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QUARTERLY

WORLD CHAMPIONSHIPS REPORT

GLIDING

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Cover Photograph.—HKS-1 sailplane, piloted by Ernst Günther Haase, soaring over Bradwell Edge during the World Gliding Championships. Photo by Charles Brown, reproduced by permission of Charles Brown and "Aeronautics".

Photo on page 86 by Donovan C. Wilson, Hereford; page 79 by Messrs. Breguet; remaining photographs by Betsy Woodward, P. A. (Jack) Lang and A. E. Slater.

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Telling the World

THIS issue of GLIDING is mainly designed as a record of the 1954 World Gliding Championships. We wish we could print it in many languages, but unfortunately space does not permit. There is one thing, however, we want to say in as many languages as possible. The first article of the F.A.I. Regulations for the holding of the World Championships reads as follows:

> "Championships are intended to stimulate the development of gliding by an international comparison of performance, and strengthen the good fellowship amongst gliding pilots of all nations."

The worst summer's weather in living memory saw to it that we could not succeed in the first aim, but this gave us all an unexampled opportunity to fulfil the second. If U.N.O. ever develops into a shade of the homogeneous and happy society we ended up with at Camphill, the shadow of another war would disappear for ever.

CE numéro de GLIDING est spécialement consacré au compte-rendu du Championnat Mondial de Vol à Voile de 1954. Nous aurions voulu l'imprimer en plusieurs langues, malheureusement l'espace restreint dont nous disposons ne nous le permet pas. Il y a néanmoins une chose que nous désirons dire en autant de langages que possible : le premier article des Règlements et Directives pour les Championnats Mondiaux de Vol à Voile de le F.A.I. dit que :

> "les championnats sont destinés à stimuler le développmeent du vol à voile par une comparaison internationale des performances et à renforcer la camaraderie parmi les pilotes de vol à voile de toutes nations."

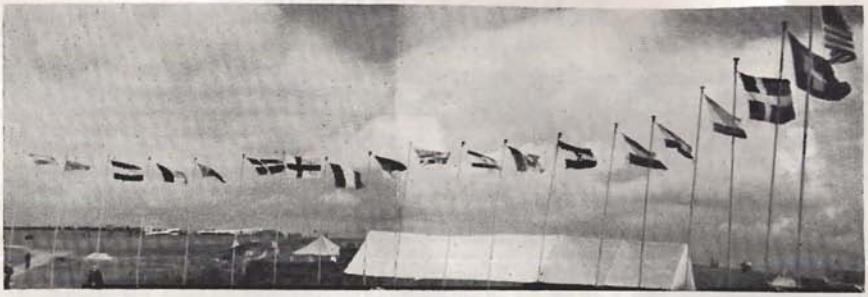
Le mauvais temps qui a sévi pendant toute la durée des championnats—de mémoire d'homme le plus mauvais été qui ait jamais existé—a empêché la réalisation complète du premier objectif. Par contre, les intempéries nous ont laissé toute latitude pour l'exécution du second et si jamais l'Organisation des Nations Unies peut arriver à atteindre même l'ombre de l'heureuse et amicale union qui s'est manifestée à Camphill, toute possibilité d'un nouveau conflit entre les peuples disparaîtrait à jamais.

DIESE Ausgabe von GLIDING ist hauptsächlich den 1954er Weltmeisterschaften gewidmet. Obwohl wir es gerne in vielen Sprachen drucken lassen möchten, entscheidet Platzmangel leider dagegen. Eines jedoch sagen wir in so vielen Sprachen als möglich. Der erste Artikel der F.A.I. Bestimmungen über die Abhaltung von Weltmeisterschaften lautet folgendens :

> "Weltmeisterschaften sollen die entwicklung des Segelflugs durch den Internationalen Leistungsvergleich fördern und die gute Fliegerkameradschaft zwischen Segelfliegern der ganzen Welt verstärken."

Das erbärmlichste Sommerwetter seit Jahrzehnten erlaubte uns nicht das erste Ziel der Weltmeisterschaften völlig zu erreichen, es gab uns allen jedoch eine unvergleichliche Möglichkeit das zweite Ziel zu verwirklichen. Wenn die U.N.O. sich je in eine so einheitliche und so glückliche Gesellschaft entwickeln würde wie die welche am Ende der Weltmeisterschaften in Camphill zustande kam, sofort dann würde der drohende Schatten des zukünftigen Krieges für immer verschwinden.

ESTE número de la revista GLIDING esta dedicado principalmente a la historia del Campeonato Mundial de Vuelo a Vela de 1954. Por este motivo nos gustaría publicarlo en muchos idiomas, pero desgraciadamente, el espacio no lo permite. Sin embargo, es nuestro deseo publicar en el mayor número de idiomas posibles el texto del primer artículo



Flags of 19 nations competing: (L. to R.): Argentina, Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Great Britain, Israel, Italy, Jugoslavia, Netherlands, South Africa, Spain, Sweden, Switzerland, United States.

de los Reglamentos de la F.A.I. para la celebración de campeonatos mundiales, que dice lo siguiente:

"Los campeonatos se celebran con la intención de estimular el desarrollo del volovelismo por medio de comparaciones internacionales de performances, y de fortalecer el compañerismo enter los pilotes de vuelo a vela de todos los paises."

El tiempo que ha hecho ha sido el peor que se recuerda, impidiendo la realización del primer fin pero dando al mismo tiempo una oportunidad inigualable para el logro del segundo. Si la O.N.U. llegara a ser una sombra de la sociedad feliz y homogenea que logramos formar en Camphill, el peligro de una nueva guerra mundial desapareceria para siempre.

QUESTO numero è principalmente destinato a pubblicare i risultati die Campionati Mondiali d Volo a Vela svoltosi nel 1954. Desidereremmo poterli stampare in molte lingue, ma sfortunatamente la tirannia dello spazio non ce lo consente. C'é una cosa tuttavia che desideriamo di esporre nel maggior numero possibile di lingue. Il primo articolo dei regolamenti della F.A.I. che disciplinano lo svolgimento dei Campionati Mondiali é del seguente tenore :

"I Campionati hanno lo confronto scopo di imprimere uno sviluppo al Volo a Vela con un confronto internazionale delle prove, e di rinsaldare la buona amicizia fra i piloti di Volo a Vela di ogni nazione."

Abbiamo avuto le peggiori condizioni atmosferiche estive che si ricordino a memoria d'uomo: ciò non ci à permesso di conseguire il primo scopo, ma à offerto a tutti l'ineguagliabile opportunità di conseguire pienamente il secondo. Se l'O.N.U. si svilupperà sempre piu nella sua missione di protettore di una società omogenea e felice come quella uscita dai Campionati di Camphill, le tenebre di un'altra guerra saranno fugate per sempre.

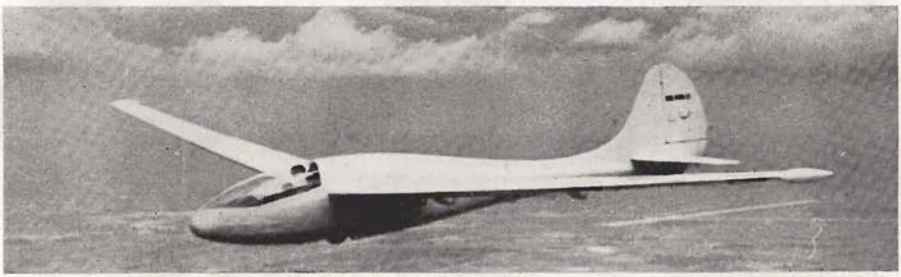
DETTA nummer av GLIDING är i huvudsak en redogörelse för 1954 ars Världsmäasterskapstävlingar i Segelflyg. Vi skulle gärna vilja trycka det på flera språk, men tyvärr räaker inte utrymmet till för detta. Det är emellertid en sak som vi vill återge på så många språk som möjligt. Första artikeln i FAI:s VM-regler lyder som följer :

"Mästerskapstävlingar avser att stimulera utvecklingen av segelflyget genom internationell jämförelse av prestationer och att stärka det goda kamratskapet bland segelflygare i alla länder."

Det värsta sommarvädret i mannaminne gjorde att vi inte lyckades med det förstnämnda med det gav oss samtidigt ett utomordentligt tillfälle att fullfölja det senare. Om F.N. skulle utvecklas till ett tillnärmelsevis så homogent och trivsamt förbund som det vi fick till stånd på Camphill skulle hotet av ett nytt världskrig för alltid försvinna.

Single-Seater Championship Results

	Name	Country	Aircraft	Daily Points				Total
				1st	2nd	3rd	4th	
1	G. Pierre	France	Breguet-901	959	825	274	898	2956
2	P. A. Wills	G. Britain	Sky	835	202	1000	818	2855
3	A. Wiethüchter	Germany	Weihe-50	835	1000	516	466	2817
4	P. B. MacCready	U.S.A.	Schweizer 1-23E	866	798	—	1000	2664
5	S. Relander	Finland	Weihe	835	202	274	943	2254
6	P. A. Persson	Sweden	Weihe	1000	254	—	864	2118
7	G. Rousselet	France	Breguet-901	—	895	290	750	1935
8	M. T. Ara	Spain	Sky	680	456	516	250	1902
9	F. Mordej	Jugoslavia	Orao	557	272	—	909	1738
10	J. S. Ortner	Argentina	Sky	680	316	306	364	1666
11	A. Feddersen	Denmark	Olympia	691	482	—	—	1173
12	M. Bar	Israel	Olympia	—	158	290	693	1141
13	T. Loef	Sweden	Weihe	—	237	242	659	1138
14	G. Stephenson	G. Britain	Olympia IV	608	237	—	284	1129
15	P. Schweizer	U.S.A.	Schweizer 1-23D	650	342	—	—	992
16	A. Koskinen	Finland	PIK-13	—	158	—	773	931
17	E. G. Haase	Germany	HKS-1	—	272	—	636	908
18	N. W. Jensen	Denmark	Olympia	—	175	—	727	902
19	M. Arbajter	Jugoslavia	Orao IIc	680	219	—	—	899
20	J. Cuadrado	Argentina	Sky	—	307	—	500	807
21	F. Vicent	Spain	Sky	—	421	—	364	785
22	F. Linher	Austria	Superspatz	—	404	—	227	631
23	A. Pow	Canada	Olympia	371	158	—	—	529
24	I. de Boer	Holland	Sky	—	465	—	—	465
25	M. Cartigny	Belgium	Sohaj	186	211	—	—	397
26	A. Kuhn	Switzerland	Sky	—	175	—	205	380
27	H. R. Lasch	S. Africa	Air 100	—	149	—	193	342
28	P. J. Beatty	S. Africa	Skylark T37	—	—	—	307	307
29	O. P. Koch	Holland	Olympia	—	—	290	—	290
30	G. Ferrari	Italy	Canguro	—	—	274	—	274
31	S. V. Owen	Australia	Olympia	—	202	—	—	202
32	R. Brigliadori	Italy	Spillo	—	184	—	—	184
33	W. Witter	Belgium	Sohaj	—	—	—	—	—
	A. Gehriger	Switzerland	WLM-II	—	—	Retd.		



Breguet 901, the type flown by Gerard Pierre, the new World Champion.

THE NEW CHAMPIONS

On the left, Gerard Pierre, of France, who won the Single-seater Championship with a total score of 2,956. He never dropped below second place throughout.

Below, Bozidar Komac (L.) and Zvonimir Rain (R.), of Yugoslavia, who won the Two-seater Championship by a big margin with a score of 3,056 points. They made the longest flight of the meeting, 106 miles.

Multi-Seater Championship Results

	Name	*Country*	*Aircraft*	*Daily Points*				*Total*
				1st	*2nd*	*3rd*	*4th*	
1	Z. Rain B. Komac	Jugoslavia	Kosava	556	1000	1000	500	3056
2	A. Mantelli L. Braghini	Italy	Canguro	407	151	—	1000	1558
3	S. W. Smith R. Kidder	U.S.A.	Schweizer 2-25	309	358	813	—	1480
4	H. Nietlispach B. Müller	Switzerland	Spyr Va	1000	—	292	—	1292
5	W. Hesse E. Neumann	Austria	Musger Mg-19	198	—	323	750	1271
6	J. Ompré C. J. Dori	Argentina	Condor IV	370	—	333	563	1266
7	L. Welch A. Welch	G. Britain	Slingsby T-42	506	236	323	—	1065
8	L. V. Juez R. Bermudez	Spain	Kranich III	457	—	271	—	728
9	M. Gasnier L. Trubert	France	CM-71	333	—	240	—	573

The 1954 World Gliding Championships

by Philip Wills

So many of our greatest hopes were drowned by the remorseless drip of the endless rain that a few weeks' reflection since the last days of the Championships have been valuable to enable one to get the perspective.

We failed to hold the best Championships the world has ever seen; we failed to provide more days' flying than ever before: indeed, only by flying on every conceivable occasion and stretching every point did we just manage to get in the minimum number of flying days required by the rules to establish an official Championship meeting at all. Let me, however, try to count our blessings and record where, in spite of the weather, we succeeded.

The triumph we achieved—and by "we" I mean all of us, organisers, pilots and helpers of 19 nations—was to show, once for all, that our joint enthusiasm for the air could overcome all the adversities of the weather. Cooped up in the friendly but remote environment of Camphill, as gales followed rain and cloud and mist followed both, we day by day got to know each other and like each other the more. Day by day the tables in the mess-tent and the tea-parties in the caravans became more and more cosmopolitan, and each suceeding evening saw more and more mixing of the nations in the various bars and the Competitors' Club, in the amateur stage shows and on the "dance-floor". Louder and louder grew the roar of conversation in many and oddly mixed languages, here an Englishmen, a Spaniard and an Italian conversing in French, there an Argentinian, an Israeli and a Finn inEnglish. The really splendid organisation of the "living" side, the caravans, the feeding arrangements, the secretariat and so on, formed a solid foundation on which was built an enduring edifice of international comradeship.

Aircraft

Doubtless, more technical pens than mine will discuss the splendid display of aircraft which came to Camphill from all over the world. I will therefore make only one or two remarks under this heading.

For the first time we have seen an aircraft of the new generation, the Breguet 901, with a best gliding angle of 36, win the World Championships. Although it was hard pressed by aircraft of lesser performance, the Sky, Weihe and Schweizer, there can be little doubt that from now on increasingly we shall see that gliding angles of less than 30 are now for the medium class of aircraft only. The Rubicon has been crossed and we saw a machine which had a splendid performance on paper without sacrificing the advantages of stability and good handling qualities, good rigging features and the like which are also essential for any good competition aircraft.

The goal which has still to be reached is the production of such a machine at a reasonably low price, but there can be no doubt now that this achievement is also in sight. The gap between the Sky at £1,400 and the Breguet at £3,000 is still large, but perhaps Breguet himself will reduce it by quantity production, or perhaps we shall see an 18-metre version of the Slingsby Skylark II achieve the goal. There can be little doubt that whoever first succeeds will have the world at his feet.

The main other point which was very much underlined at the 1954 Championships was the inadvisability of bringing insufficiently tested and developed prototype aircraft to the stringent all-round test imposed by such a meeting. I say this with much feeling, having been through the ghastly stresses myself with the K-1, which at the last moment I felt obliged to scratch in favour of the Sky. The history of the Camphill meeting then proceeded to underline the lesson, for at least four practically untried types appeared there which did no good, or even worse, for the machines or their pilots. To succeed in World Championships a sailplane needs a great deal more than a wonderful calculated Polar Curve. Let the motto in future be: "A Polar Curve is not enough."

Equipment

Of our equipment there is comparatively little to say. Our Standard cars were as good as ever and we must be eternally grateful to the Standard Motor Company

for providing so many cars on loan to our more distant visitors.

The Pye radio was again the best in the field. The weather was too marginal for me to try out the Temple thermopile thermal detectors, so the most I can say of this device to date is that I had some evidence, on two flights in really excellent conditions carried out before the Championships, that it may be useful on good days. It may of course also be useful on bad ones, but I simply don't yet know.

The unexpected instrument, which was lent me on the first day of the Championships, was the Cook compass. This extraordinary little device, being almost dead-beat, has many of the advantages of a gyro compass, and I found it invaluable, particularly in blind-flying. On two consecutive occasions it enabled me to re-centre in lift in clouds I had circled out of and would previously have abandoned. I have no hesitation in saying that within the next few years it will become a standard fitment on all sailplanes and completely supplant existing ordinary aircraft compasses. After the total-energy variometer in 1952, the Cook compass in 1954. Can we pull something out of the bag again in 1956?

Pilotage

It is most extraordinary to have to relate that, in spite of the frightful weather, which clearly should have introduced a quite unacceptable degree of luck into the results, for the first time the results this year seem to infuse some shadow of rationality into this picture.

In the first six placings in the single-seater class appeared no less than two previous World Champions and two previous runners-up, and this in conditions when one might have thought that Pierre, with all his skill, might have as easily come out 31st as 1st. Likewise, no one could have any doubts that the Jugoslav two-seater champions would have won in any conditions.

I might therefore suggest, as a very general rule, of lesser application than usual in these Championships, but still to some degree valid even in them, that the factor of luck may in the general way move a pilot's placing up or down within, say, 10 places (or 25%), but only in exceptional cases more than that. From this comes the depressing (and statistically inaccurate) idea that a potential World Champion may have to compete as many as 10 times—or over 20 years—before his skill coincides with the luck necessary to bring him his just reward.

As marking rules gradually develop, and particularly if we manage to achieve in future the full eight days' competition flying we have so far failed to do, we may hope to see this factor reduced, but obviously it can never be entirely eliminated—and if it was, probably some of the fascination of the game would go with it.

The only other point that struck me under this heading was to do with the general subject of practice. It begins to look as if good sailplane pilots are born and not made. MacCready only flies once yearly in Championships—yet does consistently well. Gehriger—who so sadly had to retire on this occasion, but has flown consistently well in the previous two Championships—gets little time to fly in between.

Enough practice to get to know one's machine intimately; and enough flying on the site to know it and its surrounding country, are clearly essentials. But practice in the sense of doing so many hundred hours a year seems as unnecessary as equivalent experience in the art of riding a bicycle.

Organization

The organization of the "living" side of the meeting was, as already described, beyond praise. On the operational side, it is easy to pick out isolated holes, but the general and devoted services of all concerned were superb. When innumerable folk, who have given up their entire annual holidays to come and help run a flying meeting, find themselves asked to help break up stones to tip onto morasses to try and avoid the whole meeting sinking into a bog, and do so uncomplainingly, the privileged flying competitor can only marvel that such heroes exist.

The number of aircraft proved to be, as rather feared, too great for the launching facilities available, and in particular we had during the practice period dire warning that sailplanes are going the same way as aeroplanes, and needing progressively larger engines to get them off the ground. But for the visiting Röder and Pfeifer winches, we should have been in a well-nigh hopeless spot, and clearly something must be done about this in the near future. We shall either have to import foreign winches or set about making better and more powerful ones ourselves. The Germans have got in ahead

Philip Wills in his Slingsby Sky.

of us, and by all accounts are building up a good export trade as a result.

Marking System

It is questionable if any marking system could have stood up to the weather we experienced, and ours only just avoided some dreadful results by the skin of its teeth. On the last day two two-seaters flew 16 miles and one 32 miles. If this last machine had also flown only 16 miles, we should have had three machines scoring 1,000 points for 16 miles, and the rest scoring 0 even if they had flown just under 14½ miles.

The Gliding Commission of the Fédération Aéronautique Internationale, meeting after the Competitions, reviewed the F.A.I. rules in the light of them, and has made certain amendments for the future, with most of which I think nearly everyone will agree.

(a) In future, a race will not count as such unless at least two pilots reach the goal. If they don't, the day may still count as a Contest Day, with distance marks, but the task as such will have to be repeated.

(b) A distance task will not count as such, or as a Contest Day, unless at least two pilots fly 50 kms. or more.

(c) On a distance day, zero marks will be scored for 20% or less of the distance achieved by the best flight of the day. A fixed absolute minimum may also be set by the organizing country if they desire it (i.e. D = d — 0.2D max, when D = distance scoring for points, d = distance flown, D max = best distance of the day).

(d) The optional task of pilot-selected goal-flight has been deleted, and substituted by a new task, a free-distance flight along a compass-course laid down by the organizers (this is a task initiated in the British Nationals last year, which seemed very interesting). Distance points for this task will be calculated as follows: the landing point of the pilot A is projected onto the fixed course at B; AB is deducted from the projected distance and the balance will be the distance which scores for points.

(e) Our initiation this year of deletion of the worst day's marks met with unanimous approval, and it is now laid down that if there are five or more days flying in a World Championships, each pilot's one worst day shall be deleted. Apart from the basic idea of reducing the factor of luck, what greatly appealed to the Commission was the fact that this rule tends to keep up the interest of every competitor to the end of the Contests.

The Future

And so I come to the last paragraph of my fifth report on the International and World Championships. What of the future? The 1956 Championships will almost certainly be held in France and we may very probably be joined in them by the countries of the Iron Curtain, so they may well be even larger, even more important, even more fiercely contested.

What must we do to have a reasonable chance against the redoubtable Pierre and his compatriots, and probably other nations, flying Breguet 901's with possibly still further improved performances? And what must we do to consolidate and cash in on the great public interest which has been aroused by the 1954 Championships, unlucky as they were, in this country? The answer is, so much that I have not space to record it in this issue of GLIDING, but hope to come back to these matters later on.

The Weather !

by C. E. Wallington

Meteorological Office

"BRITISH weather is good for the character," so we kept telling ourselves as we tried to eke optimism out of the charts and tephigrams radioed from Dunstable to our temporary Meteorological Office set up at Camphill. The MUFAX facsimile service and the 9 o'clock Spitfire flight over Camphill had been organized for the practice week and the championships so, after met. radio experts Jim Knight and Wilf Main had fitted 69 suppressors to cars, tractors, beaverettes and electric drills, we were well equipped to predict the depressing details.

The question "What *has* gone wrong with our weather?" was often asked with such emphasis that it may be as well to reassert that, far from being influenced by atom bombs or heat waves in America, British weather was simply plodding along its own devilish course. In addition to the generally poor weather a most aggravating local factor was the unusually, but not unnaturally, high humidity behind the cold fronts. The cold air was often so moist that orographic cloud and rain covered Camphill while conditions to the east and southeast were reasonably good. Even on contest days thermals were usually weak, probably because so much of the sun's heat had to be wasted in evaporating water from the soggy ground.

Nevertheless, championships in both classes were just possible, and with such a sequence of difficult conditions we were frankly relieved that, despite our depressing forecasts, an atmosphere of friendliness and tolerance prevailed throughout the meeting. Perhaps British weather is good for the character after all.

[Mr. Wallington's remarks on the weather day by day, and his weather charts, are included in the description of Championship Flying which follows.]

Alex Orde

EVERYONE in the gliding movement heard with the deepest regret of Alex Orde's decision to resign the Secretaryship of the British Gliding Association on August 31st. As Lady Kinloch, she became Secretary to the Association five years ago, having already worked two years in Londonderry House in the Air Touring Department. During her tenure of the post, the Association and the whole British gliding movement have grown in stature to a degree which would have exceeded our greatest hopes in 1949, and how much of this is due to Alex Orde is known to everyone.

All of us who have worked with her have felt it was a privilege to do so. She has an integrity and a charm of manner which go straight to the heart of any problem and solve it in the most direct and simple way. Her sensibility, her judgment of people, and her ability to see both sides of an argument are outstanding.

She took on the job because she believes absolutely in the fundamental things the gliding movement stands for: enterprise and adventure and the individual expression of personality. Having given us five whole years of her life, thinking and talking and working for gliding all hours of the day and night, I can understand her wish to give herself more time for friends and home and all the things which make life interesting outside the sphere of the gliding world. But her going will be a great loss to us.

Yvonne Bonham, who takes over from her, has worked for the B.G.A. nearly as long. So good luck to Yvonne, and our deepest gratitude to Alex, whom we hope to see as often as possible in the future, as an honoured guest, wherever gliding folk are gathered.

PHILIP WILLS.

Practice Period

WHATEVER else the weather may have done, it provided a westerly wind every day for three weeks, covering both the practice period and the contests, so that everyone could wait in the slope lift for the right moment to go away, instead of having repeated launches and trusting more to luck and less to skill.

Practice flying began on the afternoon of Wednesday, 14th July, and soon nearly a dozen machines were in the air. All launches went well except for the Swiss Spyr V, which lost some of its fuselage when the hook pulled out, and the German HKS-1, whose first launch ended in a ground-loop, though the second was successful.

Next day, July 15th, misfortune came to the Austrian team. Alois Hasenknopf, with his new Zugvogel of 52 ft. 6 ins. span and 463 lbs. empty weight, was observed to climb into a cumulo-nimbus base. Shortly afterwards a message came from two miles away that he had been seen coming out of cloud with a wing broken off and had crashed. Later, an apparently reliable witness said he had seen the machine intact before hearing a noise, looking up again, and seeing it with the wing off. The pilot's body was found, with his parachute partly opened, about 20 yards away from the wreckage, and a portion of the right wing, 16 ft. long, nearly half a mile away with the cockpit canopy.

Mr. C. E. Wallington, chief meteorologist at the Championships, whose article on the weather appears on the opposite page.

A memorial service to Alois Hasenknopf, held at Tideswell Parish Church, was attended by pilots and teams of all nationalities, and a stone memorial with a bronze plaque has since been erected on the hillside where he lost his life.

There was no other case of injury to a pilot throughout the meeting.

July 16th brought a standing wave over

The camp in the background: Guy Rousselet's Breguet 901 in the foreground.

Lord Brabazon of Tara performing the opening ceremony on July 20.

the site in which some competitors and local club members, one of them with the chief meteorologist as passenger, climbed over 6,000 feet.

On Saturday, July 17th, Pat Beatty had planned to get up at 5.30 a.m. for an attempt on the South African duration record, but the Polar Front decreed otherwise. The rain let up just sufficiently for Gehriger to try a couple of launches in his WLM-II, on the second of which his wheels came off prematurely and chewed large holes in the fuselage. A spare part was flown by relays from Switzerland to Slingsby's, while Gehriger's ten-year-old son, Konstantin, set to work on his own initiative to cover the expense by cleaning shoes at twopence a pair.

The 130-h.p. Röder winch arrived from Germany on July 18th. That evening two club Grunaus showed how to soar in weak lift below the hilltop.

Monday, July 19th, was the first and only cross-country day of the practice period, when several pilots tried to get round one or other of the three set triangular courses, unaware that the weather would never prove suitable for setting them during the actual contest. Wills went to Matlock, came back, then completed two legs of the 39-mile Matlock-Hartington triangle; Stephenson nearly completed the 64-mile triangle via Bolsover and Ashbourne; Koch got round it to Ashbourne and Persson a little further. Hesse and Neumann reached Derby in the Musger, evidently trying for the 79-mile Derby-Nottingham triangle. Ortner and Cuadrado took their Skys in company 54 miles to Cranwell.

The evening wave operated again.

Championship Flying

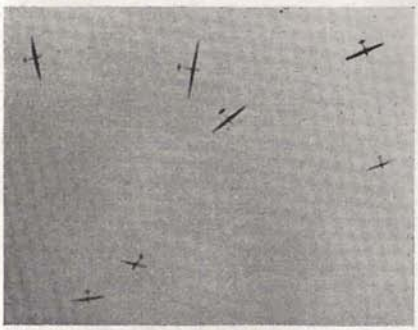
THE Championships were opened on Tuesday, July 20th, by Lord Brabazon of Tara, president of the Royal Aero Club, who was welcomed by the Derbyshire and Lancashire Gliding Club's president, the Duke of Devonshire. Lord Brabazon welcomed the guests in five languages, thanked all those whose hard work and donations had made the meeting possible, and outlined the history of soaring flight, saying it was remarkable that the human race took so long to imitate the birds who could be seen overhead "doing damn all." The nineteen national flags were unfurled, Gerry Smith swooped past through the drizzle in a Sky, and cloud base descended on Eyam Edge.

First Contest Day

Wednesday, July 21st.—The north-westerly air stream brought that mixture of small cumulus under stratocumulus which makes it difficult to get away from the site; but with a 290-degree 25-knot wind conditions were much better to the east.

Free distance was the task for the single-seaters. First to be launched, at 10.55, was Menachem Bar, of Israel, whose Olympia had been allocated Competition No. 1 as the result of a ballot previously held. In just over an hour and a half all 34 single-seaters had been launched, though by then some had landed again to avoid the congestion. Little or no clear sky was visible during this period.

First away was Wiethüchter at about 12.30. Two others accompanied him at first,



July 21st: seven share a thermal.

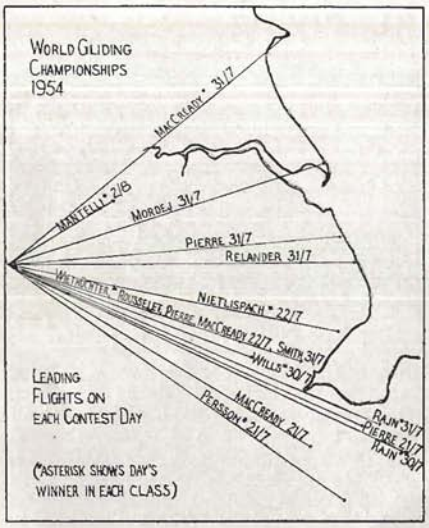
Per Axel Persson, first day's winner.

but then returned to the slope, while he hung on to his thermal and burned his boats. He reached Sheffield at 500 ft. above take-off level and picked up a 6 ft./sec. thermal which took him to Newark at 5,300 ft. a.s.l. by 14.00 hrs., 40 miles from the start. Then the sea hove in sight, so he deviated across wind to get round the Wash but could only achieve a long glide to its western corner at Holbeach St. Johns, where he landed at 15.10.

Meanwhile two pilots had escaped from the crowd to Froggatt Edge, four miles downwind, to wait for thermals there; one of them, Wills, reached it at the third attempt and eventually got away to Holbeach. MacCready likewise spent an hour over the other end of the same line of hills, south of Matlock, once dropping to only 100 ft. above the hilltop; he eventually finished south-west of The Wash. Both he and Wiethüchter said that there was none of the expected improvement in soaring conditions to the east, and it was all very hard work.

There was a big get-away about 15.30, when a few strips of sky appeared. Eleven were circling under the middle one of a row of three cumulus clouds. Probably among these were Relander, who made the same distance as Wills and Wiethüchter but landed well north of the Wash; and Pierre, who worked southwards across the wind and made the second best distance of the day. Stephenson, after three hours over the slope, shot off and covered 59 miles in barely an hour.

The last landing report came from Persson who, after four hours' slope-soaring, beat everyone else by going furthest south of all, 97 miles to Manea, where lack of thermals, not the coast, ended his flight. He



got away at 15.30 with 1,500 ft. of height and climbed eventually to 6,300 ft., finding six to 10 ft./sec. upcurrents in the clouds, but nevertheless was down to only 600 ft. on two occasions.

Altogether 21 of the 34 got away and 15 scored points (see table on page 79).

Name	*Landing*	*Miles*
Persson	Manea (March)	97
Pierre	Torrington (Kings Lynn)	93
MacCready	Nr. Wisbech	84
Wiethüchter	Holbeach St. Johns	81
Wills	Holbeach St. Johns	81
Relander	N. E. Boston	81
Feddersen	Hacconby (Spalding)	67
Arbajter	R.A.F. Coningsby	66
Ara	R.A.F. Coningsby	66
Ortner	R.A.F. Coningsby	66
Schweizer	Swinstead (Grantham)	63
Stephenson	Metheringham Airport	59
Mordej	Cranwell Aerodrome	54
Pow	Ossington Aerodrome	36
Cartigny	Heath-Holmwood	18

Shorter mileages: Bar, 10; Linher, 10; Koch, 10; Vicent, 6; Rousselet, 4; Owen, 3. Thirteen did not go away.

Second Contest Day

Thursday, July 22nd, revealed little change in the general conditions, but the strato-cumulus spreading eastwards ensured that every point gained was well and truly earned. Meanwhile the first of the fronts loomed into view.

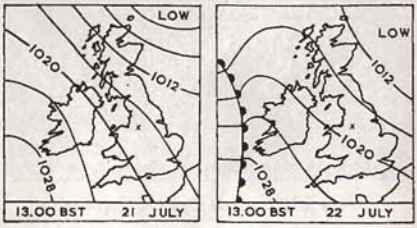
Two-seaters were given priority for a free distance competition, as they had to be kept on the ground the previous day owing to the many single-seaters occupying the air over Bradwell Edge right up to closing time for launches, 18.00 hrs.

First launch was by Ompré and Dori in the Argentine Condor IV, and by 11.10 all nine of the two-seaters were in the air. Although early cumulus had spread out into a layer of overcast by 10.30, gaps in it soon reappeared and remained larger, on the whole, than on the previous day. So four of the two-seaters were away by 11.30 and the rest by 11.45.

But they had gone off too early. At 11.30 Welch's crew could be heard over the radio telling him that no blue sky was in sight east of Chatsworth, where he and the Swiss Spyr were stuck over the slope, and when he did get away he had to deviate all over the place in search of lift. Eventually all the two-seaters came down at distances between 15 and 45 miles.

However, this did not satisfy Nietlispach and Müller, who had gone only 16 miles. So they brought their Spyr quickly back to Camphill for a second launch into a lucky spell of improved weather at 15.15 and made a remarkable flight of 80 miles to the coast. keeping below 2,000 ft. all the way. This was nearly twice as far as the best of their rivals, the Yugoslavs, and put them well in the lead on the first occasion either of them had taken part in a gliding contest. (See scores on page 80.)

Name	*Landing*	*Miles*
Nietlispach	Friskney (Wainfleet)	80
Rain	R.A.F. Swinderby	45
Welch	Farndon (Newark)	40
Juez	Southwell	36
Mantelli	Edingley Mill (Newark)	31
Ompré	Farnsfield	30
Gasnier	Thoresby	27
Smith	Cuckney	24
Nietlispach	(1st flight)	16
Hesse	Tansley	15



August Wiethuchter, of Germany, who was in the lead for two contest days.

Single-Seaters were given a race to Boston airfield, 73.4 miles (117.8 kilometres). All but two got away, making this the most successful cross-country day of the contest. But only four reached the goal and earned speed marks as well as distance marks.

Launches began as soon as the two-seaters were out of the way, but it was not until about 12.45 that a good many of the single-seaters went off. Among this lot was Pierre, who crossed the starting line (east of the club ground) at 12.48½, and was first to arrive at Boston, taking one hour 52½ mins. over a difficult flight.

Another crowd of single-seaters got away between 13.15 and 13.30. This group included the three others who reached Boston: Wiethüchter, who covered the course in 1 hr. 38 mins.; Rousselet, 1 hr. 46 mins.; and MacCready, 1 hr. 54 mins.

MacCready was some 50 feet higher than Wiethüchter when they both set off across the starting line at 13.22 and began circling up to a cloud. MacCready entered it first. Wiethüchter waited two minutes before following him in, climbed at 13 ft./sec. to 5,300 ft. above take-off, then glided east at 68 m.p.h. till he emerged into clear air at 2,100 ft., saw bad weather ahead, and slowed up to 50 m.p.h., till he found weak cloud lift near Lincoln.

It must have been at this time that he was seen by MacCready, who reported a sheet of alto-stratus ahead and only an occasional darker patch giving lift. Wiethüchter's patch was the stronger; he stayed in it half an hour till he had attained 4,300 ft. and then calculated Boston was within reach, so he glided there at 100 m.p.h. and not only won the race but rose to leading place in the single-seater class. Times and speeds of the successful pilots were:—

Pilot	*Start*	*Finish*	*m.p.h.*
Weithüchter	13.22	15.00	44.94
Rousselet	13.19	15.05	41.55
Pierre	12.48½	14.41	39.15
MacCready	13.22	15.16	38.63

Of the rest, Feddersen went furthest with 55 miles. Wills, after going 23 miles, returned at 16.15 for another start.

Name	*Landing*	*Miles*
Feddersen	Dunstop (Lincoln)	55
De Boer	Branston (Lincoln)	53
Ara	Pinkerton (Lincoln)	52
Vicent	Fulbeck	48
Linher	Skellingthorpe	46
Schweizer	Sutton-on-Trent	39
Cuadrado	Kneesall (Newark)	35
Haase	New Ollerton	31
Mordej	New Ollerton	31
Persson	Edwinstowe	29
Stephenson	Thoresby	27
Gehriger	Worksop	27
Arbajter	Church Warsop	25
Cartigny	Nr. Mansfield	24
Wills	Eastwood	23
Relander	Cuckney	23
Owen	Worksop	23
Brigliadori	Mansfield	21
Jensen	Bolsover	20
Kuhn	Bolsover	20
Bar	Holmewood Colliery	18
Koskinen	Holmewood Colliery	18
Pow	Bolsover	18

Shorter mileages: Beatty, 10; Ferrari, 9; Two did not go away.

Leading scores after two contest days:—

1. Wiethüchter (Germany)	1,835
2. Pierre (France)	1,784
3. MacCready (United States)	1,664
4. Persson (Sweden)	1,254
5. Feddersen (Denmark)	1,173
6. Ara (Spain)	1.136
7. Relander (Finland) and Wills (Great Britain)	1,037

Unfortunately, several machines were damaged through landing in corn. Cartigny's Sohaj suffered a damaged elevator and tailplane; Koch's Olympia, broken skid; Brigliadori's Spillo, nose broken off and tail and elevators damaged; Spanish Kranich III, trailing edges damaged and rudder and skid broken; Haase's HKS-1, large holes in both leading edges, necessitating its going to Slingsby's for repairs.

A Week of Frustration

Friday, July 23rd.—Warm front and warm sector conditions—warm, wet, unpleasant air with very low cloud.

Many competitors and their teams went down to Buxton to listen to OSTIV lectures and see films on meteorology.

Saturday, July 24th.—Behind the cold front—cold, wet, unpleasant air with very low cloud.

Workshop busy with repairs on Thursday's casualties. HKS back from Slingsby's, whose staff had worked on it round the clock. Pfeifer winch (1½ tons, 110 h.p.) arrived from Germany.

Sunday, July 25th.—The drier cold air behind a second cold front moving south-east over the British Isles did eventually reach Camphill, but not until 4 p.m.

Two-seaters were given a race to Sandtoft, 40 miles to the E.N.E., and started launching at 15.30 when the sky cleared as forecast. There was barely enough wind to keep them up a few hundred feet above Bradwell Edge, and the best of the evanescent thermals, in which five circled in close formation, lasted for a minute or two. At 16.40, in weakening lift, they began coming in to land, but the club two-seaters continued giving passenger rides till dark, and £500 was taken at the car parks. In the evening, a show of meteorological films in the briefing room by Dr. Dick Scorer and Dr. Joachim Küttner.

Monday, July 26th.—As Friday, Saturday and Sunday, but all in one day.

Rain set in at 10.15. The main event was another film show; José Ortner showed one of gliding in Argentina, and Lawrence Wright his cartoon film and one of last year's national championships (incredulous cries of "Le soleil!" from the audience). At a session of the F.A.I. Gliding Commission, Viktor Ilchenko was recommended for the Lilienthal medal for his two-seater record flight last year.

Tuesday, July 27th, At last blessed us with instability, but I have yet to see a blessing more effectively disguised. With excessive instability cloud and wind gusting up to 50 knots on the ridge it was little wonder that a trailer made the best flight of the day.

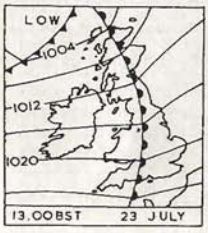
At the 09.30 briefing a free distance contest was announced for the two-seaters, but at 12.30, when it was to have been decided whether the single-seaters should join in too, flying was cancelled altogether because the gale was creating violent turbulence on the site, and cloud base was unpleasantly near the higher hilltops. Viktor Ilchenko and Pavel Tourchin turned up from Russia and were suitably welcomed. In the evening, a lively party in the Competitors' Club.

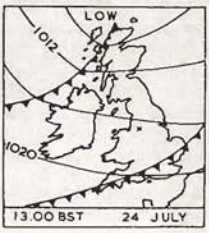
Wednesday, July 28th.—Wind speed decreased slightly but the all too familiar moist air, which had wheeled right around the depression over Scotland, returned to Camphill to give another day of low stratus and drizzle.

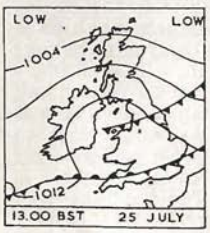
Rain started at 10.45. A partial clearance at 18.30 allowed club machines to be launched; one was pushed down to the bottom by a cumulo-nimbus base descending on to the hill.

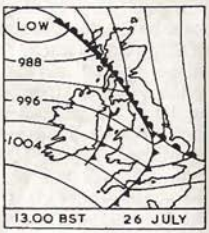
Thursday, July 29th.—Once again drier air in the north-westerly stream reached us too late to be of any use.

The most frustrating day of all. Bright sunshine and perfect cumulus was reported from all around, even from just beyond Hathersage, but the Camphill plateau remained immersed in a stationary bank of cloud from which drizzle seeped down relentlessly. The two-seaters had been set a free distance contest but did not trouble to go to the launching point.









Third Contest Day

Friday, July 30th.—After an overcast morning there was just enough cumulus to give some competitors a chance of getting away during the afternoon. Although the waves which were about seemed somewhat fickle over Camphill itself, a series of them east of Sheffield seemed to be most pronounced between 4,000 and 6,000 feet, in which layer the wind was about 290 degrees 30 knots.

Two-Seaters were given first priority for a free distance competition. The Italians took off boldly at 11.20 under a cloudy sky, but it was 12.40 before anyone went up to join them, when they were already making a first attempt to get away. The Swiss Spyr left at 13.15 for Froggatt Edge where it stuck for at least an hour. Eventually all but the Argentinians left the site, but four came back by road in time for second launches: the Swiss at 16.57, the Austrians at 17.07, the Spanish at 17.17, and the British at exactly 18.00.

The Yugoslav pilots, Rain and Komac, far outflew the rest. They contacted a wave when 900 ft. over Sheffield, recognised what it was from experience at home, then used a series of five waves to climb to 6 500 ft. above starting level, keeping above the clouds all the time. They first sighted land again near Cranwell, came into an area of good thermals which no-one else was able to reach, by-passed the Wash and landed at Marham airfield, having covered 106 miles between 13.11 and 17.20—a flight duration of 4 hrs. 9 mins., and the longest distance of the meeting.

Name	*Landing*	*Miles*
Rain	Marham (Norfolk)	106
Smith	Dunham on Trent	38
Welch	Worksop	25
Mantelli	Calow (Chesterfield)	16

Shorter mileages: Gasnier, 11; Hesse, 9; Juez, 7; Nietlispach, 4. One did not go away.

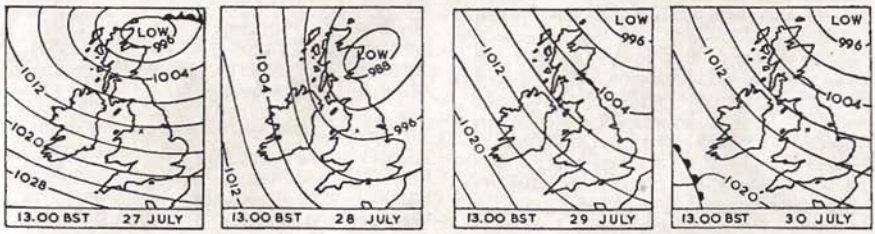
Seppo Relander, of Finland, finished 5th.

Leading Scores after two contest days:—

1.	Rain (Yugoslavia)	1,556
2.	Nietlispach (Switzerland)	1,000
3.	Welch (Great Britain)	742
4.	Smith (United States)	667
5.	Mantelli (Italy)	558
6.	Juez (Spain)	457

Single-Seaters began launching, also for free distance, when the sky was clear of two-seaters in mid-afternoon. This did not give much time for long distance, and for some hours it was believed that the greatest distances achieved were 32 miles each by Wiethüchter, who did all his circling between 250 and 1,600 ft. above starting level, and later Ara. At 16.30 a radio message came from Wills, somewhere overhead, that he was well up in a wave, soon after a similar message from the Yugoslavs, who were, by then, 60 miles away.

Wills's account of his flight, carried out entirely in a series of nine waves, and ending 62 miles away at 18.15, will be found on page 96. He thereby rose from 7th to 3rd place, and might even have reached second place if Pierre, who was still stuck over the site with many others, had not heard of it by radio. Wave lift over the site began to die out at 17.15, according to MacCready, who was back after a 10-mile flight in the



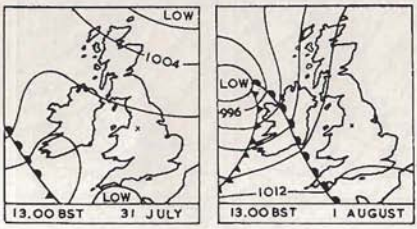
hope of a second chance, but it picked up a little again at 20.00. So Pierre got as high as he could and dashed off at 20.30 on a downwind glide of 17 miles, landing at 21.05, exactly a minute before local sunset. This gave him 274 points wherewith not only to maintain second place, but subsequently to win the championship with a lead of 102 points over Wills and 139 over Wiethüchter. But to-day, the latter increased his lead over Pierre from 51 to 293 points. Late downwind dashes were also made by Rousselet and by Ferrari, who left the site at 21.15 and landed at 21.40.

Name	*Landing*	*Miles*
Wills	Asgarby (Sleaford)	62
Wiethüchter	Retford	32
Ara	Gamston (Retford)	32
Ortner	Bolsover	19
Bar	Shuttlewood (Bolsover)	18
Rousselet		18
Relander	Staveley	17
Pierre		17
Ferrari		17
Loef	Chesterfield	15

Shorter mileages: Mordej, 14; Arbajter, 12; Linher, MacCready, Schweizer, Koskinen, Persson, Owen and Feddersen, 10 each; Witter, 4. Twenty-three did not go away. Gehriger had retired after the second contest day.

Leading scores after three contest days:—

1. Wiethüchter (Germany)	2,351
2. Pierre (France)	2,058
3. Wills (Great Britain)	2,037
4. MacCready (United States)	1,664
5. Ara (Spain)	1,652
6. Relander (Finland)	1,311
7. Ortner (Argentine)	1,302
8. Persson (Sweden)	1,254
9. Rousselet (France)	1,185
10. Feddersen (Denmark)	1,173
11. Schweizer (United States)	992
12. Arbatjer (Yugoslavia)	899
13. Stephenson (Gt. Britain)	845
14. Mordej (Yugoslavia)	829



Paul MacCready, of the United States, who made the best flight of the last single-seater contest day: in his Schweizer 1-23E. Members of his ground crew are his father (furthest left), and Commander Nicholas Goodhart (bending down).

Fourth Contest Day

Saturday, July 31st.—With the warm front in the west delayed by a feeble ridge of high pressure, just sufficient cumulus developed beneath an almost complete cover of strato-cumulus to enable some pilots to fly eastwards with a 280-degree 18-knot wind.

Two-Seaters were asked by the single-seaters to start first for free distance.

The Yugoslavs followed yesterday's track, flying in cloud as far as Lincoln; but the thermal lift let them down about 16.00 hrs., and they had been unable to cast off their launching wheels. But it was the longest flight and only the Americans, with 78 miles, came near them. Most of the others had landed two hours earlier, and three returned for second attempts.

Name	*Landing*	*Miles*
Rain	Kings Lynn	95
Smith	Boston	78
Ompré	Gamston (Retford)	32
Welch	East Retford	31
Hesse	Bawtry	31
Nietlispach	Worksop R.A.F.	28
Juez	Tickhill	26
Gasnier	Netherthorpe (Worksop)	23
Mantelli	Sheffield	11

Leading scores after three contest days:

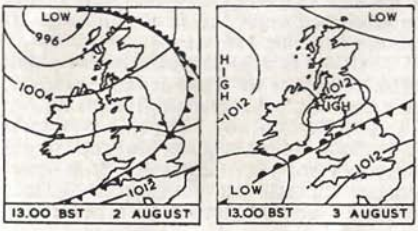
Rain (Yugoslavia)	2,556
Smith (United States)	1,480
Nietlispach (Switzerland)	1,292
Welch (Great Britain)	1,065

Single-Seaters, likewise competing for free distance, started later and mostly had easier soaring; many kept going till after 17.00 hrs. and some of these were only stopped by reaching the coast. Every possible yard of distance was squeezed out by MacCready, who landed as near as he dared to Flamborough Head lighthouse, and by Persson, who landed on the beach after a blind flight from which he emerged from cloud over the North Sea. He had been down to 500 ft. soon after Camphill, but then got a thermal which took him into cloud up to 7,600 ft.

Wills picked up a cloud street at Sheffield which took him to the coast south of the Humber, which he then crossed in the hope of making more miles, but the air went dead. Relander, Pierre, and Mordej also reached the sea.

Name	*Landing*	*Miles*
MacCready	Flamborough Head	88
Relander	Sutton-on-Sea	83
Mordej	Easington	80
Pierre	Salt Fleetby	79
Persson	North Coates	76
Wills	Sproatley	72
Kóskinen	Asterby (Horncastle)	68
Rousselet	North Killingholme	66
Jensen	Goxhill Aerodrome	64
Bar	Barton-on-Humber	61
Loef	Saxby All Saints	58
Haase	Brough Airfield	56
Cuadrado	Saxilby	54
Wiethüchter	Nr. Gainsborough	41
Vicent	East Retford	32
Ortner	R.A.F. Finningley	32
Beatty	Worksop	27
Stephenson	Church Warsop	25
Ara	Dinnington	22
Linher	Elmton (Cresswell)	20
Kuhn	Ulley Reservoir	18
Lasch	Staveley	17

Shorter mileages: Pow, 11; Brigliadori, 9; Owen, 7; De Boer, 5; Feddersen, 4; Cartigny, 4; Witter, 4. Four not away.



Wiethüchter's first launch led him only to a long wait over Froggatt. Back for a second launch at 17.55, when all but three were already down, he kept moving slowly eastwards to a landing at 19.35.

Sunday, August 1st.—For a brief period during the morning attractive fair-weather cumulus developed in the light southerly wind, but this cloud was soon flattened by the approaching warm front.

Two-Seaters were given a race to Derby, 30 miles to the S.S.E., in a forecast S.S.W. wind of six knots; but the wind increased, and nobody got there. The Americans covered 24 miles before the warm front clamped, but then unfortunately damaged their 2-25 beyond immediate repair. The Austrians went 16 "projected" miles, and the British and French 10 miles each. It was, therefore, not a contest day.

Single-Seater task, Ashbourne and back (42 miles), was cancelled at 14.00 hrs.

Fifth Contest Day

Monday, August 2nd, saw a vigorous cold front cross the site prompt on 11.30 *a.m., but during the afternoon thermals were weak despite the active appearance of the cumulus north, south, east and west of Camphill.*

Two-Seaters were launched between 12.18 and 12.48 for a race to Sandtoft, 40 miles N.E. by E., but it was 17.00 hrs. before thermals boiled up to take anyone away. The Italians rose from 8th to 2nd place, landing at 18.40 after the longest flight of the day.

Name	*Landing*	*Miles*
Mantelli	N. of Doncaster	32
Hesse	Conisbrough	24
Ompre	Whiston	18
Rain	Near Sheffield	16

Shorter mileages: Welch, 9; Juez, 8; Nietlispach, 4. One did not go away.

Single-Seater task, pilot's goal, cancelled.

Tuesday, August 3rd.—*After a fair morning, increasing cloud and rain spread northwards over the site. The associated front slowed down and became almost stationary over Camphill during the afternoon.*

No flying, so final scores remained as given on pages 79 and 80.

Wednesday, August 4th, at Buxton Pavilion: Government reception, followed by party and distribution of prizes by Mr. John Profumo, Parliamentary Secretary, Ministry of Transport and Civil Aviation.

Two-Seaters

by Ann Welch

THIS year, for the first time, the two-seater class in the World Championships was flown entirely separate from the single-seaters. Previously the division had been in scoring only, and it was not easy to see the possibilities of two-seater flying.

In the past, two-seaters have usually been of inferior performance to the general run of the single-seater competition gliders of the day, but the 1954 contests showed that this is no longer so. The modern two-seater can have a similar performance to its single-seater counterpart for little increase in size and weight. Its controllability and field handling characteristics are just as good, and the slightly greater price is amply covered by its enormously increased scope.

It has always seemed most uneconomic to have more than a small proportion of single-seater gliders in British clubs, particularly now that the cost of flying across country is so high. Admittedly single-seater soaring is highly satisfying, and will always have a very secure place in gliding, but in this country we are handicapping new soaring pilots by not having more good two-seaters.

British weather, even in a good summer, is not very easy, and the amount of soaring practice that the average British soaring pilot gets is negligible compared to that obtainable in other countries where the lift is stronger, and the summer longer. The cost is too much for many pilots to fly cross-country regularly, and in most cases the first dozen flights, at least of a new pilot, are largely fortuitous in their result. We cannot hope to produce a steady stream of high-quality soaring pilots until the new generation can do a lot more cross-country flying.

This problem of cost is a very real one, and cannot be escaped by exhortation to do out-and-returns or triangular flights to save retrieving. In England there is too much wind on more than relatively few of the days available to the inexperienced pilot. By having to attempt difficult flights for economic reasons, hours of good soaring conditions may be wasted sitting in a field 15-20 miles away from the club site after a futile struggle against the wind, when to have gone away with a good patch of easy weather would have given more badly-needed hours of real soaring practice. But a satisfyingly long journey means a costly retrieve.

Two-seaters can increase the amount of soaring done in England in two ways. Firstly, by allowing pupils to be taught the techniques of soaring—local, cross-country and cloud—properly by instructors, instead of their fumbling along and learning by short, inefficient and uneconomic trips down the road. Elementary training is no longer taught by the solo method, so why should soaring, which is, after all, the main reason for gliding?

Secondly, enabling the more experienced pilots to fly cross-country together in two-seaters and share the cost. There is really no problem over the division of work, provided that one pilot is definitely in charge. Even if the second pilot does not do any flying, he can learn a great deal if he is at all observant, and on a properly planned flight will have more than enough work as navigator, observer and possibly radio operator. The second pilot can feed into his pilot considerable amounts of useful information, such as precise position, average speeds, distance and height needed to reach a goal, distance possible from the existing height, accurate wind direction, selection of suitable fields, and observations of the developments of particular clouds; quite apart from the work of feeding the brute, ground handling and telephoning. Highly developed team work between the two can result in a more successful flight, as well as being great fun.

Now that the T-42, or its successor, will be coming on to the market, we have in England an excellent opportunity to increase two-seater soaring in British clubs. I am sure that the successful future of our unsubsidised clubs lies in the full exploitation of soaring two-seaters.

The T-42 is a good glider, strongly and sensibly built, with simply designed controls, and assorted brakes enabling it to be thrown successfully into any old field. We grew very fond of this glider in the World Championships at Camphill. It is quiet enough to talk to each other without difficulty, and for normal sized people the

Ann Welch with the T.42

seats are very comfortable. There are one or two minor snags on the prototype, such as the perspex cover being too close to the front pilot's face, but these will be altered on production models.

We also grew fond of our competitors. The two seater class was a very select and friendly class, with considerable similarity of performance, both glider and flying. I think I am right in saying that the only competition day in which everyone in a class scored was the first two-seater day.

The Championship was won, and deservedly, by the Yugoslav Kosava, flown by Rajn and Komac (3,056 points). The way they both flew in Yugoslavia showed that this was no fluke. The combination of the two pilots and their glider is one of the most formidable seen in competition gliding yet. And they are all still youog.

After the Yugoslavs came a huddle of six (out of nine) in which the marks spread over 493 points out of a total possible to be gained of 4,000. This closeness in marks gives an idea of the consistency of the two-seater performance far better than an analysis of placing, which shows very big differences day by day. For example, on the final day, position 8 went to 2nd place, although the pilot did not reach his goal, and position 4 went to 7th although had it flown 5 miles further, it would have become second. This consistency, which was most noticeable, was particularly interesting in that all nine of the two-seaters were of different make, and the total flying experience of their first pilots varied from 7,000 to 100 hours. It would have been interesting to see what would have happened if there had been any good soaring weather.

With regard to the gliders themselves, there is little doubt that the Kosava has the best performance, but it is by no means an unserviceable prototype. It won t he National Championships in Yugoslavia last year, it was third in the 1953 German Nationals, and it also made some remarkable long distance flights on its home ground. I was lucky to have had the opportunity of flying this machine, and was impressed by its good controls and quietness.

The Spyr Va was designed in Switzerland some six years ago and has had a varied life, including being abandoned in flight by both its pilots, who landed successfully by parachute. The Spyr arrived in a tree, was retrieved and rebuilt. Incidentally, this was not the only glider at Camphill to have flown by itself, one of the Olympias having also achieved this distinction.

The Austrian Musger Mg 19 looked both well-made and finished. It was the lightest two-seater and had a good performance, especially in weak lift. Its dive brakes, when extended, however, came perilously close to the ground, and would undoubtedly cause considerable confusion if the glider was landed in crops.

The Schweizer 2-25 had the great merit that it could be left in the open throughout the vile weather without harm, although this hardiness was not matched by field landability. The air brakes on all the American gliders were, by our standards, poor as approach controls, and came nowhere near to limiting the speed in a vertical dive. Metal gliders produce an interesting problem when it comes to repairs. There are obviously occasions when a metal glider would not get damaged when a wooden one would. Against this, severe damage may be far harder and more expensive to repair. It is a great pity that there are not a few metal sailplanes being flown in this country, so that we could gain some experience of them.

The French CM-71 was unbelievably heavy, being flown at an all-up weight of 1,450 lbs. Its dihedral tailplane looked a simple solution to the problem of keeping the tailplane tips clear of the ground.

The second pilot's seat in the Canguro, which is reached through a hatch in the top of the wing, cannot be described as good for instructing, or suitable for those who suffer from claustrophobia.

Five of the nine two-seaters were prototypes, but their degree of reliability was high. Four of these are intended to be put into production.

The T-42 series glider should be excellent for English soaring conditions, and at the

same time thoroughly serviceable for club use. It will fill a gap in the range of English gliders, but I hope that it will only be the first of a long line of high performance two-seaters. For the next Championships we will need something as good or better than the Kosava. At the moment we are only at the beginning of a new stage, but as the interest in two-seaters develops, it is important that this country should have high-performance machines for export as well as for home use.

In the Mountains of the Sky

by Philip Wills

Reproduced with acknowledgments from "The Sunday Times".

ONE of the unexpected by-products of the dreadful weather conditions during the 1954 World Championships was the appearance on several occasions of "wave lift", a form of upcurrents mainly confined to winter, and July 30th proved one of these days. The extraordinary combination of winter conditions in mid-summer resulted in my achieving a flight unique in my 22 years' experience of gliding, and I believe, unique in the history of aviation meteorology.

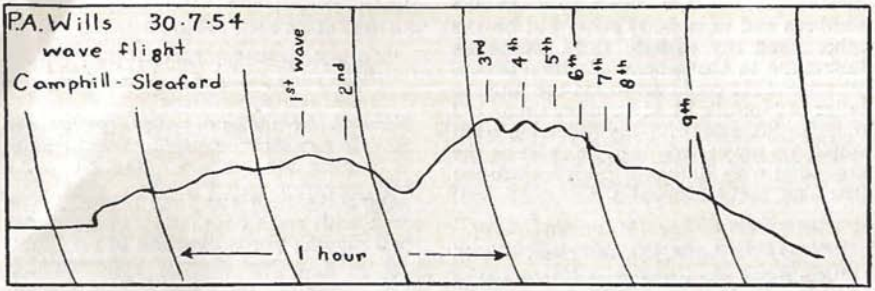
The weather all day had been hideous: a strong westerly wind, gusting to 30 knots under a torn grey sky over our damp and muddy Pennine moor. Nevertheless, as flying was possible, the small two-seater class had been launched at about 2.30 p.m., and an hour later most of the nine aircraft had left downwind, leaving the slope clear for the launch of the 35 single-seaters. My turn to start came about 4.15 p.m., almost too late to make a cross-country flight seem possible at all, but no sooner had I dropped the winch wire 600 ft. above the hill-crest, than the unmistakably creamy smooth lift showed that wave-lift was about. I climbed rapidly to 1,800 ft. and then turned north along the slope until I was over the valley running east-west, with the 1,000 ft. bowl of Mam Tore upwind of me. I had hoped to find that this aerial weir was producing a standing wave downstream of it, and immediately my rate-of-climb indicator showed that I was right.

Holding my Sky steadily facing the wind, which at that height was blowing almost as fast as my air-speed, I was thus hovering almost stationary over the valley beneath, and quietly and steadily my altimeter wound upwards until, with ragged fringes of cloud all round, I was 4,000 ft. above sea level. This seemed to be as high as I was likely to get, so I turned due east, to fly straight down-wind over the valley towards Sheffield, and immediately flew into cloud.

One main feature of these wave systems is that they frequently propagate others down-stream of them, and sure enough after holding my course in cloud for a few minutes, I again found myself climbing smoothly. But in the dark grey murk of the cloud I could not expect to fly accurately enough to be able to swing upwind again, and use this second wave, so continued eastwards until a few minutes later I emerged from cloud and saw beneath me the bare slopes of Burbage Moor, sloping down to Sheffield ahead.

Everything now hung on whether I would find a third wave ahead of me, and I flew straight on until, to my joy, over a south-eastern suburb of the town, at 3,200 ft., my instrument again swung quietly to "climb". This was it: I swung smoothly round into wind and hung almost stationary in space climbing silkily upwards. Overhead was a flat and rather dirty sheet of cloud, stretching as far as I could see in all directions. There was nothing about it to make any glider pilot or meteorologist expect lift; nevertheless I found myself rising with gently increasing speed towards it, until in a short time it quietly took me in. The lift increased further and quite suddenly I burst forth into a scene that might have been on another planet.

I was flying north along the eastern slope of a gigantic, an endless, valley of dazzling cloud. The sun, which we had not seen for over a week, was blazing down from a sky of cloudless dark blue, striking from



the rounded walls and floor of the cloud valley a white and insupportable glare. I fumbled hastily for my dark glasses and managed to find them and put them on.

The scene had the stark and splendid geometrical simplicity of a certain kind of nightmare. The cloud valley ran straight as a ruler ahead of me as far as the eye could reach. I was flying along in almost utter silence, with my right wing nearly touching the eastern slope, and about a third of the way up towards its crest, climbing steadily. On my left the slope fell away to the valley floor, which then curved smoothly up again to the parallel western side of cloud-hill. The cloud had the characteristic fuzzy and gauzy consistency of a wave-cloud, so different from the hard edges of cumulus, and the smoothness of my whispering flight was further unmistakable evidence of what I was in. As I flew along, rising quietly towards the crest, the probable shape of the air and the alternatives which lay before me rapidly crystallised in my mind.

Imagine one of those sheets of corrugated cardboard, flat on the underside and corrugated above. This gives an exact picture of the sheet of cloud I was amongst, but here the crest of the corrugations were five miles apart and the run of each valley, created as they were by the Pennine Chain to the west, might be a hundred miles or more to the north, though probably only about 30 miles to the south, where the southern end of the range drops down finally to Derby.

The wind was blowing from west to east through these corrugations, millions of tons of air cascading soundlessly down the western wall of each valley, across the floor and up the other side to roll over again at the top and once more repeat its titanic oscillation an unknown number of times to the east.

What was so unexpected was that the cloud-coverage was complete; there were no gaps between the waves through which the ground could be seen from above, and from below the sheet of cloud looked unbroken and uniform, at about 4,000 feet above the ground. The thickness of cloud from the underside to the floor of the valley above was about 800 feet, and the crest of each flanking hill was about 1,500 feet higher still.

My possible flight plans were clearly three. Firstly, I might fly on north, along the eastern wall, possibly for hours. But a mental calculation showed the disadvantage of such a plan, for with the strong westerly wind blowing from my port side, I should be crabbing across-wind, and might only make as little as 10 m.p.h. over the invisible ground a mile below. The task of the day was to cover the greatest possible distance, and as by now it was after 5 p.m., another four hours or so might bring me down in the twilight with only a comparatively few miles to my credit.

Secondly, therefore, I might fly north until I had climbed as high as possible, then turn east into the next valley I might expect to find, glissade down its westerly, down-sweeping slopes until I reached the far side, turn north again and climb its easterly face, then repeat the manoeuvre in a series of gigantic saw-tooths running north and east. This, if the system repeated itself often enough, would bring me eventually to the Yorkshire coast, but this was only some 80 miles distant, and I hoped it might be possible to go further than this.

My third plan, therefore, was to turn back and fly south down my valley, then east to the next one, and follow the same dog-legged flight path in the opposite direction. Since I could only expect the wave-system to run some 30 miles in the southerly

direction, I might in this way reach the southern end of it fairly soon, but on the other hand my easterly tacks would be taking me in the general direction of The Wash, and if I could get round this into the bulge of Norfolk I had anything up to 150 miles to go, and with the following wind would, on my easterly legs, be covering the ground at over 70 m.p.h. This seemed the best plan, and I adopted it.

"*Justin from Philip. Do you read? Over.*"

"*Philip from Justin, loud and clear. Over.*"

"*Am flying above the wave system out of sight of the ground. Height 5,000 feet, climbing. Approximate position five miles east of Sheffield. I intend to fly south to maximum height for about five miles, then turn east through the crest of the cloud to the next wave, then repeat south and east again. Suggest you make for East Retford. Will report position as soon as I can locate myself. Over.*"

"*Philip from Justin. Good gracious! Roger. Listening out.*"

I did a left hand turn back on my tracks, and there, running south before me, was the endless valley with my left wing now brushing its easterly slope. The Sky gently traversed up this until the lift petered out at 5,800 feet, about 200 feet below the top. Here goes. We did a 90° turn to the left, the milky cloud rushed at us, the valley behind hesitated and faded from view. After a few moments, the rate of climb indicator swung from rise to fall, the cloud lightened and we burst out into a valley, the exact mirror of the one we had just left. Only now we were rushing smoothly down the upwind, western slope, and out across the floor.

As we neared the eastern side again, the indicator reversed to "climb", and I turned to the right and was again traversing up the snowy side of the bulge. Again the similarity of a dream occurred to me, one of those dreams in which one is always running but always remaining in exactly the same place. This extraordinary sequence repeated itself five times, each crest being, as expected, slightly lower than the one before. The sixth time I dived into the cloud wall, I did not come out. As I sank, the cloud got slowly darker, and the unmistakable sulphurous smell of a steel-works a mile below, and probably several miles up-wind, brought back a flash of the real world I had almost forgotten in the ecstatic three-quarters of an hour behind me.

"*Justin from Philip. Do you read? Over.*"

"*Philip from Justin. Loud and clear. You sound very near. Over.*"

"*Justin from Philip. Just coming out below cloud base. Will report position as soon as I can.*"

Dimly through the mist below, I saw green fields and woods, and a long straight road running in the direction of my flight, and on it, almost directly underneath, a silver pencil scurrying east behind a small black beetle.

"*Justin from Philip. Well, of all things! Am directly over you at 4,000 ft. Over.*"

"*Philip from Justin. Fancy meeting you here! It is a small world! Over.*"

"*Justin from Philip. You are now in the unprecedented position of being able to tell me exactly where I am. Over.*"

"*Philip from Justin. You are five miles west of East Retford. What prospects? Over.*"

"*Justin from Philip. It looks as if this is the end of the waves. If so, I have about 35 miles to go, and should land somewhere a few miles east of Cranwell. Anyway, I will glide it out.*"

And so it proved. There were two more following waves, the first holding me without loss of height for a couple of minutes, and the last only providing a momentary check in my steady but gradual descent. I eventually landed 62 miles from Camphill, three miles east of Sleaford, and there within a quarter of an hour Justin found me and picked me up.

Back at base three hours later, we found that only one other machine, the Yugoslav two-seater which had left the site an hour and a half before me, had succeeded in contacting the wave, and had flown 95 miles into Norfolk. The other aircraft had flown from five to 30 miles and then been forced to land. Thus ended a flight which epitomized the fascination and the unexpectedness of soaring, and which taught both pilot and meteorologist something new about the air over even our old and fully explored country; a flight which showed that you do not have to go as far as Everest, but can still encounter surprise and adventure in a sailplane as near to home as a mile above the smoky roofs of Sheffield.

Championship Sailplanes

by F. G. Irving

An eminent member of the gliding community recently observed that whereas those who write books, paint pictures or make films suffer ruthless criticism, the designers of cars, aeroplanes and gliders usually escape more lightly. It requires long training in the art of reading between the lines to appreciate that "the steering has the distinctive feel of the *marque*" means that Morrord Motors have perpetrated their usual stupid steering box yet again. Now, whilst the design of a sailplane is often an easy target for criticism, it seems to the author that criticism, in the fullest sense of the word, is highly desirable. The design of gliders still involves perhaps more art than most other sorts of engineering, and our impression of the designers is that they are tolerant, friendly gentlemen, who are unlikely to take offence. And to soften the blow still further, the author cannot pretend to be unbiased; he is very strongly biased towards gliders with sensible air brakes and landing gear which can be rigged and handled without undue physical and mental stress and which are reasonably strong, stable and controllable. It is his firm belief that Ref. 1 should be compulsory reading for all glider designers at least once a year.

There appears to be a current sinister theory that a refined design must necessarily involve a large quantity of complicated machinery to twiddle the controls. This is a dreadful trend, for it is much easier to indulge in bad complicated engineering than in elegant simplicity, and leads to stiffness, backlashes, unreliability, difficulty in maintenance and rigging and more subtle evils in the stability department. At Camphill, one saw well-designed complexity (HKS-1), badly designed complexity (WLM-II) and elegant simplicity (PIK-13). As time passes, rigging seems to get worse rather than better. It is a fact that the Weihe, about 18 years old, is still the simplest glider from this point of view. One cannot plead advanced design as an excuse for failure to provide simple rigging; such a failure can only be due to inability to visualise the

Superspatz, flown by Franz Linher, of Austria, was the lightest sailplane at the contest. Empty weight, 276 lbs.; span, 49 ft. 6 ins.

The all-metal Schweizer 2-25; pilots Stan Smith and Bob Kidder.

scene, mental laziness or incompetence. It is inexcusable, and it could be a fundamental disadvantage in Championships. Similar remarks apply to air-brakes. The Olympia and Kranich have had good speed-limiting brakes for many years. But gliders (e.g., 1-23, 2-25, Kosava, HKS-1) still have ignorant or inadequate brakes. The latest excuse is that brakes mess up the top of beautiful laminar wings. Maybe, but what does it profit a man to have ten per cent more laminar flow if he suddenly finds the fields are ten per cent too small?

Landing gear also suffers from neglect. Driving half-a-ton of vehicle at 40 m.p.h. over really rough ground on one small wheel, or none, is a pretty major undertaking which demands good engineering. It is folly to provide an inadequate little skid (hence damage to Lo Spillo) or none (Breguet 901) or a vanishingly small ground clearance under the rear fuselage (2-25).

It was not possible to inspect every glider at Camphill, and hence many omissions occur in these notes, and some remarks are based on a rather cursory inspection. It did not require much inspection to see that the HKS-1 was the outstanding sailplane of the meeting. Apparently its designers do not claim that it is an end in itself, but rather a flying test-bed for some novel ideas. It certainly appears to be rather too fast for British thermals, and its tail parachute seems rather unsatisfactory. But it must be one of the cleanest flying machines ever built, and is obviously the result of much well-informed thought. It is very debatable whether the elaborate skin construction of the wing is worth while if the only object is to secure a smooth profile; it would be a different story if the skin were taking some bending moment. A similar observation applies to the WLM-II, whose wing and fuselage skin consisted of preformed panels of ply-spruce-ply sandwich. Such methods give a very elegant finish, but the sheer weight of glue becomes excessive unless very special methods are used.

The Italian Spillo, with an aspect ratio of 30, bends its wings on a launch.

Since the author was asked to fly the WLM-II, to give an opinion on its controls and stability, it would be unfair to take advantage of this in the present article. From external inspection, one could conclude that the fin and rudder were far too small and far too thick, that the mechanical complication was formidable, likewise the expense, but the finish of the surfaces was wonderful. Given a little development, this should be a machine of superb performance.

The Breguet 901 was obviously a practical machine, notwithstanding its complexity and weight, and in general the aerodynamics were good. Dubious features appeared to be the gaping hole left in the bottom when the wheel was retracted, the array of coat-hangers under the wing to support the ailerons and flaps, and a fin and rudder which again looked too small by current British standards. There is no doubt that until recently the vertical tail of almost every glider has been far too small, the Kite II being an extreme example. One only has to fly the Skylark II to realise what

a blessing is conferred by some genuine directional stability. One gentleman, observing the immense expanse of fin and rudder on the T-42, remarked that Mr. Slingsby had obviously designed this to cater for the engine-cut case.

The American Schweizers were impressive by reason of the clean, simple metal construction. The front fuselage skin, for example, is 16 s.w.g., so that there are virtually no frames, plenty of room in the cockpit and good protection against prangs. Apart from the air-brakes and rigging, as mentioned above, the absence of clear-vision panels on one 1-23 and the 2-25 seemed rather hazardous.

The results of the Championships leave one in no doubt that the Kosava has many merits, and an impressive performance. But again, the centre section is full of light-alloy knitting on a fairly large scale, and there are large quantities of flimsy fairings. A preliminary to de-rigging is an extensive tour of the wing roots with a delicate screw-driver, sprinkling the mud of Camphill with Serbo-Croat standard countersunk screws. Nor has this machine any drain-holes in the fuselage: a very grave omission this summer.

The PIK-13 looked clean and simple, and contained some very good engineering. For example, the nose pitot was also a lifting handle, and the wing root attachments were very good indeed.

One could obviously continue in this style for many more pages. Whilst there were many examples of how not to design gliders, there were numerous features which we might emulate. In general, the finish of continental machines is very good, both

Geoffrey Stephenson, of the British team, with the laminar-flow Olympia IV. Note reflection of air brake by highly-polished wing surface.

externally and in internal detail, although the Olympia IV wings were quite up to the highest standards. However, it is probably true to say that the finish on *production* British sailplanes is inferior. The WLM-II had a Peravia D.C. artificial horizon, taking 0.5 amps at 12 volts which was a source of much envy; cost £150. On the other hand, we have cause to be pleased at our Pye radios, which seemed to be the smallest and most reliable, the use of glass-fibre laminates and good sensitive airspeed indicators. What is quite certain is that, technically, British gliding has received a powerful stimulus.

Reference

1. WALLACE, P. J. "The Technique of Design". Pitman, 1952.

The PIK-13, from Finland, designed by its pilot, Antti Koskinen, has a span of 57 ft. 5 ins. and empty weight 419 lbs.

Statistics and Miscellaneous

by Betsy Woodward

MANY seem to be interested in statistics and wonder what the results would be if only this or that had or hadn't taken place. So to save some individual effort we will delve a bit into this aspect of the Championships.

The graph shows the standings of six pilots with respect to the total number of points possible; i.e., 1,000 points on the first day equals 100%, 2,000 points on the second day equals 100%, etc. Only those pilots (single-seat class only) who had 50% or above on more than three days are shown. It is interesting to note that these were the top six on the opening day and also in the final standings, though in different order.

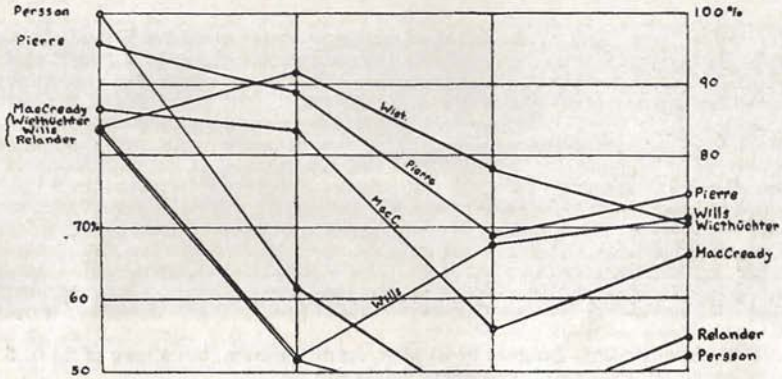
What would have happened if there had been another contest day? The only thing we can do is to assume that all pilots would receive the same number of points; in which case we can take three out of the four contest days. The same six would hold the top placings, with Pierre still leading the pack. MacCready and Persson would rise, since these two counted only three days in any case.

So Pierre wins the Championship no matter how we look at it. I would, however, be surprised if there were one contestant, official or spectator who doubts that he *is* World Champion.

Other than first place, it is more difficult to obtain consistent results in the two-seat class. With only nine entrants, it is difficult to analyse in the same way, and too many people would say: "What if one more glider had gone 15 miles on August 1st and it were a contest day?" I agree, but the outstanding performance consistently turned in by Rajn and Komac so overshadows all else, it doesn't make much difference.

As to cross-country miles flown: the single-seaters averaged a total of 108 miles for the four contest days, while the two-seaters averaged 111 miles. No tabulation has been done on the ratio between distance flown at the meet and distance travelled by the contestant from his home site to Camphill. This is, undoubtedly, higher than at any previous International.

But regardless of high ratios, and despite the weather, this year's Championships were a success. Not being British and not being on a team, I can make congratulations without sounding egotistical. To the organizers and the more than one hundred voluntary helpers who gave up their vacations and worked for the meet at their own expense, I say, "Jolly good show". To those contestants who paid their own expenses (and I would hate to hear the cost), I say: "Thanks for coming. Though you weren't able to fly as much or as far as you wanted, I hope you consider it was worth while. I know that you believe as much as I that the true value of soaring lies



not in feet gained or miles flown".

And to the governments who sent teams: "You might have sponsored your contestant for the purpose of having him bring honour and glory to the homeland. He might not have won, in fact he might be on the bottom of the list. But regardless of where he was placed, I can tell you that it was money well spent. For he became known to pilots from at least eighteen other nations and he was liked by them. He flew beside them, gave knowledge to and obtained information from them. He drank, joked and swore at the rain with them. He brought a little bit of your country with him and, by doing, gave greater understanding and friendliness to the world. And after all, isn't this why we have International Contests?"

O.S.T.I.V. 1954

1. Meteorological Papers

by P. M. Saunders

Imperial College of Science

THE fifth congress of the Organisation Scientifique et Technique Internationale du Vol à Voile took place at Buxton, Derbyshire, during the holding of the World Gliding Championships at Camphill, and a distance of some 12 miles from it. Delegates from many nations and contestants and crews from the championships attended the lectures, the film shows and the impromptu discussions.

The conference was divided into two sessions, the first devoted to meteorology, and reported here, and the second to technics and training. Reports of all the meteorological papers presented, covering the specialised topics of convection and waves, will be found later in the technical journals. In this article only those findings which are thought to be of special interest or instruction to soaring pilots are described.

Convection

Convective or buoyancy up-motions are utilised not only by sailplanes and birds but also, as was revealed during the conference, by insects. Dr. C. G. Johnson, of the Rothamsted Experimental Station, Herts., described how in the lower two thousand feet of the atmosphere the distribution of aphids (of which family a common member is the greenfly) was determined by the convective activity. The problem was a complex one because the flight behaviour of the aphid was variable; after an hour's flying the lift of its wing flapping was no longer able to support its weight. As far as could be ascertained, aphids did not soar. On the other hand, Mr. Sayer, of the Anti-Locust Research Centre, working in East Africa, was able to assert that locusts soared, and on one occasion a small group had been reported at 10,000 ft. The sinking speed of the locust was probably not markedly different from that of a sailplane.

Locust swarms were classified as stratiform or cumuliform. The former type were limited to a layer within the lowest few hundred feet of the ground; the latter, associated always with convective conditions, had a characteristic towering structure reaching up to a height of 3,000 to 4,000 ft. in what was apparently a "thermal". Mr. Sayer was of the opinion that time-lapse pictures of the development of the cumuliform swarm could make a real contribution to an elucidation of the nature of convective up-motions.

Dr. R. S. Scorer, of Imperial College, London, presented a joint paper which was the result of a visit to Dr. J. S. Malkus of the Woods Hole Oceanographic Institution in the United States. The paper, entitled "The Erosion of Cumulus Towers", represented a first attempt to set up equations to describe the motion of the Ludlam Scorer "bubble". It was assumed that the

outer layers of the rising bubble became diluted by mixture with the surrounding air, and therefore became less buoyant and were left behind in the wake. The parameter E, which is a measure of this erosion process and is defined by the equation:

$$\frac{\delta R}{\delta t} = -EgB$$

(where R is a linear dimension of the bubble with buoyancy gB), when introduced into the equation of motion gives the relation

$$E^{-2} = \frac{4t}{9} \frac{gB(gB - \dot{w})}{w^2}$$

where w is the vertical velocity and t the time.

This equation has been tested on individual cumulus towers where w, $\dot{w}$ and t may be measured from time lapse photographs and gB estimated from the temperature sounding. The value of E was found to be sensibly the same from cloud to cloud and to have magnitude 50 secs. This result, together with the internal consistency of the measurements, seems to demonstrate the further possibility of representing convection processes in terms of this simple model.

Following on was a paper presented by Dr. J. Küttner, of the Air Force Research Centre, Massachusetts, on cloud streets. He confined his investigations to the case of bands of cumulus clouds lying in the wind direction and some 20 to 50 miles in length. He stated that such streets were of non-orographic origin and arose in a type of synoptic situation—a strong north-westerly airstream flanked by a cold high—seldom met with in the British Isles but fairly common in the winter of the United States and also the Polar summer of northern Scandinavia. The airstream had a characteristic horizontal wind profile with a maximum at or near cloud base, falling away to the surface and to the cloud top. A level slightly below cloud base, where strong lift could be obtained, was thus the optimum height for a sailplane to fly to achieve maximum ground speed.

Between the cloud streets, which had a lifetime of the order of one hour and a separation of the order of five miles, were areas of sink, and when it became necessary to pass from a decaying cloud street to a neighbouring one, a fast cross-wind flight normal to the streets was suggested. A loss in height of 2,000 ft. could be expected.

Mr. Gerbier, in an analysis of flights made in France in 1953, related the favourable conditions for soaring to the structure of air masses. He found that strong solar insolation with a subsidence inversion at a height between 4,500 and 7,500 ft. produced good conditions for long distance flight. Particularly favourable was the north-easterly wind associated with an anticyclone when cloud streets were common and a good ground speed maintained. Solar insolation, however, is not a requisite for convection, and Mr. Gerbier pointed out that large-scale surface convergence or orographic lift over a mountain range can produce strong convection above cloud base. In these conditions, it should be remarked, no thermals exist below cloud base, and in order to utilise the convection an aero-tow is required.

Finally, the section on convection was closed with papers on the subject of thunderstorm electricity. Mr. J. B. Mason, of Imperial College, after rejecting the numerous theories of charge generation in thunderstorms put forward in the last half-century, proposed a new mechanism—the charging associated with rime formation, i.e., with the freezing of supercooled water drops on contact with ice to form graupel or soft hail. To estimate the validity of this theory, measurements both of the sign on the precipitating particles within cloud and of their nature had to be made. Mr. Mason asked how far this might be possible from a sailplane.

Waves

From convection the topic of the meteorological session changed to wave motion in the atmosphere, and delegates were introduced to the subject by means of a film showing some of the wave cloud forms produced above and in the lee of the Sierra Nevada mountains in the western United States.

The first paper on the subject was presented by Dr. R. Long, of the Johns Hopkins University, Maryland, who described the results of his experiments in which a small obstacle was towed along the floor of a tank. The tank contained a solution of salt and water whose density varied with height, the experiment simulating the flow of a solid current (i.e., of uniform velocity over a mountain. A film

of the motion revealed the existence of different modes of motion depending on the height of the obstacle and speed of flow. Lee-wave motions, rotor motions (i.e., stationary circulations or vortices) and turbulent motions propagated up-stream of the obstacle were all obtained. Valuable as these results were to fundamental fluid dynamics, Dr. Long, however, realised that no direct application of his laboratory results could be made to atmospheric motions—the presence of the free surface of the liquid and the uniformity of velocity with height of the upstream flow being the main difficulties.

Dr. R. S. Scorer followed with a paper in which he showed the importance of inversions on the formation of mountain waves. According to his own theory, the parameter

$$l^2 = \frac{g\beta}{U^2} - \frac{U''}{U}$$

has a basic importance. (U is the horizontal velocity, β the static stability as measured by the departure of the lapse rate from adiabatic, a prime denotes rate of change with height.) In the presence of a sharp inversion (large β), l^2 becomes large. In such conditions waves have their maximum amplitude at the level of the inversion, decreasing above and below.

Dr. Scorer concluded by demonstrating that, at the level where a discontinuity of the wind shear existed, so also did discontinuities in the horizontal component of the air flow through the waves. Such a condition was highly favourable for the production of turbulence.

The meteorological section of the conference was closed by Mr. G. Corby of the Met. Office, Dunstable. He examined the value of the l^3 parameter on some forty occasions when reports of waves had been received from air-line pilots. In order to evaluate l^3 he had used a scale devised by Mr. C. Wallington of the Met. Office, who was the forecaster attached to the championships. (see GLIDING, Autumn 1953, Vol. 4, No. 3, p. 124). As the theory required, l^2 had a maximum in the lower levels of the atmosphere, decreasing up to the level of the tropopause. Examination of the parameter for air masses in which waves were not reported showed that generally l^2 decreased with height. In the absence of waves, on the average, l^2 fell at the tropopause to about one-third of its maximum value, and on the occasion of waves, fell to one-ninth of its maximum.

The value of the conference, however, is not to be measured merely in terms of the number or content of the papers presented. To those delegates fortunate enough to attend, it has proved a most stimulating experience and one which is certain to improve knowledge of those forms of vertical motions in the atmosphere which are invaluable to soaring flight.

2. Technical Papers by Heinz Kensche

[*We are indebted to the author and to the magazine "Weltluftfahrt" for permission to reproduce these summaries, which have been condensed and translated by G. S. Neumann.* —ED.]

Planeurs Sans-Queue Monobloc.—CH. FAUVEL.

CHARLES Fauvel is the designer of the tailless AV-36 which is being built in France in quantity. After relating that he began building tailless sailplanes in 1929, he described the history, aerodynamics, construction and performance of this aircraft. Extensive flight tests were carried out which included an investigation of the dynamic longitudinal stability. An amazingly strong damping effect was observed with the elevator fixed and free, and also with the brakes open and closed.

Some New Principles in the Design and Construction of High-performance Sailplanes.—HEINZ KENSCHE.

Heinz Kensche pointed out that the classical method of improving the performance of a sailplane, namely by raising the aspect ratio, increases the production costs, and then produced a further argument based on American measurements on laminar-flow wings. With speeds at best gliding angle and above, the profile drag saved with the shorter wing may be more than the induced drag saved with the higher aspect ratio. As an example, two wings with the

same area, but different spans, 16m. and 18m., were compared. The best gliding angle was the same, but at lower speeds the 18m. wing had the better gliding angle, whilst at higher speeds that of the 16m. wing was better. The construction of the German HKS-1 was then discussed, especially the measures taken to achieve a surface free from undulations.

Thermal Location.—PETER TEMPLE.

Peter Temple has built an instrument which is capable of detecting a temperature difference of a few thousandths of a degree Centigrade (see GLIDING, Winter, 1953-4, p. 167).

It essentially consists of two sensitive thermopiles (nickel/copper, silver/copper). If one set of thermopiles is mounted at the wing-tips and another set in two places along the fuselage, the temperature gradient of the air can be measured in two directions and the location of thermals found. There has not been enough time to gather experience with the use of the instrument, which is still rather difficult to handle by the pilot.

The Total-Energy Variometer.—F. G. IRVING.

A description of this instrument has already been published (see GLIDING, Summer, 1952, p. 78, and Winter, 1952-3, p. 160).

Frank Irving stressed the importance of a variometer reading which actually indicates the vertical velocity of the surrounding air, without being affected by the acceleration or retardation of the sailplane. He also gave the mathematical proof.

New Variometer Designs.—PETER TEMPLE.

A simple electrical contact instrument was described. The membrane of the barometer vessel acts directly on electrical contacts which cause a red or a green light to flash, and the rate of flashing indicates the rate of sink or climb (see GLIDING, Autumn, 1953, p. 118). A second variometer constructed by Peter Temple works on the principle that a heating wire in the equalizing tube conveys heat to the air passing in or out.

Economy in the Construction of Sailplanes.—ERNEST SCHWEIZER.

Ernest Schweizer stressed the need for economy in the construction of sailplanes and dealt with special features on the well-known all-metal Schweizer aircraft. Riveted light alloy of 0.4-1.6 mm. thickness is used. The combination of light alloy and foamed plastics was mentioned, which is found in the powered sailplane "Humming Bird" and the new "Pearl Penetrator".

Calculation Method for Stressed-Skin Fuselages.—M. JOSIFOVIC.

A graphical and tabular method has been worked out which enables the required dimensions of the shell of a fuselage to be determined in 3½ hours with the aid of an ordinary calculating machine. The method allows for elastic deformation, and errors are kept small by considering a large number of cross-sections.

Performance Testing of the Sky.—K. E. MACHIN.

Dr. Machin's lecture was essentially a description of the testing methods employed and an analysis of the sources of error. Errors caused by inaccurate flying, especially side-slipping, were found to be negligible, and those caused by small-scale air movements could be eliminated by statistical methods. Errors due to large-scale air movements can be corrected by using data obtained from meteorological stations, although they proved to be negligible as well. The remaining scatter of the values obtained is caused by influences which cannot be estimated, and has to be accepted. These errors are of the same order of magnitude as Bonneau suggests.

On the Theoretical Elimination of the Aerodynamic Characteristics of Sailplanes.—P. MORELLI.

In a lecture given in Madrid, Carmichael assumed a quadratic and parabolic relationship for the estimation of polars. P. Morelli checked Carmichael's method against a large number of experimental results and found that the square law becomes a very poor approximation with the lift coefficient above best glide ratio. He therefore applied a cubic relation, and the values so obtained were in better agreement with the measured results.

Evaluation of Flying Characteristics.—HANS ZACHER.

As a result of the study of a large number of flight tests, Hans Zacher worked out

coefficients which enable the evaluation of certain flying characteristics, e.g., the rate of roll.

Calculation of the Pressure Distribution with Swept-back Wings.—S. PIVKO.

With previous theoretical and experimental investigations into the pressure distribution on swept-back and swept-forward wings, only the conditions at zero lift had been considered. S. Pivko made an attempt to evaluate the distribution when lift is created, and stated that this three-dimensional problem would only yield approximations, and that the method would have to be proved by experiment.

Laminar-flow Wing Sections for Sailplanes.—R. EPPLER.

The lecturer questioned the suitability of the NACA laminar flow sections for sailplanes. These profiles have a small radius of curvature at the leading edge, and laminar regions exist both on the upper and lower surfaces. However, relatively small changes in the angle of attack cause a breakdown of the laminar flow on one surface. Also, on the lower surface laminar conditions can only be maintained as far as the point of minimum pressure. With a new type of profile R. Eppler hopes to increase the range of angles of attack where laminar flow persists, but it will be found only on one side of the section. For the calculations on these profiles Eppler used a method which touches that of Theodorsen in accuracy, but which is easier to handle.

Criteria for the Rigidity of the Fuselage and the Shock Absorption of the Tail-skid.—BORIS CIJAN.

The forces on the fuselage in the vertical plane due to impact at the tail-skid on landing and take-off were considered. Cijan described elasticity tests on a fuselage and pointed out that the changes in strength at low temperatures, when the water in the wood freezes, must be allowed for. As a result of these investigations it was found that the shock-absorption capacity of the tail-skid should be twice to three times greater than that of the fuselage.

Requirements for Airworthiness.—L. L. T. HULS.

This topic was not so much the subject of a complete report, but of a discussion in connection with the following lecture.

Remarks on the International Standardisation of the Requirements for Airworthiness.—HANS ZACHER.

In this discussion it was suggested that the OSTIV should compile a list of recommended minimum requirements which the individual countries could be asked to accept. It was noted that in the specifications of the various countries nothing seemed to be laid down about

(a) the stressing of seats,
(b) the stressing of landing gear,
(c) flight characteristics,
(d) stiffness,
(e) launching equipment.

The drawing-up of such specifications was shared out as follows:—

Flying characteristics: Zacher, Yates, Irving.
Landing gear: Kensche.
Launching equipment: Matschego.
Stiffness: Cijan, Wilkinson.
Flight envelope: Huls, Graves.

Performance Measurements on Sailplanes.—T. VAN OOSTEROM.

The lecture consisted mainly of a description of the exceedingly accurate instruments used and a special method. The A.S.I. is an electric resistance thermometer, and accelerations are also indicated electrically. The recording of the instrument readings is photographic. The measurements are made in accelerated flight when the speed is taken up to the maximum on a straight flight-path and then reduced, again along a rectilinear path. The whole polar is thus covered in one flight. The method enables weak large-scale air movements to be neglected. In the discussion it was mentioned that performance measurements in accelerated flight had been carried out previously (Heinkel, De Havilland).

The Measurement of the Performance of Light Sailplanes.—P. BONNEAU.

The lecturer gave a survey of the various methods and discussed their merits. The conventional method where speed, height and time are recorded does not exclude the effect of vertical movements of the air. In an improved method the angle of inclination of the aircraft is measured as well. This permits the elimination of atmospheric interference. Further methods include measurements made in accelerated flight,

the observation of the flight-path by means of theodolites, and drag determination in aero-towed flight. In spite of the greater expense of instruments, these methods do not improve the accuracy of the results.

O.S.T.I.V. at Camphill

by A. E. Slater

REPEAT performances of some of the films shown to the OSTIV Conference in Buxton were given in the Briefing Room at Camphill for the benefit of those who could not leave the contest site. Heinz Kensche also repeated his paper on new ideas in design; Mr. de Lange, president of the OSTIV, gave his views on how gliding could help in the training of power pilots; and Viktor Ilchenko, one of the two OSTIV delegates from Russia, described his flight which won him the world's two-seater distance record and the Lilienthal Medal.

The Value of Gliding and Soaring for the Training of Military and Civilian Pilots.—L. A. DE LANGE.

Mr. de Lange, who is director of the K.L.M. air-line flying school, said that the short period available for grading pilots leads to many having to be rejected as unsuitable, and it takes a long time for such candidates to get over the shock of rejection. There should be a better method of selection based on three elements: physical fitness, character, and flying ability.

Fitness of character has become much more important due to the rapid development of the modern aeroplane; it includes such factors as intelligence, clarity of thought, imagination, conceptual thinking, adaptation in social intercourse, integration and common sense. Rather than try to judge character by "snapshot" methods, it would be better to see the candidate against a background of aviation, and study how he adjusts himself to it.

The activities of a gliding club, which involve not only flying but helping others to fly, provide just the opportunity needed for an assessment of character; this is the method *par excellence* for the grading of future pilots, either for an Air Force or for an Air Line. If a candidate is then found unsuitable, he can give up gliding quietly and will not be prejudiced in looking for another job.

If this idea is accepted, there should be gliding schools spread over the whole of each country. It should be the task of OSTIV to convince governments of this, and to produce statistics showing, as data collected in Holland had already shown, that if power pilots are divided into those with gliding experience and those without, the proportion who have to be withdrawn from flying becomes negligible in the group who have first done gliding.

The discussion on this paper consisted of a short contribution by Wolf Hirth, soaring pioneer and till recently president of the German Aero Club. When he was organizing gliding clubs in his home state 25 years ago, Hirth said, he found similar reasons for the military and commercial usefulness of gliding. But in more recent years he found himself trying to convince the Allied forces that gliding and soaring were completely useless as a preparation for . . . (laughter drowned the rest). In Germany they had formed 800 gliding clubs and had now 20,000 glider pilots "who don't want anything else than to soar high in the sky, and their highest dream is to be selected to take part in a World Gliding Championship", even if it is held in English weather.

Films

The film from the Anti-Locust Research Centre was specially interesting in that it showed the shapes of the thermals into which the locust swarms were drawn up, assuming that each portion of the thermal was fully occupied by locusts. The film did not appear to confirm the commonly held theory that narrow thermals leave the ground in a pattern resembling the roots of a tree and afterwards join up to become the "trunk" of the main thermal. On the contrary, the locusts appeared to leave the ground-level swarm in a large mass which often divided into "branches" higher up.

Another film was that of the Sierra Wave Project in California, shown by Dr. J. Küttner. It showed the rapid changes in shape of the wave clouds at various levels, and some of the flying, including shots of L. E. Edgar and H. E. Klieforth descending from their 44,000 ft. height record, taken by Betsy Woodward from another sailplane at 35,000 ft. Altogether a marvellous film, and all in colour, but it would need seeing several times to make an adequate description possible.

Ilchenko's Record Flight

On August 3rd, Viktor Ilchenko, with the help of an interpreter, gave a description of his two-seater distance record flight to a large company assembled in the briefing room at Camphill.

He had been expecting suitable weather for some days at Moscow when, at 10.30 a.m. on May 24th, 1953, he was towed to 900 metres (3,000 ft.) in company with another two-seater. The flight was made in the rear of a strong cold front.

Knowing the expected duration of the flight, he was thinking in terms of a goal flight of 600 km. (373 miles) so as to beat the previous record held in Poland. On the official flight plan he wrote that, if conditions were good enough, he would ignore the goal and make a free distance flight for the world's record. He was flying the A-10; its only difference from the A-9 is the addition of a second seat.

After release from tow, he quickly reached 1,700 m. (5,600 ft.). Thermals were of 2, 3 and 5 metres per second strength. He made the first 400 km. (250 miles) at a mean speed of 117 km/h. (73 m.p.h.). On this part of the flight he had to cross a secondary front three times; he went into the cloud three times and had icing three times. At about Tambov, at the middle of the flight, he had to deviate about 150 km. to the N.E. to avoid bad weather; then he came back on track, and the rest of the flight was made in good conditions.

He reached the goal at Borisoglebsk with 8,000 feet in hand, so decided to carry on. The flight proceeded in good conditions with thermals of 5 to 6 m/sec. and at times even 8 m/sec. The second part of the flight was made below clouds at a mean height of 1,500 m., sometimes reaching 2,500 m. (8,200 ft.). He reached the landing point at 800 m. (2,600 ft.) at 8.40 p.m., and as there was no possibility of any more thermals he decided to land. Although he could have glided for another 20 km. with the help of the wind, he could not have beaten Dick Johnson's single-seater record.

The flight lasted 9 hours 11 minutes, though the time from starting point to landing point was a little over 8 hours 20 minutes. The distance, 829.882 km. (515.665 miles), was covered at a mean speed of 101 km/h. (62.76 m.p.h.). He had to pick up height 29 times, and all these height gains would have aggregated 18,000 km. During the flight he made 960 spiral turns.

L. to R.: L. A. de Lange, President of Ostiv; Viktor Ilchenko; Pavel Tourchin, Vice Secretary-General of Aero Club of U.S.S.R.; Dan Smith, who invited the Russians after meeting them at a contest in Poland.

As to the weather, surface wind at the start was 15 m/s. (33 m.p.h.) and temperature 7 deg. C. At cloud base, wind was 70 km/h. (43½ m.p.h.) and temperature —14 deg. In such weather conditions, if he had taken off three hours earlier, he could have made 1,200 km. The single-seater pilot who took off with him made 750 km. Ilchenko's passenger had no controls. The landing was made 60 km. short of Stalingrad. The direction of the flight was 140 deg., directly down wind.

In reply to questions, Ilchenko said that maximum height was 2,600 m. (8,530 ft.) above take-off, and maximum speed was 170 km. (106 m.p.h.) on the A.S.I. At one part of the flight, 100 km. were covered at 200 km/h. (124 m.p.h.) with an altitude loss of 200 m. There were cloud streets of 60-70 km. length, with little distance between clouds. Height of cloud base rose from 1,800 to 2,700 m.; icing, while crossing the secondary cold fronts, was at 900-1,000 m.

His sailplane had a gliding angle of 1 in 30 and minimum sink of 0.8 m. (2 ft. 7½ ins.) per sec. Wing loading 38-40 kg./sq. m. (7.8-8.2 lb./sq. ft.). The type of sailplane at the Championships which most resembled it was the Breguet 901.

In conclusion, Viktor Ilchenko wished to all glider pilots, of all the nations present, higher, farther and better soaring.

1954

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Clubs & Associations

Oxford Gliding Club

EARLY in the year activities were confined to training, but on February 27th Bob Ford contacted a weak thermal and gained his C in the Grunau. A few days later, Stow and Ford kited the T-21 to 2,000 ft. and appeared content to sit there all night.

March 7th brought with it a fine cloud street under which Peter Pirow soared the Tutor and gained his C. March 28th, though cold, promised some soaring, and Prof. Varley, after getting iced up in cloud, landed at Kimble 25 miles away after declaring Cambridge as his goal. Eric Stow took Derek Barratt up in the T-21 for his first thermal flight and clocked 1½ hours, reaching cloudbase several times.

During Easter weekend Anita Schmidt soared the Tutor for two hours to gain a well-earned C—a fine achievement. Other C's during the spring were: Pat Sullivan in Tutor, Willis and Ellis in Grunau, Gales and Mann in their red Grunau, Tolley and Woodward in Tutor. Chris Wright got his Sky out on May 6th and stayed up 5 hours, and Ernie Morgan gained his Silver C height leg in the red Grunau.

On June 7th we were visited by some of the boys from Southdown Club who brought their Olympia, as did Lawrence Wright. Ray Stafford Allen set off for Cambridge and after a gallant attempt landed near Tempsford, 48 miles away. "Brewer" Holder, of Southdown, also got away and landed on the racing track at Silverstone.

Stow, Herbert and Ford have bought the Gull III from Tony Deane-Drummond and have been fitting it with a nicely planned new instrument panel.

Our week's course started on June 21st with some dozen pupils, and Stow and Stafford Allen instructing. Dick Everard soared the Tutor to 2,000 ft. and got his C after a very slow start, and Eric Stow with Stopps as pupil was nearly "run over" by a B-47 at 3,000 ft. On the 29th Daphne Wright flew her husband's Sky and gained her C, and Bob Ford, impatient to get away in his Gull, landed at Weston-on-the-Green 4½ miles away.

Great excitement on August 14th when L. Alexander and D. Clayton arrived in the Cambridge Kranich, thus winning the £5 prize offered by Prof. Varley and Mr. R. Stafford Allen. Another visitor dropped in from Dunstable in his Olympia. On August 21st Prof. Varley reached 12,000 ft. in his Olympia and thus gained his Gold height—the first in the Club. The following day Alan Mann in his Red G.B. and R. Sweatman from the Southern Club both got caught up in the toils of a cu-nimb and Sweatman reached nearly 10,000 feet, landing some 6 miles away. Mann, who managed to keep the G.B. out of cloud, made a landing on a cricket pitch in Oxford and wiped off his skid; nevertheless the publicity was helpful.

E.R.S.

Midland Gliding Club

QUITE the most intensive period of flying we have ever had took place in the months of July and August. Hours flown from the site jumped from just over 1,000 to 2,015, and incidentally, this latter figure substantially exceeds our 1953 total with three months in hand.

Our policy of fleet improvement as opposed to increasing numbers of gliders seems to be paying off. High-performance aircraft appear to be less affected by long bad patches as were experienced during the first half of this season, and in fact, our time per launch is only five minutes down on last year at 25 mins.

Outstanding performances are rare, but Briscoe, flying the Avia, covered 50 miles in one hour for his Silver C distance leg on June 26th, and Andy Coulson in his Kite II flew 120 miles to Spalding, reaching 12,000 ft. en route, on August 13th. A visiting Olympia from the Derby and Lancs. Club with Tweene up reached 11,000 ft. on August 15th.

Ab-initio training continued to occupy our instructors very fully and the up-grading of members has gone on apace—we now have 60 reasonably active Olympia pilots and the Prefects are very popular indeed.

J.H.H.

Cambridge University Gliding Club

SINCE Easter, Club aircraft have been flown at no less than five sites, apart from Marshall's Aerodrome.

In June, J. W. S. Pringle and three other members set out with the Olympia for the first nomadic camp since the war, equipped with auto-tow wire, bungy, aero-tow rope and tents. In one week they scored 30 hours soaring at Pershore aerodrome, the Malvern Hills and the Clwyds. Similar expeditions are planned.

Another group, headed by Ken Machin, went to Camphill as helpers for the World Championships and took the Kranich with them to give passenger flights.

At the beginning of August, Lionel and Barbara Alexander had the Olympia at the Long Mynd for a week and did a cross-country flight each from there. Barbara went 63 miles in only 56 minutes; Lionel arrived for the retrieve alone, but local labour was recruited and the Olympia was back in time to soar an evening wave.

Cross-country flying from Marshall's was stimulated by offering prizes. A free flight and retrieve were offered to the first pilot to exceed Silver C distance in the Tutor. On the first Saturday in July, Vincent Pollard undershot this distance by 2 miles, which by no means discouraged him from trying again. Next day he went as far as the geography of East Anglia permitted and landed at Aldeburgh, 60 miles away, only 500 yards from the beach.

The prize for the first soaring flight between Cambridge and Oxford was won on August 14th, the day when the whole Club fleet was at cloud-base by midday and then dispersed in different directions. Lionel Alexander and David Clayton in the Kranich went almost upwind and reached Oxford (Kidlington) after 3½ hours in the air. Going downwind, Peter Neilson reached Martlesham Heath Aerodrome (47 miles) in the Prefect, after a climb of 6,000 ft. On the same day Vincent Pollard landed at Aldeburgh again, this time in the T-21 with O. Buneman.

Local soaring at Marshall's was shared by a greater number of pilots than usual and produced several C's and height legs. Gordon Hudson managed his Silver C height in the Tutor. The first landing at the bottom of Marshall's Aerodrome was recorded: a Prefect pilot undershot and landed safely at 50 ft. *b.s.l.* in the chalk pit in front of the well-known cement works.

There has been a steady influx of new members, and to meet the increased demand for advanced soaring, a Skylark II has been ordered.

G.S.N.

Southdown Gliding Club

REGARDLESS of the weather's attempts to curb us, we have had quite a reasonable amount of summer flying, and the latest figures to hand are 299 hours from 1,800 launches. We have obtained ten A and B and eight C certificates, seven 5-hour Silver C legs, and a Silver C height.

In July we took our Olympia and Tutor to the Long Mynd for our annual camp. Unfortunately, the weather prevented any attempts at cross-country flying, but during our stay 93 hours were flown from 60 launches, including three 5-hour legs, one of which was flown by Margaret Crabtree—our first woman member to do so.

Since the end of July the Olympia has been based at Kidlington, Oxford, in the hope of doing some cross-countries. There has only been one of any length to date: John Holder's trip to Silverstone late one Saturday afternoon. But on August 21st Roger Sweatman entered a large black cloud base and came out at 10,000 ft. He was unfortunately locked into a turn, due to his ailerons freezing, and by the time they had thawed he could not get any more lift, so landed seven miles away, none the worse for wear. It was his first attempt at instrument flying, and gave him Silver C height and the Club record for gain of altitude.

We have had a large number of applicants for the course for B pilots and up, from September 4th to 11th, and a few were unfortunately turned away.

The Club is in a very healthy state; new members are really starting to pour in. We should like to feel that this is in response to our general spreading of the gospel that was commenced a few weeks back. The instructors are feeling the effect, and are working continuously at top pressure to keep up with the intake.

Our next social, a dinner dance, is provisionally fixed for November 13th, probably at Haywards Heath.

R.T.W.

Royal Naval Gliding and Soaring Association

SINCE the last report another Club, the Gamecock Gliding Club at R.N. Air Station, Bramcote, has formed in the Royal Navy. At the moment not much progress can be made until the Annual Dartmouth Cadets' Gliding Camps, organised by the Admiralty, have finished courses there and the Club can sort itself out. These camps, which are invaluable for making young officers "glider minded", are always a favourite with the Dartmouth cadets. At the moment Lieutenant Commander Murray Hayes and his team are slaving to get the cadets all the gliding time they can in the time available, and have achieved most commendable results in view of the fact that the first week entailed gliding in blinding rainstorms, and failure of equipment which objected to this sort of treatment!

An R.N. Team went again to the Long Mynd this summer and had a most successful nine days' soaring, thanks to the Midland Gliding Club. We felt very lucky that our weather was so good at a time when the World Championships were suffering distinctly unfavourable conditions. Five C certificates and seven 5-hour duration flights were accomplished by the 11 members attending. During the course 155 hours were flown, and two members were so enthusiastic that they decided to stay on after the course had finished. These camps are particularly welcome in the Royal Navy, where very few soaring sites are available and the opportunity for progression past the B standard is frustratingly restricted.

Clubs themselves have been as active as circumstances have permitted, the chief cause for concern being the drafting of instructors, which has always caused upheavals and which is something unavoidable in the Services. The official view that gliding cannot be recognised as a Service commitment has meant that clubs are hard pressed to make ends meet and to have instructors trained to relieve those who go. However, the formation of three new clubs this year is a healthy sign, and it is to be hoped that our difficulties can be overcome.

The following news has been received from the Albatross Gliding Club in New South Wales, Australia. It appears that gliding can suffer similar setbacks anywhere!

Albatross Gliding Club

In the Summer 1953 issue, mention was made of the new Associate Member Club of the R.A.N. Air Station at Nowra, 100 miles south of Sydney. As was rumoured in the Autumn issue, this club became the proud owner of the Navy's ex-German Kranichs, and great hopes were held of excellent soaring. Unfortunately, however, the Kranich was crashed into the bush (gum tree forest) in October last, after only a few flights. The pilot, Lieutenant Harold Kent, is making good progress from a variety of broken bones, and hopes to be back in circulation soon. His passenger was completely unhurt! The Kranich crash was a particularly severe blow, as comprehensive insurance of gliders in Australia does not seem to be effectable.

Attempts are now being made to revive the club and raise enough money to buy a new two-seater or to repair the Kranich, and Lieutenant Commander Tony Goodhart, who has taken over as Chairman/Secretary/Instructor/Treasurer, is hopeful that flying will start by mid-summer next (i.e., Christmas-time). A start towards raising money has been made by selling the Club's Kent Primary to a new club being formed at Albury, New South Wales (the new chairman, etc., does not hold with primary instruction).

Tony Goodhart, flying in last summer's Australian Nationals, was placed fourth out of eight point-scorers.

K.G.R.H.

Handley Page Gliding Club

FLYING activity has slackened due to absences on holiday, but work on ground equipment has continued. Our two towing cars have been persuaded into life alternately, with sufficient success on one occasion to launch Wass in the Tutor to 1,450 ft. before casting loose—a club record.

On July 16th our T-31b was aero-towed to Dunstable, where it was lent to the London Club for a course to replace their T-21b which was then at Camphill. When our machine was not in use by the L.G.C. several of our own members tried slope-soaring at Dunstable, a new experience for most of them. In spite of the scepticism of some of the locals, the T-31 was successfully soared on several days. One day's flying amounted to 3½ hours, compared with the normal maximum at the home site of one hour.

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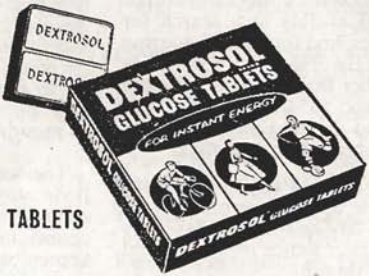

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Surrey and Imperial College Gliding Club

DURING the week-end August 14/15th we did our 10,000th launch, and it seems probable that with continued effort we will reach our target of 15,000 for the year. This week-end was also notable in that seven people attained 10,000 feet or better. These included Derek Piggott and Bill Young on their way to Lympne (90 miles) in Rudolph, the canopied T-21B. The following Sunday David Kerridge climbed to 16,000 in the Weihe and Christopher and Philip Wills to 13 and 10 thousand respectively. Record-breaking flights have been Philip's 60 m.p.h. one to Detling, Lorne and Ann Welch's trip to Yarmouth (154 miles) in the Slingsby T-42 just before the Internationals and Evie Deane-Drummond's to Tewkesbury (78 miles). Other cross-countries have included two to Halfpenny Green (107 miles), one to near Leicester (95 miles), and visits to Dunstable, Friston, Gatwick, Redhill and even Odiham twice, though one was the K-1 on its way back from Woodley.

The "School", mentioned in these notes in the Summer issue of GLIDING, has been working with great success, thanks to the hard work of Bunny Austin and Pete Murden and their respective instructors. All the Courses, in spite of some indifferent weather, have sent away, almost without exception, solo customers. The credit for this is due to Derek Piggott's untiring efforts; and thanks also to his presence, members going down during the week have been pretty certain of being able to fly.

An expedition took the Club Vanguard to France at the end of July in a search for gliding near Cannes, and found both soaring and the sun at the National Centre at Fayence. The other main exodus this year was the pilgrimage to Camphill for the Internationals, and at one time or another 75 Lashamites appeared on the scene.

This year's Christmas Party is scheduled for December 11th, and this coming winter we shall again be having talks on Saturday evenings, as well as a dance on the second Saturday of each month.

H.T.

Bristol Gliding Club

JUNE and July each saw the completion of a Silver C. On June 20th Derek Stowe completed his when he flew the club Olympia 60 miles from Lulsgate to land on Newbury Racecourse; he made good use of the artificial horizon to climb to 4,900 ft. a.s.l. and found conditions reasonable once he had passed Roundway. Mike Garnett did his five-hour leg at long last on July 31st., during the camp at the Long Mynd.

The Mynd camp was quite successful, and other duration legs were completed by Eric Smith and Peter Hansen, and C's by Arthur Bound-Pearce and David Beckett. Two groups took part: the first with the Prefect, managed to log 29½ hours in 5 flying days, with a best daily total of 11½ hours, and the second with the Olympia, which logged 13½ hours in two flying days. We would like to thank the Midland Club for helping to provide such a pleasant diversion from our usual circuits, and to say how much we admired their new club room.

Apart from the above, our flying this year has been affected by the so-called summer weather, particularly as we have not been able to do much aero-towing. However, in the few brief let-ups in the rain, Peter Collier flew 37 miles to Woodborough on July 4th, taking 1½ hours with a maximum height of 3,000 ft. a.s.l.; Peter Westmoreland flew 15 miles to Corston, reaching 5,100 ft. a.s.l. en route, whilst on August 14th, Alwynn Sutcliffe managed to reach one of our miniature local cu-nims and climb to 8,350 ft. a.s.l. before flying 46 miles to Boscombe Down. Syd James obtained the first club C of the year on July 11th with 39 minutes in the Tutor, whilst on August 13th Jack Houghton obtained some reward for his prodigious amount of work on our rather remarkable fleet of vehicles, when he also obtained his C in the Tutor with 24 minutes.

The combination of Mike Royce as Instructor and Bill Gotch as Manager is proving very popular with our summer course members, and it looks as though September will see the end of yet another successful season of gliding courses.

M.G.

London Gliding Club

LATE in May Geoffrey Stephenson brought along the Olympia IV which he subsequently flew to 14th place in the World Championships.

On June 2nd, Eric Pope was engaged as full-time instructor; he has much aeroplane experience and about 50 hours' gliding. On June 10th, Dan Smith and Charles Ellis, with A. C. Hennessy as team manager, left to take part in an international contest in Poland from June 14th to 27th, where they finished 25th and 33rd respectively in a field of 36, and had a very good time. It was at their invitation that two Russians came over later to see the World Championships.

After M. Garrod took the Kite I to Baldock on June 16th, there was a spate of cross-countries on the 27th. Dudley Hiscox flew his Olympia 51 miles to Gravesend, Norman Preston the Gull I 42 miles to Felstead, V. Huggett an Olympia 33 miles to North Weald, and L. Poulton the Prefect 22 miles to Goff's Oak; while Stephenson gave the Olympia IV its first cumulo-nimbus flight. He reached Aylesbury upwind, tried a cloud which didn't work, got back to Ivinghoe, and picked up a thermal there which led directly into a cu-nim and nearly up to its top at 11,500 ft., from which viewpoint all the other clouds were well below.

Early in July the whole Argentine party and several of the South Africans stayed with us some days on the way to the Championships, and other teams found a comfortable night's lodging with which to break their journey. On the first flying day of the international contest, July 21st, where cross-countries of three to 97 miles were being done, Dudley Hiscox flew 87 miles from here to Birchington, S. Fursman 58 miles to a place merely called Birch, and M. Garrod 23 miles to Gt. Munden.

During July the club acquired a second-hand Tiger Moth for towing on days when the slope is not soarable or thermals are best caught higher up. We have also taken on John Everett for full-time work on ground transport, except when he is more urgently needed to help with instruction at the camps. He had A.T.C. experience before joining the club last year.

On August 14th, when cu-nim clouds were imbibing sailplanes at other clubs, a task was set for a flight to Kidlington (Oxford) and back. Jack Hands got there after being down to 700 ft. at Halton, and several others went part of the way and came back. Christopher Wills landed two fields short of the club on an attempted goal flight from Lasham to Cambridge. His father Philip had called here without landing, during an out-and-return between Lasham and Dunstable, one day in June.

On August 29th Stephenson set out for Kenley, where he was booked to do aerobatics in his Olympia next day, and got within four miles of it in a roundabout flight to Ewell.

Coventry Gliding Club

OWING to the poor weather and a ground handling accident to the Grunau Baby early in the year, this summer has been rather a disappointment. There have been some four months club flying with the Cadet as the only solo aircraft, so that, to keep up the club's morale, the more advanced members have been allowed to fly "mutual" in the T-21. It was on one of these flights that Haynes and Daniell achieved the best altitude of the year. 4,500 feet on one of the very few soaring days of the season.

In spite of these setbacks, more launches and more flying hours have been achieved this year than for the same period last year, although less qualifying badges have been obtained.

The aircraft situation should be considerably improved by the introduction of the Tutor which has just been bought as a replacement for the Cadet. Also, the first flight of the Viking, heralded to take place by September 1st, will be a welcome milestone in the club's progress; many months of work have gone into the rejuvenating of this sailplane which will bring high-performance soaring within the reach of all club members. It is clear that additional winching gear must be arranged, and every effort will be made to build a two-drum winch as soon as possible.

Several members are attending a fortnight's course at Lasham; another group is running an almost impromptu week's course at Coventry, chiefly to test the suitability of Baginton aerodrome as a site for summer camps.

A.S.H.

Yorkshire Gliding Club

CEASED to exist? We've been so busy existing that we missed the post with the last two issues of GLIDING.

We started the season with a long spell of east winds, during which we made an expedition to the Black Hambleton Moor seven miles away and found a pretty good N.E. soaring site. When we fill in a few gullies and build a few bridges we should be able to get there fairly easily. However, it effectively sent the wind into the west.

After a members' camp in May, we have had three very successful Introductory Courses for non-members, and a fourth additional one, which we had to arrange to cope with the overflow from the earlier camps, is in full swing now. Bob Swinn, the resident instructor, has been in charge of the camps, with Henry Doktor as assistant instructor, and we have indeed been fortunate in our club-member-helpers who have done the winching, breakfasts and generally kept things running smoothly. Mr. Turner of the Central Council for Physical Recreation has again lent a hand and introduced archery as a sideline for those waiting their turn to fly, and Mrs. Allatini and Maria have again satisfied our enormous appetites. A cup of early-morning tea in bed is now an institution for campers.

The following have recently obtained their C's, and in the much despised Cadets, on occasions, outsoar the higher-performance machines: Geoff Wood, Jack Lawson, May Lawson, Ewie Haswell, Mike Manderfield, Frank Dawson, Dave Rennison, John Forrest, Doc MacQuillan, John Daly and Ted Wilson.

The waiting list for flying training now numbers 24; they are nobly busying themselves with ground duties and getting in what air experience we are able to give them until we can take them on for training. We have been busy during the week as well as week-ends, with members on holiday, those who live near, and the general public.

We are now beginning to reap the benefits of work put in last winter. The second winch being built by Jack Lawson, Ewie Haswell and Geoff Wood is nearly ready; it will eventually be twin-drum and self-propelled. The light and airy workshop with central heating, built by Bob, is a great boon, and the massive dry-stone-wall windbreak has so far broken the wind. The new runways, prepared with ancient cultivators and rollers and sheer brute force, give us long launches in N.E. and N.W. winds, and many of the worst bumps on the airfield have been levelled out.

We greatly enjoyed the visit of the Argentine Team, before the Championships, and hope some time to have them with us again, next time with a west wind.

SUE.

Scottish Gliding Union

CONSIDERABLE effort at this time of year is devoted to the seven-day courses, which continue throughout July, August and half September. Normal club flying has been restricted by north winds, for which Balado has no runway, and other more unsuitable and unpleasant meteorological conditions, but frustrations due to unserviceability of equipment have been infrequent. The two 30-h.p. Ford V8 brakes, now fitted with four-speed lorry gearboxes, give efficient and reliable launches.

The T-21b has been fitted with a Campbell enclosed canopy which has become very popular with instructors, pupils and passengers. Conversion to an open machine for first solo presents no difficulty, as the cover can be left off if desired.

Club Week had a record turn-out and provided some flying for everyone. A. Laird-Philip, M. Berry and I. Kerr took their C's on Bishophill on July 24th. On the 25th, Andrew Thorburn completed his Silver C with a flight to Crail aerodrome. Again, on July 30th, J. Reid, J. Thom, D. Tweedie and D. Bryce took C's, while R. Porteous and R. Gairns in Krajanek and Tutor did the 5-hour duration leg.

On July 11th R. Porteous, launched at 10 a.m. in Krajanek, flew south to the Forth, turned east, but had to land on the coast at Buckhaven, 17 miles. On August 7th John Paterson took the Krajanek to 4,000 feet, while M. Berry thermal-soared the Tutor for 30 minutes, but the Olympia failed to soar, though it flew all day. On August 22nd Angus Thomson, from the second of two aero-tows in Krajanek, reached 5,000 ft. in cloud.

D.H.

Newcastle Gliding Club

FLYING on Newcastle Municipal Airport was terminated in June, 1952, and the joint flying agreement with the Yorkshire Gliding Club in September, 1952, bringing all of our flying activities to a close. However, we not only hung on, but increased our membership, and with the assistance of the B.G.A. and the Kemsley Flying Trust, we have obtained permission to operate on the service airfield at Usworth.

We had 83 launches during Easter week-end, with several thermal flights on the Monday, when Commander Littlejohn of the Portsmouth Club and Andy Coulson made a flight of 40 minutes to Gateshead and back.

During June, 105 launches were made. On June 13th there were four soaring flights in succession, each to cloud base at 3,800 feet, by Andy Coulson with Mrs. Coulson, then with C. Knaggs and next with Alan Crawford—all in the T-21, and finally by Coulson in the Kite 2a for 20 minutes.

On July 4th Charles Knaggs obtained the first C certificate at Usworth on a 17-minute flight in the Tutor, and Andy Coulson made a flight of one hour in the Kite 2a, while Alan Pratt with Jack Smith did 25 minutes in the T-21, then another soaring flight with Henry Clark. Total launches in July, 177.

On August Bank Holiday Week-end there were 71 launches. Ian Paul obtained his C on a 20-minute flight in the Tutor and followed this with a 15-minute flight. Jack Anderson and Leo Culliman reached 3,000 ft. in the T-21 on a 45-minute flight.

On a gliding holiday at the Long Mynd, Andy Coulson set out in his Kite on August 13th for his Gold C distance with Great Yarmouth as his goal, 200 miles away. He was winched to 500 feet, and, after half-an-hour's search, contacted a thermal and climbed to 7,000 ft. over the Mynd. He then set course and after losing considerable height had to circle over water-cooling towers at a power station in Birmingham, and contacted a thermal in which he climbed to 14,000 ft. a.s.l. During this climb his variometer stuck at its maximum reading of 50 ft. per sec. This altitude gave him Gold C height, and as he was 11,000 feet above cloud base, he straightened up and continued on course, but was still climbing unwillingly. He broke out of cloud a quarter of an hour later with ice on the wing-tips and on the cockpit cover, which cleared and he sighted ground over Leicester when at 4,000 ft. He was unable to contact any more lift and continued a glide for 30 miles, making 110 miles in all, and had to land at Baston, near Spalding, south of the Wash, at 5 p.m. His wife Hilda and Doug Collinson had waited at Leicester and retrieved him at 6.30.

At the Annual General Meeting on July 9th the following officers were elected:—

Chairman, Alfred P. Miller; Vice-Chairman, Coun. R. G. Hutton; Secretary, Miss Anne M. Gray; Treasurer, Alan T. Crawford. Committee: A. Coulson (C.F.I.), J. Anderson (Flight Sec.), L. B. Tate, L. Kiloh, L. Scott and S. C. O'Grady in an advisory capacity.

A. P. Miller, S. C. O'Grady and L. Kiloh were appointed to make arrangements for celebrating the Silver Jubilee of the Club early next year.

A.P.M.

Isle of Wight Gliding Club

EARLY in January a temporary committee was elected at a meeting of those interested, and on May 26th 53 persons signed a resolution forming the Club, and a committee was elected to make full facilities available as soon as possible.

We are extremely fortunate in having been offered the use of the Isle of Wight Airport, Sandown, on very generous terms. With it comes the use of excellent clubhouse and hangar accommodation. A considerable amount of equipment has already been purchased, including a winch and a Fordson fire engine chassis, which appears to be the ideal vehicle for conversion to a one or two-drum self-propelling mobile winch.

The only gliders purchased to date are four ex-Air Ministry Kirby Cadets. It is hoped to obtain a T-31 and use dual training, but at present we have no suitably qualified instructor, so we may be forced to adopt the old solo training technique with one of the Cadets.

It may be thought that a club cannot succeed due to the limited area from which we can draw members, and geographical limitations to high-performance flying. However, we were surprised to find 40 enthusiastic supporters, with several others waiting for something to happen. It is of interest that we have had enquiries from Southampton and Bournemouth.

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