rhön (including Rhönadler etc.); *but* Wasserkuppe, Innsbruck, Grunau Baby. There is no such type as a Granau.

It is permissible to leave out the two dots if one adds an "e" after the vowel instead; thus: Oerebro, Kuettner, Huetter, etc., but the "ü" in the last two is nevertheless pronounced short—Huetter does *not* rhyme with Pewter.

The Scandinavian A with a ring on top is pronounced "aw" and can be transcribed Aa; e.g. Haakon, Aalleberg (the Swedish national gliding centre).

SPELLING.—HANGAR, *not* hanger (it is a French word meaning a shed, not an English word meaning something to hang a coat on. BAROGRAPH, *not* baragraph (one says barometer, not barameter). VARIOMETER, not variometre (metre is a unit of length, meter a measuring apparatus). CENTERING or CENTRING (in a thermal): the Oxford Dictionary decrees "centring", despite its pronunciation. PAUL MACCREADY, *not* McReady (i.e. use the maximum possible number of letters). SEDBERGH, *not* Sedburgh (the famous

public school, after which it was named, is most particular about this).

The abbreviation "Derby & Lancs" was invented by us because, in the certificate lists in the pre-war SAILPLANE & GLIDER, it would just fit into one line. It will no longer do so, owing to our narrower columns, and as it cannot be further shortened and remain recognizable, we have reverted to "Derbyshire & Lancashire". Thus there is no excuse for using this abbreviation where room is available for the full name.

"Its" without an apostrophe means "of it"; "it's" with an apostrophe is short for "it is" or "it has".

"Practice" is a noun in English and a verb in American; "practise" is a verb in English and a noun in American.

"Lamina" and "peninsula" are nouns, "laminar" and "peninsular" are adjectives; thus "laminar flow" but "Banks Peninsula".

ILLUSTRATIONS

For printing illustrations, a "block" has to be made by a "blockmaker"; it is usually a block of wood with a metal surface on which the picture is imprinted by a process resembling photography.

PHOTOGRAPHS.—These are reproduced by a "half-tone block", which means that the picture is divided into minute dots. In general the photograph sent should be at least as large as its reproduction, or larger. But if it is very clear in detail, the photograph can be smaller than the eventual reproduction.

In the lighter parts of the picture, the contrast is *reduced* in the reproduction, so it is no use sending a photo of a white cloud against a near-white background, because it will not show at all; nor will any light shading on a white cloud show in the reproduction. In the darker parts of the photo, on the other hand, the contrasts will be enhanced.

DRAWINGS.—These are reproduced by a "line block", in which all parts of the picture are *either* black *or* white. Since the process is photographic, blue lines do not show at all, and blue-black lines of varying blackness are unreliable; red and brown, however, reproduce as black. It is preferable to make the drawing much larger than the eventual reproduction; this results in a big increase in neatness when it is reduced. For drawings containing right angles, a useful method is to make the drawing in black ink on graph paper, provided that the background squares are light grey or blue; the ink lines can then be reproduced without showing the background squares.

If you cannot draw neatly enough for reproduction, then send a drawing in pencil which someone else can ink in; not in ink, because it would then have to be redrawn with great trouble on another piece of paper. Similarly, if you can make the drawing but not the lettering in professional style, then do the lettering in pencil. Lettering should be large enough to bear reducing in the reproduction, where it should be at least a millimetre high to be easily legible. Do *not* send a drawing the same size as its intended reproduction; somebody else will have to re-draw it to a larger size, and without the help of tracing paper.

It is possible to include, in a line drawing, a shaded area made up of small dots; the artist should indicate the desired area with light blue shading, and the blockmaker will do the rest.

MANUSCRIPTS

Typewritten manuscripts are preferred but are not obligatory (except for Club News). A few handwritten manuscripts can be accepted, but all proper names must be written legibly, because the spelling cannot be guessed from the context. This is the origin of the Services' rule that proper names must be written throughout in capitals. Unfortunately the reason for it has long been forgotten, so it has been carried over into the typewriting era—which is ridiculous, because a typewriter can produce small letters as legibly as capitals. People who send us typed articles with all the names in capitals cause endless trouble in preparing the manuscript for the Printers.

Typewriting should be double-spaced; any corrections or additions can then be written in legibly, instead of illegibly, and this has certain advantages. It should also be done on one side of the paper only, and the sheets should be at least quarto size.

NATIONAL CHAMPIONSHIPS

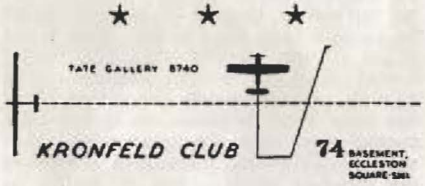
THE 1962 National Gliding Championships will be held from Saturday June 2nd to Whit Monday, June 11th at R.A.F. Aston Down, near Minchinhampton, Gloucester (a few miles from the Bristol Gliding Club).

The Meeting will be organised by the R.A.F. Gliding and Soaring Association, under the aegis of the B.G.A.

EASTER RALLY IN NORFOLK

THE Norfolk Gliding Clubs propose to hold another Rally and Competition at Swanton Morley next Easter from Thursday 19th to Tuesday 24th April inclusive.

Entries will be limited to 20 aircraft and preference given to those who attended the "bad weather" Rally of 1961 and are willing to try again. The entry fee is 2 gns. to include pilot(s) and crew up to four persons inclusive, the fee for additional persons being 10s. 6d. each. Launches will be by aero-tow at 15s. to 2,000 ft. and competitors will be responsible for their own retrieving and accommodation costs. It is anticipated that billeting will only be available at Swanton Morley for service personnel, but there is a caravan site in the adjoining village and ample hotel accommodation available locally. The closing date for entry is 1st March, 1962. Applicants should apply to Mr. P. Salmon, "Cumulus", Charles Close, Wroxham Park, Norwich, Norfolk (Tel.: Wroxham 167).



Diary of Lectures and Film Shows
Wednesday evenings at 8 p.m.

31st January	U.S. Film "Counterblast", the bombing of Hamburg and "Fools, Daredevils and Geniuses", stunt flying of the twenties.
7th February	The 1962 Long Mynd Wave Soaring Expedition.
14th February	Film, The destruction of the Ploesti Oilfields.
21st February	Spinning Trials by David Morgan (Vickers Test Pilot).
28th February	"With the Navy in Malta", Talk-film by R. Duckett.
7th March	"Air pioneers I have known" (Bleriot, Cody, etc.) by Geoffrey Dorman, veteran air writer.
14th March	Film, U.S. bombing of industrial centres in Germany.

Lectures for Ab-initio Soaring Pilots

ON Monday, 29th January at 8 p.m., a series of eight Lectures especially planned for pilots who have just reached or hope to reach the soaring stage of their training this coming season, commences at the Kronfeld Club, 74 (Basement), Eccleston Square, London, S.W.1.
The syllabus will be as follows:—

29th January	"The Art of Soaring", by Derek Piggott, one of the most experienced all round instructors in the country.
5th February	"Navigation", by Ann Welch, Chairman of the B.G.A. Instructors Panel.
12th February	"Away Landings", by Lorne Welch, an instructor and pundit of many years standing.
19th February	"Meteorology 1".
26th February	"Pre-Flight Planning and Cross Country Flying", by John Williamson, British National Gliding Champion.
5th March	"Accident Prevention", by Air Commodore G. J. C. Paul, Chairman B.G.A. Accidents Analysis Panel.
18th March	"Airways, Control Zones and other Regulations "by Air Commodore Paul.
25th March	"Meteorology 2", by C. E. Wallington.

The Lectures will be open to both members and non-members of the club and Registration Forms may be obtained from Mrs. Bonham, 14, Little Brownings, London, S.E.23. Telephone: FORest Hill 9390 or the B.G.A.

The Fees will be as follows:—
Full Course 8 Lectures £1 to current members (non-members 25/-). Single Lectures 3/6 (non-members 4/-). There will be special rates for married couples booking the whole course in advance.

Y.C.B.

O.S.T.I.V. Papers

THE following papers appeared in the OSTIV Section of the Swiss Aero Revue. The descriptions of sailplane types give comprehensive data such as are shown in the OSTIV publication "The World's Sailplanes".

November 1961

P. J. Feteris (Holland): "The influence of the circulation around cumulonimbus clouds on the surface humidity patters." (In English.) Air is apt to subside rapidly from below a cumulonibmus "anvil" (at 2 ft./sec. in the example investigated), reaching the ground as a patch of unusually dry air, perhaps 10 to 30 miles across, in which cumulus clouds either evaporate quickly or do not form at all. Glider pilots should avoid these areas, which are likely to be found downwind of the anvil.

HP-8: detailed description of Richard Schreder's all-metal design, called "Air-mate", in which he flew in the 1960 World Championships.

Sisu 1: U.S.A. metal design by L. A. Niemi; "a prototype for testing structural and aerodynamic ideas". Span 50 ft.

J. Michalczewski (Poland): "Die Anwendung von mikrosynoptischen Karten zur Wettervorhersage für Segelflieger" (The use of micro-synoptic charts for weather forecasting for sailplane pilots). (In German.) These charts enable local influences to be taken into account. An example is given of a "microcyclone" in a warm sector to leeward of the Tatra Mountains.

December 1961

J. Landi: "Ondes de Ressaut" (Obstruction waves). (In French.) A thorough description of air flow and upcurrent regions in the lee of an idealized mountain 2 km. high.

Letov 21 and 22: Polish training gliders of mixed construction with a single strut to each wing; the 21 is a single-seater of 15 m. span, and the 22 a tandem two-seater of 16 m. span.

Supplement: Much enlarged diagrams of the forward thickenings of the leading edge of a Ka-6 which improved its performance (illustrating paper in October issue by Wortmann and Althans, reported in SAILPLANE & GLIDING for December, 1961 p. 367).

A Sore Point

(*from "Australian Gliding"*)

"WHAT'S in a name?" This old saw is a sore point with Adelaide Soaring Club Secretary, Colin Edwards.

Col recently received a letter addressed to the club from a very famous youth organisation which planned to hold a "Festival of Hobbies". The letter, which seemed to be written by an indifferent speller, said in part:

"We are enquiring whether the Adelaide Sawing Club or you personally would care to make an exhibit available for the Festival.

"A similar function was run two years ago and similar bodies as yourself who exhibited found a great deal of interest was shown by the public, and in some cases new members were found.

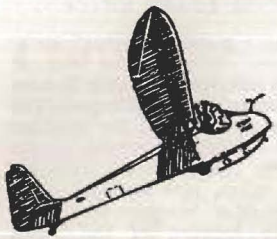
"In our opinion, sawing is certainly an unusual hobby and we feel sure that if you could put on a display of the different saws —old and new—and inform us of any unusual facts, then we will place cards with the exhibits and at the same time publicise your club . . ."

Col, it might be added, rang them up and informed them of one or two unusual facts.

— V. G. —

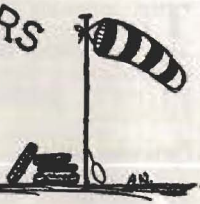
For all types of aircraft repairs and spares, estimates

83 WICKSTEAD AVENUE, LUTON, BEDS



ITS - ALL - YOURS

For and About Instructors



WEIGHTS AND MEASURES

With the Common Market and decimal coinage steadily approaching, we could do worse than look at our own gliding measuring systems.

To the patient audience of the enthusiastic pilot the account of a flight must seem bewildering. First of all he goes off on a 100-km. triangle, climbs to *x* thousand feet, dashes between thermals at the rate of knots, and finally falls to earth 6 miles short of his goal. Now, it may well be that British Team pilots do well *because* they have been brought up capable of assessing exactly what is happening, no matter what the yardstick; nevertheless, I think some rationalisation could well provide a greater benefit, particularly to those new pilots who are thinking in knots when flying a miles-per-hour Tutor. The problem lies in deciding what should be done, or disposed of, and this is really quite difficult. Kilometres are international gliding measurements, but not very satisfactory for altimeters (this is presumably why the World's airlines work in feet). Knots are very logical, and link up with variometers in hundreds of feet per minute (100 ft. per minute equals 1 knot almost precisely) but make the flight seem less impressive when used to announce successes. Miles (the statute ones) are something that everyone understands, and can usually be measured on a map with a school ruler, but do not link up with other measurements in an interpretive sense, nor mean anything when considering international records. There seems to be nothing in favour of measuring rate-of-climb in feet or metres per second. Hundreds of feet per minute are much more readily appreciated, since going up at 200 f.p.m. obviously means that 1,000 ft. will be climbed in 5 minutes; 3½ feet per second does not relate to anything.

We therefore have no less than three independent measuring scales in everyday use. Even if these could be reduced by one, instruments could be better standardised, and even the odd accident might be avoided. On balance, it would seem that the long established miles-per-hour should be the one to go. Would it seem too depressing in official lists of records to put nautical miles in brackets after the kilometres? After all, the bright Press boy can always do his own conversion, and kilometres always look a long way. British gliders could then standardise on knots and feet as measurements of speed and height. This still allows a satisfactory link with the international kilometres, since courses, which are laid out on the ground beforehand, can be measured in these units without confusing in any way calculations in the air.

Recommendations

Distance nautical miles.
Speed knots (nautical miles per hour).
Height feet.
Rate of climb 100's of feet per minute (=knots).
Ground measurement for course planning kilometres.

(if necessary check points for in-the-air calculations being laid off along the line in nautical miles.)

ANN WELCH.

B.G.A. ANNUAL MEETINGS

The Annual General Meeting of the British Gliding Association will be held at the Middlesex Yeomanry Drill Hall, Duke of York's Headquarters, King's Road, Chelsea (on the south side of the road near the Sloane Square end) at 10 a.m. on Saturday, 10th March, 1962. The Instructors' meeting and that of the Secretaries and Managers will be in the same building at 11.30 a.m.

BOOK REVIEW

Gliding Clubs, by GODFREY HARWOOD. Published 1961 by the British Gliding Association. Price 7s. 6d.

A GREAT many books have been written about gliding, and now the first to deal with matters relating to the development and operation of a club has, not before its time, been produced by an author well qualified by experience to bring into daylight the facts and processes which go with the organisation and management of a club. Primarily intended as a guide and help to those intending to form a new club, the book deals in detail with every aspect, and how personnel and resources are to be marshalled to efficiency and good management. So full is it of useful information that even the most sophisticated committee member will find in its pages much to interest him. In every way Godfrey Harwood's publication adequately fulfills its purpose and is invaluable to those who have in contemplation the formation of a club, exposing, as it does, all that goes on behind the scenes and makes gliding possible. The book is a valuable addition to the British Gliding Association's list of publications.

B.M.

Correspondence

THE FIRST 500-KILOMETRE RACE

Dear Sir,

In her very interesting article in the October issue of SAILPLANE AND GLIDING describing the 1961 Polish Championships, Ann Welch states that on the last day there was held ". . . the first 500-km. race ever to be set in gliding championships". This may well have been the case in Europe, but it was generously exceeded in the U.S.A. three years earlier.

In the U.S. National Championships held at Bishop, California, in 1958, the Task Committee on the third day, 31st July, set a task which many of us believe was the most daring and challenging one ever laid before pilots in an organised competition. After the met. briefing, the chairman of the Task Committee announced the task for the day would be "A flight to El Mirage airport. . ." and then he paused while most of us breathed a sigh of relief at the prospect of a very interesting but not too difficult 310-km. flight. Then he added, almost as an afterthought, ". . . and return!"

The significance of this 620-km. task was brought home when it was pointed out that it was 106 km. longer than the then existing world record for goal-and-return. Many of us howled in protest, but the sagacity of the Committee was well demonstrated when *two* contestants, Schreder and Jensen, completed the task in times of 7:29 and 8:02! Unhappily the finish line had been set up more than 1,000 metres from the release point, so the new record could not be claimed. But this should not diminish the honour due the Task Committee for their courage and wisdom, or the two pilots for their skill in completing the task.

HARNER SELVIDGE.

Altadena, California.

GLIDER SIGNALS TO WINCH

Dear Sir,

Are there any practical objections against the use of lights to signal from a glider to the ground? For instance, if we want to signal during a winch launch "too slow", we waggle the wings in the rolling plane. If the launch is too fast we signal by moving the tail from side to side in the yawing plane.

There are objections to these conventional methods of signalling which I would like to point out.

(1) Excessive use of the stick, especially when signalling "too slow".
(2) Unnecessary use of the controls in both methods.
(3) Excessive wear and friction of the automatic release mechanism. The ring on the launching cable does have a grinding effect in both instances.

No doubt the conventional methods of signalling to the winch from the airborne

glider are effective. They are certainly effective in the unnecessary wear and tear of the glider as outlined above. To eliminate this ridiculous "tugging" of the glider's heart-strings, which almost makes *me* cry, I suggest the following:—

A white (or red) light could be fitted in a conspicuous place, with an on/off switch. Experiment would determine the best position for this light, and for the minimum lighting power required.

During the launch, suppose the glider is flying too slowly. Simply signal "too slow" by switching on the light. Once the winch driver observes the signal, and increases to the speed required, signal by switching the light off.

If the launch is too fast, signal to the winch driver by a series of switching on and off.

The light could easily be checked at each D.I., and the battery replaced when required with a new one—the dry type. There would be very little to go wrong with such a simple device. I can hear a quiet sigh from the glider!

R. B. SMITH.

Dumfries & District Gliding Club.

GATE-CRASHERS

Dear Sir,

Further to my letter in the December issue of SAILPLANE AND GLIDING, I should point out that a very severe check is given to pilots of unknown ability at my own club. However, we have on occasions been wrong, and a member who has done a perfectly satisfactory solo check or checks has then frightened us by his lack of airmanship at a later stage.

With regard to not disclosing the name of the pilot concerned in an accident, I do not think clubs would be very reluctant to disclose them now, as the cost of accidents is going up each year and this could be a very effective deterrent. Nobody would blame an instructor for "T-21, failed to take over in time—heavy landing, £5." Or "1 hour solo—landed with slight drift, knocked skid off Tutor, £5." But when a pilot of Silver C experience attempts a circuit too low off a cable break and spins in, his name should be blazoned forth, "*pour encourager les autres*" or words to that effect.

Alternatively, could not a separate circular be sent out giving names to C.F.I.'s only—a sort of Soaring *N . . . of the W . . .*?

M. C. USHERWOOD.

Doncaster.

THE B.G.A. ACCIDENTS ANALYSIS OFFICER comments as follows:—Hitherto I have always regarded accidents reports by Clubs as "CONFIDENTIAL", and consequently I hope they feel that they can report in a way which publicity would render impossible. My aim is not the elimination of individuals from gliding, but the elimination of accidents.

If your Correspondent feels that the ability of new arrivals requires more searching examination than is possible by means of dual checks, what about a look at his log book? A properly kept record of flying, in a logbook signed periodically by the appropriate C.F.I., should constitute a pilot's bill of health. Too many pilots fail to keep their log books properly, and the people responsible for encouraging them to do so are the Instructors. A pilot without a log book, or with an incomplete or badly kept record, ought to be suspect at once. So the remedy seems to lie in Clubs' own hands.

As for publishing offending pilots' names! I have more than once received threats and unpleasantries from individuals whose pride was pricked, and would certainly require the B.G.A. to insure me if your Correspondent's suggestion were to be adopted. So far they have not volunteered to pay the premium!

BIRDS SOAR IN WAVES

Dear Sir,

Further to I. H. Shattock's letter in the October issue describing rooks thermalling for fun, readers may be interested in a note by John Barlee published in *Ibis* (Vol. 99, p. 686) in which he describes gannets doing much the same thing in waves. This was observed on several occasions at the gannetries of Little Skellig, Bass Rock and Ailsa Craig. Besides birds slope-soaring to windward of the rock there would be a column of gliding birds some 200 yards downwind of it, and often another a similar distance downwind of that; on one occasion there was a third column still further downwind. Each column

contained 200-300 birds, with a layer of herring gulls and sometimes fulmars at the top: the top was wider than the base. At the Bass Rock the column generally extended from about 50-400 ft. a.s.l., but at Little Skellig the birds could sometimes soar up to 1,000 ft.

The birds circled in the wave, almost always turning to the right (these would be narrow blobs of wave, not the long thin things glider pilots are used to). Individual birds would soar from the base to the top of the column, then glide upwind to the rock, and would then often return downwind to the bottom of the column and repeat the process over and over again. Others would merely circle near the top of the wave for long periods. Birds coming in low over the sea from fishing would use the wave to gain enough height to glide in to their nests on the rock, thereby saving themselves as much as 2,000 ft.-lb. of work.

It is my impression that those kinds of birds which are capable of soaring get just as much fun out of it as we do. All cliff-nesting species of sea birds that I have seen, even the fast ones which usually flap their wings all the time, like auks and cormorants, will tack and hover in front of a cliff face for long periods if the wind is strong enough.

C. J. PENNYCUICK.

Dept. of Zoology, Univ. of Cambridge.

Soaring a Line Squall

by Peter Vaughan

Chilterns R.A.F. Gliding Club

ON Sunday, 6th August, cumulus clouds were building nicely by 10 a.m. and soon flying commenced. After a spell of winching I climbed into "Sweeney", our T-21, with a pupil and we were launched.

A small thermal took us to 1,600 ft., where we could see a curtain of cloud and rain approaching from the north-west. It stretched as far as I could see to the north-east and south-west.

The wind being fresh, we turned for Benson, arrived at 1,200 ft. and picked up another thermal, which took us to 1,800 ft. By this time the squall was almost upon us, and back over Benson we encountered slight turbulence, then strong, smooth lift.

The vario stayed at 20+ f.p.s. whilst we circled up to 4,000 ft. just below cloud base, then turned onto a south-west heading parallel to the rain. To our starboard was a ragged wall of cloud, forming and decaying, behind which was a translucent curtain of rain. Flying at 60-70 knots we just kept level. I had previously opened the spoilers and dived to make sure we could escape if need be!

After three miles or so we turned through a gap in the low cloud and into the rain in 15 f.p.s. down. Once through the rain the air became very smooth and after a few practice 360's we did a circuit and landed. The flight lasted 45 minutes.

I am sure a good cross-country could have been flown, but at the time we had no T-21 trailer available.

The wall of ragged cloud we encountered was forming and decaying well below normal cloud base and the whole squall moved cross-wind at 10-15 knots.

EDITORIAL NOTE.—This line-squall formed in polar air following a cold front which had passed over about 1 p.m. the previous day. The westerly airstream had a horizontal temperature gradient: i.e., it was about 1° colder for each 300 miles westward over the Atlantic (ignoring irregularities). In such a situation the usual vertical wind gradient causes the colder air to arrive sooner high up than down below, creating the sort of instability which is apt to give rise to line squalls.

Warren Storey

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An Analysis of the Logistics of Training
or, Why is a B not a Silver C

by John M. Knotts

I WOULD like to throw into the discussion on Instructor Training, Accident Rate and costs and quality of instruction, a view which I have not so far seen mentioned: that there are enough Categorised Instructors but not enough launches.

Before reaching for a vitriol-filled pen, I would ask the reader to consider the following analysis of B.G.A. statistics published each April in SAILPLANE AND GLIDING.

1.—We want to produce soaring pilots who are competent to fly safely across country and land away—who have gone through the over-confident stage of expensive accidents between 5 to 30 hours solo.

2.—Such a person will require the following average number of launches based on existing performance:—50 launches to B certificate (40 launches dual, 10 launches solo—see A.T.C. statistics); 30 hours solo at 0.15 hrs. per launch (200 launches solo); dual instruction for away landings—say 20 dual soaring, checking during the 5-30 hrs. Total 270 launches (60 launches dual, 210 launches solo).

3.—There are approximately 100 Categorised instructors. Assume that the professional and non-professional instructors average 10 days' instructional flying per annum, are launched 4-5 times per hour for 8 hrs. Then the average launches per instructor per annum is 360. For 100 instructors this is *36,000 launches per annum.* If a pupil requires 60 launches dual, this amounts to an instructor capacity of *600 pupils* for 100 instructors. As a check on this, a direct proportion of two-seater launches for civilian clubs in 1960 gives $\frac{51 \times 115,605}{176} = 33,500$ launches per annum. This seems a reasonable agreement.

4.—But a pupil requires 210 launches solo. Hence 600 pupils will require $210 \times 600 = 126,000$ launches per annum.

5.—The total number of training launches per annum to utilise the capacity of 100 instructors is thus $36,000 + 126,000 = 162,000$. The total of launches for civilian club aircraft was 115,605 in 1960. Let us assume the National Training Fleet is (1960)

51 two-seaters
51 secondary
20 "club operated" (secondary?)

122

Also 54 club-operated high-performance.

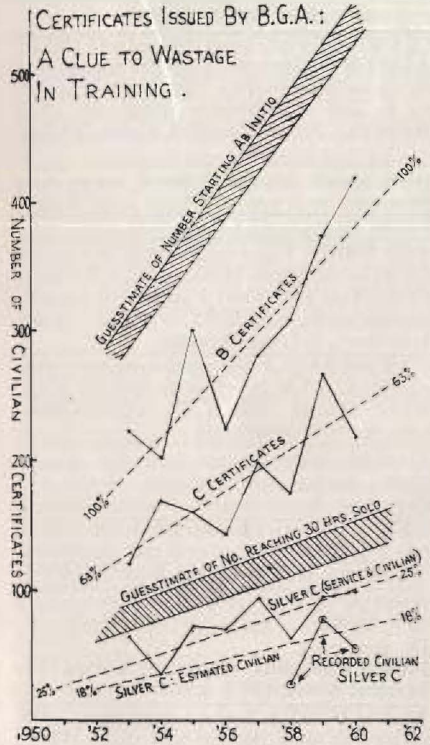
Taking a direct ratio, training launches were $\frac{115,605 \times 122}{176} = 80,000$. This is probably less than actual as there is usually more pressure for training launches. *Say, 90,000 training launches per annum.* Thus there was apparently a shortage of 162,000 $-90,000 = 72,000$ training launches. 90,000 launches represents capacity to train $\frac{90,000}{270} = 335$ pupils to 30 hrs. solo standard.

6.—Compare this with the graph of certificates issued since 1953. This illustrates the enormous wastage during training. The number of intake and 30 hrs. solo are pure guesstimates, and factual information on this is obviously useful, if it is available. It would seem that our instructors are at present getting about 150 pupils per annum to the 30-hr. stage from an intake of about 3-4 times this number. Each 30-hr. pilot thus represents about 600 training launches of which he personally required about 270.

It would appear that our 100 instructors could just about cope if properly organised, but their efforts, and their solo pupils, are frustrated by a lack of launches for solo pilots under 30 hrs.

7.—What we apparently need is an increase in training launches from 90,000 to 162,000, i.e. 72,000 launches per annum at least, if we are to match the apparent training capacity of our 100 instructors. This represents an increase in civilian launches from 122,557 (1960) to about 200,000 launches per annum, i.e. a 65% increase.

This does not seem an impossible task if one notes that the average club did only 36



launches per flying day in 1960. A 65% increase would make this 60 launches per day. (If Doncaster G.C. really did average 211 launches per flying day in 1960, would they please let the rest of us in on their secret!)

To summarise:—

(a) 100 instructors at present probably produce about 150 pilots to 30-hr. solo standard.

(b) Without wastage, the same instructor force could get about 300 pilots to the same standard within the 90,000 training launches available.

(c) If 170,000 training launches were available per annum, the same instructors could get 600 pilots to the same standard, assuming no wastage.

I would conclude that the lack of launches is the main reason for discouraging the 66% of B certificates who do not complete the course. I would suggest that:

(a) Courses should be fitted into the club training programme so that this valuable training capacity is not frittered away.

(b) If each instructor was responsible for only one or two *ab initios* at a time plus about 5 under 30 hrs. solo, there could be more personal interest and consistent instruction without much record-keeping. Instructor and *ab initio* would arrange to visit the site at their mutual convenience and the instructor would not sit in the two-seater all day with a succession of pupils it is difficult for him to know well. It would be easier for the C.F.I. to control the waiting list and training programme.

This may seem a chronic waste of instructor capacity, but it should be considered in conjunction with launching capacity.

In connection with this last point, is this in fact an application for self-launching sailplanes so that a high launch rate could be achieved for pilots between B certificate and 30 hrs., where any reduction in soaring performance would not be critical?

I do not suggest that the figures deduced in this analysis are any more than the right order of accuracy. Assumptions have been made which are perhaps excessively inaccurate. It would be of interest to know what the average number of instructional launches per instructor per annum were for professional and non-professionals and how many of each and where they are, but I am sure that the general conclusion is correct, that the *balanced* use of launching capacity is the key to reduced frustration and the chronic wastage during training.

It is obviously very desirable to train more instructors, but their efforts will be largely wasted unless sufficient launches are produced and allocated for solo training.

I hope this analysis will promote those with experience of running waiting lists and training programmes to go into print and distribute the benefit of their experience.

HEIGHT IN N. RHODESIA

DURING December Mr. Brierly, of Kitwe Gliding Club in Northern Rhodesia, made a climb to 35,000 feet. No further particulars are available yet, but a photograph on page 51 shows that a Sisu sailplane recently arrived at the Club.

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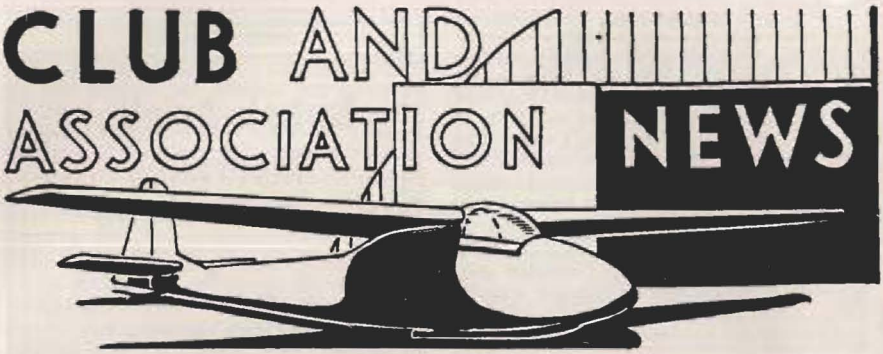
WANTED. Kirby Cadet-Tutor. State Condition, Price. Beal Bros., Charlton Mires, Alnwick, Northumberland.

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After the official proof-loading of the Sisu's cantilever wings, members of the Kitwe Gliding Club, Northern Rhodesia, test it again.

CLUB AND ASSOCIATION NEWS



AFTER an absence for over a year we are glad to have news this issue from the Dublin Gliding Club and to hear that the gliding movement in Eire has expanded by the dormant Cork Gliding Club commencing operation at Ballicnollig Airfield and the formation of a new club in Clonmel, Co. Tipperary.

With the soaring season almost with us we next think of the Nationals and it is necessary to mention the press date for the June issue now, because the date for Club News copy is just after the April issue is published. Press secretaries please note that copy for the April Issue is required by 1st post Wednesday, 14th February, and that for the June issue not later than first post, 4th April. So please have your copy ready typed double spaced on foolscap, and sent to Mrs. Bonham, 14 Little Brownings, Dulwich, S.E.23.

YVONNE BONHAM,
Club and Association News Editor.

BRISTOL

1961 has turned out to be a record year for the Club with almost 2,000 hours flown from 9,000-odd launches. This total included over 1,000 aerotows which is way above the target figure set when we first had the Tiger.

This is partly due to the C.F.I.'s policy of encouraging early aerotow training and in some cases soloing pupils on aerotow.

Little of the flying at the end of the year was of any note but in November Jane Warter did five hours on the ridge in the Prefect, the first woman member to have achieved this.

Several more pupils have gone solo, including the Chairman's son, Martin Corrick, who also did his C flight very shortly afterwards. Other C flights were made by Lavinia Pitman, June Stanier and Barbara Webster.

After two years of negotiations, mains electricity has at last reached us and we no longer have to rely on the vicissitudes of the paraffin engine which has done valiant service for the last six years. The brilliantly-lit workshop is now a hive of industry with the C.'s of A. well in hand.

We apologise for stating in the last report that the Scud III was being renovated by a group of seven optimists. It should have read eight super-optimists.

A.L.S.

BLACKMORE VALE

THE first annual dinner was a very big milestone in the club's progress and it proved a great success. We were very pleased that Mrs. Ann Welch was able to be present and the support of over 100 people makes us realise that our club is striding ahead.

The Social side is being well looked after at present, with a skittles evening in December, and a dance organised in January.

A new Swallow has been ordered and should be with us before the next soaring season.

Recently we have made a couple of expeditions with the Tutor, trying out promising sites and sampling the lift available when the wind blows on the



At the Blackmore Vale annual dinner. L. to R.: Tudor Pugh, Geoffrey Warwick, Ray Crowe Ann Welch, John Garrood, Derek Jesby.
(Photo E. P. and M. A. Baker.)

Dorset hills.

Although these trips have met with only limited success, they have shown promise and been great fun, all the members involved being keen to go again as soon as the weather is suitable.

The Club Caravan has been taken over by the gliding wives, who supply cups of tea and cooked meals on Sundays.

G.B.W.

CAMBRIDGE

OUR club is particularly vulnerable to poor weather in the late autumn and during the winter months when marginal visibility or a soggy surface on the aerodrome may put a stop to all gliding.

In October and November about 80 flying hours were logged, and Lionel Alexander soared the Olympia for almost 2 hours over Cambridge as late as on the 29th October.

At the beginning of December, however, there was no more escape from frustration, except for an enterprising group of pilots who took the Skylark 2 to the Long Mynd, mainly on the initiative of John Brenner.

In November the Club held its Annual Dinner which proved a great success. Among the guests and visitors were members of at least ten other gliding clubs. Two of the trophies presented at the Dinner deserve special mention.

The Brunt Trophy, offered for the greatest climb of the year achieved by a member of a university gliding club, had got into the hands of the Imperial College G.C. by utter misfortune, but was retrieved by John Brenner with a climb of almost 10,000 ft.

The Slazengers' Trophy for the fastest flight round a set course in a Club-operated aircraft was awarded for the first time, and the winner was Paul Bethell-Fox who steamed round the 71-mile triangle at 31.3 m.p.h. in the Skylark 2.

One of the guests at the Annual Dinner mistook the hall of Emmanuel College for our clubhouse, maybe in jest. The truth is, we have no clubhouse, and the workshop at Marshall's is our main social centre.

Here reigns Ted Warner, our Resident Instructor and Ground Engineer. Ted uses the winter months to carry out the certificate of airworthiness inspections on our relatively small fleet, comprising a T-21, a Swallow, an Eagle, an Olympia and a Skylark 2. Negotiations are in progress to make a privately owned Sky available for Club use.

Professor J. W. S. Pringle who has moved to Oxford will remain President of the Club, but his office as Chairman of the Committee has been taken over by Wing Commander J. E. P. Thompson, who has served on the Executive Committee of the C.U. Gliding Trust since 1958.

G.S.N.

CORNISH

THE Autumn has provided a fair amount of ridge soaring and quite good thermals. Peter Lanyon flew his five hour leg in November on the cliffs and in thermals.

Our Annual Dinner and Dance, in November was very well attended. Our Chairman, Bernard Warmington welcomed the guest of honour, Mr. Charles Milner-Haigh and other guests.

Deputy C.F.I., Pip Phillips had the support of the entire Club in thanking our C.F.I., George Collins for the great work he has done for us during the last five years and in hoping that he would continue as C.F.I. for many years to come.

Congratulations go to Jane Pollard, who won the Flying Proficiency Cup. She flew her accurate and safe circuits in rough and wintery weather which made her performance the more creditable.

The Swallow pilots' list is now mounting fast, Peter Lanyon, Pat Pearson, "Titus" Bate, Ted Mann, and Bob Langhorne's names having been added during the last few months.

J.E.K.

COVENTRY

SINCE the last bulletin the following members have gone solo: Messrs. Bateman, Frogatt, Hornby, Pickles, Sower and Blagden. Despite the temporary reduction of the club fleet due to the absence of one of the T-21s for her "10 year" C. of A., training is continuing steadily.

The most important item of news in recent months is the announcement of the club's purchase of a Skylark 3.

We hope that this move will lead members to longer and better cross-countries, apart from any question of competition flying and great rivalry is expected for the honour of doing the first Gold distance in this outstanding aircraft.

The club held its annual dinner and dance on Friday, 8th December. This function was a great success, thanks to the kindness of the Coventry Aeroplane Club and the hard work of Elsie and Bill May.

Speeches were made by the Chairman, Mike Hunt and John Large, our secretary, who greeted the guests, for whom Mr. Parkes of the Aeroplane Club replied. Following the speeches, Mrs. Gregg presented the trophies.

The Coventry Evening Telegraph Trophy, for best progress in the year, went to Bill Hall, who went from first solo to passenger carrier during the year. Mike Hunt took the prizes for the longest cross-country and the most outstanding flight, both being awarded for his trip from Lasham to near Perranporth during the nationals.

Doc Gregg was the first winner of the Boomerang trophy, which he had presented for out-and-return flights. He was also declared the current holder of the Ludgate-Turner Tankard for the most recent flight between our site and that of the Swindon Club (or vice versa). C.D.-J.

DEVON & SOMERSET (Dunkeswell)

SATURDAY, 2nd December, proved to be quite a good soaring day, with two half-hour flights being made. One to 1,500 ft. and the other to 2,000 ft. in really strong lift!

We now have 88 members who can fly solo and after careful consideration it has been decided to limit membership.

A Kite 1 has recently arrived at the Club to join an Olympia and Skylark 3 which are syndicate owned. Plus the Club's T-21, T-31, Swallow and two Tutors, this makes eight gliders now flying from Dunkeswell.

All being well, with the assistance of a full time instructor we hope to run many more courses during 1962 and if we can make the necessary arrangements we would like to run a Regional Competition at Dunkeswell later in 1962. P.E.B.

DONCASTER

AS the year closes, we can look back with a certain satisfaction on our first full year at operating. We are looking something like a gliding club what with a hangar, two workshops and a clubhouse with push-

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Our target of 5,500 launches in the year has not quite been attained but at least we have topped 5,000. As we have only three club aircraft and three privately owned, we do not think we have done too badly.

The second diesel winch (ex Pudsey Corporation single decker bus, once ridden in by Sir Leonard Hutton) is away for final modifications. When it returns it should really be something; two drum, self propelled and able to tow the original winch which is to be made two drum as well.

This should give us a four cable "Launching System". We are, I believe, the only gliding club in the country where the M.T. Committee meet in the winch. M.C.U.

ESSEX

It is some six months since we took delivery of the T-21 and became fully operational at the end of June. During that time we have successfully begun to establish ourselves as a gliding club fulfilling the needs of those enthusiasts throughout Essex and around London.

The total of first solos has reached 16, with an ever increasing number expected in the very near future. Praise is due to our members for their undiminished enthusiasm in the face of a bad bout of cable breaks, a problem that we believe is now behind us. If our present rate of progress is maintained their should be a fair crop of C's to report in the Spring. It is encouraging to report that during these first few months our average launch rate reached 43.5 per day, our initial target being 40 per day.

The Club's first Christmas Party exceeded expectations, thanks (foodwise) to the wives, and we all look forward to meeting more members at our next social evening. M.G.R.

HANDLEY PAGE

Flying at Radlett has progressed relatively smoothly throughout the summer and although our total number of launches for the year is likely to be down on 1960, we seem to have more to show for them in the way of noteworthy flights.

These include Silver C heights of 4,700 ft. and 4,850 ft. by Tony Newton and Laurie Frakes flying the Skylark. Geoff Wass has flown two cross countries, Radlet-Little Snoring, a distance of 95 miles on 1st July and Dunstable-Scampton-Grimsby, a distance of 124 miles on 9th September.

Laurie Frakes, trying for his Silver C distance also flew from Radlett to Little Snoring, only to find on arrival that his barograph was not switched on.

The popularity of Little Snoring is due to the large number of aerodromes suitable for forced landings placed on the route by a benevolent government, hence the expression "the chicken run" by those who have completed it.

The T-31 has also been indulging in thermal soaring, achieving two flights of an hour and a maximum height of 4,800 ft.

On 27th May we were visited by Stewart Johnson from Cambridge, in his Eagle who then very sportingly gave flights to some of our members in this machine.

The Skylark trailer chassis has been converted to independent suspension by fitting commercially produced "Flexitor" spring units utilising rubber in shear.

This has resulted in the towing performance improving from a state of negative stability at any speed one cared to think of to it now being stable at all speeds tried to date. This makes retrieving less interesting, but somewhat safer.

A.W.

KENT

We have been very fortunate in the weather since the start of flying at West Malling in July, having been able to operate nearly every Saturday and Sunday.

However, winter seems to have arrived in earnest, and as the members become muffled in all their thickest flying suits, so it grows more difficult to recognise individuals at a distance. The strangest garment yet to be seen is a long sheepskin coat of great antiquity.

David Woods has gone solo recently in the T-31, while Gavin Dix, Don Connolly and Bill Gartland have all converted to the Prefect, and Charlie Dance and Ken Brissenden to the Olympia.

Towards the end of October sailplanes from the Kent club soared again on the ridge near Detling, after an interval of two and a half years.

On the 22nd Denis Crabb in the Syndicate Skylark was aerotowed the five miles back from West Malling to the ridge and spent an hour soaring there in very rough conditions and the following Saturday Peter O'Donald in the Olympia also soared there for some time, before landing at Boxley. P.B.

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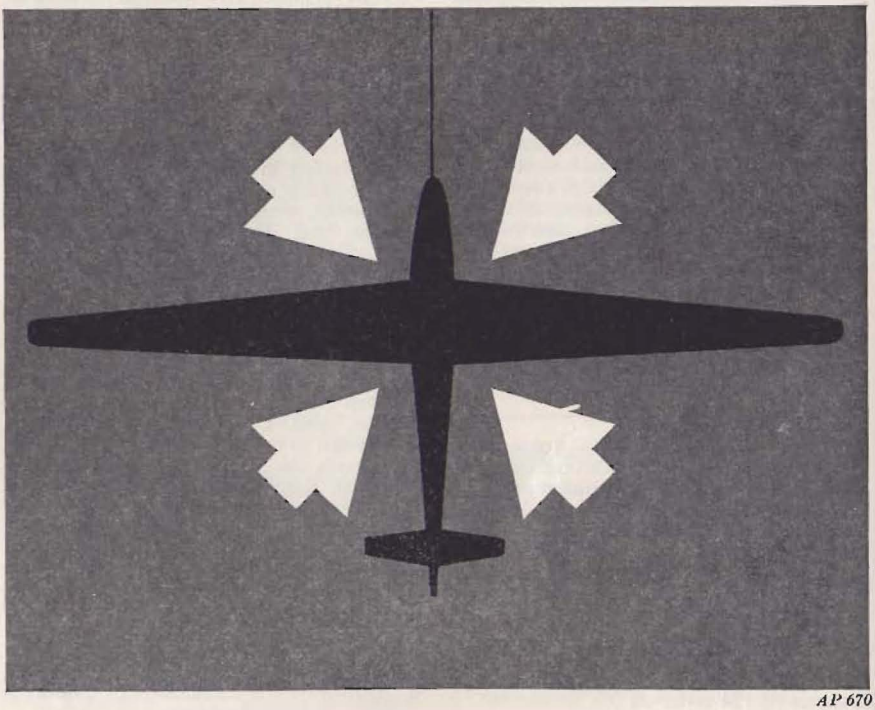
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LAKES

THE Fourth Annual Dinner Dance was held on Thursday, 23rd November, at the Royal Station Hotel, Carnforth.

The Leighton Hall Cup was presented by Dr. Edgecombe, who was the guest of honour, to Reg. Wolff for his successful wave flight. He contacted the wave after a winch launch of 1,000 ft. His flight took him up to 5,600 ft. where he remained until dusk forced him down after 2 hrs. 25 mins.

This is only the second time that wave has been contacted from a winch launch at Tebay, although a visiting aircraft has remained over our site in wave at 9,000 ft. before terminating a cross-country flight to our Club.

Over the years since the formation of The Lakes Gliding Club, some excellent work has been achieved by Ron Reid as the Club's C.F.I., and Mathew Hall as its Chairman. Now that each of these enthusiasts for the Club's welfare have vacated their posts, the members offer their appreciation for their past efforts.

John Young now becomes the Club's new C.F.I. John is a popular and energetic instructor, and under his direction we look forward to advancing our training.

It should not be forgotten, however, that Ron Reid brought numerous solo pilots to their present stage from scratch, as he and Mathew Hall were the only people with any gliding knowledge when the Club was formed.

A hearty welcome is also extended to Ernie Dodd who is now our Chairman.

D.H.M.

LASHAM

LAUNCH total for 1961 to mid December is 25,000, our best year by some 1,000 launches. Figures for flying time cross-country miles, etc., are also expected to show record totals when the thankless task of compiling has been completed.

Main interest on the flying field during recent months has been various prototypes flying. The T-49 appeared early in November and its purposeful appearance and fine finish have made a good impression. First reports of its handling have also been definitely favourable.

New versions of the Olympia 460 have also appeared and comparative runs made. On calm days the enterprising Southampton man-powered aeroplane skims the grass, pedalled by a perspiring Derek, its 80 foot span cutting a swathe through the assembled pressmen and T.V. cameras.

J.N.C.

LONDON

THE weather has been uninspiring. Flying, apart from circuits, has been restricted at week-ends to two soarable days when it was just possible to creep back and forth through the murk along a short beat.

An extremely glamorous T-21B, resplendent in red and cream colour scheme, has now joined the fleet. This machine was bought third hand or so and was revived in the club workshop. We now have four two-seaters in the club.

The scheme for ab-initio training in batches with which this club has been experimenting has now been modified. Forty members will now comprise the batch and will have priority over others wishing to receive training at week-ends.

Ronald Watson has installed a magnificent coke-fired stove in the Ottley Hut, a building reserved for those private owners who wish to build Skylark 3's and trailers, and carry out C. of A's. Loafing types now enjoy this luxury of roasting heat whilst tendering advice to those who work.

A.S.H.F.

MIDLAND

DURING the last two months we have welcomed back to the Mynd, David Lowe and his Skylark 3 from Lasham, Mike Randle from Singapore and Glyn Davies. On the other hand, however, we are sorry to lose Norman Spencer, who has gone to work in Mexico.

Winter time is party time and on the 11th November we held the usual Trogs' Party at which we were pleased to see members of several other Clubs.

The Auster Tugmaster has been operating from Condover, a nearby disused airfield, and much useful training at both ends of the rope has been accomplished. The tug has already broadened the Club's outlook and should prove to be of great benefit in the future.

"Are you interested in forming a syndicate?" seems to be a common question lately and it will be interesting to see how much of the talk comes to fruition.

The Club will hold the usual Easter Rally, which it is planned to run as a B.G.A. qualifying competition.

With the lifting (we hope) of the cloud flying restriction, the prospects for the coming season look bright and we look forward to improving on 1961 when we set new Club records with flying totals of over 11,000 launches and over 3,000 hours.

K.R.M.

NORFOLK & NORWICH

ALTHOUGH we have had our fair share of bad weather this last month, we have not been altogether too disappointed having had one first solo flight by Mr. G. W. Harrington from Wisbech in the Kranich.

We are still having good attendances at our weekly talks on Thursday nights at the Air Centre, St. Giles, Norwich.

The most outstanding talk was by Alf Warminger on his flight from Swanton Morley to Troyes, France, some 250 miles (my word, what an excitement it must be to cross the channel).

Other talks were by Mr. J. Hemstead, and Mr. W. Reekie on Meteorology.

At our Annual Dinner and Dance held on the 24th November at the Grosvenor Ballroom, Norwich, the Norfolk Trophy was this year awarded to Ian Strachen of the Fenland Gliding Club for his flight of 183 miles from Marham to Yeovilton, and was presented to him by our President, Mr. A. Rice.

D.G.T.

NORTHAMPTONSHIRE

THINGS are definitely moving in the right direction now. Our new chairman, Gordon Grant, is proving himself to be a lively, capable organiser. A seven-year lease of Podington's fine runways is "in the bag". Eddie Clarke is making us very comfortable, in our re-organised clubhouse.

Reg Spokes and his M.T. section have performed wonders with our winches. Genial Ken Pearson, our C.F.I., is keeping us all moving along the right flying channels.

Since our last report, B certificates have been gained by Les Higgins, Derek Wilcox and Les Johnson. Frank Rowell gained Silver C duration whilst enjoying Sutton Bank hospitality.

F.R.

SCOTTISH

BY the time you read this our Christmas Party-cum-Dinner Dance in the Green Hotel, Kinross will have taken place and the festive season celebrated in the usual S.G.U. manner.



Ian Strachan receives the Norfolk Trophy from the Norfolk and Norwich president, Mr. A. Rice, for his flight of 183 miles from Marham to Yeovilton.

STEPPING HILL 5742

The annual award of cups and trophies shows some considerable activity by the chairman A. J. Thorburn during the year. He collects the Club Championship and Best Height Awards (i.e. the Maclay Trophy and Robert Parker Trophy respectively), the Best Distance Award being retained by T. P. Docherty (The Alan Boyle Trophy).

Since our last report little of note has occurred and the final exercise of the period —The Aircraft Movement Census—was a fitting finale. During this census not one of our aircraft was airborne due to the bad weather.

A recent announcement by the Directors that one of the Club Olympias would be sold early in 1962 has caused considerable stir in the advanced pilots group and embryo syndicates are now furiously bidding for the Olympia—a most healthy sign.

On behalf of the S.G.U. Members, I should like to offer Best Wishes in 1962.

W.A.S.

SOUTH WALES

SINCE our last report, the weather has stopped flying on only two Sundays when the mountain has been shrouded with rain and low cloud.

On other days it has been largely circuits, except for the 8th October when Alan Newton explored the ridge to Pontypridd in the T-31. The first four trips averaged thirty minutes, height being limited to 1,400 ft. by cloud base.

All are eagerly awaiting the arrival of the G.B.-2B and we have started constructing a building which should make life less spartan.

D.E.F.

SWANSEA

NEGOTIATIONS for permission to fly from our chosen hill-site are proving rather lengthy and the commoners have not yet given their consent. We hope, however, that in the New Year we will be soaring in conjunction with the West Wales Club from this ridge.

At the moment, one of our headaches is our shortage of instructors as our C.F.I. has heavy commitments and our other instructor's business will take him out of town for the greater part of the time in the New Year.

Our thanks must go to "Taff" Davies for his untiring efforts during the past four months in making it possible for us to fly regularly. Any B.G.A. categorised instructor who lives within reach of Swansea would be welcomed with open arms.

Our annual dance held in October was a great success and we were particularly pleased to welcome the C.F.I. and ten members from Haverfordwest.

Since our last report five members have been checked out and sent solo by our chairman, Freddie Abraham, in the ballasted T-21. They are:—John Howells, "Willie" Miles, Brian Gorvett, Jack Richardson and our first lady member, Julie Waters.

D.B.W.

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SERVICE NEWS

BANNERDOWN (R.A.F. Colerne)

DURING the period, personal achievements were fewer than usual, but on 29th October Steve W.-F. angled for 40 mins. and 51 mins. in the Olympia, returning with graphic description of the Goldfish that got away and making muttered reference to battery trouble. 25th November was a good day for Kathy Fielding, who is a slim 8 stones. On the word from Bill Longley she had much advice and many offers of help in donning a parachute preparatory to her first flight in the Eon Baby, seated on a thick sponge cushion, backed by three blankets and carrying a pocketful of spanners.

However, it is a great pleasure to report that activity on the deck has increased, with majors and minors carried out by our proud new J/T Paddy Stephenson and his helpers, while Vince Griffith, Bob Cockerill, Brian

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Campbell, George Millington and Percy Hoyle have slaved away at the M.T. Now with the addition of a Ford V8 our tow-cars are in triplicate and the Rover with healthy exhaust is operating on cable retrieve. At a recent Instructors' meeting, opportunity was taken to review operations generally and a new duty roster will ensure an early start for flying. It was also decided that each student should carry his logbook at all times to be presented before flight, so that progress can be noted. This will be a great help to students, ensuring good continuity in their instruction.

Our Committee has been reshuffled and new office-holders are:—

President: Air Vice Marshal P. Wykeham
Treasurer: Sqdn. Ldr. Mac A. Bacon
Asst. Technical Member: J/T J. W. N. Stephenson. A.N.O.N.

CLEVELANDS (R.A.F. Leeming)

We at Leeming look back on 1961 with satisfaction. It has proved to be a year of steady progress. Only just over 700 cross country miles were recorded—but we believe that we are developing safe soaring pilots and this must surely be the aim of every club.

For the record, here are our "statistics": One Gold distance; four members completed their Silver C's; five Silver "legs" were flown; twenty pupils soloed and five converted their B's to C's. Four members are now categorised G.S.A. "B" instructors.

Finally for the "Book" the record of which we are most proud: no member of the Clevelands G.C. was involved in an accident either in the air or on the ground in 1961.

We recently had a visit from the Newcastle G.C., our neighbours at Carlton. They brought with them a privately owned Bergfalke, a two seat German glider which aroused great interest.

Our aircraft are in pristine condition. The T-21 has been partially re-covered and resprayed, and also the T-31 and Tutor have been given the full "treatment". The Tutor now sports a checkered tailplane. We have to thank Sgt. Kaye and Cpl. Ogden for their artistic and practical skill.

We are now operating two winches and the Chipmunk (when available) and also a field service type telephone system con-

necting the winch with the launching point.

To all our gliding friends we wish all that. we wish to ourselves—A Very Happy 1962.

R.F.P.

EAST YORKSHIRE

THE end of September marks the end of soaring at this site, so it is into winter storage for the Olympia and T-21. Full attention can now be given to student training and aero-tow upgrading, to prepare for a greatly expanded flying programme in the new year. The Tutor has had a very complete major and will soon be earning its keep again. Winter non-flying weather has its compensations in that it brings together in closer contact the hard core of gliding people who make the club run. The year, in retrospect can be regarded with some satisfaction. For a relative newcomer to the ranks, the East Yorkshire club has done well. Winter soaring will be continued through participation in the Wave Project, with an assist from the weather. See you there. W.F.O.

FULMAR (R.N.A.S. Lossiemouth)

THIS is the first time that we have burst into print, and on this auspicious occasion it is fitting that we should have something of interest to report. For the majority that have never heard of us our club site is Milltown Airfield on the Moray Firth, near Elgin; which is surely the northernmost site in the U.K.

On Sunday, the 1st of October, we were blessed with the presence of lee waves produced by a South Easterly wind over the Banffshire Hills, and by eleven o'clock Nick Humphreys in the Skylark 2 had reached seven thousand feet off an aero-tow by John Williams in the Tiger. The pot was then kept boiling by John Harris in the Prefect and Dave Innes, who recorded a stately 5,000 in the faithful T-31.

At 16.15 John Williams received his consolation for tug duty and was towed to 3,000 to invistigate a suspicious but rather dubious cloud system which stretched away from the field out over the Firth towards Tarbat Ness. He found steady wave lift at this cloud, which occasionally revealed its character by hardening of the upwind edge. This took him to 8,000 ft. and for the next hour he explored this and two more waves to the west, which took him almost as far as Lochindorb and the onetime fortress home of the "Wolf of Badenoch".

John Harris, meanwhile, was enjoying three hours in the Prefect at 8,000 ft. over Rothes, and landed back at Milltown at roughly the same time as John Williams and the Skylark descended upon a startled trio of blackberry pickers at Allanfeam, three miles East of Inverness—there is a paucity of fields West of the city where the monster rears its humps.

We anticipate more success with Morayshire waves in the coming season and look forward to being able to report our first Gold C height, for it cannot elude us for long.

J.P.W.

HOME COUNTIES (Hornchurch)

WE are sorry to say that Sam, "Teekoop-slark", Churchman has now been posted to Germany. He was a founder member and a very hard worker.

The Christmas party was well attended and we were pleased to meet many of our neighbouring Essex club members for the first time.

Looking back over the past year we see signs of steady progress and as we share the airfield with the A.T.C. Gliding School, we would like to mention that the satisfactory results are to a great extent due to their friendly help and co-operation.

During the year we have done well over 2,000 launches. In the hangar we now boast five aircraft, two winches, three airfield vehicles and also a signals caravan. The completion of the club room towards the end of the year at last enables us to organise social activities.

We remind you that this is the nearest R.A.F.G.S.A. club to London, being only a few minutes from Elm Park station. We will be very pleased to see new service members wishing to take up gliding and also any other visitors who may happen to pop in.

G.H.M.

NIMBUS (Geilenkirchen)

AT the recent A.G.M. it was decided to adopt the above name for the Gliding Club at R.A.F. Geilenkirchen; it was in fact the name of the club at R.A.F. Wildenrath which was amalgamated with the Geilenkirchen Club by Andy Gough in 1958; as we still have in use two of the

Wildenrath aircraft, we feel it is an appropriate name for the club.

At the same meeting Group Captain P. de L. Le Cheminant agreed to take the post of Chairman and Cpl. Wilf Pickles was elected C.F.I. to replace Wing Commander Croshaw who is posted. We have also recently lost Cpl. "Spider" Webb to the Redhand Club at Ballykelly, Chf. Tech. Bill Andrews to Bicester Centre and Chf. Tech. Eddie Sowter to the Fenland Club. Jnr. Tech. "Ben" Bennet has joined us from East Anglian at Duxford.

In the last year we got one Diamond Height—Wing Commander Croshaw at Zell am See who got to 31,700 ft., one Gold Height—Sgt. Norman Wilkinson who climbed to 12,000 ft. over the site in a Cu-Nim. We also completed two Silver C's; Norman Wilkinson did 5 hours and distance in the Meise, while on a visit to Gütersloh Centre to complete his Silver C, and Jnr. Tech. Harry Howitt got his at Lasham. We also gained another 7 Silver legs and several A, B, and C's.

Our fleet consists of one T-21B, two Grunau 3's, one Meise, one Rheinland, one Weihe and one Skylark 3F. We offer a warm welcome to any gliding types who happen to be in the area. We fly every week-end unless the weather decrees otherwise.

C.G.T.

WINDRUSHERS (R.A.F. Bicester)

THE Club's "Open Day" on Sunday, 29th October, was a great success. The aerobatic competition for the Maygothling Cup was keenly contested and there were some very good displays.

Ron Newall had a "field day", winning both the aerobatic and spot-landing contests and was also in the winning rigging team; Dick Barton won the intermediate spot-landing contest. The formation team of Andy Gough, Dave Cretney and Ken Poole put on a very polished display which was much appreciated by the crowd.

We now have the R.A.F. Gliding Centre in operation with Andy Gough as C.F.I. and the first Instructor's course has recently been completed. Ken Poole is Centre Secretary and all requests for courses and accommodation should be addressed to him.

Our Club secretary will soon be leaving us for foreign parts and his place is being taken by "Doc" Saundby.

The Novices Trophy was won this year by Dick Barton who has done extremely well since joining the Club early in the summer; in addition to his flying progress, he has worked very hard behind the scenes.

H.G.

OVERSEAS NEWS

DELHI

ON 30th November, Major Yuri Gagarin visited the Delhi Gliding Club. A small air display was arranged. It opened with the Rohini, flown by F/L. D. P. Soni, performing loops and stall turns. This was followed by Miss Raj Mitroo flying an Indian-made Olympia.

The Ashvini took off on an Indian winch (powered by 120 h.p. Dodge engine) and got 1,500 ft. in less than 45 seconds and was only 200 ft. below the Bocian, which had taken off 8 minutes earlier on aero-tow. The tug pilot was Capt. R. S. Jammal and Bocian pilot was S/L. I. S. Loughran.

After Miss Suriender Gill, with D. Chandra as passenger, had landed Ashvini, the Bocian gave a magnificent display of aerobatics by performing loops, stall turns, spins, barrel roll and finally a low run.

After the display, Major Gagarin renamed the Rohini "Friendship". He then had tea with the members and gave a talk on his space flight.

Another important occasion for the gliding movement in India was the opening of a gliding and flying club at Banasthali School for girls in Rajastan. I think this is the only club exclusively for girls of its kind in the world.

D.C.

DUBLIN (Baldonnel Airfield)

ALTHOUGH it is over a year since news of the Dublin Gliding Club last appeared in these columns, we have not been at all inactive during that time. In fact, 1961 has been a record year for us, both in respect of number of launches and of soaring hours.

It was also the first full year of operation of our KA-7, and the popularity of this aircraft may be gauged from the fact that

the club membership has nearly doubled in the last 12 months and is now approaching 50.

We have recently bought a Kite 2b and other arrivals during the year have been an Olympia and a KA-8, both privately owned.

Wave flying has been in fashion and on a number of occasions altitudes of around 13,000 ft. have been attained in the wave off the Dublin Mountains. Thermals, too, have been popping and the cross-country mileage has been higher than average in 1961.

An interesting innovation which we have tried out recently is a "reverse-launching" system, designed by John Byrne. With this system and using a tow-car on a 6,000 ft. runway, we have found it possible to obtain launching heights of 2,000-2,500 ft. in average conditions, even in the two-seater.

"Reverse-launching" is a sort of cross between auto-towing and winch-launching and it has the great advantage that, if properly operated, no cable retrieving whatever is necessary.

In fact it is possible, with only one cable (13 gauge piano-wire), and using two tow-cars, to give a 2,000 ft. launch every two minutes. The apparatus required cost less than £20 to build.

We hope to have this system in full operation in 1962 and to make our tenth anniversary year even more successful than was 1961. Visitors from "across the water" will be very welcome to visit us at Baldonnel Airfield, Co. Dublin.

A.G.M.

EAST AFRICAN ASSOC. (Nakuru, Kenya)

THESE notes are being written whilst sitting under the wings watching the daily one and a half inches of rain cover the runway. The gloomy weather of the past few months hasn't helped our ever-present membership problem—only the hard-core, the incredibly keen and/or insane, are braving the elements.

Since the last notes, we have lost Bill Shephard (posted back to England and the congestion of Lasham) and Mike Garrod (languishing in the wastes of Entebbe). After several years' devoted service as C.F.I., Tony Stocken has relinquished that post to John Ryde. We are very grateful to Tony for all his work.

We welcome Jim Brimfield, of London and Andover, who is instructing turn and turn about with John.

Flora Stocken gained her "C" certificate with a comfortable 37 minutes in the Cadet. Ron Mills has found sufficient flying time between burying himself in the engines of the tow-cars to obtain his "A" and "B" certificates, whilst George Locke gained his "C", with 16 minutes in the air.

We are still examining the maps of Kenya for a new site—while the 2,100 yd. runway couldn't be bettered, it is felt that the lack of a hill site and, as a result, long non-thermal flights, discourages newcomers.

The latest possibility is a long field which wiggles along the ridge of Menengai Crater, which rises about 1,000 ft. above the surrounding countryside and drops into the crater the other side for 1,365 feet. G.L.

HOLLAND

THE bad weather this summer has been the main reason for no Dutch news. During 1961 we have done less launches, fewer hours and also less performance flying than in previous years.

Since the nationals, only one diamond and gold leg was achieved—by J. C. Bernsen and only 7 Silver C's were completed. On the other hand, the accident-rate decreased as well and we hope this is due to the new advanced training scheme which will be fully in operation when all the KA-7's are delivered.

The second batch of six arrived in September and there are seven more to follow. Furthermore 16 new KA-8's were ordered after consideration of the new Polish Lis-trainer.

A new Rhönlerche (built in the Fokker factory by members of the Kennemer Gliding Club) was flown out from Schiphol (Amsterdam-airport) on 24th June, stopping all civil air traffic for about half an hour.

At the beginning of December the first series Sagitta was flown and showed a lot of improvements against the prototype.

Two new gliding sites have been acquired, de Voorst and Witten; the former is part of the newly reclaimed land in the ex-Zuiderzee, the latter near Groningen replaces the civil airport Eelde.

On Walcheren, one of the islands in the south-west (flooded in 1953), a new site is under preparation. The club, however, are already flying as guests at Woensdrecht, about 40 miles away.

Expeditions to wave-centres in the South

are planned. Two Terlet KA-6's and an instructor will be stationed at Yssoire (France) during the wave season and about 20 people are expected to go there at different times.

Ed van Bree (runner-up in the 1961 Nationals) completed Dutch Diamond C number 2 with a 5,080 metres gain of height in a lee wave at Innsbruck, Austria on the 9th November. J.TH.v.E.

NORWAY

IN Tröndelag, Norway, last autumn offered extremely good lee-wave conditions. On 29th September, Jon Trengereid from the Technical University Flying Club, broke two Norwegian records by reaching 22,000 ft. after a gain of 18,000 ft. over Selbu, 25 miles south-east of Trondheim.

The same day Ola Raaness of Trondheim Flying Club gained 11,000 ft. before he had to descend from 14,000 ft. because he had no oxygen on board. The planes used were a L-Spatz-55 and a Lo-100.

On 8th November, Ole A. Heintz, of Technical University Flying Club, completed his Silver C tests by flying 40 miles from Bratsberg to Rinleiret. This flight also gave him an altitude gain of 12,500 ft.

Waves giving such results only appear in connection with extreme turbulence below 3-4,000 ft. and are strictly reserved for pilots with great experience.

Those who needed more training, however, had several chances of improving their ability by flying in more moderate waves. There have also been some primary training and checking of pilots, for which a Bergfalke 2, owned by Trondheim Flying Club, has been used.

This club also have two Grunau Babies, a Mucha 100A and the Lo-100 mentioned above. The Technical University Flying Club is owner of the record-breaking L-Spatz and the Silvaire 85 h.p. Luscombe, used for towing. R.C.A.

U.S.A.

THE Sisu 1A sailplane is now in production by the Arlington (Texas) Aircraft Co. It is all-metal, vee tailed and boasts a 40 to 1 glide ratio. The initial run is for eight.

The Schweizer Aircraft Corp. is completing work on the prototype of their all-metal, two-place 2-32 sailplane. It will have a 56-foot laminar flow wing and a glide ratio of over 35 to 1. Production models of complete and kit versions should be available in 1962.

Another all-metal, vee tailed sailplane is slated for production, the Prue Standard, a Standard Class, laminar airfoil design with glide ratio of over 32 to 1. Paul Bikle flew the prototype to 4th place in the 1961 Nationals.

Dick Schreder has licensed the new Helisoar Aircraft, Inc., in Danbury, Conn., to manufacture and sell HP-10 sailplane kits and these will go into production early in 1962 if enough orders are received.

Price has been set at $3395. This all-metal, honeycomb wing sailplane was featured in an article in the April, 1961, issue of SAILPLANE AND GLIDING. Dick is hard at work on the HP-11 to fly in the 1962 Nationals.

Another significant flight made in 1961 and not previously reported here, was one by Bill Ivans on 22nd July. He landed only one thermal short of a new world O. & R. record of just over 400 miles, flying a Schweizer 1-23H-15 from Inyokern, Calif., north past Bishop to Hawthorne, Nev., and back to Olancha, Calif., in 7 hours, a total of 365 miles. L.M.L.

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