1939 Competitions. Flying instruments. Magazine
Photos F. Charles. Blind flying. Inspections
Death F. Charles.

SAILPLANE AND GLIDER

APRIL, 1945
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The First Journal devoted to Soaring and Gliding

Our Post War Policy

The experience of fourteen years as specialists in the design and construction of glider aircraft will be devoted to the design and quantity production of the most up-to-date sailplanes and gliders on a large scale.

Every machine will be up to C of A standard and tested by our own sailplane pilots with many years of soaring experience. Sailplane pilots will also supervise the detail production.

Interchangeability of spares will have most careful consideration.

Quantity production will ensure minimum costs. The following types, evolved from our successful pre-war sailplanes, will be in production at the earliest possible date.

Kirby Kite II. An advance on the now famous Kirby Kite known throughout the world.

Gull III. A full cantilever version of the well-known Gull I, with a tested performance well ahead of any other sailplane of 50 feet span.

" Type 21 " 2-seater, a side-by-side soaring training machine of 54 feet span. The prototype version of this machine has been flown by many well-known pilots and voted a winner.

The following will also be produced in quantities in the next phase of our programme :—

The Petrel II. A high performance competition sailplane, developed from the pre-war Petrel.

The Olympia II. A development of the German type designed by Hans Jacobs for the Olympia competitions, incorporating the original features plus certain improvements gained from our research experience of the past five years as an approved design organisation.

Reservations may now be made for any type in our programme. Orders will be fulfilled in rotation shortly after authority is granted for the production of sports type sailplanes.

Slingsby Sailplanes, Ltd.

Kirbymoorside, York.

FULLY APPROVED FOR DESIGN AND PRODUCTION

Sailplane and Glider

THE FIRST JOURNAL DEVOTED TO SOARING AND GLIDING

APRIL 1945 ★ Vol XIII No 3

EDITOR:
F/L VERNON BLUNT

ASSOCIATE EDITOR:
ALAN. E. SLATER

ADVERTISEMENTS:
C. K. MARSH

EDITORIAL OFFICES:
THANET HOUSE, 231 STRAND, W.C.2
PHONE: CEN. 7081

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Well! Believe It or Not!

IN last month's *Sailplane* the Editorial consisted of a letter addressed by the Editor of *Sailplane* to the Editor of *The Times*, on the subject of Soaring being necessary to all airmen as the best method of obtaining that intimate knowledge of Meteorology which is essential to the best pilot and the best navigator. The heading to the piece was "Believe it or not." Well! Believe it or not, something has been done about this matter, and decisions have been taken on these lines which are simply unbelievable. It is not suggested that there is anything of cause and effect, or anything beyond mere coincidence, and it may be looking a long way ahead, but *Sailplane* understands that decisions have been taken at a very high level which may remove once for all the shadow of misunderstanding between the Soaring Community and the Air Ministry (Flying).

After the war, Soaring is to be an integral part of the flying education of Royal Air Force Pilots, and it is known that certain people at the Empire Central Flying School have taken to Soaring.

In the A.T.C. it appears that the instructors are to be trained as two-seater instructors (when the two-seaters are ready) with a view to being able to teach A.T.C. Cadets to Soar later on. This move might well be necessary as an inducement to recruiting after the war if boys are to spend two or more years in the A.T.C. and then to be directed to the Mines, the Factories, or the other Services than the Royal Air Force.

Now it also appears that their Lordships of the Admiralty do in fact think that just as you learn about the sea in rowing and sailing boats, so you learn about the air in Sailplanes, and future Admirals will have to be Admirals of the Fleet Air Arm as well. So the Navy, if circumstance be any guide, are also going to take up Soaring, and it is not to be limited to the flying personnel alone.

It is already known that a certain Flying School in the Middle East has already experienced the benefits of the requisitioned machines of the Royal Egyptian Gliding Club. All these facts, if they are facts, and there appears to be much to support the belief, are such a long way from the traditional attitude of the powers-that-be that they stagger belief.

For the Soaring Community it will be good news, for in the long run the support of the Services will be all to the good. With more people practising the sport, the standard will be higher; more machines will be built and more needed. Machines and instruments therefore will be cheaper and more within the reach of the less-rich enthusiasts, of whom there are so many.

The short term view is not so good. If the Services, who have commandeered the best machines as it is, continue to monopolise the productive capacity of the country to make Sailplanes, the poor private individual will have to wait so long for his machines, Club or private, that his ardour may well be impaired. This goes for those who are interested but have not experienced the ineffable joys of the sport. For anyone who has experienced its pleasures, of course, though waiting may exasperate, it will never discourage them from their pastime. Anyone who doubts this should be in the Editorial Office when some mad enthusiast pays a call to talk about Soaring. They come from all quarters of the world, and we are glad to see them and make their acquaintance. It is refreshing to say the least of it, and it is evidence of the international friendliness which binds together the Soaring Community of the world.

I Learned to Fly a Glider

By FREDERICK W. RUBLE, Jr.

(Continued)

ONE time while I was flying in a strong wind I was hitting fairly good thermals which were moving down-wind quite rapidly. I did not spiral in them due to the wind, but gained fifty to seventy-five feet by just flying straight through them. I went down-wind and covered a tremendous amount of distance, but when I turned around to come back I merely stopped moving as the wind was as strong as my cruising speed. I did not lose much altitude, due to the thermal activity, but I was getting nowhere. I had to put the nose down and increase both my air-speed and groundspeed. Finally, after much worrying and careful flying, I made my landing spot with about seventy-five feet to spare, so I proceeded to make figure-eights while losing altitude.

CARELESS !

As I was flying back to the landing spot, one of the inexperienced students had retrieved the cable from the winch. He now parked the tow car right in my path. As it is impossible to " stretch " a glide, I went into a side-slip to lose altitude and land short of the car. I lost altitude, just as I had figured, but I had not kept the nose extra low due to the wind, and I started to go into a stall—a disastrous movement at that altitude and position ! The only thing I could do was kick opposite rudder and turn for a down-wind landing. As soon as I had started the turn, the wind whipped me around, and at five feet above ground I started off at a sixty-five mile per hour speed. I was going much too fast to land on the single skid we use for a landing gear. I could only use my rudder and elevators as the wind was blowing from the back to the front of the wings, and made the ailerons ineffective. I " fish-tailed " back and forth with my rudder to try and slow down. I was busy watching the ground a short distance ahead of me to tell just when to land, when I looked up. Directly in my path, two hundred yards away, was a set of power lines and a fence ! All I could do was pull back on the stick ; stall ; and drop on to the ground !

GLIDERS ARE SAFE

I did not hurt the ship or myself, but I had stopped just twenty feet short of the fence and power line ! Things like this cause cold sweat to break out on you, but it is certain you will not make the same mistake twice. If I had been flying a power ship, and had to make the same down-wind landing, I would necessarily have needed much more skill than I had at that time. Another proof that gliders are safe.

Gliding aids considerably in learning power flight. This is because all the glider pilot must do to fly power planes is to learn the operation of the engine and the new type landing gear.

Gliding also adds tremendously to the pilot's knowledge of aircraft design. Even some of our huge trans-oceanic air liners have gull wings which are patterned after sailplane wings, which in turn are modelled after birds. Many glider and sailplane designs are applied to aircraft.

INSTRUMENTS

Gliding and soaring are most enjoyable. Though it is not what you might call easy, it is much easier than power flight in so far as flying the ship itself. Of course, soaring is something that takes considerable amount of skill, while a power pilot depends only upon his engine for altitude. A sailplane or glider for soaring has a turn and bank, an air-speed indicator and altimeter, variometer and sometimes an accelerometer, while the heavy power planes have all these in addition to all the engine controls.

NEVER TOO OLD TO LEARN

My grandfather wanted me to stop glider flying when he heard of it. He said that it was too dangerous. I know, as well as does my father, who has seen me fly, that this is not true. We tried to convince him of this, but he would not believe us. Finally, my father persuaded my grandfather to come out to the field and watch me. I went up to a thousand feet, flew back over my father and grandfather, and made slow spirals. I then flew about a quarter of a mile away, turned around, came back and landed beside them. My grandfather smiled and walked over to the ship where I was sitting. He looked it all over and said, " Freddie, I believe I could do that, and I'll bet it is tremendous fun ! " This is a remarkable statement for a gentleman seventy-three years old to make.

If people who are afraid of gliders, or afraid to have their sons or daughters fly them could only see them in operation, nine out of every ten would change their mind as to the danger involved. I think it is much safer than a number of sports that are quite popular.

I have been trying to get my mother to fly with me, but she had an unpleasant experience a number of years ago. She went up with my uncle, a navy pilot, and had the thrill of every stunt in the books, and she vowed never to get into a plane again. I think now, however, I see signs she is weakening, and may be able to get her to go up again.

Q.E.D.

The trouble with many people is that they have had some experience with power planes, or heard stories, and do not realize the tremendous difference between gliders and power planes. I am sure that if gliding and soaring were made known to the public, much more activity would occur, with the result that our airmindedness would be advanced.

At our Glider School we have made thousands of flights without a single casualty.

Any normal person can learn to fly a glider, and you cannot imagine the thrills it holds, until you try it.

(Acknowledgements to "Soaring")

THERMAL ACTIVITY

By J. N. SAUNDERS

TO be able to appreciate the "mechanics" of Thermal Activity it is necessary to consider the adiabatic expansion of air containing water vapour. Now adiabatic expansion simply means that a gas is permitted to expand under conditions such that no heat, from any external source, is added to the portion of gas which we are considering, nor is any heat allowed to escape from the gas to any external source. As air itself is a poor conductor of heat we can say that any portion of air considered in an environment of air is insulated and will, if moved from one level to another, change its condition adiabatically.

If the pressure on a portion of air is reduced and the air is allowed to expand adiabatically, the energy required to do the work of expansion is supplied in the form of heat from the air itself, and so its temperature is reduced.

TWO LAPSE RATES—

In considering air warmed at the earth's surface and being transported to higher levels thus cooling adiabatically, it has been found that the rate of this cooling is 5.4° F. per 1,000 feet of vertical ascent, for air which is not saturated with water vapour. With air, not initially saturated, cooling will eventually bring about saturation, and if cooling is continued condensation of the water vapour will occur. Now when water vapour condenses into water, a considerable quantity of heat (latent heat) is liberated which, still considering adiabatic conditions, is made available for warming the air. Clearly then, saturated air, when condensation is taking place, will not cool as quickly as unsaturated air, under the same conditions of ascent. This rate can be taken to be 3.2° F. per 1,000 feet of vertical ascent for this country, but will vary somewhat with the temperature of the air concerned. Thus we have two rates of adiabatic cooling with vertical ascent, which are known as the Dry Adiabatic Lapse Rate and Saturated Adiabatic Lapse Rate respectively.

—AND RELATIVE TEMPERATURES

In considering thermal activity we are dealing with conditions of instability, that is conditions where colder and denser air is at a higher level than warmer and less dense air; there being then a tendency for the colder air to sink and force upwards the less dense air. If, therefore, we are to study a portion of warm air, released from the surface of the earth, on its journey upwards, we must also take into account the temperature conditions of the atmosphere surrounding our particular portion of air at each stage of its journey. That is we must know the observed lapse rate of the environment. Thus, if our portion of air has reached a height of 2,000 feet, and is surrounded by air at a lower temperature than our portion has reached, then it is still in a condition of instability and will continue to rise. We must, therefore, consider both our warmed portion of air and the environment through which it

rises before we can make any estimate of the activity of our thermal.

UPPER AIR CALCULATIONS

Now if we know the temperature and relative humidity of our portion of air, before it leaves the surface, we can quite easily calculate its temperature at any other level, but we can only discover the temperature of its environment by taking upper air soundings. These soundings have, of course, been taken at some Meteorological Stations for many years, but the results are not made public under conditions of war. If we are in possession of this data we can imagine our portion of air elevated from the surface to any desired level, calculate the conditions that it would assume at that elevation and compare it with its environment at that level. We can then see whether it is heavier or lighter than its environment at any particular level and so, by trial and error, arrive at an estimate of the height to which the thermal will reach, and also the energy available to lift it to that height.

GEOGRAPHIC INFLUENCE

The air which surrounds a thermal and constitutes its environment is a part of a large Air Mass which is travelling in the general system of circulation round the globe. This will have characteristics which will have been influenced by the segment of the globe over which it was last stationary for a considerable time, and also by the nature of the nature of the earth's surface over which it has recently travelled. For instance, an air mass starting from polar regions will be cold and will contain only a small weight of water vapour, if now this travels in a southerly direction to warmer regions and over land heated by the sun there will be considerable and violet thermal activity. If, however, the air mass had started from equatorial regions and travelled northwards to cooler conditions the lower levels would be cooled and would become very stable.

COLD FRONTS BETTER

Usually, in this country, we get a mixture of both of these extreme types of air mass, but we can generalise and say that under normal conditions air of polar origin will provide plenty of thermals, whereas with air from equatorial regions will be stable and will, at best, provide only weak thermal activity. Air immediately following a Cold Front in summer, for instance, will usually provide excellent thermal activity, particularly if the Cold Front passes during the morning.

It is hoped that this brief outline of the salient factors concerned in thermal activity will be of some use in helping newcomers to gliding to some appreciation of this fascinating subject.

A Corner of Slingby's Workshop.

SWEDISH SOARING

The New Swedish Sailplaning Records Approved

By YNGE NORRVI R.S.C.A.

THE Executive Committee of the Royal Swedish Aero Club approved on October 27th, 1944, the new Swedish sailplaning records which had been submitted for investigation by the R.S.A.C.'s Sailplaning Committee.

SINGLE-SEATER SAILPLANES

Distance. 11th July, 1944. Ljungbyhed-Norrokoping. 330 k.m. Rolf Svartengren, of Ljungavhed.

Distance to specified goal. 3rd July, 1944. Allberg-Ystad, 300 k.m Stif Fagerblad, Vasteras.

Duration Flight. 12-13th June, 1944, 21 hours 46 minutes. Karl Erik Ovgaard, of Stockholm.

Height. 29th July, 1944. Arne Wennerstrom, of Karisburg, 5,700 metres.

MULTI-SEATER SAILPLANE

Distance. 30th June, 1943, Norrkoping-Vaxso, 209 k.m. H. Kipp-J. Blomberg, Norrkoping.

Rolf Svartengren's flight was carried out in a two-seater plane of Kranich type. The pilot was alone and there was no ballast, so the flight was therefore regarded as a single-seater flight and the record also. The same flight in a single-seater would have been much easier so the record is a worthy one.

Stig Fagerblad's record for distance to a given goal was set up in a " Weihe " plane. The proper distance was 304 k.m. (about 200 miles) from the *point of release* to the landing point. Fagerblad was in fact aiming to carry out the distance flight of the Gold C, which requires a minimum of 300 k.m.'s. In order to be quite certain of covering that distance, Fagerblad had himself aero-towed at the launch some 4 k.m. to the north of Aalleberg. But measurements for goal-flying records must, according to the Regulations, be counted as having begun at the starting place —in this instance Aalleberg. Hence the above-mentioned reduction by 4 k.m. was made.

The duration record, now held by Karl-Erik Ovgaard, was made on the 12-13th of June with an " Olympia " Sailplane, and was achieved by slope flying above the western end of Aalleberg. The immediately preceding record was held by the Chief Instructor of Swedish Sailplaning, J. G. Karlsson, who on 27-28th April flew the same plane for 17 hours 2 minutes.

" GOLD C "

Competition for the altitude record was very keen. On June 13th, 1943, Aake Gavert, of Stockholm, attained an altitude increase of 4,570 metres (15,000 ft.) flying at Bromma. This figure was not beaten until July 18th, 1944, when Stig Fagerblad, in a " Weihe," made an altitude increase of 4,941 metres (16,500 ft.) over Alleberg, and thus earned his Gold C. (The International requirements of the Gold C are that the pilot shall have gained 10,000 ft. from the point of release from tow.)

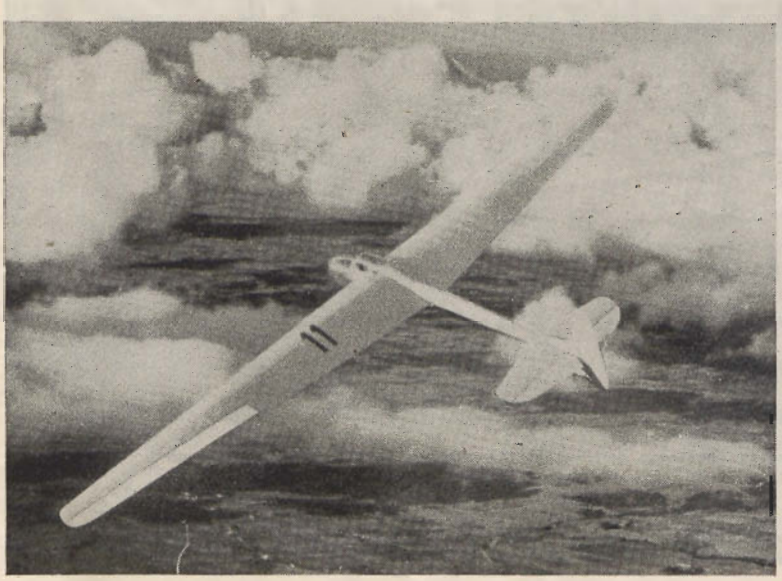
But this record stood for no longer than 4 days—until July 22nd — when Bengt Bergman obtained an altitude increase of 5,163 metres (17,100 ft.) in the Aalleberg Competitions. Exactly a week later on the last day but one of the Competition, Bergmann registered an altitude increase of 5,540 metres (18,300 ft.), but at the same time Arne Wennerstrom, the present record holder, also flying at Aalleberg, made an altitude increase of 5,723 metres (18,800 ft.). As a result of certain factors connected with the reading of the instruments, the R.S.A.C.'s Sailplaning Committee found itself compelled to reduce the altitude increase originally attained to around 5,700 metres.

WITHOUT OXYGEN

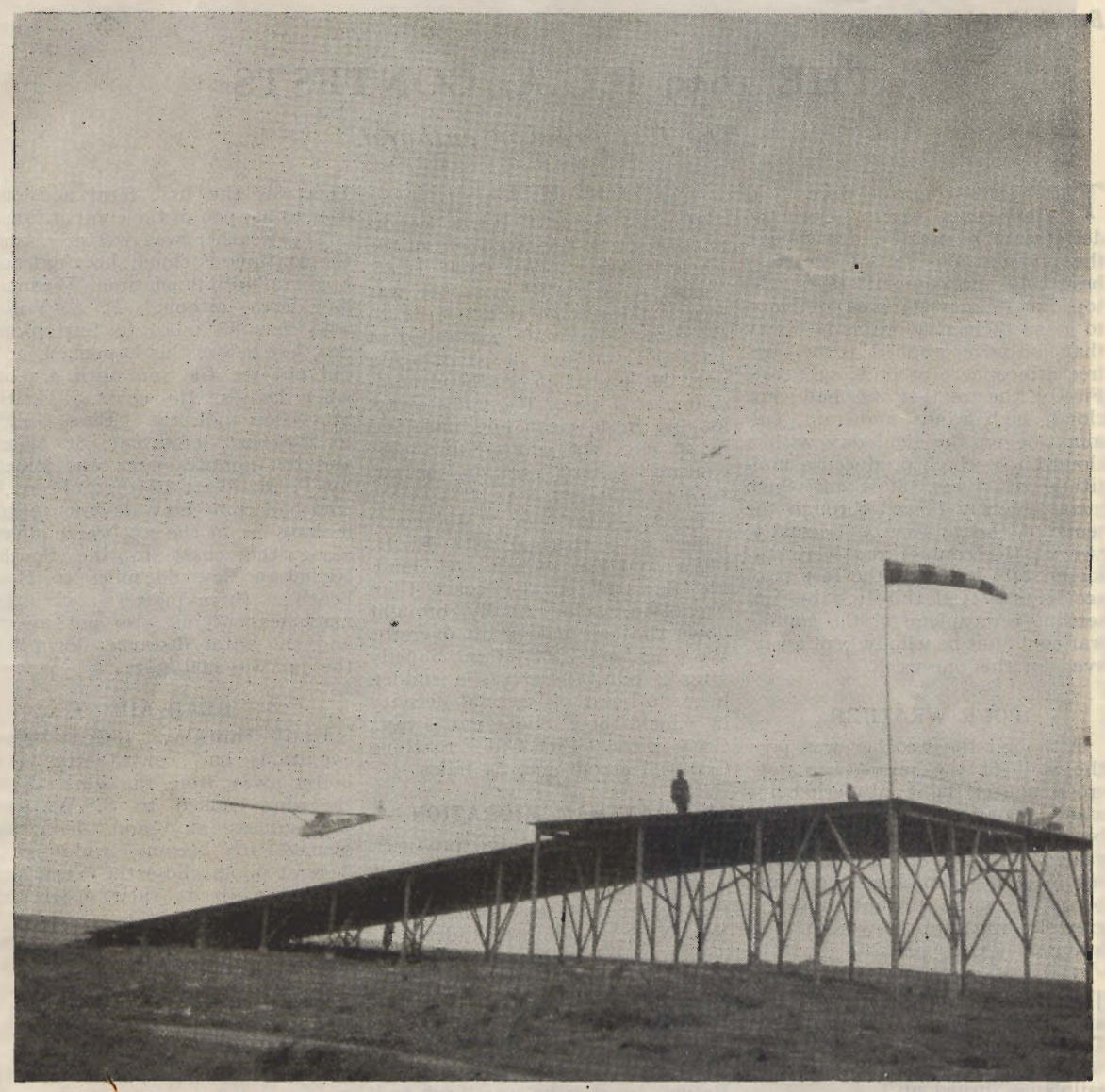
All the above flights were undertaken without oxygen, and all, except Aake Gavert, used "Weihe" type sailplanes, Gavert flying a " Grunau Baby " — a secondary type.

As regards the long distance record for multi-seater sailplanes, it may be observed that it was made in a " Kranich " two-seater, the type used for dual instruction and the same type as used by Rolf Svartengren for his distance flight on July 11th, 1944.

For purposes of comparison, the corresponding world records are quoted below. It must be pointed out, however, that communication with the International Organisation which approves Sailplane World Records, that is to say, the F.A.I. in France, have been extremely faulty during the war, so that due reservations must be made.



Sailplane Fi I. A.—B. Flygindustri Sweden.



Launching Platform at Alleberg.

According to the latest information which the R.S.A.C. has been able to obtain, the altitude record stands at 6,838 metres (22,600 ft.), and not, as hitherto erroneously stated by the R.S.A.C., at 5,687 metres (18,900 ft.). The distance record furthermore is 749 k.m.'s, not 794, as was stated in a misprint.

INTERNATIONAL RECORDS
SINGLE SEATER SAILPLANES

Distance. Olga Klepikova, Russian, 1939, 749 k.m. (465 miles).

Altitude. E. Ziller, 1938, Germany, 6,838 kms. (22,429 ft.).

Duration. Ernst Jachtman, Germany, 1943, 53 hours 52 mins.

MULTI SEATER SAILPLANES

Distance. Kartachev - Sawtzov, Russia, 1938, 619 km. (385 miles). (*Translated by A. V. Burbury*).

A NORWEGIAN RUMOUR

A statement was published recently in a British aviation paper to the effect that a Norwegian sailplane pilot had broken the Norwegian duration record by sailflying for 19 hours in an "Olympia."

The Norwegian Air Authorities in this country stated that gliding could only be undertaken in their country by collaborationists, and they knew nothing about the truth of the report. It was possible they added that the record might have been achieved by a member of a Norwegian Air Force unit which is training in Sweden, but that in that event it would hardly be a Norwegian record.

Another suggestion was that the flight had been made by a Swede in Sweden, but that the event had been inaccurately reported. Further enquiries are proceeding. Of course the whole story may be German propaganda report meant to boost the "Olympia" with an eye to post-war German sales. The impression obtained from official circles, however, is that Germany will be prohibied from manufacturing Sailplanes after the war.

British Soaring Contests—9

THE 1939 B.G.A. CONTESTS

The last pre-war outburst.

THE 1939 contests were held just seven weeks before the declaration of war, and although the organisation was of the very best, and the competitors on the top line, circumstances combined to make them memorable in a way that had never applied to the carefree atmosphere of previous years. Firstly, the weather was bad; low cloud, high winds and rain, culminating on the final day with a cloud-burst which produced a multitude of rivers, most of which inconveniently flowed through the tents of the unwary. Secondly, two of the competitors were unfortunately killed as the results of accidents. And thirdly, the unsettling atmosphere of the coming war could not be wholly kept away, even for this one week.

POOR WEATHER

Although the weather was poor the skill of the pilots was not; cross-country flights of merit being made in conditions that would have been regarded as hopeless a few years ago. It was fascinating to see machines climbing higher and becoming more distant under a grey sky apparently devoid of such luxuries as thermals.

The competitions were held from July 8th—16th at the Derbyshire and Lancashire Gliding Club. Twenty-nine machines were entered with seventy pilots, twenty-four sailplanes turned up.

On the practice day before the actual start of the contests, the clouds lay just above the hilltop, giving strangers to the site little opportunity to test its capabilities. Three pilots, however, managed short flights on the west slope, although one was forced to land at the bottom.

Sunday, 9th, cleared up enough for P. A. Wills and Greenshields to start away on short cross-country flights; Wills spending two and a-half hours on a journey thirty-seven miles, with a maximum height 1,600 feet. Five pilots made flights of over five hours' duration over Bradwell Edge.

162 MILES

Monday brought better conditions, and also the best flight of the whole meeting. At about 12.45, Nicholson, in the Rhönsperber, was seen making several attempts to get away; he finally succeeded at 1.15 and was not heard of again until he landed at Southend aerodrome at 7 p.m., 162 miles away. looking fresh, clean and unruffled in spite of six and a-half hours' continuous hard work in the air, without lunch or tea.

P. A. Wills, in "Minimoa," joined in a thermal with R. H. Shaw, and was soon in the cloud. He flew nearer the coast than Nicholson, being finally brought down through lack of lift over the West Fenland—103 miles. Shortly after 2 p.m. there was a sudden brief outburst of thermal activity in which three pilots got away; Greig in the "Blue Gull," reaching Cranwell aerodrome, 54 miles.

GRANTHAM MIGRATION

Tuesday, 11th July, produced weak and patchy lift, and the average speed of the best flight of the day, that of Miss Joan Price to New York (4 hours 68 miles) was only 17 m.p.h. Three pilots landed independently on Grantham aerodrome 55 miles away, within a few minutes of each other; Wills, because the town did not hand him the expected thermal, and Philip Brown, because he was "set on" by an exuberant Hart. Seven flights of 35 miles and over were made on this day, but all the pilots concerned flew high performance, or medium high performance, sailplanes. Altogether, 12, or one-half of the competing machines, managed to get away on cross-country flights.

FIRST FATALITY

During the afternoon, while W. E. Godson was circling low down in a patch of lift at the site, he unfortunately got into a spin and hit the ground squarely with the nose well down. He fractured his skull and died a few hours later. This was the first fatal accident ever to happen in the competitions.

The weather was westerly, and the continuous cloud sheet did not break up until lunch time. Wednesday, 12th, although P. A. Wills, who flew 83 miles to Sutton-on-Sea, left before this happened, and did not see the sun until 4 p.m. when he saw the coast. G. H. Stevenson took the "Blue Gull" to Skegness aerodrome, 86 miles, and ten minutes later was joined by P. M. Watt in the "Petrel," who had come by a devious route, making use of the sea breeze effect along the coast to the South. Nicholson flew 83 miles to Holbeach; three-quarters of the machines entered also got away, and the total distance flown for the day was 600 miles.

DEAD AIR

Until Thursday, 13th, soaring conditions had consistently been better away from the site. Now the wind backed to S.S.W., and the sunless sky and dead air seemed to become widespread. Several pilots chose the Yorkshire Gliding Club as their goal, and F. T. Gardiner, in the "'Sperber," got to within 16 miles of Welburn, a distance of 60 miles; and P. M. Watt flew 57 miles and landed only 13 miles short of his goal, although he had not arrived back from his previous days' flight until 5 p.m. Ten pilots got away, although only five exceeded twenty miles.

TURBULENT

Friday, 14th, brought a cold front with cumulo-nimbus cloud in its wake, which certainly made a change from the previous flat condition. R. C. G. Slazenger made good use of one of the storms, climbing his "Kite" to 7,200 feet in 22 minutes. He then spent half-an-hour trying to keep under control, and a further half-hour trying to get out of the storm again; he also travelled a distance of 36 miles, but was unlucky enough to hit a stone wall on landing, due to his spectacles still being iced up, and himself extremely cold. P. M.

National Contest, 1939. "That sort of weather—grey skies and rain."

" Rhonsperber " Landing.

Some of the seven Sailplanes which all got away in the same thermal on July 12th.

C. Nicholson in cockpit of " Rhonsperber." Facing him are :—C. Winkfield, F. Charles, E. Taylor, J. S. Sproule, J. C. Neilman, and H. Bergel.

(All Photos : A. E. SLATER).

Watt also made a 25 miles' flight in turbulent and unpleasant conditions.

FRANK CHARLES' ACCIDENT

Saturday, the last competition day, produced even bigger cumulonimbus, but no one was able to connect with the lift. P. A. Wills, in " Minimoa," attempted the flight to Blackpool for the £100 prize, but was only able to manage 16 miles of the distance. This final day was, however, marred by the fatal accident to Frank Charles, the well-known speedway rider. As so often happens, the accident was due to a combination of circumstances and conditions. His " Petrel " was being launched on a long cable during a heavy shower and resulting poor visibility. In the middle of the launch, the pilot must have thought the cable had dropped out of his quick release, whereas it apparently had only temporarily become slack, while the winch crew thought he had released due to the heavy rain and poor visibility ; anyway, the outcome was that he turned downwind away from the winch with the cable still attached. When the cable came up taut, of course, pulled straight into the ground, and the pilot was killed instantaneously. Frank Charles' death was a very great loss to the Furness Gliding Club, for which he had done so much. He had taught himself to fly three years earlier, by insisting on his friends launching him off the tip of a mountain in his "Kirby Kite." He learned to control the machine before reaching the ground a few minutes later, when he made a safe landing !

The traditional final night supper was held at the Marquis of Granby with the usual generous hospitality, but the entertainment arranged to follow it was cancelled.

WASHOUT

As mentioned in the first para-

graph, the weather produced an angry cloud burst on Sunday, almost designed to speed the parting competitors, who were gathering up their sodden tents and skidding in the mud.

And so ended the last B.G.A. National Contest before World War Two. The most obvious inference to be drawn was that good soaring flights are possible in almost any weather between Spring and Autumn, but, under such poor conditions, only experienced pilots, with high performance machines, are able to extract the best from what is available. In previous years, when there had been good weather as well as bad, every competitor had the chance to demonstrate what skill he possessed, but this year, with the weather consistently poor, the less experienced pilots just did not get their chance, and so the plums went to the few who had developed their flying and soaring skill over a period of years, and with regular practice.

FINAL MARKINGS

The final markings show that the machines entered by those two veterans, Nicholson and Wills, led with over 240 marks to spare between them and a following group of three. This second group consisted of Greig and Stevenson's "Blue Gull," the Cambridge Club's "Kite," and the "Petrel" flown by P. M. Watt, who were about 170 points ahead of the rest of the competitors. Moral: Regular practice, and further development of British high-performance sailplanes.

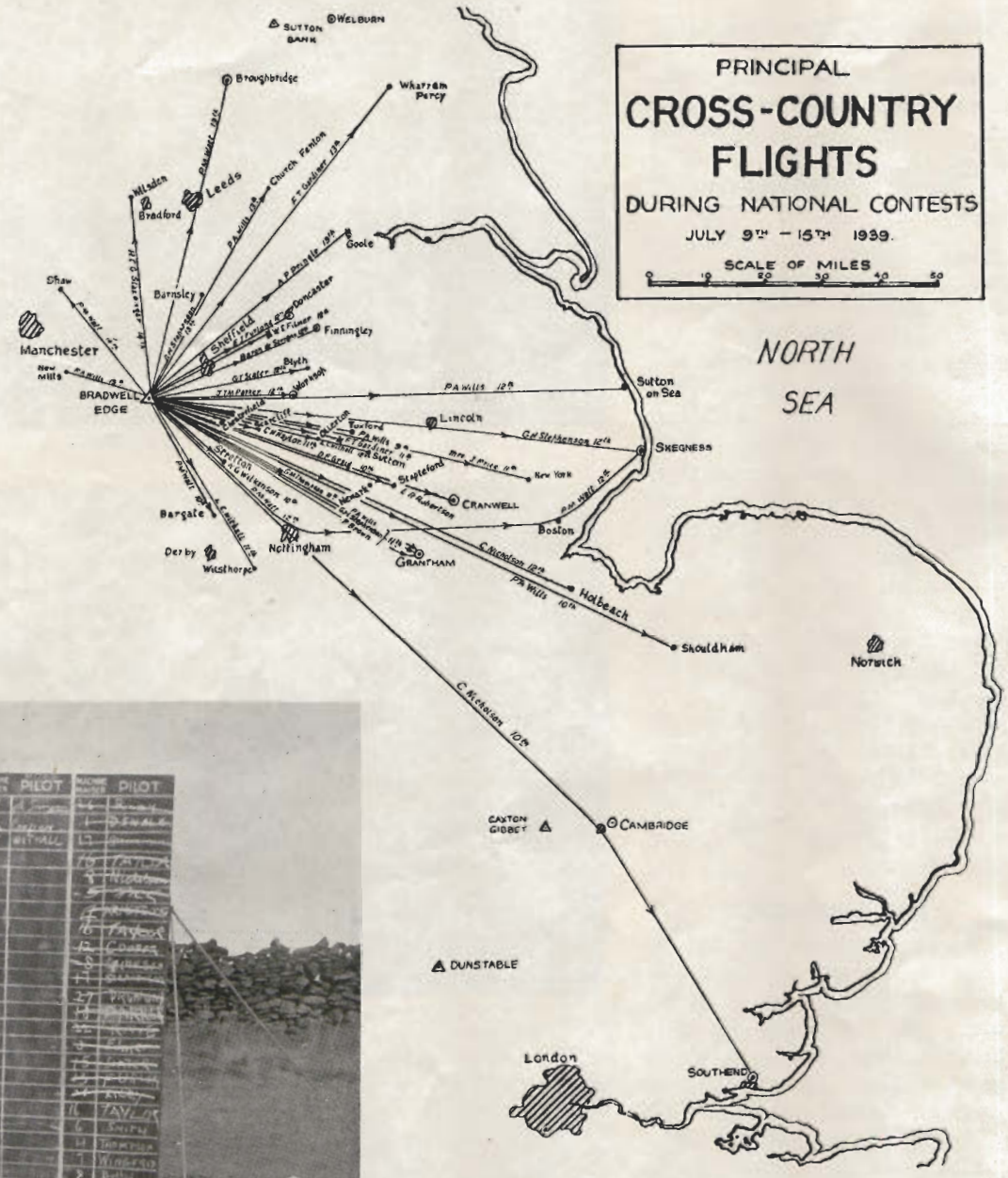
The lessons that have been, and can be, learned from the study of the B.G.A. Contests since their start until 1939, will be worth the trouble to anyone who hopes to take an active part in the furthering of advanced soaring after the was has finallly ended.

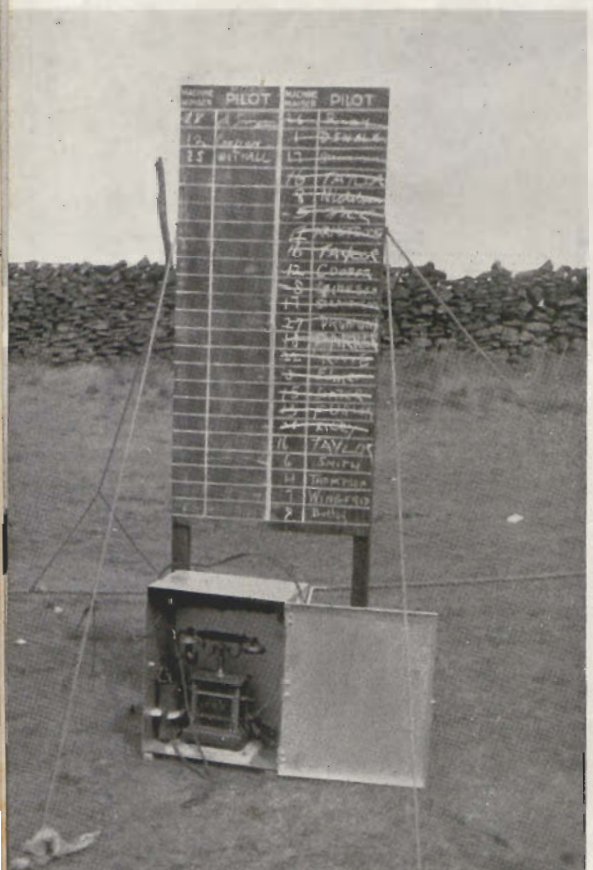
A "Kirby Kite" is launched.

Philip Brown (in dark suit) beside his "Minimoa."

E. J. Furlong in cockpit of "Petrel." Standing beside him is the late Frank Charles. And on the extreme left, Harold Perrin of the Royal Aero Club.

(*All Photos:* A. E. SLATER).





The starting board and telephone for communication with winch driver. (Photo: A. E. Slater

THE PRACTICAL SIDE OF AIRWORTHINESS

By ICARUS

AIRWORTHINESS as a term is well understood even by the layman. The general impression usually implied being that airworthiness represents the reluctance of a glider or sailplane to fall apart while airborne or partially airborne as in normal landings.

It is, however, readily seen that the responsibility for this happy state of affairs is borne by three groups of people, the designers, the maintenance staff and, to a lesser degree, the pilots.

The designer must have some standard by which to design a given machine ; if it is too weak it may break up in the air due to adverse conditions. Should he, on the other hand, decide to make sure that it will never under any circumstances suffer structural failure he may easily make the machine so heavy as to unduly penalise the performance. The Air Ministry and the British Gliding Association have however stipulated certain minimum strength requirements for four categories covering all machines from primaries to high performance types suitable for cloud flying without parachute.

NEED FOR MAINTENANCE

The designer's job is thus fairly easy (on paper !), and he stresses the machine for a given set of requirements and feels confident that the most foolhardy pilot will not be able to tear the wings or tail off the machine even in turbulent cloud conditions.

However, despite all the numerous regulations bearing on the safety of the machine as it affects the designer, it is obviously very necessary to ensure that the machine must at all times be kept up to this high standard. To ensure that any given glider or sailplane is never flown unless its airworthiness comes up to the original design requirements necessitates further personnel, sufficiently competent and conversant with the relevant regulations.

Such personnel are known as maintenance staff, ground engineers, inspectors, etc. They are not greatly concerned with design requirements, and their job is to ensure that all features incorporated by the designer to ensure airworthiness are maintained by inspection and repair (when required) up to the same standard. As a rule thay have to do the job themselves, and this series of articles deals with this aspect of airworthiness, the practical aspect as distinct from the designers', or theoretical, point of view.

THE CERTIFICATE OF COMPETENCE

The writer would like to acknowledge at this point the assistance rendered by Commander Harold Perrin of the B.G.A., the Air Registration Board, and Mr. H. Holdsworth of Chilton Aircraft, who was for many years the engineer to the Yorkshire Gliding Club.

From the inception of the movement in this country until a few years before the war the maintenance of motorless aircraft was not on a very clear basis. Clubs and individuals maintained their machines as they wished, but, it should be emphasised, maintenance was of a high standard ; repairs as a rule were based on common sense and carried out by the people who had to subsequently fly the machines. It just so happened that there were no definite directions from the controlling bodies bearing on the matter apart from a few technical recommendations.

ONE PER CLUB

Eventually the B.G.A. advised that clubs should, wherever possible, appoint some responsible person to supervise the maintenance and repair of their machines and the A.R.B. made provisions for the issue of a Certificate of Competence to such persons giving adequate demonstration of their abilities.

Up to the outbreak of war seventeen such certificates have been issued, and it is anticipated that there will be a substantial increase in the number issued after the war. Each certificate is valid for a period of 2 years and the fees payable are £1 if an examination is required and 10s. if an interview only is required.

It is believed that the A.R.B. will shortly be in a position to issue further licences, and a form (A.R.B. No. 27) can be obtained from the *Secretary, Air Registration Board,* 105, *Promenade, Cheltenham, Gloucestershire.*

Licences when expired can be renewed for a further period of two years on payment of 5s. renewal fee. Before the war examinations were held forthnightly in London and approximately quarterly in Glasgow, Liverpool and Southampton.

THE EXAMINATION REQUIREMENTS

An applicant for a Certificate of Competence as a Glider Ground Engineer must have attained the age of twenty-one years, and will be required to have had such experience as, in the opinion of the Board, will enable him satisfactorily to perform the duties for which the Certificate is needed. He will be required to have had practical experience of the maintenance of construction of aeroplanes or gliders.

In addition, to obtain the Certificate, the applicant must pass, or satisfy the Board, that he can be exempted from, an examination based on the syllabus hereunder. Subject to a satisfactory interview by the Board, consideration will be given to exempting an applicant who holds an aeroplane ground engineer's " B " Category Licence.

The general principles of the systematic maintenance and inspection of gliders including :—

1. Knowledge of (*a*) the **methods of inspecting and checking** the assembly of the whole of the glider structure ; (*b*) the rigging of an erected glider ; (*c*) the adjustment and functioning of the flying controls ; and (*d*) the correction of faults that may be experienced in flight.

2. Knowledge of the **defects and deterioration** in wing coverings, timber and metal members, metal fittings, streamline wires, tie-rods, cables, shock absorbing devices and other parts of the glider structure that may be expected to occur as the result of wear and tear, or may be produced by slight mishaps experienced during normal operation of the glider.

3. Knowledge of the methods of effecting **structural repairs** and replacements.

4. Knowledge of **non-metallic materials**; methods of identification, examination and testing; characteristic defects which render them unsuitable; and precautions to be observed in their application to glider construction.

5. Knowledge of **metallic materials**; methods of identification, examination and testing; characteristic defects which render them unsuitable and precautions to be observed during processes of manufacture (heat-treatment, welding, brazing, soldering, plating, etc.).

6. Knowledge of the **methods of construction,** examination and testing of glider parts and components.

7. Knowledge of **methods of installing and testing** the instruments and other appliances to ensure correct functioning.

8. Knowledge of **methods of testing,** construction, examination and maintenance of launching appliances and quick release gear for aircraft towing.

SOME GENERAL POINTS

It will be seen that the examination requirements present no difficulties to anyone having sound and practical previous experience. Although it is not necessary to have any knowledge of the Air Navigation Directions, it should not, however, be assumed that the granting of such Certificates is a less serious matter than the issue of the A, B, C, D and X licenses for power aircraft.

All regulations governing flying in this country are fundamentally concerned with the safety of aircraft, the protection of property, and the avoidance of injury to the public as well as the occupants of aircraft.

With the above paragraph in mind it might not come amiss to give a very brief exposition of the procedure as it affects the licensed engineer. It has already been stated that strength regulations for design purposes have been drawn up and that the designer must rigorously comply with these requirements.

GOOD QUALITY FENCES ESSENTIAL

Should, however, the foreman in a works decide to pull down a nearby wooden fence to manufacture a pair of wings, it will be readily seen that the designer's efforts are largely wasted unless by a wild coincidence the fence was of good quality aircraft timber, and the same reasoning applies to all aircraft materials.

Consequently the materials from which aircraft are constructed must be subject to fairly rigorous control, and in the case of materials used in structurally important parts, must have certain minimum strength requirements. Going back to the foreman previously mentioned it would be of little avail to tell him that the root end fittings for a glider should be good quality steel; some steels are twice as strong as others, some cannot be welded, some can but are only a fraction of their original strength unless subsequently heat-treated and so on.

"SPECS"

To cover all materials for aircraft the D.T.D. (Directorate of Technical Development Branch of the Air Ministry) and the B.S. (British Standards Institution) have issued some hundreds of Specifications generally referred to as "specs." Each spec lays down the minimum strength requirements for the particular material, often stipulates certain conditions of manufacture or chemical analysis, describes such defects as will necessitate rejection and covers the methods to be employed when testing materials.

It cannot be too strongly emphasised that the relation of D.T.D. and B.S. Specs to sailplane construction and maintenance is a very important one and that, unless one is experienced in such matters, it is the height of folly to trust to one's own judgment or the wisdom of the local ironmonger or timber merchant.

HOW IT WORKS

Now assuming that the designer has called for some strut bolts to be made in high tensile steel to B.S. Spec. S2, and that the correct material has been obtained the normal procedure is as follows:— The S.2 bar is placed in a bonded store and kept there until such time as the work's inspector (or licensed engineer) has satisfied himself that the material is what it pretends to be. If he has no facilities for testing the material he could get it tested at an approved test house, but in actual practice this is seldom necessary. The S.2 bar, when received, is accompanied by a release-note; the chief inspector of the firm supplying the bar has signed this release-note stating that the material complies with all the requirements of B.S. Spec. S2.

The S.2 bar can now be moved into the stores proper, the ends of each bar being painted in accordance with the Air Ministry colour code to avoid confusion with materials of similar appearance but different characteristics. In addition it is given a batch number, so that when material is removed from the store to the machine on which the strut bolts are to be made a further check on its movements can be made.

This takes the form of a stores requisition on which must be stated tha date, the spec, the batch number, and the person responsible for issue. Finally when the bolts are made they are inspected, and the person inspecting must satisfy himself that they have been made from S.2 bar and then records this fact.

FUNDAMENTALLY SOUND

To ensure that this procedure works correctly and is not contravened, the Air Ministry appointed another department, the A.I.D. (Aircraft Inspection Directorate), to safeguard the airworthiness of the machine, and the safety of the public. Note how this leitmotif is never for a moment absent from any phase of aircraft construction or operation. It is often regarded as being "just a lot of red-tape," but careful reflection will prove that whatever anomalies may exist in other branches of the aircraft business the regulations dealing with the control of airworthiness are fundamentally on the soundest basis.

SYNOPSIS OF FUTURE ARTICLES

The foregoing cannot pretend to be more than the sketchiest treatment of the subject, but it is hoped to amplify the requirements for the Certificate of Competency in further articles as follows:—

Part 1. Assembly, rigging and controls, adjusting for trim.

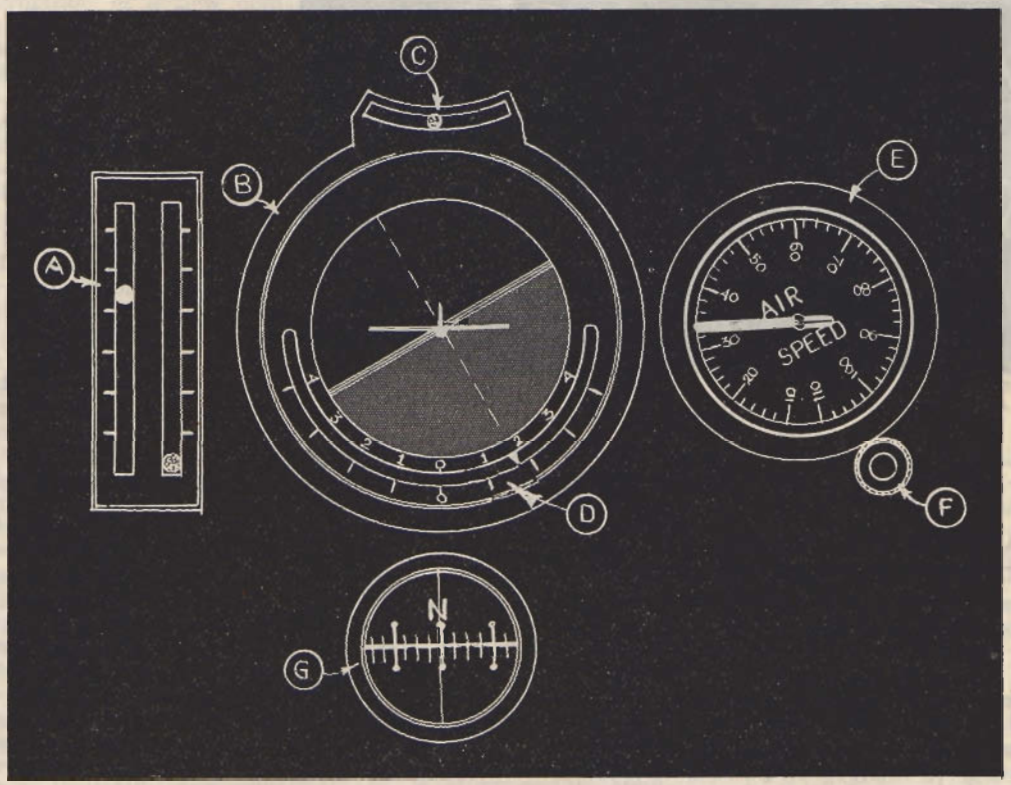
Part 2. Materials and processes covering timber, ply, ferrous metals, light alloys, fabrics, gluing, welding, brazing and doping.

Part 3. Instruments, their installation and maintenance.

Part 4. The daily inspection, the certificate of flight and the subject of repairs.

(*To be continued.*)

INSTRUMENTS AND THEIR LAYOUT FOR SAILPLANES



(A) Variometer.
(B) Aerobatic artificial horizon (untoppleable).
(C) Ball type bank indicator.
(D) Rate of turn indicator.
(E) A.S.I.
(F) External knob for rotating the whole A.S.I. case.
(G) Compass (apparent motion similar to points on horizon)

BLIND or instrument flying in the R.A.F. or in airline planes, and blind circling with sailplanes inside cumulo-nimbus clouds are entirely different things requiring a different technique of instrument flying, instrument design and lay-out. In the former, flying accurate courses and keeping constant rates of turn, and avoiding any decent cumulus clouds are important. cumulo-nimbus clouds, of course, are to be avoided like the plague. In the latter the instruments must enable the pilot to circle tightly, yet with perfect safety—he must never let the speed become dangerous—he must be able to tighten or widen his circles according to the dictates of the variometer to keep within the best lift—all this in the most turbulent conditions not encountered during normal instrument flying with power planes.

NEW INSTRUMENTS

The new instrument required is a fully aerobatic artificial horizon which will never topple. The Sperry Co. have produced an aerobatic "attitude" indicator similar to the artificial horizon in bank, but its horizon line seems to behave in the opposite way to that in the conventional instrument (*e.g.* nose up—horizon line goes up). This could quite easily be altered by the use of a mirror, or a lens, which will leave the bank correct, yet make the horizon line behave in the orthodox fashion. An Italian aerobatic artificial horizon has also appeared, but it seems to be even more unsatisfactory in its pictorial representation. It is most important that the representation given by instruments should conform as closely as possible to the actual attitude and movement of the sailplane. The amount of mental effort required to interpret the readings of the instruments must be kept to a minimum, and hence the instruments must conform as closely as possible to the pilot's visual picture, under conditions of normal visibility. In fact, instrument reading must follow natural, and not abstract interpre-

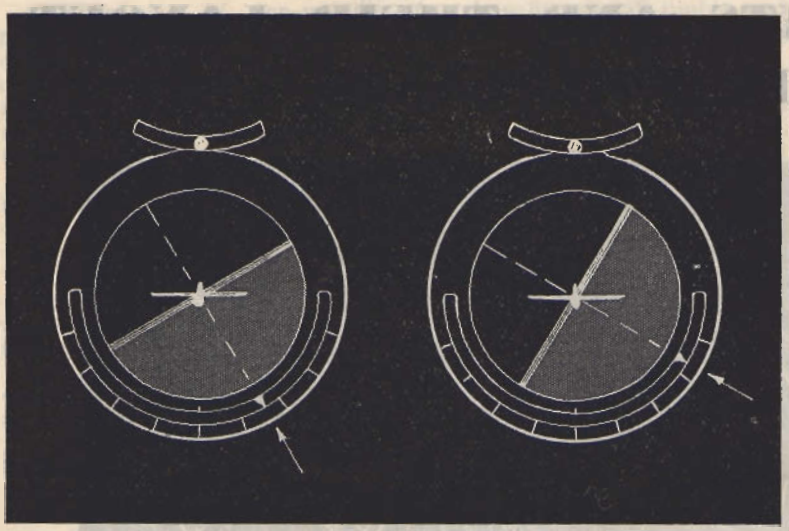


Diagram 2

tation. All these gyro instruments must, of course, be electrically driven, and not by venturis.

LAYOUT AND FURTHER INSTRUMENT MODIFICATION

Eye acrobatics caused by thoughtless positioning of the instruments, cause unnecessary strain on the pilot, and reduce his efficiency. The best positions for instruments for the Lorenz and controlled approaches are not also the best positions for circling in sailplanes. Diagram 1 shows a fully aerobatic artificial horizon, with " sympathetic " rate of turn indications immediately below and round the circumference of the artificial horizon, and a side-slip indicator immediately above it. The compass is immediately below the rate of turn indicator. A Cobb-Slater variometer close on the left, and a " sympathetic " A.S.I. immediately to the right of the horizon. The whole A.S.I. must be rotateable so that the desired speed on the clock face can be lined up at three o'clock on the artificial horizon. If the nose is put down, the A.S.I. pointer will move up—so will the artificial horizon, and *vice-versa*. The same reaction is required for similar instrument movement. It is easier to keep the A.S.I. pointer horizontal, than to keep it to a certain figure on the clock face. Referring back to the term " sympathetic " rate of turn indicator—by this I mean the alignment of the rate of turn indication with the central perpendicular of the artificial horizon, during a correctly banked turn . (See diagram 2).

Recently the blasphemous thought occurred to me, that a rate of turn indicator is really unnecessary for circling. The aerobatic artificial horizon with the bubble, ball, or pendulum side-slip indicator are quite sufficient to make perfect circles—who cares whether the rate of turn is 4 or 4½—why the extra expense ? Especially as the instrument makers will have to use all their ingenuity to put the rate of turn indications in the place where I want them (along the lower circumference of the aerobatic artificial horizon). The only answer is : duplication for safety, even though the horizon cannot topple, but it is not really necessary, and it is a very abstract form of representation in any case. The most natural and realistic representation of rate of turn, would be points, or bars of light moving along the horizon line (they would have to bank with the horizon) at a speed corresponding to the speed of points on the actual horizon. This is the purist's ideal, but a compromise could easily be effected by making the compass or directional gyro move in the same way (direction) as points on the real horizon and not in the opposite way as with the conventional instrument (again with a mirror or lens). Possibly the last refinement is that the side-slip indicator could be superimposed on to the little sailplane in the centre of the aerobatic artificial horizon. (See diagram 3.)

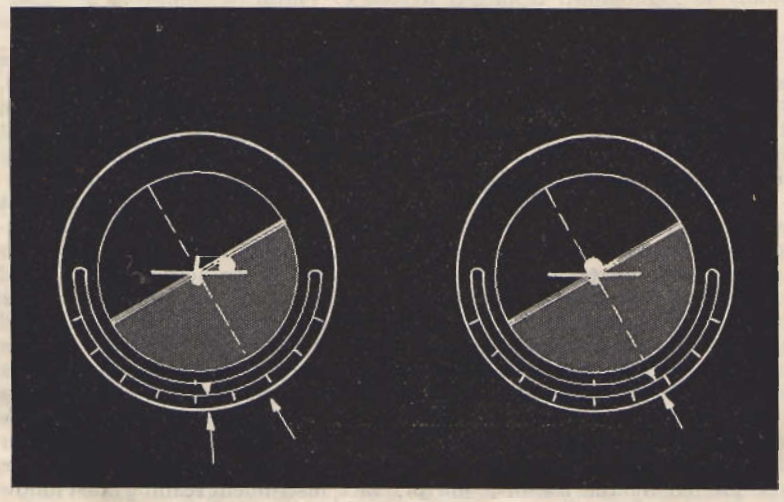


Diagram 3

Long range thermal detectors do not fall within the scope of this article.

To sum up the main points :— Instruments must be (1) Fully aerobatic ; (2) Designed for circling ; (3) Representation and interpretation must be as " natural " as possible ; (4) Closely placed together and combined in order to avoid eye acrobatics.

The practical consideration of cost has been disregarded—the aim has been to state my ideal, and I hope that others will come forward with their opinions on this subject.

O. W. N.

AUSTRALIAN GLIDING ASSOCIATION

SOUTH AUSTRALIA

A NEW CLUB

Mr. A. G. Killmier has advised of the formation of a new club known as the **Gliding and Soaring Club of South Australia,** on 8/11/44. Office Bearers are :—*President*, V. Hastwell; *Secretary*, A. G. Killmier; *Treasurer*, A. E. Mibus. *Committee* : C. M. Moir, G. Lusher, G. Vasey, P. Robilliard, R. E. Killmier and F. Gear.

Membership is at present 40 members, and efforts are being made to secure a flying ground at Pooraka (between Gepps Cross and Parafield). Steps are being taken to have the Club incorporated early in 1945. The Club has forwarded a donation of £1 1s. 0d. to the Australian Gliding Association on 9/12/44.

NEW SOUTH WALES

N.S.W. GLIDING ASSOCIATION

A meeting of delegates from Clubs (which agreed to affiliate at meeting held on 18/10/44) was held on 6/12/44 at De Havilland's Factory, Parramatta Road, Camperdown, Sydney. The meeting decided to charge 5/- entry fee (2/6 Juniors) and 5/- Subscription for 1945. Efforts are to be made to obtain the use of Quakers Hill Aerodrome for the Clubs. The Clubs represented at the meeting and their Secretaries are as follows :

Sydney Soaring Club : Harry Ryan, 25, Hydebrae Street, Homebush.

Beaufort G. and S.C. (D.A.P.) of N.S.W. : C. Springall, C./-D.A.P., Chullora.

A.W.A. Gliding Club (Ashfield): E. Baker, 156, William Street, Granville.

Cumberland G. and S. Club : Leo Diekman, 8, Harold Street, Parramatta.

Technical G.C. of Sydney : Jack Watt, Engineer, Beecroft Road, Beecroft.

Mercury Soaring Club : Ken Kirkness, Craigness Flats, Salisbury Street, Waverley.

Phoenix Gliding Club : John A. Edwards, 21, Cole Street, Concord.

Granville Gliding Club : Reg. Cairnie, Blaxcell Street, Granville.

Bill Doctor's G.C. (under formation) : 87, Crystal Street, Petersham.

Mascot Beau G.C. : A. Richards, c/o D.A.P., Mascot.

A meeting of the N.S.W. Gliding Association was held on 10/1/45.

BEAUFORT G. & S.C. (D.A.P.) OF N.S.W. (CHULLORA).—New Club rooms and Workshop address is 245, Merrylands Road, Merrylands, about 150 yards from the railway station and 1¼ miles from proposed gliding site.

MERCURY SOARING CLUB.—Ken Kirkness test flew his water glider about end of October 1944. It was flown dual once and solo once to a height of about 100 feet on the land. It has yet to be tested on the water.

SYDNEY SOARING CLUB.—Flying day was held on 19/11/44 at Box Hill with " Kite II " Sailplane. The sky was full of dust and smoke, and except for a number of sharp bumps in the early part of the day, " thermals " were conspicuous by their absence. No one was able to rise above the point of release, and as the wind began to drop later in the day mild aerobatics were indulged in—hence the short times. The " Kite II " was flown by H. Ryan, S. Newbiggin, J. Watt, M. Waghorn and F. Whitlock. Heights up to 1,200 feet were reached on the tow (winch), and longest time recorded was 9 minutes by H. Ryan. Total, 19 flights for 1 hour 48 minutes. The Club hopes to be able to take " Kite II " to Kiama for a few days over the Christmas holidays.

CUMBERLAND G. & S. CLUB.—This Club was formed on 1/5/44 by Messrs. L. Pitt, K. Long, T. A. Reeves, A. H. Ash and L. Diekman. Office Bearers are :—*President*, T. A. Reeves; *Vice-President*, L. Pitt; *Secretary*, L. Diekman; *Treasurer*, A. H. Ash. Membership is at present 16 members, including one girl member. Construction of a primary glider was commenced on 2/5/44, and it is reported to be ready for test flights shortly. Estimated weight of this machine is 190 pounds, and it is built mainly of Australian Bolly Gum.

SYDNEY METROPOLITAN GLIDING CLUB.—The initial meeting of this Club was held on 21/11/44, and following Office Bearers were elected :—*President*, M. Waghorn; *Secretary*, Cecil Hughes; *Treasurer*, A. L. Munn; *Instructors* : Jack Munn and M. Waghorn. Jack Munn's " Falcon " two-seater and winch are being used at Matraville nearly every week-end. A new winch is being constructed, using a 20/60 Vauxhall engine, 4-speed gear box—2ft. diameter drum 18 inches wide, fitted with friction brake with 2 to 1 reduction between gear box and drum.

VICTORIA

THE GLIDING CLUB OF VICTORIA

Arrangements have been made for camp to be held from 23/12/44 to 1/1/45 inclusive at Belmont Common, Geelong (45 miles from Melbourne).

The following machines are expected to be at this meeting :—" Grunau Baby II," " Utility," " H.17 " (Davies and Bartram), " Merlin " 2-seater, " Golden Eagle " (Richardson), White " Kestrel " (Iggulden), Red " Kestrel " (Pratt), " Coogee " (Proctor), Pratt 2-seater.

Car towing and winch launching will be used from flat aerodrome, and camping and hangarage facilities are being made available by Mr. P. J. Pratt. A new open trailer 20 feet long by 6 feet wide, capable of carrying two machines, has been constructed and will be used to transport the " Merlin " and " Utility " from Fawkner to Geelong.

Training operations were carried out at Mordialloc on 3/12/44 and 17/12/44 with " Eagle " Rhon Ranger open " primary." 4½ hours' ground training has been given to trainees and 19 ground skids have been made, using No. 2 (Moon) winch.

Flying has also been carried out at Fawkner, using No. 3 (Dodge) winch and " Utility," " H.17 " and " Merlin." Modification of No. 1 winch is now well in hand, and spare parts have been obtained by purchase of Dodge for £5 from Mr. Cid Knight, of Moorabbin.

The White " Kestrel " (previously Balsillie's Yellow " Kestrel ") owned by Iggulden Brothers, was test flown at Mordialloc on 17/12/44 following repairs and repainting.

THOUGHTS ON POST-WAR LAUNCHING METHODS.

RECENT developments in aviation must have caused many ex-sailplane pilots to ponder over the possibility of their application to gliding.

One of the greatest difficulties in soaring has been the scarcity of suitably equipped soaring sites reasonably near to the large towns. Attempts at soaring from flat fields conveniently situated near the towns have met with little success. High winch launching has been used in some instances, but does not seem to offer a great deal of promise, as to obtain a sufficient height an aerodrome of a size well beyond the means of the average club is necessary, and winch gear becomes cumbersome and unreliable. Aero-towing has been used with success, but is very expensive, and slow if numbers of launches are required. " Little engines " have been tried, but as well as offending the purist, these enormously increase the cost of the machine, and reduce its performance considerably.

ROCKET PROPULSION

Rocket propulsion seems to offer a solution to the problem in a manner which cannot be taken exception to, even by the purists to whom any form of power assisted flight is looked upon as sacrilege. A rocket propulsion charge could be fitted into a built-in container on the keel of the fuselage, the jet being inclined slightly downwards to clear the tailplane and give increased lift. A climb of 2,500 feet in 5 minutes, involving a 1 in 9 climb at 8½ feet per second rise and 50 m.p.h. air speed should be well within the capabilities of a normal sailplane, and would give ample height for the commencement of thermal soaring.

ADVANTAGES

A rocket charge giving approximately 4 h.p. for five minutes should enable the above performance to be attained, and immediately the charge had burnt out, the machine would become a normal sailplane, with no possibility of cheating by restarting the engine. A bungy-assisted launch might be necessary in the case of sailplanes fitted with skid undercarriages. Launching by this method would be both simple and rapid, and would enable a club to operate soaring from a conveniently situated flat field, and put all its machines in the air at a moment's notice, instead of each waiting its turn for a winch launch or aero tow.

INFORMATION NEEDED

Details of the size and probable price of a rocket charge giving 4 h.p. for 5 minutes are unknown to the writer, but some of the better-informed *Sailplane and Glider* readers may be able to furnish information on this subject. Judging from pre-war prices, it may well be that the charge would be expensive, but research on rocket propellants may conceivably have developed charges which would be a commercial proposition for the above purpose. A launch to 2,500 feet for 5/- to 10/-, without the need for complex winches or aero-tows would be a great step forward and give an enormous fillip to the gliding movement.

K. L. W.

Letters to the Editor.

Kirbymoorside, York.
8th March, 1945.

DEAR SIR,

I have just read in your March issue a letter from Mr. Arnold Pierce, of Aldershot. I also saw Lt.-Commander Terence Horsley's article on sailplanes in the *Aeroplane*. Incidentally, the article was excellent apart from the price estimates, which were entirely Horsley's own idea arrived at by methods known only to journalists. However, I am flattered to learn that my machines are worth so much to at least one of my friends.

On the subject of post-war prices, Horsley and Pierce are both wrong—too high and too low respectively ; but Pierce is likely to be more off the target than Horsley, whose estimate for a post-war " Kirby Kite " is not much out.

The following comparative costs of timber and plywood is an indication of how selling prices will be affected :—

Grade " A " Spruce—Per standard : pre-war price, £75 ; to-day's price, £170 to £300.

Aircraft quality ply—Polish, purchased in large consignments : pre-war price, 3d. per sq. ft. ; to-day's price, 1s. 1d. per sq. ft.

Other commodities such as steel sheet, steel tubing, glue, fabric, nuts and bolts, pulleys and all odds and ends average at least 80 per cent. above pre-war.

Labour rates in my district have risen by 80 per cent. above pre-war, which includes district upgrading. Prior to the war, labour costs in relation to material costs could be taken as 60 per cent. and 40 per cent. respectively, with both items carrying an overhead factor.

Mr. Pierce's method of computing labour costs in proportion to material costs based on pre-war prices for " kits of parts " is inaccurate and misleading. The kits included a high percentage of labour ; all frames, ribs, bulkheads, fittings, struts and so on were made with fittings attached ready for component assembly. Fantastic value ; I wonder we survived such generosity !

As regards overheads, practically every item of expense shows an increase above pre-war. Technical, inspection and administrative salaries ; heating, lighting and power, maintenance and replacements ; insurances, rates and taxes, stationery and postage ; communications and transport, all well up and we have not been promised early reductions for post-war. Therefore, we must expect selling prices to be much higher than pre-war. The only way to keep prices down is to standardise types to a small range and produce in large quantities using the maximum jigging facilities and up-to-date methods of production. Cutting prices down by using lower grade materials must not be tolerated ; a complete first-class inspection organisation is essential. In short, a certain standard of quality must be maintained, irrespective of cost, otherwise the effort is wasted.

I know I speak for all my friends in the aircraft industry when I say that we would rather quit than produce machines in which we have no confidence, pride or interest.

Yours faithfully,
F. N. SLINGSBY.

IMPORTANT NEWS

News has just been received from Slingsby's. The firm is now planning large scale production of the " Kirby Kite " and the " Olympia " owing to the extraordinary demand. The firm will concentrate on these two types to give quick delivery and service immediately restrictions are lifted.

LETTERS TO THE EDITOR

(Continued)

DEAR SIR,

In the January issue you ask for views on two published letters and comment on a third letter yourself.

You say we must become air-minded as a nation and that Tom, Dick and Harriet must be interested in gliding.

If these three are to be interested, gliding will have to become less dependent on clubs for getting the machines off the ground and for retrieving the machines. As your correspondent argues no Tom, Dick or Harriet can afford to be without an engine in their yacht. Only the comparatively wealthy can rely on sails or rather have the time which sails alone necessitates.

Hitherto gliding has only been worth while if a whole day at a time was available. Once again T.D. and H. cannot always afford a complete day. This would seem to require not only some power propulsion in adversity but flying ground near the home. A special machine would be required for this, and it seems that the Germans have produced one according to the *News-Chronicle* of 14th inst.

The Germans have developed a small autogyro-sailplane. With jump-start mechanism, perhaps set in motion by pedalling, this would seem ideal for a small flying field near the home. (I would not want such machines in the back garden. I have seen what novices who have passed their driving tests can do with their cars.)

There is a further advantage in autogyros. It has for years seemed to me rather ridiculous to turn in circles in order to rise in an up-current. With the autogyro type machine one could remain motionless.

My conclusion, therefore, which seemed apparent even in Carden-Baynes' days, is that an autogyro-sailplane with auxiliary power is necessary if Tom, Dick and Harriet are to become interested.

Yours etc.,

GILBERT RAE.

DEAR SIR,

Mr. Warring certainly clears the air by admitting that he has never been in a thermal. I don't think I would have the temerity to write an article on how to handle a sailing ship if my only knowledge came from observations from the shore.

We can exchange useful knowlege with the model flyers to our mutual advantage, but let's be quite clear how we arrive at our conclusions.

I have only casually observed models, but have been astonished at the way they apparently find and stay in thermals, but Mr. Warring makes no attempt to explain why they tend to "tighten the turn," I would suggest that perhaps the turn seems tighter because the small machine is receding rapidly upwards.

If as stated a model is set in a turn, then how can it help turning into a thermal? Does Mr. Warring suggest that if a model set to do, say a left hand turn, encounters a thermal on its right that it will turn right? I have a theory, but let's hear what the model expert says.

Another suggestion to help an agreed "interesting controversy" is that a model being only about one-twelfth the span of a sailplane has not the difference in lift at its extremities in a thermal to overcome the powerful dihedral plus present turn applied. Incidentally, Mr. Warring's illustration of the ping-pong ball on the jet of water just doesn't fit this argument in the smallest degree, quite a different principle being involved.

I am not going to argue against models doing flat turns efficiently, although I doubt it, but I very definitely state that a sailplane cannot possibly do the slightest turn flat as efficiently as it can with correct bank.

As for his remarks that "I rather feel that there is more in thermal circling than merely holding a machine in the correct bank," I can only suggest Mr. Warring gets himself a thermal ride in a two-seater before he says much more about how to handle a sailplane under such conditions—he might learn quite a lot about the most fascinating sport in the world.

Yours faithfully,

E. J. FURLONG.

CLUB ANNOUNCEMENTS

LEICESTER GLIDING CLUB

Fixtures.—For details contact Secretary. Theory and construction classes, with wind tunnel models, now enrolling. Prepare now for your post-war soaring. Secretary, Park Road, Blaby, Leicester. Wigston 89289.

THE MIDLAND GLIDING CLUB LIMITED

The Secretary invites enquiries *re* post-war programme at Long Mynd. Subscription rates, etc., forwarded to those interested on application to:—F. G. Batty, F.C.A., 2, Lombard Street West, West Bromwich, Staffs.

DERBYSHIRE & LANCASHIRE GLIDING CLUB, GREAT HUCKLOW, TIDESWELL, DERBYSHIRE

Still on the active list. Club activities will commence as soon as civil flying is permitted. Full particulars, booklets, etc., from Secretary, 87, Fargate, Sheffield, 1.

INTER STRUT BRACING CABLES

By NORTHERN NOMAD

STRUTTED wings of the training type of glider, are provided with inter-strut bracing cables or piano wires tensioned with the normal wire strainer or turnbuckle. These bracing cables or wires have important work to do and should receive frequent attention.

One cable of each pair takes some of the wing drag loads when the aircraft is launched, the other takes the anti-drag or inertia loads on landing.

If these cables are allowed to become slack or incorrectly tensioned excessive loads have to be taken by other members in the structure. For instance, a pupil makes a very fast landing and bangs the ground "good and proper," the anti-drag loads from the wing are taken by the cable connecting the bottom of the rear wing strut to the top of the front strut. If this cable is slack, and therefore non-effective, the internal wing structure will suffer, and possibly the rear spar, near the root anchorage, will be badly damaged, although landing skid and rest of the fuselage may show no signs of damage. Give particular attention to the anti-drag bracing cable—make sure that this cable is tensioned first and then bring up the drag cable to tension. A heavy landing will stretch wires or cables, therefore frequent inspection is essential.

LIVERPOOL AND DISTRICT

There exists in Liverpool the nucleus of a live Gliding Club if someone with experience can be found to give it a lead. Some sixty youths, of fifteen and upwards, are anxious to begin. If anyone is interested in volunteering for this commendable job, would they please write to the Editor?

SOARING

Your Emblem

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

The A  **GLIDING BADGE**

The B  **GLIDING BADGE**

The C  **SOARING BADGE**

Silver C  **and Golden C**

SOARING BADGES

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

ROYAL AERO CLUB GLIDING CERTIFICATES

		Gliding School	Date taken
	"A" Certificates (39)		
2341	Anthony Stuart Price	M.50 E.G.S., Hereford	4.11.44
2342	Ronald William Percival	S.W.89 E.G.S., Christchurch	14. 1.45
2343	Albert Arnold	M.45 E.G.S., Meir	29.10.44
2344	Harry Pretoria Davis	C.124 E.G.S., Aldenham	7. 1.45
2345	George Bryant Podger	S.W.89 E.G.S., Christchurch	14. 1.45
2346	Ralph William Dale	M.45 E.G.S., Meir	11.11.44
2347	Gordon Horace George Saxby	L.148 E.G.S., Southend	21. 1.45
2348	Stanley Harold Goward	Ditto	21. 1.45
2349	Ralph Herbert Hanger	M.44 E.G.S., Rearsby	10. 9.44
2350	Norman Henry John Cant	S.W.83, Moreton Valence	21. 1.45
2351	Harley Seaton	M.45 E.G.S., Meir	17. 9.44
2352	Arthur Nigel Kitching	N.E. 30, Sherburn-in-Elmet	15. 8.44
2353	Ernest William Hoptroff	M.45 E.G.S., Meir	17. 9.44
2354	Maxwell Frederick Grunert	M.41 E.G.S., Bretford	14. 1.45
2355	Alan Arthur Charles Allcock	L.145 E.G.S., Colchester	24.12.44
2356	John George Brian Little	S.W.89 E.G.S., Christchurch	13. 1.45
2357	Albert Frank Parslow	S.E. 163 E.G.S., Portsmouth	1.10.44
2358	Richard Harvey Tickle	186 E.G.S., Speke	22.10.44
2359	Herbert J. W. Nemec	L.148 E.G.S., Southend	21. 1.45
2360	Hubert Ernest Picter	S.W.83, Moreton Valence	21. 1.45
2361	Stanley Gregory	N.E.24 E.G.S., Netherthorpe	22.10.44
2362	Keith Brian Smith	M.44 E.G.S., Rearsby	11. 2.45
2363	Lawrence Frederick Southorn	N.E.24 E.G.S., Netherthorpe	17. 9.44
2364	Albert Stubbs	Ditto	11. 2.45
2365	Frank Brandfogel	C.122 E.G.S., Harrow	26. 3.44
2366	Albert William Gargate	N.E.26 E.G.S., Greatham	29.10.44
2367	John Alan Pooley	Ditto	10.12.44
2368	Richard Harry Tebb-Pitt	M.44 E.G.S., Rearsby	14. 1.45
2369	Joyce Paulina Fisher	N.E. 27 E.G.S., Woolsington	30. 7.44
2370	Arthur White	S.E.068 E.G.S., Rochester	14. 1.45
2371	Winton Richard Wood	Ditto	14. 1.45
2372	Robert Edward Glover	W.65 E.G.S., Cardiff	17. 2.45
2373	Barbara Moden	M.44 E.G.S., Rearsby	30. 6.44
2374	Jack Ronald Hayward	C.121 E.G.S., Halton	18. 2.45
2375	Albert William Sidney Ducker	C.122 E.G.S., Harrow	18. 2.45
2376	Henry Walker	184 E.G.S., Woodford	18. 2.45
2377	Robert Stanislaus Moore	N.E.27 E.G.S., Woolsington	15.10.44
2378	Laurence Edwin Draper	M.44 E.G.S., Rearsby	14. 1.45
2379	Kenneth Herbert Garwood	L.145 E.G.S., Colchester	18. 2.45
	"B" Certificates (11)		
2344	Harry Pretoria Davis	C.124 E.G.S., Aldenham	7. 1.45
2352	Arthur Nigel Kitching	N.E.30, Sherburn-in-Elmet	22.10.44
2146	Robert James Curry	203 E.G.S., Newtownards	28. 1.45
2357	Albert Frank Parslow	S.E.163 E.G.S., Portsmouth	31.12.44
2359	Herbert J. W. Nemec	L.148 E.G.S., Southend	4. 2.45
2363	Lawrence Frederick Southorn	N.E.24 E.G.S., Netherthorpe	29.10.44
2369	Joyce Paulina Fisher	N.E.27 E.G.S., Woolsington	5. 8.44
2370	Arthur White	S.E.168 E.G.S., Rochester	4. 2.45
2371	Winton Richard Wood	Ditto	4. 2.45
2373	Barbara Moden	M.44 E.G.S., Rearsby	17. 9.44
2377	Robert Stanislaus Moore	N.E.27 E.G.S., Woolsington	21. 1.45

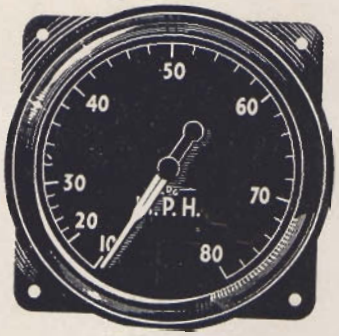
Five shillings per copy offered for back issues of SAILPLANE, March 1944; 6 copies wanted, May (1), July (2), November (3).—Send to Box 2, SAILPLANE.

APOLOGIES

Last month's SAILPLANE was published on the 1st of the month, and advertisers and subscribers duly received their copies. All trace was lost of the main bulk of the issue, however, between Printer and Publisher until the 15th. For this mishap, for which they are in no way to blame, the Directors offer their sincere apologies. Steps have been taken to obviate this happening again.

The "Pioneers of British Soaring" series will be resumed next month with an appreciation of J. C. Neilan.

The series on Soaring Meteorology by the President of the Soaring Association of Canada, will also be resumed next month.



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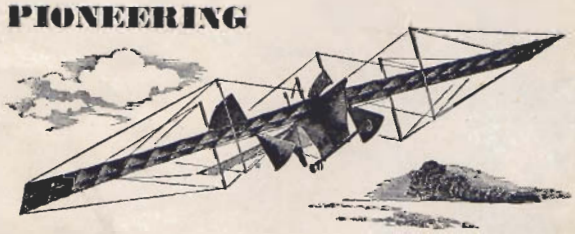

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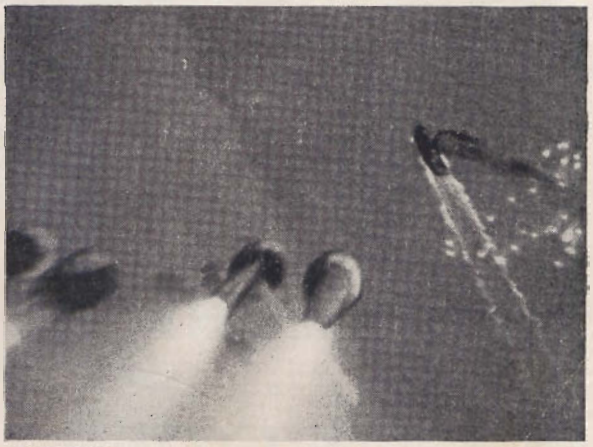

KODAK FILM reports results

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F.25v