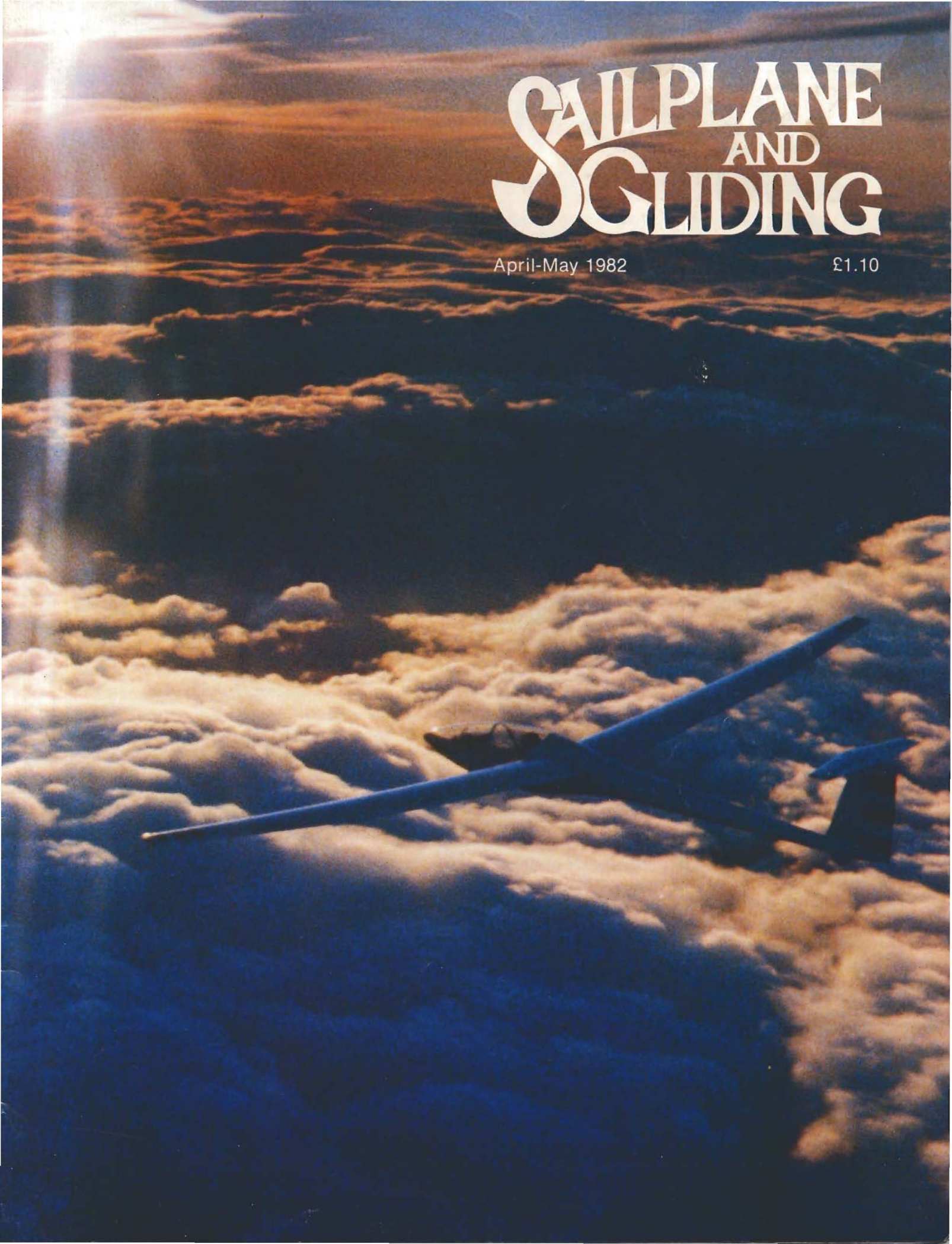


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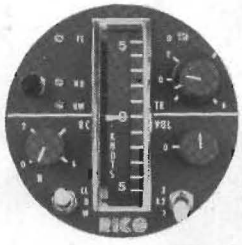
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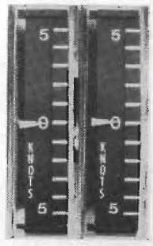
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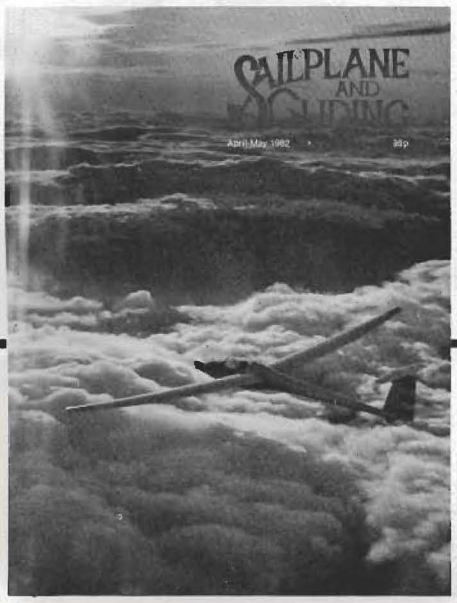
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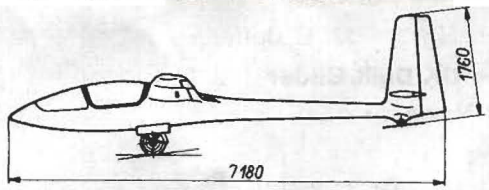
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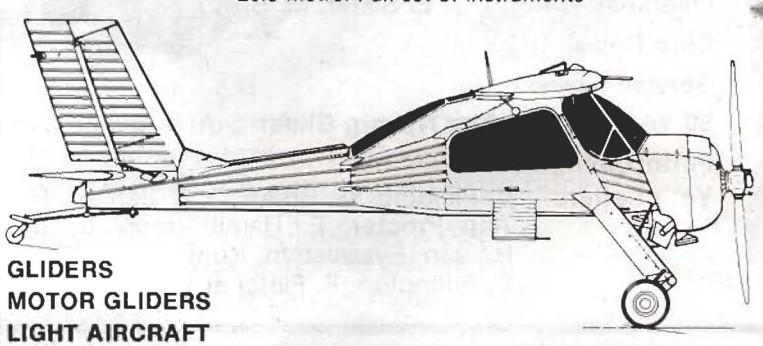
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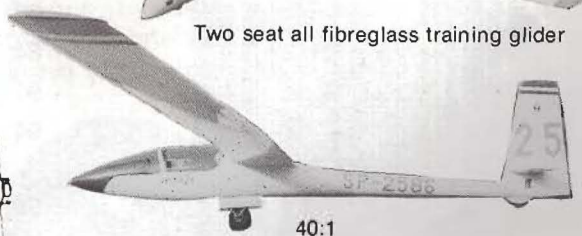
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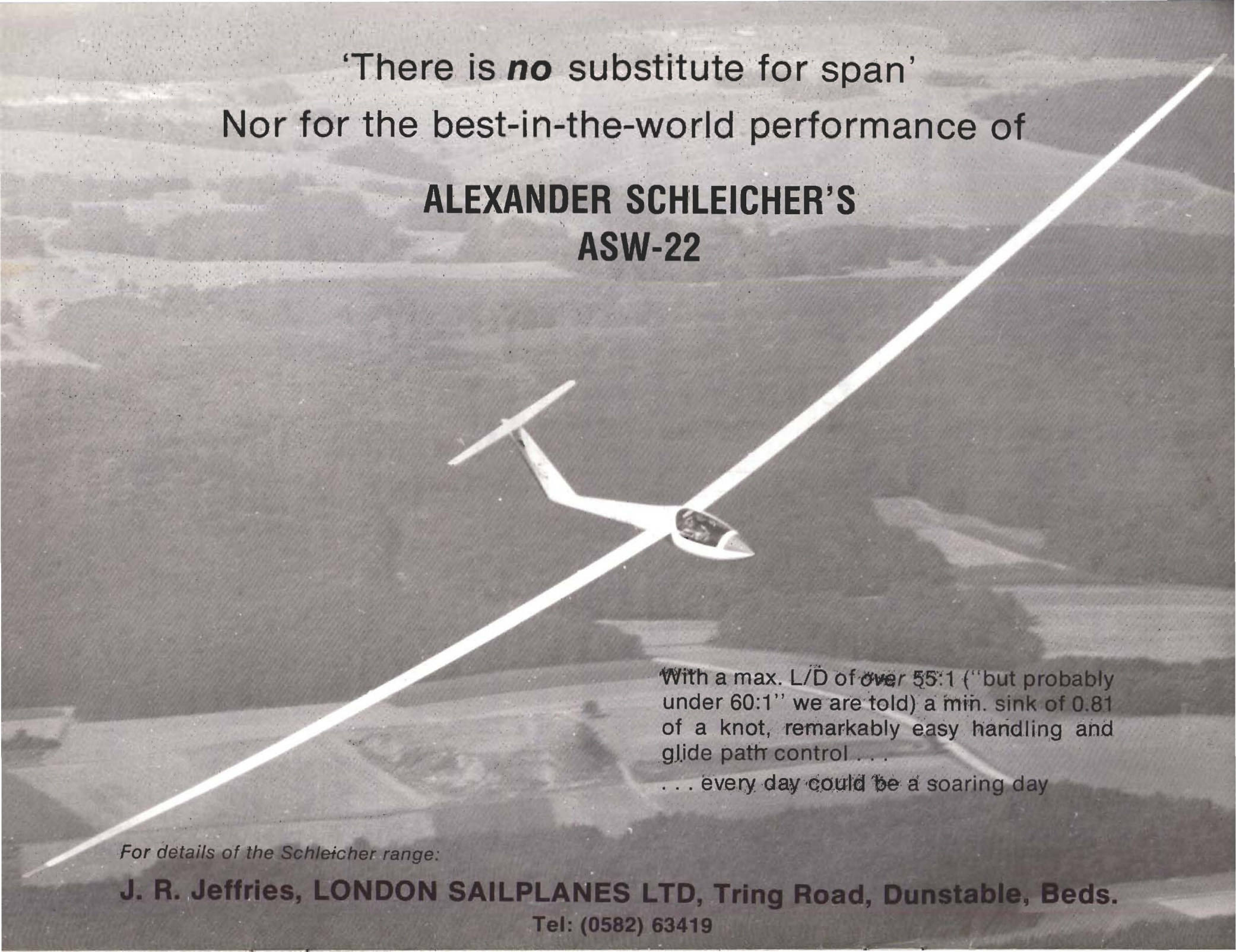
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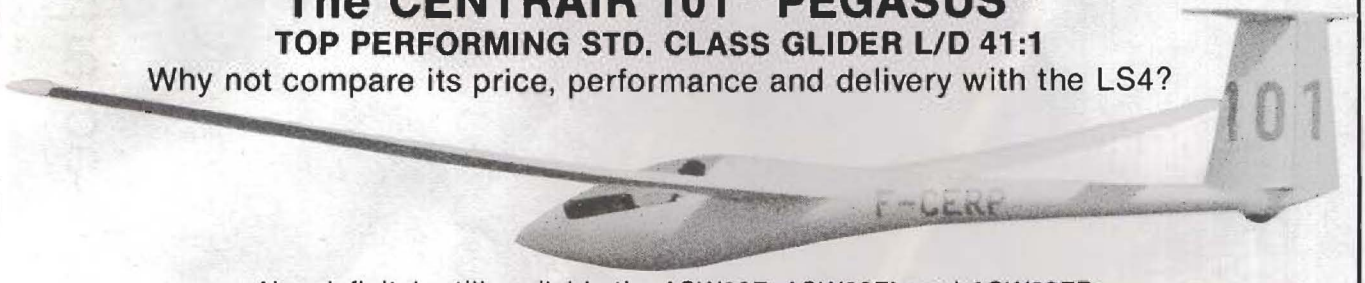
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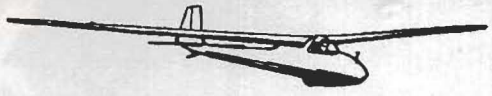
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CHAIRMAN'S REPORT, 1981

TOM ZEALLEY

Last year I concluded my annual report by drawing attention to three important issues for our sport: the struggles for airspace and groundspace and our relations with the British Hang Gliding movement. All three have continued to cause concern during the last year. With the exception of Dunstable, the sounds of battle at the hill sites have grown quieter and it can therefore be said that relations between the two sorts of gliding have improved a little, but there is still some way to go.

On airspace the feeling of "threat" persists and the year has seen enlargement of the London TMA despite our protestations and plans for an airway in Scotland which would seriously impair wave flying there. There are signs that National Air Traffic Services (NATS) are bringing increasing "professionalism" to their consultation process — NATMAC. We are listened to by NATS staff with great courtesy and at considerable length — but with very little effect.

On groundspace I can report on a happier note the acquisition of two more "permanent" gliding sites — Aston Down for the Cotswold Club and Rufforth for the Ouse Club. The freehold of land offers a lasting reward for all the effort involved in these achievements.

Despite the economic depression all our clubs have survived, although many are having a hard struggle. The flying statistics show a marked increase in flying hours and cross-country kilometres flown which must have helped finances as well as demonstrating the previously noted trend of improving "quality" in our gliding. The soaring and cross-country courses have flourished and the BGA has purchased its first high-performance solo glider to assist and encourage the trend. Another related achievement is the granting to the BGA of a third radio frequency which will ease the communication congestion that has arisen with increased cross-country gliding.

Another important development has been the Inter-Club League which lends encouragement to competitive cross-country gliding at club level. The traditional Regionals and National Championships continue to thrive — in the teeth of the elements, although there were complaints that Dunstable Nationals had too much of *fire* and Greenham Common had too much *water*!

Some readers will consider I have taken too long to work my way up to the World Gliding Championships held last June at Paderborn in Germany. There must be few glider pilots in Britain who are unaware that George Lee won the Open Class for the third time in succession thereby establishing a new record. George and the whole British team won for themselves wide support in this international forum and brought us great credit. It must be remembered, however, that significant funds are needed to send British teams to World Championships and these have regularly involved considerable voluntary efforts to raise the money — mainly from within the gliding movement. Accordingly, at the recent EGM in October 1981, it was agreed by a substantial majority to carry out this fund-raising more directly, by means of a levy on all glider pilots.

Besides the World Championships there are other notable award winners to whom I should draw your attention: David Benton received a Royal Aero Club Bronze medal for a record height climb, Arthur Doughty an FAI Tissandier Diploma for his work on safety and the Vintage Glider Club of Great Britain received an FAI Group Diploma. Joan Cloke our honorary treasurer received an MBE from the Queen for her many years of devoted service to gliding.

On the technical front, publication of our report on the Technical Committee investigation into the use of "Mogas" in light aircraft engines has generated widespread interest not only within the British gliding movement but amongst airworthiness authorities, petroleum companies and aircraft manufacturers both at home and internationally. The past year also saw the conclusion of the Glider Design Competition with a substantial award from the Sigma Fund to the winning designer Paul Wheatcroft.

Turning to a less happy aspect of our sport, I must comment on our accidents. These continue to cause concern: the year saw a repetition of the previous year's abnormally high figure with a total of seven fatalities. (Other accidents were marginally reduced.) The BGA Executive Committee is currently reviewing the committee structure with respect to both Safety and Instruction.

While many people think that accidents only happen to other people, the financial cost falls on all of us through our insurance premiums. The BGA has a working group studying this field and there has been an interesting development with a transatlantic insurance agent planning to enter the British market with some new ideas about which I expect we will hear more.

Passing from accidents it is not inappropriate to recall that 1981 was the year of the disabled. The BGA, through the loan of its Airedale tug, assisted Peter White of the Bannerdown Club in his fund-raising project called "NationGlide". With help from many, including the BBC "Nationwide" programme, funds were raised for the disabled by means of sponsored cross-country flights round Britain.

We should all spread the gospel

I would like to take this opportunity to raise another issue which deserves our attention. I refer to our public relations image. This is not just a matter of getting more done by a public relations officer of national level. There is a need for all of us at grass-roots level to spread the gospel of our sport. The general public are woefully ignorant of us and we can all do something about it. In our numerous informal discussions with "outsiders" we should put it across more simply and ensure that we leave the impression that gliding is readily available and accessible to all who think that it might be fun.

Finally, remembering that the BGA is a movement of people may I record my thanks to all those who continue to serve us and make it all happen. A major part of the work done by the BGA, both by staff and voluntary officers, comprises of attending numerous meetings and lobbying and negotiating with government and other authorities on behalf of gliding as a whole. Starting at the top, you will recall that the last AGM appointed Basil Meads as our president. At the same AGM, in addition to the names I mentioned in my report last year, we were sorry to lose Chris Nicholas from the Executive Committee, although I'm pleased to note that he remains active in various BGA jobs. The Executive Committee welcomed new faces in Terry Stevens and Pete Saundby. Ian Strachan after many conscientious years of service has retired from his position as the BGA representative on the CIVV and as a member of the BGA Competitions Committee (which he also chaired for a number of years).

The BGA flying staff are well known and appreciated throughout the movement and I thank them on your behalf for their service along with Barry Rolfe and the other BGA staff in our Leicester Office who, while less conspicuous, keep essential wheels turning.

THIS TIME LAST YEAR...



By MENTOR

March Hare, April Rabbit!

Tom had always admired "them". "They" included his boyhood heroes, fighting his country's battle over his Sussex home. "They" set records, flying little aeroplanes half way round the world. "They" took passengers swiftly to romantic places. "They" were pilots!

Tom had wanted to join the Air Training Corps but his school only did Army Cadets. Then he did his National Service — in the Army. Then the need to earn proper qualifications and get a good job going. He got married, started a family — and found excuses to stop outside airfields, just to watch. And always he hankered after the gift of wings. He read the right books and one day even mustered the nerve to take a trial lesson at his local flying club. His flight entitled him to a month's social membership, and for thirty magical days he could go to the bar and listen to "them", talking of drift, headings, QFE and QNH! But his family commitments were against him and cash was tight just then.

But one day Tom spotted an advert for a gliding holiday. The kids were now grown up, there was a bit of fat in the family budget, so Tom took the bait.

★ ★ ★ ★

This was it! His five days went by in a golden haze. *He* was flying! *He* could be one of "them".

After his holiday Tom found the local gliding club and joined. Of course, he still had to find time for all the other things which had filled his life until then but he got along to the club as often as he could and, at last, two years and 135 flights later, he went solo. Now he felt that he could sit at the bar in his own right, as a pilot.

He didn't really want more than that, He flew his modest circuits once or twice a month, and occasionally had spells off altogether. Once he was quite ill and missed almost a year but inside him all the time was this comfortable glow — he could fly! They tried to teach him to soar but his total year's flying rarely was more than five hours, so his skill didn't improve enough to let him concentrate on finding thermals. Truth to tell, he preferred the air when it was smooth!

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He got to fly the two-seaters quite a lot and was on checks for ages of course. He flew the K-8 too and was beginning to wonder if he would ever make it to the 18. He had heard about the 18! Rumour had it that it had been pranged and rebuilt and now flew a bit crooked. One wing a bit droopy, they said. Actually young Dick got quite heated on the subject one evening over a pint. Claimed it wasn't *his* fault he ground looped. There was this crosswind and the left wing just dropped on him! The left wing always wanted to go down, Dick said. Of course, Dick should be listened to. He was going places.

★ ★ ★ ★

Tom was not the pushy sort and was genuinely surprised when he was offered the chance to fly the 18 one sunny April morning. As it happened he had hardly flown at all since the previous autumn. True, he had had a couple of check rides a month earlier and had flown the K-8 the week before. And here he was, being offered the 18 by an enthusiastic duty instructor. With a gulp and a bit of a flutter in his stomach he accepted and strapped in. The briefing seemed straightforward and it wasn't until the rope was tightening that he remembered the bar talk. He wished he had thought to ask how to cope with a wing that wanted to drop all the time but it was too late now. He would have to manage. The tow went smoothly enough although, true to it's reputation, the left wing **had** dropped on take-off. Tom flew around and actually soared for twenty minutes or so but all the time he felt he was having to hold off bank to the right. This nagged at him and he wondered what might happen if he stalled. Could spin, he supposed, and this frightening thought made him trim forward a bit more, just in case. All in all he wasn't sorry to lose the thermal and turn for home even though he hadn't tried half the things he was supposed to, like check the stalling speed, the feel of the brakes and the rate of roll.

On take-off the wind had been across the runway from the left so he was going to have a crosswind landing. Then he remembered Dick's mishap. That had been a crosswind! Oh! Help. What should he do? He really was worried now and finally decided, boldly for him, to land on the rougher strip, more into wind. True, it didn't really fit the circuit he had been flying but he thought that would be the lesser evil. He chose his touch down point and turned in for the approach. And now, for the first time he realised that he would have to fly over the aircraft at the in-use launch point. Not only that, but a K-13 was approaching from his left and he couldn't be sure which would get there first — it or him! So, in desperation, he changed his mind, to land after all in the regular direction. And, of course, he didn't have enough time or height to complete the turn. His right wing brushed the grass, round he went, unceremoniously, and found himself looking back at the other gliders, and an anxious duty instructor running towards him.

★ ★ ★ ★

Supervisors, please note: At This Time Last Year . . . of 33 pilots with less than 100hrs, who were involved in an accident, 21 had gained their experience at less than 10hrs a year. Current? Competent?

AN INTRODUCTION TO COMPETITION FLYING

Part 2 – Participation



Photo: Gerd Schäfer

GEORGE LEE, World Open Class Champion, gives advice in this second article on all aspects of contest gliding for those new to the competition scene.

Illustrations by Mike Spencer

The first part of my article was basically about preparation — preparation of aircraft and associated equipment, and preparation of self, both physically and mentally. We've now reached the point where it's all about to be put to the test. The feeling as you arrive at the competition site should be one of quiet confidence, secure in the knowledge your preparations have been comprehensive and that all you lack is exposure to the competition environment.

I strongly recommend you do everything possible to give yourself at least a couple of practice days (a week if possible) operating from the competition site. Even if you feel you are already familiar with the surrounding countryside, it is psychologically beneficial to get settled in early and to develop a daily routine with your crew. Financial aspects apart, you should give serious consideration to your domestic set-up. Some people need eight hours sleep a night, others seem quite happy with five to six — camp sites are not always blissfully peaceful and it may not be the best idea to live in a tent for your first competition unless you have had prior experience of the associated problems.

Training objectives

It is very unlikely the competition organisation will be operating during the practice period but you can set yourself some training objectives for your pre-competition flying. I offer the following suggestions:

a. Familiarise yourself thoroughly with the local area and note the position of the major navigation features (useful for initial track orientation and weather assessment when preparing to start).

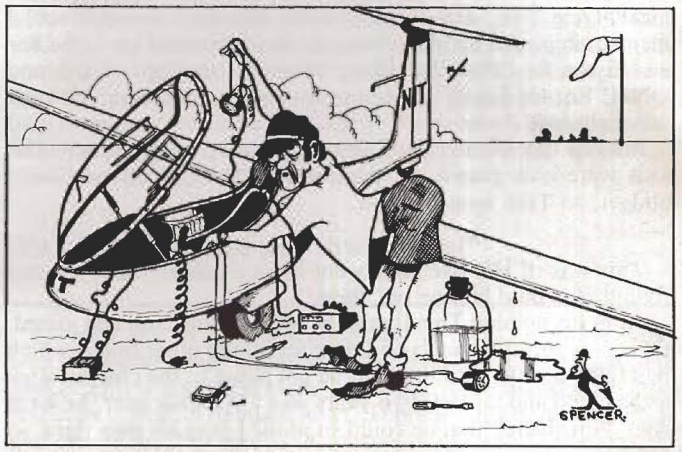
b. If the visibility is good, see how the airfield looks from about ten miles away at a representative final glide height. Note any useful lead-in features when approaching the airfield from different directions (useful when final gliding under conditions of poor visibility).

c. Check out the sources of local "house" thermals. From map study and talking to locals, note any potentially good/bad soaring areas (such information may be useful when considering the advisability of deviations from track, both at the beginning of the task and during the final glide).

d. Select an afternoon to stay airborne until soaring virtually finishes. Use the last hour to note those areas that continue to generate usable thermals after activity has ceased in other areas (your notes may be useful when you're trying to make it home at the back end of a blue day without the luxury of gliders just ahead to mark the lift).

e. Make a careful study of fields in the local area. I am not advocating the reduction of any of the safety margins associated with field selection based on the results of such a study; however, during a marginal final glide with the attendant competitive pressures it may be useful to know if one is gliding into a generally good or bad area.

Finally, try to fly at least one closed circuit task during the practice period. Select a distance you think you can comfortably achieve within the forecast soaring period and apply the disciplines of making a start, taking TP photographs and carrying out a final glide. Use the flight to check the performance of both air and ground radios at range, and evaluate your flight afterwards by comparing the elapsed time on task with the theoretical time required considering glider performance and average thermal strength. It is also a good time to check the barograph is working correctly.

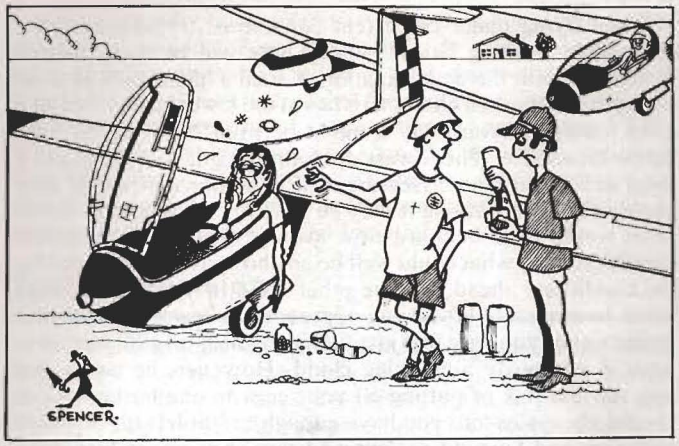


Last minute fettling and "fine-tuning"

Throughout your practice flying ensure that your instrumentation is still in good shape. You will undoubtedly experience a strong desire to indulge in some last minute fettling and fine-tuning, but unless there is something basically wrong I strongly recommend you leave well alone! Hopefully you have been able to ensure that the glider and equipment is "competition ready" before you arrive at the site. If there is still some basic fettling to be done you should obviously go ahead and do it in the evenings and during non-soarable weather, but if even greater demands are being made on your time you should consider whether the fettling or the practice flying should have the greater priority.

Apart from being physically fatiguing, last minute aircraft and/or trailer work is not conducive to a relaxed frame of mind! Assuming there is no pressure from work still to be done, I recommend you spend some time during the evenings preparing you maps (if not already done) and thoroughly familiarising yourself with the contents of the BGA Competition Handbook. You may also want to discuss with your crew daily routine, reporting code and whether or not to use check-lists.

I recommend you book in with the competition organisation as early as you can. This gives you the maximum amount of time in case of queries and also plenty of time to read and absorb the local regulations before you go to join your fellow competitors in the bar! This is a suitable time to consider the



Learning the hard way

question of normal evening routine. As I have already indicated, everybody's constitution is different and the best general advice I can give is that you should not make any fundamental changes in your drinking/sleeping habits. A couple of drinks after a hard day's competitive flying is very relaxing and many a pearl of wisdom can be gleaned over a pint, but don't overdo it or you will learn a very basic lesson the hard way the next day!

And so to the action. Each day will start with 15 to 20 minutes briefing at which domestic notices and details of the weather forecast for the day, grid layout, launch order, start and finish lines and tasks for each Class (including airspace restrictions and any standby tasks) will be given. It pays to take note of the important points (using either the BGA competition task sheet or one of your own design) and to ask questions if you are unsure about anything. In particular you should make sure you have been given as much detail on the weather prospects for the day as is available. Once the briefing is over you should carry out your flight planning, either in the briefing room or in a caravan. If your crew have been with you at the briefing (I find it useful for a number of reasons to have my crew-chief there) they should now leave to carry out final preparations on the glider and to get it in position on the grid.

Flight planning

As far as flight planning is concerned, draw the track lines of the primary task on either your 1:500 000 or your 1:250 000 map — both if you're keen! (I personally use a 1:500 000 map, except for TP detail or if the visibility is bad.) If you've got plenty of maps (and time) you may wish to plan the basic details of any standby task on a separate map. Having drawn the track lines, you should measure and mark on the magnetic tracks or wind compensated headings (I personally use the tracks at the planning stage and apply wind corrections in the air). Even if you intend using the 1:500 000 map for general navigation, I recommend that you mark the TP photographic zones accurately on a 1;250 000 map (the penalties for missing the zone are too great to take any chances!).

Next consider the weather forecast and the size of the task and calculate how long you think it will take you (based on theory and your experience to date). Until you gain competitive experience I suggest you add on one hour to whatever figure you come up with as an insurance against *en route* weather problems or low points. You should then try to bracket the best forecast soaring period of the day and come up with a provisional start-time. Next sit back with the prepared map and carefully consider the task. Memorise the magnetic tracks, make a mental note of major navigational features and consider likely good or bad soaring areas (based, collectively or individually, on your experience, what you have been told and what the map is telling you). Finally, prepare your maps for cockpit use by careful folding — I suggest you leave ten miles both side of track available to cater for tactical deviations or navigational fumbles. (I remember during my first attempt at 300km . . . but that's another story!)

Having ensured that you have everything you need with you, you should now join your crew on the grid. I suggest the use of a check list at this stage to ensure that everything has been covered. One thing still to do is to photograph the task board — I feel that both this and the packing of the aircraft brake 'chute should be left to the pilot. There could now be either a rapidly approaching first launch time or a considerable wait. Again, everybody's constitution is different: I like to have eaten before I start the task — either before take-off or while local soaring. Similarly mental efficiency is enhanced by one's body being adequately hydrated — I recommend "stocking up" some one or two hours before take-off.

Whatever else, you should try to relax as much as possible during this waiting period. At the same time keep a close watch on the sky and any local gliders to compare the actual weather development with the forecast. Ensure that you have everything you need in the glider (barograph, maps, calculator, soaring hat, sunglasses, telephone change, sweets, a final glide/land-out apple, drink bottle, urination bag and warm clothes in the "boot" — to name a few!). As first launch time approaches, I suggest you should attend to nature and strap in a few minutes early.

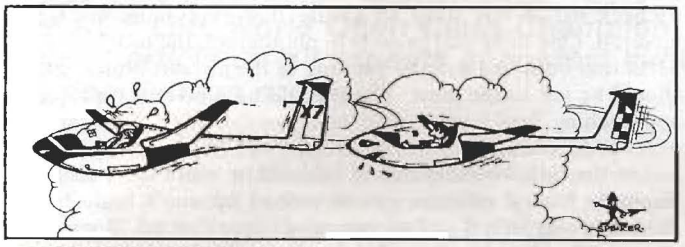
Get high and relax

Use your on-tow time productively, trying to get a feel for the low-level coherence and overall spacing of the thermals. Once off tow you should not be too selective in your choice of first thermal: join any glider(s) nearby that seem to be climbing well, otherwise head for the nearest likely looking cloud and climb in the first reasonable lift you encounter. It is important to get high so that you can relax, check cloudbase and assess the overall weather picture. Use the time before the startline opens to assess the distribution and strength of thermals in the local area, always relating such information to the appearance of the clouds. You should also confirm the position of the best lift in relation to the overall cloud structure — if it seems to be under the upwind, sunny corner of the cloud for the first two or three thermals, there is a good chance it will remain much the same for most of the day. Try not to wear yourself out by being too aggressive in your flying at this stage; stay high, eat your lunch (if you didn't have time before take-off!) and attend to nature in good time before the startline opens.

Now is the time for a mental gear change and you should aim to experience an increased level of determination and awareness of external factors as your selected start-time approaches. It's easy to say but try not to be too influenced by what other pilots are doing. There will be a certain amount of startline gamesmanship but don't be overawed — your aim should be strict non-participation and adherence to your planned start-time (subject of course to any changes brought about by weather assessment).

As that time approaches try and get as high as possible and close to the start-gate (but not between the gate and the line!). Orientate the cloudscape with your first track and, if conditions look pretty good, head for the gate and call the startline organisation. You should manage your height carefully as the aim is to cross the line with as much height as possible (below the maximum of 1000m) and British conditions rarely permit a text-book height profile. If it is one of those rare days, a height

of approximately 4500ft agl through the gate should be about right for Club/Standard Class gliders. As you approach the line, time your acceleration to ensure crossing it below 1000m agl *and* red-line speed. Once you are sure that you have crossed the line, reduce speed to the cruising value for the anticipated strength of your first thermal and head for the nearest good looking cloud or rapidly climbing glider (ideally you should have identified your goal before the "gate" call).



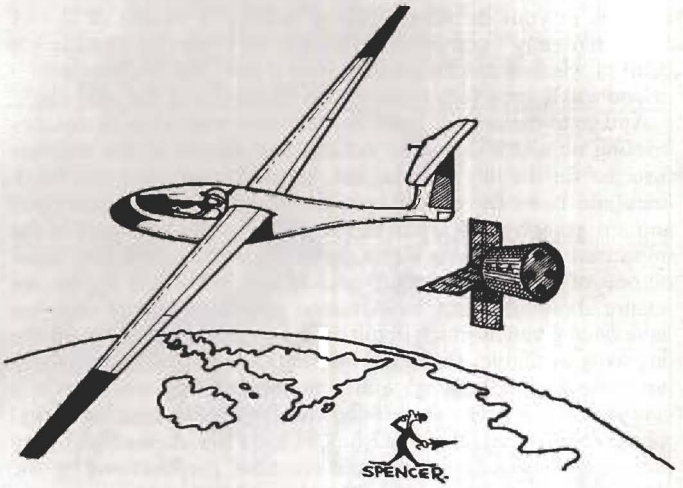
Don't follow others all the time

Although a good start (both the mechanics of crossing the line and contacting with a good first thermal) can have a significant impact on elapsed time on task, it is more important during your first competition to start near to the correct time for the conditions and your experience. A final point on starting procedures — if you find for any reason that you are local soaring for a considerable period, ensure you comply with the requirements of the briefed Recognition Time Interval (RTI) by either photographing the ground markers or by taking a start comfortably within the relevant period of elapsed time since take-off (you may want to brief your crew to give you a call with, say, ten minutes to go).

Once you have left that important first thermal after the start you should aim to follow the route of best thermal energy. I would like to make two very important points at this stage. First you should try and avoid the temptation to follow other pilots all the time — apart from annoying the pilot in question, you will invariably find you are slowly but surely being left behind. You will generally produce better results by making, and sticking to, your own decisions. A related aspect is the subject of gaggle flying. As with decision-making, most pilots find they produce better results by doing their own thing. That is not to say you should not make use of the information provided free of charge by other gliders *en route*, but rather that it should be considered as another input to the decision-making process. There will, of course, be times when it makes sound tactical sense to join a group of circling gliders, such as on weak blue days, or when they seem to be climbing well under the best looking cloud in the area. However, you need to be aware of the risks inherent in joining a gaggle. Your rate of climb may suffer because of the concentration and inefficient flying that may be required in avoiding other gliders; secondly, the herd instinct can take over and you may find yourself staying in the lift longer than is tactically sound, or just flying on mindlessly with the group when they decide to leave.

My second major point is that you must try and fly as you normally do, even with the competitive pressures. If you try doing things in a different way, your flying will suffer and you will become unsettled. Go back to the basics of efficient cross-country soaring I mentioned in Part 1. When you decide to use a particular thermal, try to achieve the best rate of climb you can. If you see a group of swifts or a buzzard circling nearby, you will often experience an increased rate of climb if you move over to join them. If you see another glider circling under a different part of the cloud, wait for a few circles to see if he is outclimbing you before you join him — if you do join him, be prepared for the possibility of finding youself below his thermal bubble and not getting the core you had hoped for (keep a mental picture of where your own thermal was!).

When flying under consistent conditions, try to establish a reasonable working height band. There will be many factors associated with the determination of such a band (such as wind strength and thermal characteristics at the lower levels), but on a good, straightforward day it might be from 2000ft agl to 500ft below cloudbase. The lowest operating height will depend to a large extent on your assessment of conditions ahead. If they seem to be deteriorating it may be wise to stop a little earlier in what would have been a below average thermal under earlier conditions, but what could well be an above average thermal for the conditions ahead! On the other hand, if you pass through weak to moderate lift as you approach the lower limit of your height band, you may feel justified in pushing on a bit further to what is obviously a cracking cloud. However, be aware that you run the risk of putting all your eggs in one basket — you should always ensure you have enough height left for safe field selection and I would recommend you slide under that cloud with enough height in hand to check out one or two of the neighbouring clouds without the pressure of specific field selection (other than checking that you are in a generally good area).



As much height as possible

At the other end of the scale the discipline of leaving thermals as the rate of climb falls off significantly should be automatic by now, with the qualification that it may be prudent sometimes to get as much height as possible under your belt if you don't like the look of the conditions ahead. Throughout your flying you should keep radio transmissions to the minimum necessary to keep your crew informed of your progress. Listening to the excessive chatter of other pilots may disturb your concentration, but if you can live with it you may glean useful information such as advance warning of deteriorating conditions ahead.

Now let us consider how we should put our hard-earned height to the best possible use during the cruise. As I indicated in Part 1, the best "energy route" rarely lies directly on track. You must be prepared to deviate off track to make the best use of the good looking clouds. Deviations of up to 30° from your track will not result in a severe extra distance penalty — deviations of greater than 30° can normally only be justified under extreme circumstances, such as a cracking cloud street lying 50° off your track when you're desperately trying to make progress against a punishing headwind! All things being equal, try to make any deviations on the upwind side of track but don't get so carried away by your progress that you lose awareness of your position. Both navigation and tactical decision-making can be made very much easier by the intelligent use of significant geographical or man-made features. For example, if, as you climb towards the top of your working height band you look ahead and see a prominent hill or lake you know lies close to your track, you can put your map to one side and use that

feature as an easy track reference when deciding which line of clouds you should follow. In general you should aim to give navigation the minimum amount of time necessary for general awareness of position (increasing the degree of accuracy if you are flying near to restricted airspace or are approaching a TP). Within reason, the less time you spend on navigation the more time you have available to assess the big soaring picture up ahead. On the other hand being lost is a most frustrating, time-consuming experience — need I say more!

Tactical decisions

Although the ability to achieve the best possible rate of climb in a given thermal is extremely important, *en route* tactical decisions (such as off-track deviations, when to press on and when to slow down etc) assume an even greater degree of importance in the realisation of efficient performance soaring. Of lesser importance is the need to fly at precisely the right inter-thermal speed; for example, a speed-to-fly ring setting that is in error by 25% will result in a speed loss of less than 1%. There is also the consideration that a cruising speed that is slightly less than the theoretical optimum offers the inexperienced pilot more time for the assessment of *en route* options. (See p74 for more on this subject.)

As far as dolphin flying is concerned it is apparent that the greatest gains will be made by pilots flying high performance sailplanes at high all up weights. However, a K-6 pilot will also achieve significant gains in his overall performance by accurately timed decelerations in lift and accelerations before the associated sink is reached. The piloting technique should relate to the characteristics of the thermal (a smooth, gentle transition when the area of lift is wide, and a more vigorous manoeuvre when transitting strong, narrow cores); however, I recommend a cautious approach on windy days with broken lift or you may end up losing more than you gain!

Turning point techniques

The efficient negotiation of TPs underlies the importance of planning ahead. It is nice to achieve the ideal of turning high when transitioning to an into-wind leg and *vice versa*, but conditions in the area of the TP don't always co-operate! You should base your decision on a careful assessment of conditions leading into and out of the TP, making due allowance for the height loss inherent in TP photography. Turn as tightly as you feel comfortable with (based on your experience to date) but bear in mind that your turn should be efficient in the aerodynamic sense, and that the penalty for taking your photographs from a position outside the designated zone can be severe. It is particularly important to treat the negotiation of a TP as a normal phase of flight — it is all too easy to consider it as some sort of goal and then have difficulty settling into a rhythm on the next leg.

At some stage during the last leg of each task you will start to think about your final glide. The main point here is that you should not always relate the final glide to a specific range from base (varied according to weather conditions). You should rather aim to continue making your normal *en route* decisions until you get stuck into a good thermal that looks as if it may take you high enough to carry out a racing final glide (it may even be possible when flying a high performance sailplane under good conditions to continue dolphin flying until the final glideslope is intercepted). At this stage I usually change my altimeter setting from sea level pressure to base airfield pressure (noted during my pre-take-off checks). As you climb you should confirm your range from base; then, working with a cruising speed applicable to your glider type for the achieved rate of climb, apply the relevant wind component and establish the height required from your calculator. You will know from practice how accurate your calculator is — if in doubt add a few hundred feet.

As you climb past the calculated height accelerate efficiently to the appropriate cruising speed and make the normal course deviation decisions as you carry out your final glide. You should fly according to the speed-to-fly-ring as normal and make regular height versus distance-to-go checks using your calculator. If you find you are slipping below the glideslope you have the choice of either slowing down or stopping to top-up in a thermal — if you are only just below the slope slowing down should have the desired effect. On the other side of the coin, if you find yourself above the glideslope you should progressively increase speed to regain the ideal. Continue your checks during the final glide until you can see the airfield and then you should be able to judge the final stages visually.



Dumping water in good time

Start dumping your water in good time, call the finish line organisation and, having crossed the line, either land straight ahead if your speed is marginal or ease up smoothly to enter the briefed circuit pattern (do *not* pull up sharply after the line — apart from giving you less height at the top of your manoeuvre, you may embarrass whoever is following you). It is all too easy to relax as you cross the line but the flight is not over until the glider has finally come to rest — I use the simple pre-landing mnemonic of WUF (water, undercarriage and flaps).

And so to the important aspect of the psychological approach that you should adopt for your first competition. It is important to have the right level of self-confidence during competition flying: too little makes the realisation of your potential unnecessarily difficult, whereas over-confidence can result in erratic results or, at worst, a bent glider. Try not to be too disappointed if you don't do as well as you thought you would. On the other hand you will have the problem of keeping your ego in check if you do a lot better than you expected!

Whichever way your results lean your objective should be twofold — to familiarise yourself with all aspects of the competitive environment and to take every opportunity to learn all you can. You can learn a lot from your more experienced fellow competitors, although you should bear in mind the "wheat from the chaff" problem I referred to in Part 1. Finally, try not to be overawed by the proceedings! Don't change your style of flying and think ahead as much as possible — this should help you to avoid making hasty, ill-considered decisions when you get into a hole.

Above all enjoy yourself! Involve your crew in your flying as much as possible, sharing your feelings of satisfaction and, inevitably at times, frustration. Competition flying can be great fun — whatever your motives for giving it a try, I wish you success in the pursuit of your personal goals.

India's First Glider Flight

A £50 British primary shipped out to India and flown by a young man whose flying experience totalled a few minutes from a bungy launch at Dunstable, introduced gliding to the East. Hugo Irwin, now living in Devon, worked for an oil company in South India and before the war imported the first glider into that country, had it copied by native craftsmen and established the Indian Gliding Association. It is a fascinating account and forms part of Hugo's autobiography. The following are extracts from the yet to be published book.

Now there are more than a dozen gliding sites in India apart from the 20 or so operated by the National Cadet Corps (Air Wing), but when Hugo founded the Indian Gliding Association in 1940 he knew of only one qualified glider pilot in the whole of the country, and he was a Persian — F. H. Irani.

The author, who says his interest in aviation went back to early childhood when the nearest he got to motorless flight was running down the slopes of the South Downs with his mackintosh wide open in the hope of becoming airborne, was employed by the Burmah-Shell Oil Company. On a visit home in 1934 he had the flight at Dunstable which was enough for the "germination of the gliding bug". He promptly ordered S&G and has been a reader ever since.

He returned to South India, this time to the Blue Mountains, some 7000ft asl.



Hugo's imported glider, No G207, photographed with the Todas, his launch crew, in the background.

Why not join them?

"Motoring up and down the mountains when on tour I was entranced by the very large, brightly coloured butterflies which remained airborne without moving their wings in the tremendous heat given off by the jungle below," he recalls. "Hundreds of feet high up, vultures with their enormous wing span soared and soared with scarcely a flutter of their smallest feathers. I thought — well, this is it — why shouldn't I join them? I therefore wrote to Slingsbys and ordered the primary glider.

"A few months later it arrived by steamer alongside Madras docks. It was unloaded but it took several weeks to clear it, this being the first engineless aircraft ever imported. All the ports in India were consulted and eventually a duty of 5% was established."

But Hugo's difficulties were only starting. "The enormous wooden crate, 12 to 15ft long and several feet square, had to be loaded on to a rail truck and brought several hundred miles to the foot of the Ghats mountains. There I arranged for an Indian driver to load it on his 30cwt lorry. He had to manoeuvre it through about 6000ft round 12 hairpin bends.

"Its final destination was Ooty Golf Club of which I was a member. I really only joined to keep the glider there which made me most unpopular, especially as it stayed there in the garage long after I had left."

There were problems ahead. Hugo's "site" was only a short distance from the road but being very small and flat within a bowl, it was quite unsuitable for a beginner. Then there was the snag of rigging the glider. It was in six parts consisting of two halves of the main wing, the rear wing, rudder, fin and wooden fuselage with the addition of a plywood bucket seat, foot bar for the rudder and various cables. With the help of Dan, his young Indian car driver, plus a borrowed spirit level, the glider was eventually assembled. Fortunately Slingsbys' instructions were so clear they really could not go wrong.

"Our final problem," he recounts, "was how to get the primary down the hill and away from the eyes of the members of the golf club, most of whom were English. I wanted this to be an entirely Indian affair apart from myself and I was the man in charge, ignorant and inexperienced as I was. At that moment it never, never occurred to me that every movement, every decision made by the driver — and I place us in this order — and myself were to be the very foundation of the future gliding movement in this Eastern country."

Twelve local hill men, returning from selling buffalo milk in the bazaar, were enlisted as the bungy crew. Hugo continues — "I took up my position in the bucket seat and fastened the harness. This was the first time I had been alone in an aircraft and I felt very lonely and with no protection in front of me, only my legs and the rudder bar. Even the main wing was well above and behind me.

Feel of the stick

"The breeze was just enough to let Dan take his hands off the wingtip and enable me to get the feel of the stick and ailerons should the wing drop one side or the other. It was not possible to practise the effects of the elevator at ground level.

"It was a lovely blue sky day up in those great mountains but I was already sweating, especially my right hand on the stick on which life and death depended.

"I skidded across the grass, the stick gradually being raised and then down again. I had achieved three to four feet in this rare Indian air, all I wanted for the first time."

Hugo remembers feeling more confident on the second attempt and he raised the Indian altitude record to some ten feet!!

Talking of vultures, he recalls a sad story of one which committed "Harikari" when it soared into the landing wires of his enormous Vickers Valentia biplane during the war in Burma, causing Hugo to make a forced landing not far from the Japanese lines.

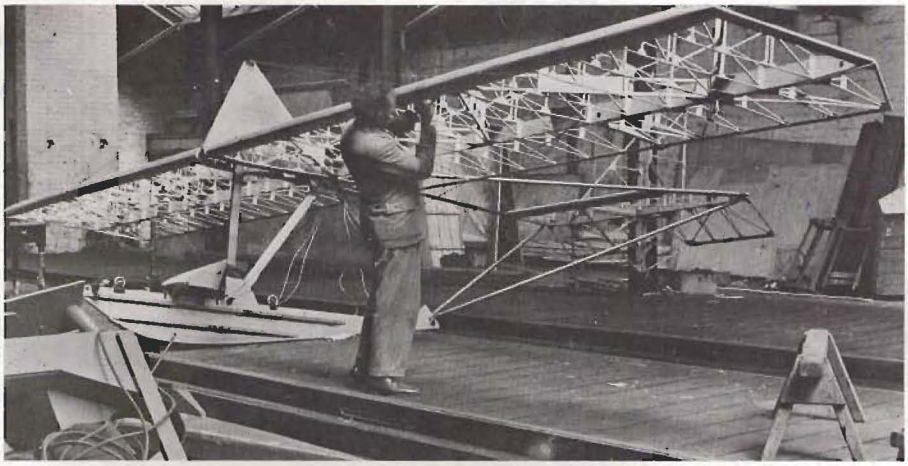
"Now to my third flight," he writes. "For some reason my friends managed a much better thrust along the grass which was encouraging and up I went, clearly making more height than on the previous flights. But, all of a sudden there was complete silence and no rush of air and — to use my own term for stalling — I ran out of air. Down I plunged at a 45° angle. Within seconds there was a loud crunch and my back became excruciatingly painful. The seat had broken away, even the harness bolts had parted and the port main wing was dangling. I reckon I had got up to about 12ft, which was much too ambitious in those days in a primary on a third solo.

Able to stagger away

"It is often said in flying circles that any landing one can walk away from is a good one. I had obviously made a terrible one and was only just able to stagger away with a bent back. The machine was only designed for ground hops so that an *ab-initio* could get the feel of the air not many feet up. Unlike the modern sailplanes there were no instruments in front of me, only the bearded Todas (natives) in a vic formation, the grass, the hills and the blue sky ahead. Neither an altimeter nor a variometer would have functioned in such a low flight but if only I had had a speedometer I might not have stalled and pranged.

"In my ignorance of flight, even if I had got sufficient height, done a steep right hand turn and aimed down the turbulent mountain, which was really my ambition, amongst the butterflies and smiling vultures above me, it is doubtful whether I would have landed down in the plains intact. It would have been suicidal. That 'prang' no doubt saved my life."

Hugo described clearing up the mess and packing the glider away in the crate. "As I replaced the last screw I was determined this was not to be her coffin and, for once, I was to prove myself right. Eventually she became the very foundation of all gliders in India. I hope she will be remembered for ever. I still have her BGA number plate — G207 and today, 45 years later, there are almost 3000 registrations.



The first glider to be built in India. It was an exact copy of G207.

"G207 was to resume her working life as a prototype for gliders made in an Indian billiard table factory during the war. I should mention that in December 1931 a motor assisted Planette No. 3 was shipped out to India but my primary was the first man-launched glider to become airborne out there."

Hugo returned to England in 1937 and went solo in a Tiger Moth after 6hrs 55min dual, five minutes longer than Douglas Bader, but on being posted to Poona his interest in gliding was reborn. He decided the best move would be to find a suitable site and this he did at Chatushringi Hill, 2365ft asl and 300ft higher than the surrounding paddy fields with a Hindu temple in the middle of its bowl. It is now one of the leading gliding centres.

After starting the production of the primaries, founding the Indian Gliding Association and introducing gliding to countless Indians, Hugo left to join the RAF in India and Burma when he did some parachuting. But he came back to gliding 32 years later when he joined the Dunkeswell GC and went solo at the age of 65, gaining his C certificate on his third flight. He continued gliding for another eight years.

Bird Strikes: The CAA has published an analysis of bird strikes reported in 1980 by UK airlines which shows the downward trend recorded since 1977 continues. There were 400 bird strikes to fixed-wing aircraft and seven to helicopters, which was 3.5 strikes per 10 000 movements. In nearly half the cases where damage was concerned the species of the bird was not identified but it was gulls (46%) and lapwings (23%) which were most vulnerable.

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LOOK BEFORE YOU LAND



Brian Spreckley

Most of the fisherman's tales in gliding are related to out landings or narrowly escaping them. It is an opportunity for pilots to indulge in a little exaggeration and to massage their ego with not too much fear of contradiction from their fellow pilots, however sceptical the latter may be. Listen in the bar on any competition day which resulted in a lot of out landings, and I guarantee the selection heights will get lower and lower with each telling, the fields smaller and the bulls bigger as the beer flows.

If it were not for my own experience of out landings I might even start to believe some of these entertaining and truly amazing stories we are all guilty of telling from time to time. But every now and again one of the pilots comes in and relates the story of his crash; this is usually a much more sober story delivered mostly in a humble manner with occasionally some attempt to justify his actions. It is only then that you realise that there may be more than just a grain of truth in the tales and dramas.

Don't rely on luck

It is just possible that the other chaps have been lucky to get away with it and possibly landing out is much more dangerous than we believe. Luck can be a significant factor in any field landing, both good and bad, but it should not play a part in the basic safety of the exercise and will only do so when the pilot relies on it. It is plainly trusting to luck if you fly down to 500ft agl before assessing the available fields. Will you return to say "I was lucky" or "I was really unlucky, there was only this one field that was a bit small and had power wires . . ."

If field selection is undertaken at a reasonable height and in a logical way there should never be any need to land in anything other than a satisfactory field except in extreme circumstances. Whenever a glider lands in a field that is unsuitable it is the pilot's field selection that is at fault and not bad luck; by unsuitable, I refer to standing crop, too small, sloping steeply downhill etc. It is possible to run into unseen objects in a field or have a tractor drive out in front of you. That may be bad luck but it is rare by comparison to the accidents and dramas that occur each year with pilots landing in unsuitable fields.

Field selection starts before you even take-off. An experienced pilot will have a good idea of the best type of fields for the time of year and will be prepared to assess the availability of them if conditions deteriorate. The less experienced pilot must be aware of the types of field preferred in the area, again taking into account the season.

Before flying it is wise to look at the fields locally, check their colours and establish the shades of the surfaces you are looking for. This changes a little between flat and hilly countryside but mostly with the change in season. If you feel it is difficult to distinguish one surface from another, which may be the case at certain times of the year, then you must be more cautious.

The height at which selection of your field will start will be influenced by this factor. In mid to late July it can be very difficult to differentiate between crop, pasture and hay fields, whereas in late August, when suitable fields are plentiful, it is possible to continue concentrating on soaring for longer, confident that it should not be difficult to find a good field.

There is rarely a clear cut-off point which indicates the obvious time to start thinking of landing. Occasionally one is gliding out into a sky that promises no lift and then it is obvious you should not continue if there are no good fields ahead. The decision as to which field and circuit etc can be made without any other pressure, like trying to stay up. This is the easiest type of field landing and as long as you do not leave the actual selection too late, there should not be any difficulty.

The drama usually results from trying or believing you should try to soar at a height and in a situation where you should be sorting out a landing. A typical situation is to be heading for a likely cloud and thinking if it doesn't work I shall land somewhere underneath it. Arriving under the cloud you find a scrappy bit of lift and decide to turn, the result being sink and more height loss. Now, do you go on and look for the lift or should you land? It seems a shame not to use it but you start to worry about your height and look out to see if there is a suitable field. From that moment on, you are in trouble unless you are very experienced (more than 25 actual successful field landings). Trying to find the lift whilst thinking about landing is very difficult, trying to pick a field whilst attempting to centre is stupid.

Land if unsure

It is at this point where you need to use your common sense and airmanship. If you feel at all unsure make the decision to land. Commit yourself and relax. Once the decision is made, follow the steps covered below:

1. Look at fields of the correct colour for the time of the year.
2. If the largest of them is satisfactory, look no further and organise your landing.
3. If the largest is not satisfactory, look at the next largest and so on.
4. If none of the fields are large enough or satisfactory, look for the next colour preference and repeat from 1.

Do not limit yourself to the fields immediately below. Look around, particularly downwind, as you can cover more area than you would at first imagine.

For most of the summer over the majority of England the choice is usually obvious and a good field almost invariably stands out, but there are areas where they are few and far between and one has to know and recognise these and avoid getting into them low down.

It is a mistake to try and select your field too early as you do not always get a good idea of the surface condition until you are around 1000ft. Provided that

there are fields ahead of the right colour and size it is reasonable to leave actual selection until 1500ft or sometimes even lower.

It is imperative to know the wind direction at the surface as this has a significant bearing on the available fields and when there are several possible fields, it is usually the wind direction that determines which is the best.

It is not possible to cover all the other considerations here as they are many and will vary according to your experience, but a complete field landing briefing can be obtained from the BGA in the publication titled "Cross Country Soaring". The booklet covers most aspects of cross-country flying from the beginning to competition flying, and a flight planning card is included by courtesy of the Avon Soaring Centre which also contains a pre-flight check list with an *aide memoire* to field landings on the reverse side. Whether you are an experienced or novice cross-country pilot, the booklet and card is an essential part of your equipment.

Finally if you have any doubts about field surfaces or landing out in general, the best way to overcome them is by talking to experienced cross-country pilots within your own club, making due allowance for the fisherman's tales.

1983 World Gliding Championships

MIKE POPE, British team manager

Having worked as deputy team manager and treasurer for the last World Championships I fully understand the duties and responsibilities to be undertaken as manager. The objective is simple: to win one or more of the World Championships Classes. The 1981 British team achieved the best overall results ever and to better them in 1983 will be hard. George Lee, having won the Open Class three consecutive times, can now relax and win his fourth title! But who in our team will win in the other Classes? By this time next year we will know.

The 16 pilots for the British Team Squad are: John Delafield, Ralph Jones, Dave Watt, Chris Rollings, John Cardiff, Andrew Davis, Bernard Fitchett, Chris Garton, John Glossop, Alistair Kay, George Lee, Ted Lysakowski, Brian Spreckley, Martyn Wells, Steve White and Justin Wills. The selection for the team for Argentina will be made from the squad in September, although the 1982 British Champions will also be eligible if they are not already in the squad.

During a World Championship there is an enormous amount of work to be undertaken by a team manager. At Paderborn many of the teams had two executives, a captain responsible for policy decisions of the team and liaison between the team and the World Championships organisation and a manager, responsible for the team administration.

Our team will be run on this basis in Argentina with Mike Carlton working as captain. If we win I take the glory and if we fail it will be his fault!

The greatest problem I have encountered, to date, is the matter of communication with the general organising committee. "Gaggle" bulletins are issued but they take time to arrive (sea mail takes one month!).

Sluggish communications

We had hoped to enter a team in the International Championships this January. In September I applied for suitable gliders to hire for the event but despite various telegrams sent to seek information I finally received a cable on Christmas Eve offering two Std Jantars. The information obtained about the site is as follows.

The Championships will take place at an airfield named Adolfo Gonzales Chaves. The site is located approximately 450km south-west of Buenos Aires and 2.5km from the town of Chaves which has a population of 8000. There are two grass runways, one of 1700 and one of 1900m long.

The area has no air traffic restrictions and has been the site of two recent Regional contests and one Argentinian Nationals. An International contest was held this January as a practice run for the 1983 World event. All Argentinian speed records have been made in the contest area.

The site is located on the "Pampa Interserrana" (Pampa between ridges) which is a subregion of the Argentinian Pampa plains. The area lies between two areas of hills which run approximately north-west, south-east; the Sierras de la Ventana (highest peak Co Tres Picos, 1250m) about 120km due east and the Tandilia hills (highest peak Co. La Juanita, 500m) about 80km due east.

The Championships will be held from January 9 to 29 and, according to the meteorological date provided, temperatures can be expected to reach up to almost 40°C while the average rainfall for the month is between 70 and 100mm.

The entry fee for the 1983 contest has been set at US$3700 per pilot which includes two crew members and ¼ of the team manager. The fee includes air transport of members to Buenos Aires, maritime freight of gliders, car hire, maps, films, aerotows and petrol for retrieves. The cost of accommodation, food and car insurance is not included and this element of the budget is likely to be high. A reconnaissance trip will be arranged soon to establish the standard of accommodation available and the cost.

Training of the squad this year will involve members entering British Nationals and European Championships and it is hoped that the selected team will spend a week flying together in Spain during September.

Kitty, the team mascot, has spent a quiet winter in hibernation but will shortly spring into action!! Kitty Competitions are to be conducted from various clubs, by members of the squad, starting in mid-April. A full list of venues and dates will be sent to all clubs.

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AEOLIAN TONES

JULIAN WEST writes about lee wave harmonics

In a previous article, "Wave Interference" in the December issue of S&G, p256, I discussed the phenomenon of wave bars forming herringbone patterns. The satellite picture for June 16, 1981, printed with that article shows another intriguing feature, that of the wavelength varying discontinuously with the wind speed rather than continuously as might be expected.

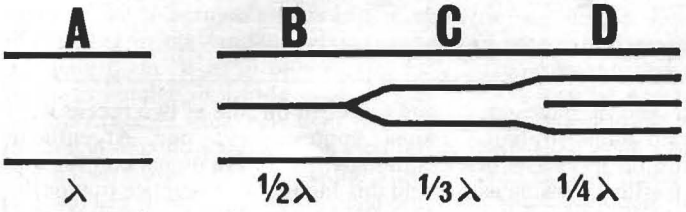


Fig 1 ***Wave bar spacings***

In the picture there are three distinct wavelengths which are illustrated diagrammatically in Fig 1 as B, C, D. The longest wavelength B occurs over Scotland and England, the smallest D over Southern Ireland, and a narrow band of an intermediate wavelength C occurs over Northern Ireland and Wales between the other two.

Measurements indicate that these wavelengths are related to each other by the ratio 1:1⅓:2. This ratio is very interesting because it indicates that these wavelengths form part of a harmonic series B, C, D having a fundamental wavelength A. Fig 1 also shows two observed patterns of the wave bars at the transition zone between different wavelengths.

If the bars are of herringbone form rather than straight, then their basic zig-zag lengths, which are directly proportional to the wavelengths, also vary in the same harmonic ratio as the corresponding wavelengths. These effects can be observed in the satellite picture for June 16, 1981.

Harmonics

If a string of finite length is set into transverse vibration it can only do so in certain distinct modes. The mode with the longest wavelength is called the fundamental, and modes with successively shorter wavelengths are called the 2nd, 3rd, 4th . . . harmonics. The fundamental and the next three harmonics of a string are shown in Fig 2. From this it can be seen that the ratio of the wavelengths of the 4th, 3rd and 2nd harmonics is also 1:1⅓:2.

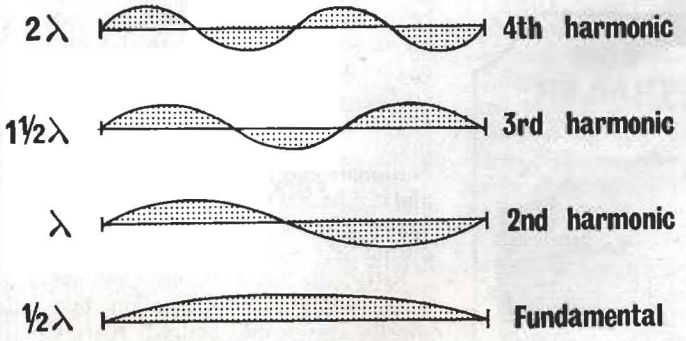


Fig 2 ***Harmonics of a vibrating string***

This does not imply that a vibrating string is analogous to a lee wave, but merely that they both share the same set of solutions to the wave equation. It is the boundary conditions which determine the set of solutions that are possible. In the case of a string it is the fixed ends that provide the boundary conditions.

Critical velocities

It seems that, like a vibrating string, an air mass capable of lee wave activity prefers to sustain waves having either a basic wavelength λ or one of its harmonics ½λ⅓λ, ¼λ. Which harmonic is excited is determined by the wind speed. Light winds produce high harmonics and strong winds produce low harmonics, or even the fundamental. For each harmonic there will be a range of wind speeds that are effective. The amplitude will vary reaching a maximum when the wind speed is in tune with the harmonic. There will also be a set of critical velocities above which one harmonic is excited and below which another higher harmonic occurs.

On June 16, 1981, the geostrophic wind speed varied across the UK (SW to NE) from 18 to 36kt. The wind speed in the area of the 3rd harmonic was between 25 and 30kt. Now assuming that the wavelength is directly proportional to the mean wind speed in an area covered by a given harmonic, this gives average wind speeds of 20, 27½ and 40kt for the 4th, 3rd and 2nd harmonics respectively.

The probable wind speed ranges for the various harmonics are thus:

4th — 15 to 25kt; 3rd — 25 to 30kt; 2nd — 30 to 50kt and fundamental — over 50kt.

The critical velocities are therefore 25kt, 30kt and 50kt. At a critical velocity only a small variation in wind speed will be sufficient to cause the wavelength to change dramatically.

Wave jumps

It is a transition between odd and even harmonics that is responsible for the sudden upwind jumps of wave bars that can occur. Change overs between even harmonics or between the fundamental and the 2nd harmonic will not result in a wave bar jump since certain bars would merely appear or disappear whilst the others remain in the same position.

Wave jumps can therefore only occur between the 2nd and 3rd or 3rd and 4th harmonics. Since the third harmonic occurs here over a wind speed range of only 5kt, it is possible that a double wave jump involving three different wavelengths corresponding to three harmonics could occur. Has this ever been observed?

Multiple wave systems

It is the very existence of harmonics that enable multiple wave systems to occur. In an air mass suitable for lee waves the wind velocity Vw usually increases steadily with height. It is therefore possible at a certain height for a critical velocity Vc to be reached and so above this level a lower harmonic will be excited while a higher harmonic occurs below.

This is why in a double wave system the upper system has the longer waves. These upper waves will be in phase with the lower ones at regular intervals. In the case of the 2nd harmonic and the fundamental, this occurs at every other peak of the lower system as shown in Fig 3.

Double wave systems are not uncommon and can explain some of the odd effects pilots experience when flying in wave.

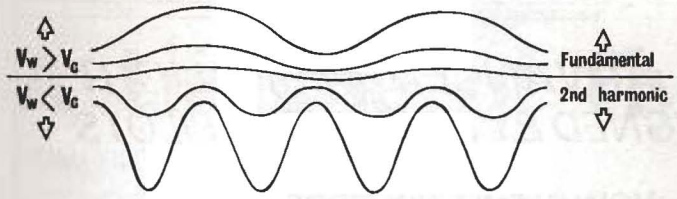


Fig 3 ***Double wave system***

When transiting the nodal surface between upper and lower systems the rate of climb can be very low and mild "cobblestone" turbulence may be experienced. Since odd harmonics occur over only a narrow wind speed band they usually have only a shallow depth and give lower climb rates than even harmonics which have a wide speed band and a much greater depth.

In the case of the 2nd harmonic occurring above the 3rd harmonic, the wind may be quite strong but the wave gives only moderate lift and is confined to a low level (6000ft). Some pilots then break through and get good climb rates to a high level (24 000ft). Since only one in three peaks in the lower system are in phase with the upper system, and the wave seems to be going only to a low level, some pilots may miss out.

In the case of the 3rd harmonic occurring above the 4th harmonic the wind may be quite light yet good climb rates are achieved to a moderate level (12 000ft). As only one in four waves in the lower system are in phase with the upper system, only one or two pilots break through and climb more slowly to a medium level (18 000ft). The lucky pilot might even be one who quite illogically drops a bar downwind instead of pushing for the "primary" like everyone else.

This is why Diamond heights can seem to be a matter of luck more than anything else. If there are no problems then you are probably flying in the fundamental or possibly the 2nd harmonic.

It has been reported that an upper wave system can lie at an angle to a lower wave system. Any herringbone pattern in the lower system will be repeated in the upper system if possible but with a longer wavelength and a longer basic zig-zag length. This is the case of the fundamental and the first harmonic and, provided the herringbone pattern in the lower system has a zig-zag pattern of double basic lengths, the upper system will comprise every other line of zig-zags.

If the transition between an upper and a lower system is made at the apex of an invisible herringbone pattern, it is possible for a pilot to make his beats on opposite sides of the apex in the upper and lower systems. The upper system can then appear to be at an angle to the lower system although this is not the case. An extreme example of this situation is shown in Fig 4.



Fig 4 ***Change in beat orientation between upper and lower systems***

Fundamentals

In the above discussion it has been assumed implicitly that the fundamental wavelength (8nm) for June 16, 1981, is typical of a good wave day and this is probably true. However the fundamental wavelength can vary considerably from air mass to air mass. For example measurements made on the satellite picture for January 8, 1981, reveal five distinct wavelengths corresponding to the 3rd, 4th, 5th, 6th and 7th harmonics of a 24nm fundamental.

When the fundamental wavelength is as long as this then the lowest harmonics can only be excited at high levels if at all, since exceptionally high wind speeds are needed. The magnitude of the fundamental wavelength is a characteristic of the air mass and is independent of the wind speed.

Summary

Lee waves tend to occur with a fundamental wavelength or one of its harmonics. Which harmonic is excited is determined by the wind speed. The longer the fundamental wavelength the higher the harmonic that is excited by a given wind velocity. Even or low harmonics are excited over wider speed ranges than odd or high harmonics. Upwind jumps are caused by transitions between even and odd harmonics. Multiple wave systems can only occur if the wind speed increases with height sufficiently to exceed the critical velocity of the next higher harmonic.

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A Lifetime of Flying

HUMPHRY DIMOCK

In the days of long ago it was customary to send boys to boarding school at a very early age, in my case it was eight years one month old. Flying for me started immediately when I was given a kite to fly from the school playing fields. This was co-incidentally after a lecture by the governor based on Shakespeare's "Seven Ages of Man" in "As you like it". I remember so clearly watching my kite flying under lovely little white clouds thinking to myself "I will never be 40 years-old, no, never never be 40". Then I started making aeroplanes with rubber driven propellers, and one day flying one in canard fashion driven by two contra-rotating pusher propellers. The headmaster was so impressed that he bought me a lovely box kite which lasted several years.

Specially built plane

Later in life while learning to fly a Moth from Cambridge I decided to buy a modern monoplane. There were only two types available, a Klemm Swallow and a Miles Hawk. The Klemm people boasted that their Swallow would not stall or spin. When I held the nose up at 45ft to test it, the stick was slammed forwards out of my hand. The demonstrator explained that the aeroplane might have done a tail slide and broken off the ailerons!! A week later I flew the Miles Hawk, and asked Mr Miles what would happen if his Hawk were to do a vertical tail-slide. His reply was "If you would really like to know, come along and we'll do it". So I had a Miles Hawk, specially built as a three-seater, in which I could carry my wife and a friend plus my two boys. It cost me £550, and a field to fly from cost me £10pa.

First glider flight

Then I bought more aeroplanes and shared a field at Caxton Gibbett with the Cambridge University GC. They had a primary launched from a drum on the jacked up wheel of the rear axle. There I had my first glider flight, unknown height or speed because of no instruments.

After the war I was made an instructor in the ATC and also instructed at the club started in 1946 which subsequently became the Portsmouth Naval GC. Due to winching trouble the only method of launching for the whole of one season was by autolaunching by my own motor car.

In 1959 I bought a share in a Sky syndicate and this started me off in gliding competitions, which I have loved ever since.



Humphry photographed at Gap-Tallard with "Pic de Bure" in the background, the 9000ft asl mountain he has soared on many occasions.

In 1961 in a Skylark 3F I won the Camphill Competitions by 5pts in about 500pts over Mike Bird. The next year I was leading again but on the last day Mike Bird won by one point. I was furious, and thereafter was very cross when other pilots won more races than myself.

The great excitement of my gliding life has always been the French Mountain Gliding Competitions. On my first day I asked Jean Pierre Cartry, one of France's leading pilots, for advice on which mountains to fly. Amazingly I won the competition. The second day I asked Jean Pierre for more instruction. His reply, translated from George Bernard Shaw was "Not Pygmalion likely" you find your own way round in the future. This was in a 17 metre Dart which Slingsbys' built to my specification to be the best in the world. Then the Swiss produced the 18 metre Diamant, around 28% more efficient. In this I won the French Open Class of the Mountain Competitions.

Thereafter younger pilots seemed to learn new techniques more quickly than I, and gradually after passing my 70th birthday I found my name in the competition results nearer the bottom than the top. Nevertheless two or three competitions a year in England and France became the norm. Now however at last I have to cease being the owner of a glider, due to the pressures of the present recession, as well as my age with its attendant disabilities. So my beautiful glider, the Carbon Mini Nimbus must be sold. For years I have used sun cells to charge the battery while flying, and this has saved many hours of battery maintenance. In this I was the first in the world to do so.

Back in 1962 I developed wingtip sensors using thermistors so that I knew which way to turn on suspecting a thermal. This was only partially successful because of the difficulty of getting matched thermistors to a fine degree. The thermistors were very temperature conscious and the meter had to be re-set continually. Later that year I had the idea of using thermocouples, which are not mismatched by changing temperature. This system shows great promise, but requires more research.

Mountain flying

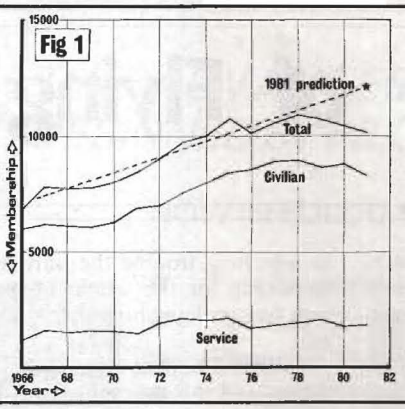
In June-July last year, flying for enjoyment from a French aerodrome called Gap-Tallard in the centre of many ranges of mountains I had the exhilarating experience of meeting an exuberant thermal at 6000ft which lifted me up to 12 000ft in around three minutes. It was extremely turbulent and at 12 000ft it seemed that it exploded into cloud all round, above and below, in what had been blue sky a few moments earlier. From here I flew at 90kt to a wave cloud, and remained at 12 000ft for over 100 miles. In the past 14 years I have had this wonderful experience only twice before, and each time it enabled me to win the day's competition.

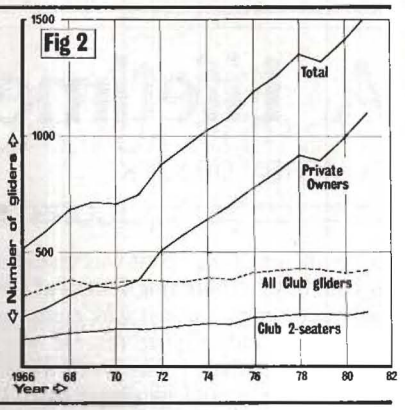
Flying in England cannot offer even a small proportion of the scenic delights of the French mountain flying. If anybody would care to come and see my photograph albums I should be delighted to show many aspects of this wonderful sport.

Please send all editorial contributions to 281 Queen Edith's Way, Cambridge CB1 4NH, and not to the BGA office.

WHERE IS GLIDING GOING?

BILL SCULL, BGA director of operations





Some years ago I decided to plot graphs of the information in the annual statistics with a view, at the time (1976), of predicting gliding's growth in the next five years. Now those predictions can be looked at with hindsight and, perhaps, further predictions made.

Club membership

The increase from the mid-sixties until 1978 was steady at approximately 340 new members a year; the prediction in 1976 for 1981 was 12 000 members — the reality 10 200! (see Fig 1). On the basis of the graph no one could now make a prediction for the years to come except perhaps a further decline. It is not really possible to decide what has caused this downward trend although one could speculate about the effects of the recession. A better idea of the movement's trends might be given by the number of gliders on the register.

The number of gliders

My 1976 prediction for 1981 was a total of 1480-1500; the actual figure is 1520. Virtually all the increase in the ten years 1971 to 1981 has been in privately owned gliders — the number of club gliders increasing from 380 to 425. A closer look at the composition of the club fleets in that same period reveals that all the increase has been in the number of two-seaters:

	1971	1981
Civilian club two-seaters	118	169
Service club two-seaters	42	53
Total	160	222

Effectively the increase in the number of two-seaters has been at the rate of five a year (civilian) and one a year (Service). For the single-seaters the figures are:

	1971	1981
Civilian Clubs	140	149
Service clubs	80	63
Total	220	212

Contrast this with the growth in private ownership (Service and civilian) from 375 in 1971 to 1095 in 1981 — a rate of approximately 75 gliders a year! The increase in the number of gliders is given in Fig 2.

Further analysis regarding the number of people flying in club or private gliders must be, in some degree, speculative.

Pilots per glider

If, for the sake of argument, we assume four members for each private syndicate then the following figures give some idea of the distribution:

Year	Members			Club gliders	Members/ glider
	Total	POs	Remainder		
1971	8400	1500	6900	390	17.7
1981	10200	4500	5700	425	13.4

This might suggest an improving lot for the club member except that one would need to know the numbers flying dual and solo — not figures that are available from the annual statistics but which might be in club files. Has anyone worked it out at your club?

Here, of course, we should be concerned with the quality of gliding rather than the quantity; so far it's been a case of "never mind the quality — feel the width."

Quality of flying (and utilisation of gliders)

The enthusiast will probably measure the quality in kilometres flown — the least accurate of our statistics. However, the following table shows a steady improvement in some respects:

Year	1966	1971	1976	1981
Av flight duration	10.9	14.4	18.6	24.1
Launches/member	40.3	40.2	42.2	39.1
Hours/member	7.3	9.7	13.1	15.6
Kilometres/member	39.4	17.9	70.3	77.3
Launches/glider	525	448	366	244
Hours/glider	95.3	107.6	113.4	98.0
Kilometres/glider	288	199	610	482

For the average member there has been a marked improvement in the number of hours flown for a similar number of launches in each of the four years in the table. The average glider achieves a similar number of hours for half the number of launches it did ten or fifteen years ago — only a sign, perhaps, of more emphasis on soaring and more aerotowing (compare 49 tugs in 1971 with 104 in 1981).

No more refined an analysis is possible because we do not know how many launches are by aerotow and other means.

What does all this data reveal? The answer may be "not very much" except that one fact stands out — the growth of private ownership which brings one back to the quality and convenience of flying.

The decline in the growth of the sport may be of no consequence at all except, as felt subjectively, that it's not as healthy as it was. Clearly such statements can be refuted locally if your club is doing better than ever but my impression, and that of the national coaches, confirms this lack of health and attributes it to

a number of factors broadly related to club management — not so much practically as philosophically. What is required is a new awareness of where gliding is going and steer it at club and national level in the best direction.

The factors in the background which have determined our direction up to now, and which may continue to do so are:

1. That for many years the demand for gliding has exceeded the supply (the filter being the frustration of pursuing the sport in its early stages).
2. That private ownership has offered (and continues to do so) the best quality and opportunity of soaring — the trend in this direction seems likely to continue.

Growth potential is, however, limited by the capacity/frustration element and the number of private gliders that can be launched in a reasonable period. The last three years or so have shown a change in regard to (1) above; there is now a surplus of launches at times of day when it is not soarable and these launches could be used by people learning to glide. There may be no alternative if continued growth is a criterion and there is a limit to the number of clubs and their size; in this respect the following figures are interesting:

Year	1966	1971	1976	1981
No. of sites	64	77	90	88
No. of members	6831	7830	9571	10182
Members/site	107	102	106	116

The figures indicate that virtually all the growth has been due to the increase in the number of clubs — the average membership per site being similar in the first three of the sample years; only lately has the membership (per club) increased and the number of clubs reduced. The balance of membership between club and private is shown by the following:

Year	1966	1971	1976	1981
No. of sites	64	77	90	88
No. of club gliders*	302	380	410	425
Club gliders/site	4.7	4.9	4.6	4.8
No. of private gliders	222	375	764	1095
PO gliders/site	3.5	4.9	8.5	12.4

Service and civilian clubs

Looking at the civilian clubs alone the picture is slightly different:

Civilian sites	48	59	73	75
Club two-seaters	96	118	172	169
Two-seaters/site	2.0	2.0	2.4	2.3
Club single-seaters	117	140	130	140
Single-seaters/site	2.4	2.4	1.8	1.9
Club gliders	213	258	302	309
Club gliders/site	4.4	4.4	4.1	4.1
No. of private gliders	217	371	729	1013
PO gliders/site	4.5	6.3	10.0	13.5

All of these figures show a no-growth or slight decline in club activity. With changing emphasis to soaring and private ownership the capacity for expansion in gliding only lies in improved utilisation of the club facility since the number of sites seems unlikely to increase and the launching capacity at soaring times is already stretched. So with under-utilised launching facilities at off-peak times the subsidy from training to the overall operating costs is reduced and a rising prices/diminishing return spiral ensues. The only way out appears to be the stimulation of growth and those clubs which have taken a positive approach to recruitment are, generally, in a better financial state than those that haven't.

In club management terms recent years have shown an "if-you-don't-know-where-you're-going-all-roads-lead-there" syndrome but a bit more analysis of the information available might suggest a new sense of direction. Certainly if a healthy (and financially viable) club depends on growth then a recruitment campaign is called for. It may also be appropriate, if club flying really does subsidise the overall operation, that a limit to the number of private owners has to be set — some clubs have and seem to be better for it!

At national and regional levels the only influence can be the generation of more clubs but, since this is a spontaneous phenomenon, it cannot be controlled and improved site security for existing clubs is the answer. In this respect it seems that the secure clubs are the ones that grow although the limited growth potential of the hill sites is evident.

All these factors, of course, come back to good club management and a policy for survival or development. Can your club look forward to the day when it buys its own site as the Cotswold and Ouse GCs have done this last year or is it a battle for survival?

Make Insurance problems just plane sailing . . .



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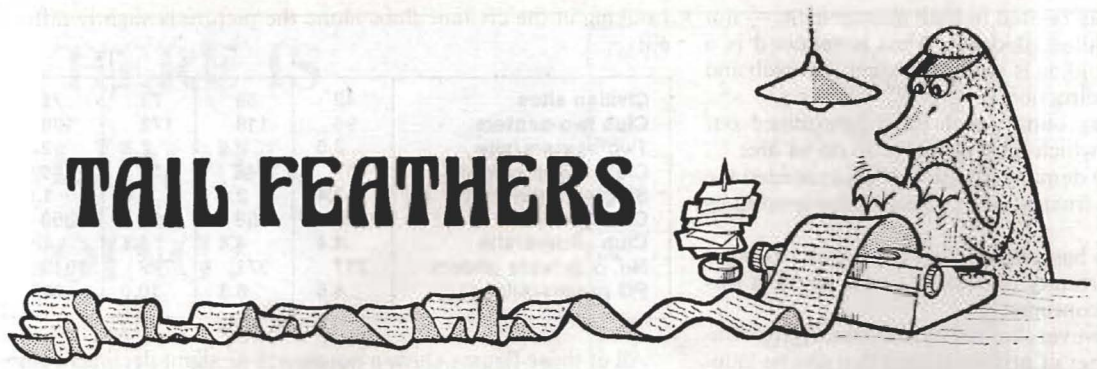
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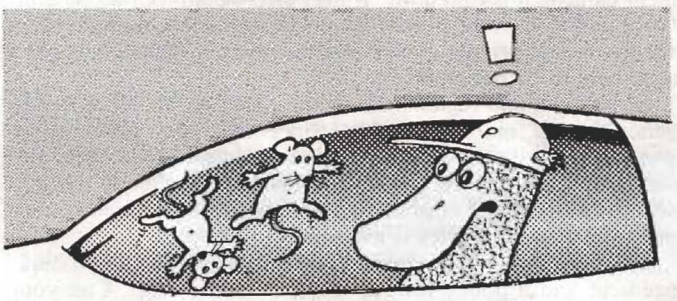
TAIL FEATHERS



by PLATYPUS

OF MICE AND PLATYPI

Last Saturday, during the haphazard poking about that I call doing a C of A, I found a mouse in the Caproni. *(Waiter, there's a mouse in my Caproni, call the manager!)* That's nonsense for starters, of course. First, I saw no mouse, just a wee nest made from chewed-up quarter-mill maps and Opal Fruit wrappers. Second, it's well known that there's no such thing as *a* mouse in the house — if there's one there are at least a dozen. A whole tribe, scampering from tip to root, from rudder-post to rudder-pedals. Breeding all over the place. Not only parturating, but masticating. Not to mention micturating and all the rest. It's the masticating that really bothers me at present. (Though I'm not too keen on the thought that a small amount of zero *g* while I am dolphining might be all that is required to suspend a troupe of



Furry creatures in front of my eyes.

furry creatures weightless and slowly revolving in front of my unbelieving eyes, not to mention the effects on any female passengers.)

No, as I say, it's the masticating. Having succeeded in getting the radio to receive for the first time in years, by a process of trial and error using an Avometer (he's just not a pretty face, you know) I could not get the thing to transmit. Then I noticed that a great bite — or hundreds of little bites, I prefer to think — had been taken out of the spiral plastic microphone cord, right through the covering, wires and all. It was practically severed. Why Jaws, or whatever his name is, gave up at this point I don't know. I'm only glad that it isn't a wooden glider . . .

After the mice, the rabbits or, citizens banned

Talking about radios, you all know of course that Platypus's first law of radio warfare states: *The length of a radio message is inversely proportionate to its importance.* Thus a revered late chairman of the BGA (I'm using *late* in the British sense to mean *ex-*, not in the American sense which is rather more final) wished to convey this message last year while soaring — or in the case in question failing to soar — in the Alps "I am in a spin or spiral dive from which I cannot recover, I have lost 4000ft, the aircraft appears to be breaking up, I cannot bale out because of the *g* forces and I am in rather pressing need of some practical advice on what to do next." All he said, with commendable economy was "HELP!!" which brought advisers sprinting to the groundset, especially his partners — or as the French call them, *co-propriétaires*, which rather better expresses their material interest.



Advisers with the groundset.

By extreme contrast, this is the sort of thing you hear, usually in the middle of a very busy comp:

Cabbage White Base from Cabbage White, do you receive?

Silence. Well not *silence*, there's a comp on. But silence from CWB.

Cabbage White Base from Cabbage White etc, etc, repeatedly. The fool goes on like this for ages, without thinking of transmitting his vital message — if he has one — blind. It hasn't occurred to him that either (a) CWB isn't listening or can't receive (in which case why say anything at all?) or (b) CWB is receiving OK but has poor transmission on his groundset so the pilot can't hear the reply. But the silly berk still goes on trying to get a response from CWB *before* sending his message.

Ah, at last — CWB has come back from the bar. Now civilised conversation, intellectual intercourse and wit, badinage and repartee can coruscate across the ether to the edification of all the rest of us — whether we want it or not.



"Been fixing the trailer . . ."

That you, Ron?

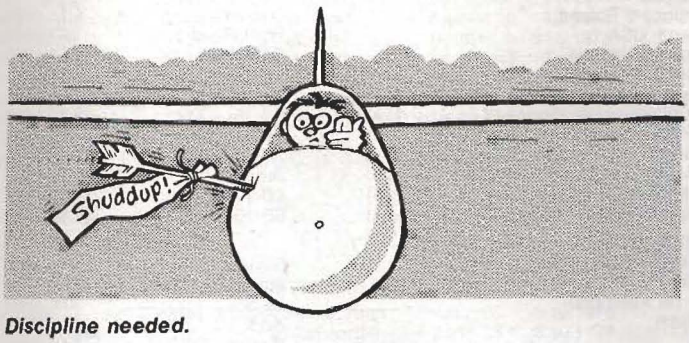
Where've you been?

I've been fixing the trailer (liar) *It's got a duff bearing, I think.*

(Long description of this real or imagined crisis)

Well, I'm over a little village with a church with a spire, can you find it on the map? It's got a pond to the south-east, no sorry, the south-west, etc, etc.

This description of precisely where Cabbage White is goes on for ages, and since his finger hardly ever comes off the button he can't hear people bellowing: "Shaddup! Can it! Pipe Down! Belt up! Can't you hear there's a comp on? etc, etc." (CW isn't in the comp, of course. Comp pilots aren't gods, but they do deserve a small share of the action. The better they are the smaller the share they want.) Even if he heard them he'd only



Discipline needed.

think what a selfish, uncouth and callous crowd, with him lost and no one to assist him with the nav. The punchline is when you hear, willy-nilly, as the cut and thrust of CW and CWB's dialogue crackles merrily along, that CW is at 4000ft and is only local soaring anyway. Our collective fury knows no bounds.

When I was flying at Hahnweide in 1975 someone made a joke on the radio (at least I think it was a joke, my German not being up to much, but there was a lot of Hoch-Hoching and general bierkeller bonhomie) and instantly there boomed out from the contest direktor *"Achtung! Funkdisciplin!"* which nipped all that Bavarian jollity right in the bud. Quite correct too. What we need is some *FUNKDISCIPLIN* in this crowded little Isle.

A Curse

To those who heed not, I pronounce with bell, book and candle: May a pox, a murrain and a hundred assorted other plagues smite your rotten radio. May mice devour your microphone and rats your co-ax. May the Lord flatten your battery. May foul growths form on your terminals. May you always receive "Rigoletto" on Radio 3 when you want your crew in an emergency. May you get laryngitis, streptococcal throat and inflamed tonsils. May you be compelled to write out a thousand times — nay, a million times — SILENCE IS GOLDEN

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INTERNATIONAL GLIDING RECORDS (Correct as at 9.3.1982)

SINGLE-SEATERS

Height Gain	12 894m	P. F. Bikle, USA	SGS 1-23E	25.2.1961
Absolute Altitude	14 102m	P. F. Bikle, USA	SGS 1-23E	25.2.1961
Straight Distance	1460.8km	H-W. Grosse, W. Germany	ASW-12	25.4.1972
Goal Distance	1254.26km	B. L. Drake, D. N. Speight, S. H. Georgeson, New Zealand	Nimbus 2	14.1.1987
Goal & Return Distance	1634.7km	K. H. Striedieck, USA	ASW-17	9.5.1977
Triangular Distance	1306.85km	H-W. Grosse, W. Germany (in Australia)	ASW-17	4.1.1981
100km Triangle	165.35km/h	K. Briegleb, USA	Kestrel 17	18.7.1974
300km Triangle	158.67km/h	H-W. Grosse, W. Germany (in Australia)	ASW-17	24.12.1980
500km Triangle	151.28km/h	G. Eckle, W. Germany (in South Africa)	ASW-17	10.12.1979
750km Triangle*	144km/h	H-W. Grosse, W. Germany (in Australia)	ASW-17	6.1.1982
1000km Triangle	145.32km/h	H-W. Grosse, W. Germany (in Australia)	ASW-17	3.1.1979
1250km Triangle	133.24km/h	H-W. Grosse, W. Germany (in Australia)	ASW-17	9.12.1980

MULTI-SEATERS

Height Gain	11 680m	S. Josefczak and J. Tarczon, Poland	Bocian	5.11.1966
Absolute Altitude	13 489m	L. Edgar and H. Klieforth, USA	Pratt Read	19.3.1952
Straight Distance	970.4km	I. Renner and H. Geissler, Australia	Calif A-21	27.1.1975
Goal Distance	864.86km	Isabella Gorokhova and Z. Koslova, USSR	Blanik	3.6.1967
Goal & Return Distance	1000.88km	T. L. Knauff and R. Gannon, USA	Twin-Astir	28.9.1981
Triangular Distance	1112.62km	H-W. Grosse and H. Kohlmeyer, W. Germany (in Australia)	SB-10	28.12.1979
100km Triangle	147.19km/h	E. Mouat-Biggs and S. Murray, South Africa	Janus	21.11.1977
300km Triangle	140.48km/h	E. Müller and O. Schäffner, W. Germany (in Australia)	Janus	30.11.1979
500km Triangle	140.06km/h	E. Mouat-Biggs and S. Murray, South Africa	Janus	17.11.1977
750km Triangle	131.84km/h	H-W. Grosse and H. Kohlmeyer, W. Germany (in Australia)	SB-10	14.1.1980
1000km Triangle	129.54km/h	H-W. Grosse and H. Kohlmeyer, W. Germany (in Australia)	SB-10	21.12.1979

SINGLE-SEATERS (WOMEN)

Height Gain	9119m	Anne Burns, Gt Britain (in South Africa)	Skylark 3B	13.1.1961
Absolute Altitude	12 637m	Sabrina Jackintell, USA	Astir CS	14.2.1979
Straight Distance	949.7km	Karla Karel, Gt Britain (in Australia)	LS-3	20.1.1980
Goal Distance	731.6km	Tamara Zaiganova, USSR	A-15	29.7.1966
Goal & Return Distance	1127.68km	Doris Grove, USA	Nimbus 2	28.9.1981
Triangular Distance	814.01km	Karla Karel, Gt Britain (in Australia)	LS-3	9.1.1980
100km Triangle	139.45km/h	Susan Martin, Australia	LS-3	2.2.1979
300km Triangle	129.52km/h	Susan Martin, Australia	Ventus	8.2.1981
500km Triangle	133.14km/h	Susan Martin, Australia	LS-3	29.1.1979
750km Triangle	95.42km/h	Karla Karel, Gt Britain (in Australia)	LS-3	24.1.1979

MULTI-SEATERS (WOMEN)

Height Gain	8430m	Adela Dankowska and M. Mateliska, Poland	Bocian	17.10.1967
Absolute Altitude	10 809m	Mary Nurr and H. Duncan, USA	SGS 2-32	5.3.1975
Straight Distance	864.85km	Tatiana Pavlova and L. Filomechkina, USSR	Blanik	3.6.1967
Goal Distance	864.86km	Isabella Gorokhova and Z. Koslova, USSR	Blanik	3.6.1967
Goal & Return Distance	617.43km	Pelagia Majewska and V. Malcher, Poland	Halny	14.5.1980
100km Triangle	126.28km/h	Adela Dankowska and E. Grzelak, Poland	Halny	1.8.1978
300km Triangle	97.74km/h	Adeli Orsi and F. Bellengeri, Italy	Calif A-21	18.8.1974
500km Triangle*	93.7km/h	Adela Dankowska and S. Piatek, Poland	Halny	4.5.1980

BRITISH NATIONAL RECORDS (Correct as at 9.3.1982)

SINGLE-SEATERS

Height Gain	10 065m	D. Benton	Nimbus 2	18.4.1980
Absolute Altitude	11 500m	H. C. N. Goodhart (in USA)	SGS 1-23	12.5.1955
Straight Distance	949.7km	Karla Karel (in Australia)	LS-3	20.1.1980
Goal Distance	579.36km	H. C. N. Goodhart	Skylark 3	20.1.1980
Goal & Return Distance	1000.88km	W. E. Malpas (in USA)	Mini-Nimbus	28.9.1981
Triangular Distance	814.01km	Karla Karel (in Australia)	LS-3	9.1.1980
300km Goal and Return	141.3km/h	E. Pearson (in Rhodesia)	Nimbus 2	25.10.1975
500km Goal and Return	137.63km/h	B. J. G. Pearson (in South Africa)	Nimbus 2	18.12.79
100km Triangle	143.3km/h	E. P. Hodge (in Rhodesia)	Std Cirrus	30.12.1976
300km Triangle	146.8km/h	E. Pearson (in South Africa)	Nimbus 2	30.11.1976
500km Triangle	131.9km/h	E. Pearson (in Rhodesia)	Nimbus 2	5.11.1975
750km Triangle	109.8km/h	M. R. Carlton (in South Africa)	Kestrel 19	5.1.1975

MULTI-SEATERS

Height Gain	9836m	T. J. Wills and B. Igguiden (in New Zealand)	Twin Astir	13.1.1982
Absolute Height	10 607m	T. J. Wills and B. Igguiden (in New Zealand)	Twin Astir	13.1.1982
Straight Distance	472.43km	M. R. Carlton and M. French (in South Africa)	Calif A-21	18.12.1979
Goal Distance	472.43km	M. R. Carlton and M. French (in South Africa)	Calif A-21	18.12.1979
Goal & Return Distance	692.02km	M. R. Carlton and C. Greaves (in South Africa)	Calif A-21	23.12.1978
Triangular Distance	762.72km	C. M. Greaves and C. Simpson (in South Africa)	Janus	28.12.1977
300km Goal and Return	105.44km/h	M. R. Carlton and C. Greaves (in South Africa)	Calif A-21	19.12.1978
500km Goal and Return	113.08km/h	M. R. Carlton and C. Greaves (in South Africa)	Calif A-21	23.12.1978
100km Triangle	137.22km/h	M. R. Carlton and Leonie Lawson (in South Africa)	Calif A-21	27.12.1978
300km Triangle	112.59km/h	M. R. Carlton and C. Greaves (in South Africa)	Calif A-21	17.12.1979
500km Triangle	108km/h	M. R. Carlton and C. Greaves (in South Africa)	Calif A-21	21.12.1978
750km Triangle	104.01km/h	C. M. Greaves and C. Simpson (in South Africa)	Janus	28.12.1977

SINGLE-SEATERS (WOMEN)

Height Gain	9120m	Anne Burns (in South Africa)	Skylark 3B	13.1.1961
Absolute Altitude	10 550m	Anne Burns (in South Africa)	Skylark 3B	13.1.1961
Straight Distance	949.7km	Karla Karel (in Australia)	LS-3	20.1.1980
Goal Distance	528km	Ann Welsh (in Poland)	Jaskolka	20.6.1961
Goal & Return Distance	545km	Anne Burns (in South Africa)	Std Austria	6.1.1966
Triangular Distance	814.01km	Karla Karel (in Australia)	LS-3	9.1.1980
300km Goal and Return	107.5km/h	Karla Karel (in South Africa)	ASW-15B	1.1.1975
500km Goal and Return	102.6km/h	Karla Karel (in Rhodesia)	ASW-15B	16.10.1975
100km Triangle	110.8km/h	Karla Karel (in Rhodesia)	ASW-15B	2.11.1975
300km Triangle	125.87km/h	Karla Karel (in Australia)	LS-3	12.2.1980
500km Triangle	120.69km/h	Karla Karel (in Australia)	LS-3	20.2.1980
750km Triangle	95.42km/h	Karla Karel (in Australia)	LS-3	24.1.1979

UNITED KINGDOM RECORDS (Correct as at 9.3.1982)

SINGLE-SEATERS

Height Gain	10 065m	D. Benton	Nimbus 2	18.4.1980
Absolute Altitude	11 031m	D. Benton	Nimbus 2	18.4.1980
Straight Distance	718km	T. J. Wills	Std Libelle	1.8.1976
Goal Distance	579.36km	H. C. N. Goodhart	Skylark 3	10.5.1959
Goal & Return Distance	801.3km	C. Garton	Kestrel 19	22.7.1976
Triangular Distance	606km	C. Garton	Kestrel 19	10.6.1976
300km Goal & Return	106.4km/h	D. G. Lee	Kestrel 19	17.8.1975
500km Goal & Return	89.7km/h	C. Garton	Kestrel 19	22.7.1976
100km Triangle	114.2km/h	R. Jones	Nimbus 2	30.4.1974
200km Triangle	97km/h	R. Jones	Nimbus 2	30.6.1975
300km Triangle	105.45km/h	R. Jones	Nimbus 2	29.5.1974
400km Triangle	90km/h	D. G. Lee	Kestrel 19	19.5.1974
500km Triangle	106.9km/h	R. Jones	Nimbus 2	31.5.1975
600km Triangle	88.8km/h	C. Garton	Kestrel 19	10.6.1976
100km Goal	128.4km/h	K. A. Harrison	SHK	13.4.1969
200km Goal	114.3km/h	I. W. Strachan	Skylark 4	2.6.1963
300km Goal	132.8km/h	A. H. Warminger	Kestrel 19	24.4.1976
400km Goal	73.8km/h	T. J. Wills	Std Libelle	7.6.1976
500km Goal	90.7km/h	H. C. N. Goodhart	Skylark 3	10.5.1959

SINGLE-SEATERS (WOMEN)

Height Gain	7833m	Alison Jordan	Astir CS	8.10.1978
Absolute Altitude	8701m	Alison Jordan	Astir CS	8.10.1978
Straight Distance	454km	Anne Burns	Skylark 3B	10.5.1959
Goal Distance	309km	Anne Burns	Skylark 3B	12.4.1958
Goal & Return Distance	303km	Angela Smith	K-6E	14.8.1970
300km Goal & Return	60km/h	Anne Burns	Nimbus 2	25.7.1975
100km Triangle	80km/h	Anne Burns	Cirrus	14.6.1970
200km Triangle	69.3km/h	Anne Burns	Std Austria	22.8.1964
300km Triangle	76.8km/h	Jane Randle	Kestrel 19	18.8.1976
400km Triangle	60.6km/h	Anne Burns	SHK	5.8.1967
500km Triangle	76.1km/h	Anne Bums	Nimbus 2	31.5.1975
100km Goal	83km/h	Rika Harwood	Olympia 2B	27.5.1957
200km Goal	85.5km/h	Anne Burns	Olympia 419	2.6.1963
300km Goal	63.9km/h	Anne Burns	Skylark 3B	12.4.1958

MULTI-SEATERS

Height Gain	6740m	J. R. Monteith (USA) and M. Mahon	Capstan	2.11.1972
Absolute Altitude	7650m	J. R. Monteith (USA) and M. Mahon	Capstan	2.11.1972
Straight Distance	421.5km	J. S. Fielden and Valerie Fielden	Bergfalke 3	14.8.1970
Goal Distance	421.5km	J. S. Fielden and Valerie Fielden	Bergfalke 3	14.8.1970
Goal & Return Distance	407.3km	J. S. Williamson and C. Buchanan	Twin Astir	24.8.1980
300km Goal & Return	81.91km/h	J. R. Jeffries and N. Foster	Calif A-21	17.8.1975
100km Triangle	83.5km/h	J. R. Jeffries and G. Love	Calif A-21	22.4.1974
200km Triangle	72.8km/h	J. R. Jeffries and A. Kirtly	Calif A-21	5.8.1974
300km Triangle	85.87km/h	B. Fitchett and A. Miller	Janus	9.5.1979
400km Triangle	68.4km/h	J. R. Jeffries and G. Love	Calif A-21	7.5.1974
500km Triangle	88.4km/h	J. R. Jeffries and Gillian Case	Calif A-21	31.5.1975
100km Goal	96.5km/h	D. B. James and K. O'Riley	Gull 2	27.5.1957
200km Goal	77.8km/h	B. J. Willson and H. Daniels	Blanik	11.7.1970
300km Goal	69.2km/h	W. A. H. Kahn and J. Williamson	Eagle	12.4.1958

RESTRICTED CLASS

Straight Distance	718km	T. J. Wills	Std Libelle	1.8.1976
100km Triangle	109.7km/h	D. S. Watt	Std Jantar	16.8.1976
200km Triangle	92.2km/h	A. J. Stone	Std Cirrus	16.8.1976
400km Triangle	91.7km/h	S. J. Redman	Std Cirrus	31.5.1975
300km Goal	131.1km/h	T. J. Wills	Std Libelle	24.4.1976
400km Goal	73.8km/h	T. J. Wills	Std Libelle	7.6.1976

15m CLASS

200km Triangle	93.49km/h	B. T. Spreckley	ASW-20	14.7.1979
300km Triangle	99.46km/h	D. S. Watt	ASW-20FL	19.5.1980

UK 750km DIPLOMA

1. Goal and Return	801.3km	C. Garton	Kestrel 19	22.7.1976
2. Distance	761km	D. S. Watt	ASW-20L	6.5.1980

MOTOR GLIDERS (†BRITISH NATIONAL RECORD ONLY)

SINGLE-SEATERS

100km Triangle	57.3km/h	I. W. Strachan	SF-27M	13.6.1971
200km Triangle	48.2km/h	I. W. Strachan	SF-27M	23.8.1976
500km Triangle†	71.75km/h	B. J. Willson (in Finland)	PIK-20E	22.5.1980
100km Goal	85.7km/h	I. W. Strachan	SF-27M	16.7.1971

MULTI-SEATER (** Also British National Record)

100km Triangle**	35.6km/h	P. T. Ross and H. Daniels	SF-28A	27.6.1976
100km Goal	76.2km/h	P. T. Ross and K. Winfield	SF-28A	22.8.1976
200km Goal	66.3km/h	P. T. Ross and P. Fletcher	SF-28A	18.7.1976

INTERNATIONAL MOTOR GLIDERS (Correct as at 9.3.1982)

SINGLE-SEATERS

Height Gain	8923m	G. Cichon, W. Germany	Nimbus 2M	27.5.1979
Absolute Altitude	10 408m	G. Cichon, W. Germany	Nimbus 2M	27.5.1979
Goal and Return Distance	1008.89km	F. Rueb, W. Germany (in South Africa)	Nimbus 2M	7.1.1981
Triangular Distance	1013.21km	F. Rueb, W. Germany (in South Africa)	Nimbus 2M	31.12.1979
100km Triangle	152.16km/h	F. Rueb, W. Germany (in South Africa)	Nimbus 2M	29.12.1977
300km Triangle	131.75km/h	F. Rueb, W. Germany (in South Africa)	Nimbus 2M	27.12.1977
500km Triangle	127.51km/h	F. Rueb, W. Germany (in South Africa)	Nimbus 2M	24.12.1980
750km Triangle	120.21km/h	F. Rueb, W. Germany (in South Africa)	Nimbus 2M	29.12.1978
1000km Triangle	109.94km/h	F. Rueb, W. Germany (in South Africa)	Nimbus 2M	31.12.1979

MULTI-SEATERS

Height Gain	4523m	F. Jung and G. Marzinzik, W. Germany (in France)	ASK-16	26.3.1978
Straight Distance	952.53km	W. Binder and K. Heimann, W. Germany	Janus M	16.5.1980
Goal Distance	646.42km	G. Jacobs and G. Hüttel, W. Germany	SF-25E	28.4.1976
Goal & Return Distance*	617.95km	L. de Preter (Belgium) and D. Sohn (W. Germany)(in South Africa)	Janus M	29.12.1981
Triangular Distance	756km	W. Collee and K. Pummer, W. Germany (in South Africa)	Janus M	31.12.1979
100km Triangle	128km/h	W. Collee and E. Doerr, W. Germany (in South Africa)	Janus M	15.1.1980
300km Triangle	129.72km/h	O. Wegscheider and A. Ascher, W. Germany (in South Africa)	Janus CM	12.12.1980
500km Triangle*	111km/h	O. Wegscheider and K. Zuleck, W. Germany (in South Africa)	Janus M	5.12.1980
750km Triangle	98.97km/h	W. Collee and K. Pummer, W. Germany (in South Africa)	Janus M	31.12.1979

New records have to exceed the old ones by: Distance 10km. Heights 3%. Closed circuit speeds 2km/h. Goal speeds 5km/h.
For records, no side of a triangle may have a length less than 28% of the total distance of the course, except that for triangles of 750km or more for International and British National Records, or of 500km or more for UK Local Records, no side may have a length less than 25% or greater than 45% of the total distance.
Conversion Factors: Multiply km or km/h by 0.621 to get statute miles or mph. Multiply km by 0.54 to get nautical miles or kts. Multiply metres by 3.28 to get feet.

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Speeds-to-fly—or not?

In this first of two articles MIKE JEFFERYES introduces the traditional speed-to-fly theory and the MacCready ring for the benefit of those early cross-country pilots who were not given the right books for Christmas. He considers the relative importance on a cross-country flight of some of the variables under the pilot's control and concludes with advice given by members of the British team squad. In the second article he will examine in more detail the effects of choice of cruising speed under a range of conditions.

Imagine a glider cruising cross-country with a steady sink rate of 4kt and stopping regularly to climb at an average of 3kt. Since height lost cruising equals height gained climbing, if all is going to plan then 4/7 of the total time is spent climbing and 3/7 cruising. If the cruise speed is 75kt then the average cross-country speed is 3/7 × 75kt, that is 32kt (60km/h). Fig 1 shows this mathematically by the proportions of similar triangles, BC (achieved speed) = 3/7 × DE (cruise speed).

Our objective is to maximise BC the achieved speed. This is not only to win competitions. On a day with five hours of soaring 61km/h will complete a 305km task, 59km/h means an outlanding 5km short of Gold.

Looking at Fig 1 we can increase BC in two ways. 1 — by moving point A upwards — *ie* increasing the average climb rate and therefore reducing the time spent not cruising; 2 — by moving point E generally up or to the right.

1. To move point A upwards the average climb rate is partly dependent on thermal strength but can be improved by the pilot in several ways, *eg:*

..By rapid centring (and re-centring as the thermal moves).

..By accurate, tight circling.

..By use of only the stronger thermals.

..By not stopping in every strong thermal. Fewer, longer climbs waste less fumble-time spent centring.

..By leaving the thermal when the climb rate deteriorates — but only if the next thermal is stronger than the lift you're leaving.

The last three points come under the heading of "pressing on", which must be based on confidence in the sky ahead. The best way to gain that confidence is by flying out there to try it. This will result in some eye-opening achievements and valuable field selection practice. Don't under-estimate the experience gained in analysing the consequences of positive decisions, particularly relating to reading the sky ahead.

2. Now let's address point E on Fig 1, which represents 75kt cruise at 4kt sink. This is a point on the Pirat's polar curve. Fig 2 shows the whole polar with this point marked E_1. Line A_1E_1 crosses the airspeed axis at C1 (32kt achieved speed as Fig 1).

To increase the achieved speed, *ie* to move C to the right, we must select a cruise speed which moves point E to give the shallowest angle for line AE. This is done at point E_2 where line A_1E_2 is a tangent to the polar curve. Cruise speed has reduced from 75kt to 60kt (D_2E_2) but achieved speed has increased from 32 to 33kt (BC_2). This 3% increase is the difference between the 59 and 61km/h we saw earlier.

Achieved speed increased

If we can improve the average climb rate to 5kt (point A_2) then from line A_2E_2 we significantly increase the achieved speed to 40kt (73km/h) at point C_3, an increase of over 20%. However we will gain a further 4% by increasing cruise speed back to 75kt at point E_1 where line A_2E_1 is a tangent to the curve. This gives 41.5kt achieved speed at C_4.

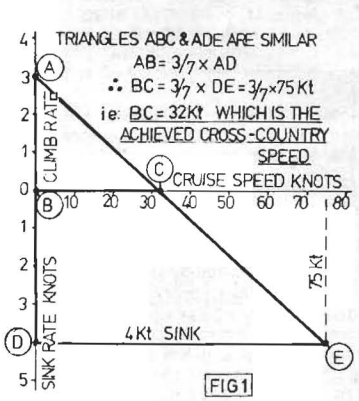


FIG 1

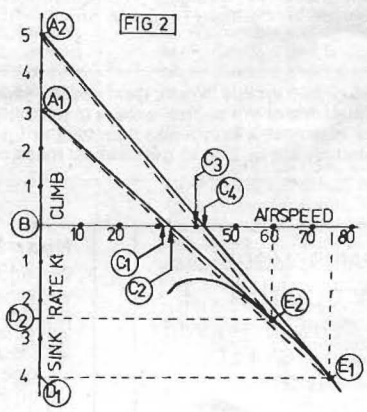


FIG 2

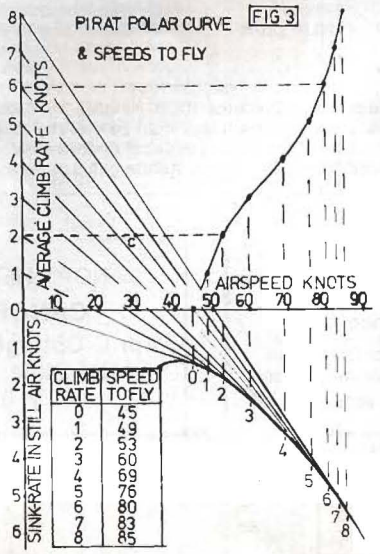


FIG 3

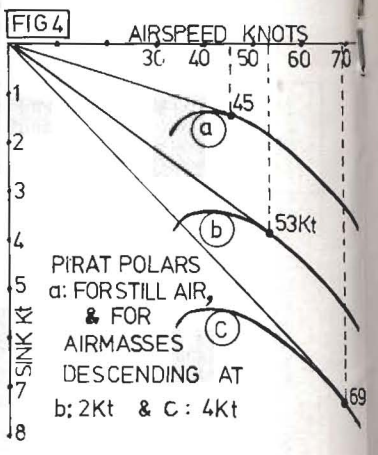
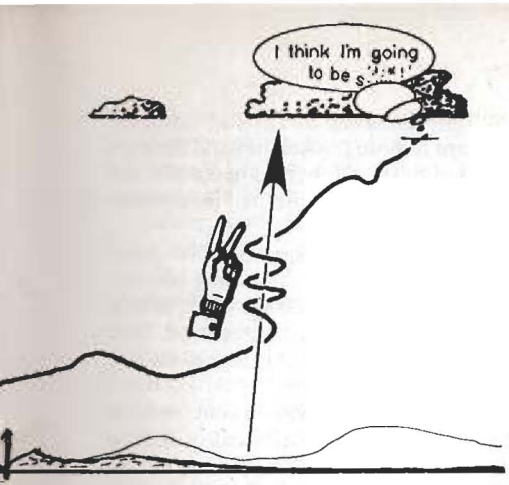


FIG 4



Conclusions so far

..High average climb rate is most important to cross-country speed.

..For any average climb rate there is an optimum cruise speed for each glider.

..The optimum cruise speeds are determined by drawing tangents for each climb rate onto the polar curve as we saw on Fig 2.

Fig 3 shows the Pirat polar curve with tangents drawn for a range of climb rates. The resulting cruise speeds for each climb rate are tabulated and also plotted onto the curve at the top of Fig 3.

A 4kt sink rate at 75kt cruise looks 60% worse on the vario than 2½kt sink at 60kt, but is in fact only 28% worse in terms of glide angle −18.75 versus 24:1. The 4% increase in achieved speed we showed above is therefore gained at the expense of a 28% greater height loss over a given distance, increasing the risk of having to stop and climb in any weak lift or worse, landing out.

This again demonstrates the need to be confident of the conditions ahead and shows that choice of cruising speed from the table on Fig 3 must be based on a judgment of the average rate of climb in the next thermal.

Speeds-to-fly for maximum distance in sinking air

Fig 4 again shows the Pirat polar curve. The tangent from the origin gives the best glide speed in still air of 45kt (greatest ratio of airspeed to sink rate). Further polar curves are shown on the graph 2 and 4kt lower, representing the Pirat sink rates at any speed in air sinking at 2 and 4kt (airmass movement). The tangents from the origin onto these curves show 53 and 69kt to be the maximum glide speeds in these sinking airmasses. By this process we can generate a scale of speeds-to-fly for maximum distance through any sinking airmass which is identical to the scale on Fig 3 for optimum cruise speed in still air for any anticipated climb rate.

The MacCready speed-to-fly ring

This scale enables us to mark up a MacCready ring, which is easiest to understand if we first relate it to a Netto vario before adapting it to the standard vario.

A Netto vario is a normal vario converted with a Netto/dolphin system so that it shows only airmass movement, not glider sink rate, *ie* in still air the needle will stay on zero at all airspeeds. We can therefore mark our Netto vario to show speeds-to-fly for maximum distance using the scale on Fig 3. Opposite zero we mark best glide speed (45kt for the Pirat), opposite 2 and 4kt airmass sink rate we mark 53 and 69kt etc. The vario then not only reads airmass sink rate but also speed to fly for maximum distance, see Fig 5.

The scale is marked onto the MacCready ring which can be rotated round the vario. We've seen that the optimum cruise speed through still air for anticipated climb rates of 2 or 4kt is 53 or 69kt. If we rotate the scale to set best glide speed opposite 2 or 4kt climb, then in still air the needle on zero will point to 53 or 69kt showing the required cruise speed. However, when flying through an airmass sinking at 2kt the Netto vario will point to 2kt sink and, if the speed ring is set for a 4kt anticipated climb, will indicate a cruise speed of 80kt.

Is this correct? To check, looking at Fig 3 we must draw a tangent from 4kt climb onto a polar depressed by 2kt — geometrically the same as the tangent from 6kt onto the standard polar, giving 80kt speed to fly. What is the achieved cross-country speed for this condition? (Answer on p 82).

The answer shows a 20% reduction in achieved speed compared with a glide through still air emphasising the importance of route selection between thermals to avoid this sinking air.

We've now seen that the speed scale is multi-purpose, showing maximum glide in sinking air when set to zero (as Fig 5), and showing optimum speed-to-fly when set for any anticipated climb rate while flying either through still air or sinking air.

Standard varios show total glider sink rate, that is airmass sink plus glider sink rate relative to the airmass. The Pirat speed-to-fly scale from Fig 3 used for the Netto/dolphin vario must now be modified by adding the glider sink rate at all speeds which come direct from the polar curve. For simplicity on the vario the speed scale is marked to show round numbers of airspeed against odd fractions of sink rate rather than *vice versa*.

Note that the zero vario reading no longer represents still air corresponding to best glide speed; it now represents zero sink requiring min sink speed, 40kt. Best glide 45kt occurs opposite 1.4kt, the Pirat sink rate at best glide speed in still air.

Fig 6 shows a normal vario with Pirat speed-to-fly ring equivalent to the last condition we considered for the Netto vario: anticipated climb rate 4kt, total sink rate 6.6kt comprising 2kt airmass sink plus 4.6kt polar sink at the indicated speed-to-fly of 80kt.

Conclusions

We've now seen why and how the MacCready ring works. When set to zero we should fly at the indicated speeds to cover the greatest distance through any sinking airmass. When set for an anticipated climb rate we will make some improvements in achieved speed if our guess of climb rate was correct.

However as cruise speed increases and glide angle deteriorates we risk having to stop in weak lift, with disastrous consequences to our average rate of climb.

We have seen that high average climb rate is of far greater significance than precise speed setting and also that route selection to avoid sink has a major effect.

We will examine in more detail the benefits and penalties of variations in climb rate, speed ring settings and route selection in the next article.

How do the experts do it? With very many thanks for the response received in answer to this question, I quote the following advice on the next two pages.

FIG 5

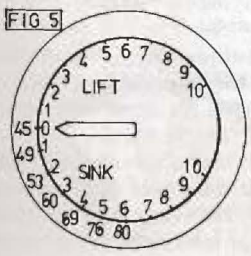
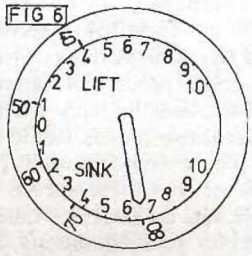


FIG 6



How important is it to cruise at the "correct" speed?

Dave Watt: "The effect of flying at the wrong speed between thermals is minimal. I regard MacCready as a perfectly valid and watertight theory. I think it should be understood by anyone aspiring to successful speed flying. However, to the airborne pilot I think it is a complete irrelevance. One simply does not fly fast round cross-countries by flying the correct speed between thermals (especially in British weather). Our low cloudbases ensure that the number of thermals sampled is ten times more important than the speed between them. In addition, I am certain that because most people do not appreciate this they waste vital concentration on looking at the ASI, changing attitude unnecessarily, fiddling with rings/directors etc. If they realised that if, due to any of these things, they miss *one* pull up, fail to see another glider circling, miss a wisp of cloud that shows a thermal or in any way miss information that would lead to lift, then the effect of having flown the correct speed for the **whole flight** would be more than nullified."

Others are less emphatic:

George Lee: "I believe accurate maintenance of the theoretically correct inter-thermal speed for the prevailing conditions to be one of the less critical factors involved in the realisation of efficient cross-country performance."

Danger of theoretical speed flying

Chris Garton: "The novice needs to understand the speed-to-fly theory, but I can't help feeling that too much emphasis has been placed in the past on **how fast** we should fly as opposed to **where** we should fly. The risk of over-concentration on the theoretical side of speed flying can, I suspect, tempt the novice into spending too much time following instruments rather than taking more note of what is going on outside the cockpit, and arranging his flight to derive the maximum advantage from what the air is doing, accepting the higher navigational workload this policy will entail. For example, failure to deviate from track by ten degrees to follow a line of lift and hence ending up in the sink alongside will produce an immeasurably greater loss than an error of 10kt away from the theoretically correct speed."

John Glossop: uses capitals to declare: "THE RATE OF CLIMB ACHIEVED IS MUCH MORE SIGNIFICANT THAN INTER-THERMAL SPEED. If you set 50% of average rate of climb on the speed ring you achieve approximately 95% of the possible cross-country speed, but achieve a fair gain of range and therefore greater ability to discard weak lift, the most important aid to fast cross-country speed."

Better to fly slower?

Others agree on the advantages of reduced cruise speed:

John Delafield: "Flying fast increases the probability of an outlanding in general."

Dave Watt: "Erring on the slow side gives a greater chance of not landing out (or perhaps more importantly so far as speed flying is concerned, a greater chance of reaching an abnormally strong thermal)."

Maximise climb rate

Andrew Davis: "Don't fly too fast — it is better to be pessimistic when setting the MacCready rate of climb because you glide just a bit further between climbs, sample more thermals and have more chance of picking an above average climb. The single most important factor in achieving high cross-country speed is maximising achieved rate of climb.

"Quick centring is very important, but also the ability to decide **quickly** whether to take or leave a climb. It is better to make the wrong decision than no decision at all.

"The day's average climb rate should be established as soon as possible, and then only take climbs of this strength or better. Time lost on a 3kt day by only climbing at 2kt can never be regained. It is equally important to note the height band through which the thermal strengths are best and then to make this the working layer for the day. Flogging a dying thermal for another 300ft is very wasteful of time.

"If your working layer on the day in question is 2000ft deep, try to glide all 2000ft and then climb 2000ft. Assuming you use the same thermals as someone only working 1000ft you will beat him because he uses twice as much time getting centred. Grit your teeth and keep your wings level. But **do** stop and climb any time you hit an above average thermal."

Martyn Wells agrees: "Thermal for the minimum time and use the maximum height band increasing the likelihood of finding the correct lift."

John Glossop: "Circle as short a time as possible, and when circling climb at the maximum rate. It is often better to be flying on track in zero sink than making a conventional thermal climb, even in quite a good thermal. Equally if one can minimise height loss by careful inter-thermal routing, less height has to be regained and therefore less time spent circling."

Route selection

John Delafield: "Flying a route through the air which follows the maximum energy (*ie* lift) is of far greater significance than flying the precise inter-thermal speed."

Andrew Davis: "When cruising between climbs it goes without saying that the pilot should fly the path of least resistance by making the maximum use of cloud streets. It pays to follow a good street even if it leads way off track."

Dave Watt: "The paramount ability necessary for a successful cross-country is that of knowing where to go to find good lift. It is from this that everything else stems. It is what makes you change gear at the right time, it is what makes you leave a thermal before the top or take it into cloud etc. The ability to find good lift obviously comes from experience. In some cases only a little experience is necessary, others take years and years — I suppose it depends on how efficiently you practise soaring and how good your visual memory is (**I'm very keen on visual memory.**)"

Speed Selection

John Cardiff differentiates between record attempts (when his only constraints are ballast capacity and the sound barrier) and competition flights, when "flying slower than theory gives more chance of finding and centring quickly in the all important strong thermals. In the ASW-20 my speed on a good day is around 65-70kt unless there is a spiralling glider going up at 10kt roughly on track! (This is fairly new for me — I used to fly faster.)

Correct speed is less important

"Apart from the odd fluke, flying in the correct place is much more important than flying at the correct speed."

Dave Watt: "A sensible speed is all you need. I think that three speeds are enough to get to top Nationals level. When your flying is so good you can't think of any way of improving it, then perhaps you can waste time flying to ±2kt.

Eg: K-6E 45-55-65kt; ASW-20 55-65-80kt."

Ted Lysakowski thinks in terms of three categories of speeds: for good, predictable conditions; for intermediate conditions and for hanging back when nothing is predictable. For a 15m glider these speeds would be 75-80, 65, 50-55kt.

"There would naturally be variations for strong sink, reduced sink etc, but these speeds illustrate the frame of mind which I think sets the pace. I would thus set the average rate of climb at 3-4kt for good conditions, 2-2.5kt for intermediate and 0-0.5 for

hanging back. Even a 2kt ring setting seems to demand fairly rapid progress. In general, with the exception of an occasional Kamikaze, I feel that most pilots fly too slowly, particularly at intermediate working heights.

"In very good, exceptional UK conditions I would not fly a ballasted 15m machine at more than 85kt or a Nimbus 2 at more than 90kt."

Martyn Wells agrees that three or four speeds suffice for bad, mod, good and excellent days and emphasises "know when to change speed or deviate from track when conditions dictate".

Chris Garton: "On an absolutely consistent day, with the thermals of regular strength and regular spacing, the pilot who adheres closest to the theoretical optimum is likely to go fastest, provided, of course, he does everything else right. But on other days, the kind we see all too often in the UK, it is not too clear what the theoretical speed is simply because it is difficult to assess what the strength of the next thermal will be.

"Faced with this situation, an experienced pilot will probably opt for a compromise speed, which may be expressed simply as a datum speed, *eg* 70kt for a flapped 15m ship, or as a conservative speed ring setting, *eg* 2kt. Either way, he must expect to vary his speed according to whether he is in lift or sink along the lines of the theory — but striving for theoretical accuracy may be counter-productive."

George Lee: "Under relatively consistent cumulus or blue conditions it is not unreasonable to assume that the strength of the next thermal you stop for will be much the same as the one you are leaving. A basic requirement is that the pilot should know what rate of climb he achieves under different conditions. Without the benefit of an averager this knowledge can only come from timing a lot of climbs (from rolling into the first turn to rolling wings level from the last turn) under widely varying conditions (broken, narrow lift as well as wide and strong!). If the conditions are straightforward the pilot can go ahead and set the average rate of climb that he expects to achieve in the next thermal.

Advisability of lower ring setting

"A less experienced pilot should still know the average rates of climb he achieves under different conditions, but it may well be advisable for him to set a slightly lower ring setting (say 3kt for an anticipated 4kt climb). This would result in a 1% reduction in average speed from the ideal, but it offers the inexperienced pilot more time to assess conditions ahead during the cruise and reduces the risk of a premature out-landing, as he will reach the next thermal with more height in hand. The main thing to emphasise about ring settings is that they should relate to the conditions ahead — everything behind is history. This is particularly important when considering transitions from good to poor conditions (or *vice versa*!).

"Accurate assessment of conditions ahead is one of the more important factors in efficient cross-country soaring — particularly the ability to mentally change gear under cycling conditions. Early recognition of a sticky patch ahead and the taking of appropriate action, such as topping up with height and cruising at a lower speed, may result in one being able to glide through the area and reach better conditions beyond, while one's colleague, whose appreciation of the situation was late, is scratching at low altitude just out of reach of the good clouds.

"During the cruise towards the next thermal movements of the airmass should be matched by corresponding changes of airspeed. However, in practice I tend to react only to significant changes, as the penalty for rapidly slowing down in narrow, broken lift only to find oneself at a slow speed in heavy sink can be pretty severe. A most useful aid to efficient cruising is a variometer that can indicate airmass movements. (See Netto vario in earlier text. M.J.). The best arrangement is if it can be hitched up to an audio as the pilot is then free to concentrate on decision making by devoting his attention to what is going on outside rather than inside the cockpit."

John Delafield has been watching: "Small variations in speed seem to have little impact: indeed, the pilot who flies steadily but rarely stops to thermal is the one who normally wins (*ie*, Lee and Fitchett)."

Andrew Davis: "Don't over-estimate your achieved rates of climb. The only proper way to estimate this is with a stopwatch and altimeter from the moment you first pull into the thermal until you reach cruising speed after accelerating out of it. I find a stopwatch too distracting. A good rule of thumb is half the **average** vario reading, *eg* vario flickers from 1 to 3kt, average 2kt, achieved climb 1kt. A really good pilot might achieve 2/3 the average reading.

"In the UK cycling weather is common. Try to anticipate the cycles and look for an increased rate in the good patches. If possible glide right across the bad patches, even if it means going below your working layer. If you can't glide across the bad patch don't go below your working layer, expect to have to take a below-average climb. If you are forced to climb in a bad patch, only climb high enough to reach the better weather. Avoid situations where you can only **just** reach the next cloud. Ideally you want to arrive with sufficient height to reach a suitable alternative."

Final thoughts on speed ring setting

John Glossop: "As a general rule I never set the ring to more than 50% of my generally achieved rate of climb."

Dave Watt: "I feel sure that people would get better results if they set their MacCready rings/directors to say 40% of the cloudbase (in thousands of feet) instead of what they expect in the next thermal."

Chris Garton: "When can we expect to use lower than optimum inter-thermal speeds? I suggest the following circumstances:

1. When thermals are widely spaced or hard to locate.
2. When thermal cycling is suspected.
3. When there is a well developed pattern of lift near cloudbase but lower down the thermals are broken and it is hard to climb.
4. When there appears to be a deterioration ahead.
5. Late in the day.
6. With any wing leading edge contamination (flies, rain, etc).
7. After a high climb (depending on the calibration of your speed ring).

"The strongest case for using the higher speeds is when not only has your experience of the day told you that you can find strong well formed thermals with ease, including low down, but the sky ahead looks good and consistent, and so does the cloud/shadow relationship (particularly when the shadows are strong)."

Finally some golden rules

George Lee: "My golden rules for high cross-country speeds are:

a) Careful selection of the thermals to be used, bearing in mind conditions in the immediate area and ahead on track.

b) The achievements of the maximum rate of climb in the thermals that one decides to use, and the recognition of the best moment to leave the lift.

c) Always try to plan at least one move ahead, recognising changing conditions early and trying to avoid putting all eggs in the one basket — low is slow (usually?).

d) In my opinion the most important point is that one should be constantly looking to follow the route of best energy."

Andrew Davis: "Finally the only **golden rule** (and the one I disobeyed in Germany): When it all turns to worms, forget all about speed, turn back on yourself, if necessary, but above all fly to **survive.** It's better to get there an hour late than not at all."

THE PASSING OF THE UK BUILT GLIDER

J. C. RIDDELL

The announcement in the last issue, p32, that Slingsby Engineering Ltd have ceased glider production left me very sad. My association with the company goes back some twenty-seven years to when I bought the Skylark 1 prototype from Fred Slingsby.

"Slings" had been financed by Major Shaw, a local landowner near Kirkbymoorside whose foresight had brought the Scarborough woodworking manufacturer, Fred Slingsby, to a new purpose built factory on Shaw's land at Ings Lane, Kirkbymoorside.

When Major Shaw died in the early sixties the world had decreed that rich men should be relieved of their wealth on death, no matter what the consequences might be to trade, industry or employment. Shaw's executors had to sell. Philip Wills was concerned the sailplane company might fall into unsympathetic hands and sets up the Shaw Slingsby Trust to buy the shares of the company and use the income to fund glider development in this country. It is a measure of the stature of Philip that he gave £5000 to the trust to establish it.

At its height

The trust flourished for several years and "Slings" settled down to new ownership. This was the period it was at its height — the Skylark 4 was in production with the Swallow, Capstan and T-21.

We had used the trust facilities at the Yorkshire GC to finance the building of the clubhouse. However, it transpired that the trust had to be dismantled. It was a severe blow though we managed to repay the loan of £6000 within six months, but the situation was less straightforward at the factory.

The control of the company passed to Jack Bradley. There is no doubt that Bradley was a man of the moment. A builder from York who had made money fast in the building boom of the sixties, he had floated his company and was the darling of the Stockmarket. He was impressive. He drove a Rolls-Royce, lived in a castle and had the wife to go with it. His activities were widely chronicled in the *Sunday Times*.

The knockabout period now followed at Ings Lane. There was extensive rebuilding, gold plated taps were fitted in the director's loo and part of the factory was set up to make volume wooden fittings for the building industry. The Sigma project was partly carried out there and Dick Schreder licensed them to make his HP-14. Light aircraft replicas of the SE-5A, Camel and others were on order.

It really looked as if Slings might be established on a higher level of activity. However, soon reports filtered through of an extravagant life style of some of the directors. Rolls-Royces and other expensive cars were leased for the use of directors of the newly styled Slingsby Group. Then in 1968 part of the factory caught fire, but even so the company collapsed with liabilities of about one million pounds.

Vickers Ltd bought the company from the receiver to gain Slingsby's workforce to make glass-fibre components for defence contracts. Sir Leonard Redshaw, a soaring pilot and director in charge of the Vickers Shipbuilding division at Barrow in Furness, appointed George Burton as managing director, George was at that time Open Class Champion and a long standing member of the British team.

The new management went to Germany and bought licences for the Falke motor glider from Scheibe and the Kestrel from Glasflügel. They also arranged to sell the Libelle in the UK. Much of the top technical talent in sailplanes was not available to Slingsby's and no doubt this influenced them to seek German designs representing the new wave of technology.

Stimulated growth

There is no doubt that the Falke and the Kestrel made a significant contribution to British gliding. They stimulated the growth of the movement and the Kestrel in particular showed how long flights could be achieved without the expensive and time consuming road retrieves that had been the norm before. However the Kestrel design was not followed by a range of sailplanes and a one product firm is always vulnerable. It was not until five years later that Slingsby's began the Vega design and, it was reputed, spent some £350 000 to bring it to the market place.

To me, this inability to build up a product range when it was possible at a low cost in the seventies is the underlying reason for today's decision. However I don't think it was because one or two people at Slingsby's did not look far enough ahead. The reason is far more subtle.

The company always had something of a captive market. There were perhaps fifty customers who had bought their gliders regularly and the new management found many of these pilots willing to buy the Kestrel. However their licence arrangement precluded them from selling in any large numbers in the important US market, and they were



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therefore unable to set up sales agencies. The Germans did and were able to build up their agents to gain substantial sales in the USA. At Kirkbymoorside sales fell away.

But Slings were also dependent on German technology. Wooden construction with the DH Mosquito had been largely developed in this country. Composite materials were developed for aircraft components in W. Germany where Eugen Hänle of Glasflügel was one of the early workers. Such exciting opportunities for improvement in airframes were seized eagerly by Akafliegs — the academic practical group of students that came together to build experimental sailplanes.

In this country the College of Aeronautics at Cranfield had never set up such an Akaflieg, although they were perhaps the best placed to do so. Instead the students on their well regarded aircraft design course were unable to turn their paper projects into hardware unlike their counterparts in W. Germany. Today the Boeing Company recognises the value of Akaflieg experience and favours them in their technical recruitment.

So Slingsbys did not have a Holighaus, Waibel, Lemke or Dirks to show the way after Fred Slingsby had gone. Each new design was started from scratch by another group. There was little continuity in design or manufacture.

In today's world it gets more and more difficult to start from scratch in established products and beat the competition. For success to be possible the market must be entered at the right time and products must be developed with imagination to satisfy both the customer and the sales outlets.

We have ended up without British commercially built sailplanes after fifty years. Fred Slingsby, and every other glider maker I have met, was dedicated to making sailplanes and depended upon it for his livelihood. That is why he — and they — succeeded when many better qualified and better financed have failed. None of them could afford to lose, nor did they have substantial corporate debt.

All pilots can read — but the BEST PILOTS read

Sailplane & Gliding

The magazine can be obtained from most Gliding Clubs in Gt. Britain, alternatively send £8.15 postage included for an annual subscription to the British Gliding Association, Kimberley House, Vaughan Way, Leicester.

Red leather-cloth binders specially designed to take copies of the magazine and gold-blocked with the title on the spine are only available from the B.G.A.

Price £3.50 (£3.99, including post and packing).

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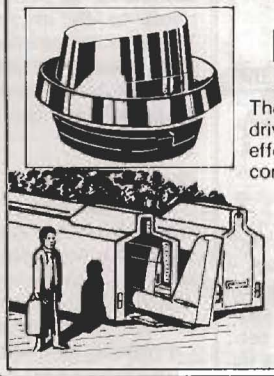
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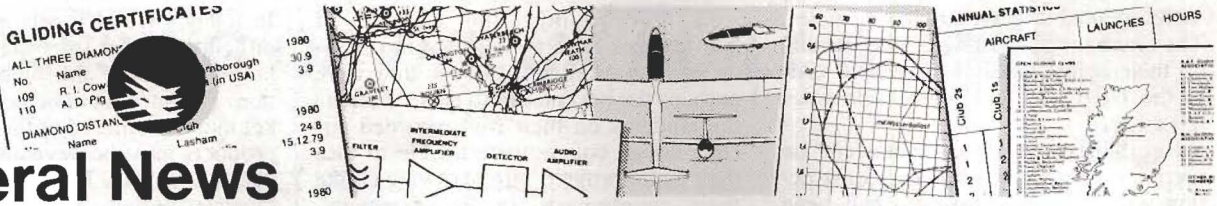
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BGA and General News



BGA DIPLOMAS

Three BGA Diplomas for 1981 were awarded at the AGM in March for services to gliding. They went to three outstanding club servants; Lionel Alexander of the Cambridge University GC, D. G. (Barney) Banks of the RSRE Pershore Flying Club and John Holland of the Cotswold GC.

Lionel Alexander has been associated with the Cambridge Club for over 30yrs and was a member of the BGA Council and Executive Committee from 1960 until 1981. He also chaired the BGA Sites Committee and has always been a source of concise and accurate legal advice for the Association.

Barney Banks has just stepped down as CFI of the RSRE Club after holding a full gliding rating and being a tower of strength in the club for over 30yrs. His infectious enthusiasm has been known not only at Pershore but at four other clubs in which he was involved in founding.

John Holland started gliding in 1968 with the Cotswold Club and was their chairman from 1973 to 1976 during a crucial period in their existence at Aston Down. His was the main responsibility in ensuring the future stability and existence of the club by the fund raising and eventual purchase of the freehold at Aston Down.

Barry Rolfe, *BGA administrator*

NO SAFETY LINKS

Investigation into a fatal accident in the USA last March, when a Schweizer SGS 1.26C pilot was killed while on tow, showed there were no safety links in the towrope. According to the FAA type certificate, the max gross is 600lb giving an allowable towline strength of 1200lb but the actual breaking strength of the towrope involved was 2350 and 2325lb on successive tests.

The Cessna tug turned downwind at approx 1000ft and the glider yawed to the right. A passenger in the tug couldn't see the glider but remembers the rope was in an extremely high tow position. Suddenly the tug was strongly jerked into a partially inverted attitude. The tug pilot pulled the tow release and recovered from the dive at about 200ft but the glider spun in.

VHF R/T LICENCE

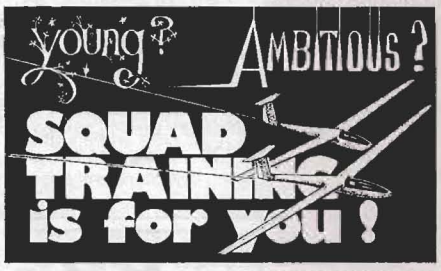
Glider pilots are permitted to use the radio frequencies allocated for gliding, namely 129.9, 130.1, 130.125 and 130.4MHz without holding an R/T licence.

However, those pilots of gliders equipped with 360 or 720 channel VHF radios are reminded that it is a legal requirement to hold a VHF R/T licence if you intend to use frequencies other than those mentioned above.

The licence may be obtained by studying CAP 416 Radiotelephony — Procedures and Phraseology, available for a modest sum from: CAA, Printing and Publication Services, Greville House, 37 Gratton Road, Cheltenham, Glos GL50 2BN, tel 0242-35151, and passing a short test based on a simulated flight, conducted by a CAA approved examiner, which your nearest flying club would probably be able to arrange.

Aeronautical Information Circular 16/1981 sets out a list of all examination centres. In the event of difficulty, contact CAA (FCL 2), Aviation House, 129 Kingsway, London, WC2B 6NN, tel 01-405-6922 ext 508.

SQUAD PREPARATION TRAINING — 1981



The Squad Preparation Training Scheme continued in 1981 by inviting 15 young pilots to fly in five three-pilot courses. Three of these were held in conjunction with established competitions. At the same time five pilots from the 1980 intake flew in Regionals and two in the Nationals.

Direct tuition

The bulk of the training given was by lead/follow techniques, the coach flying the BGA's new ASW-19. The Twin Astir was also available if needed, to boost an individual's own potential by direct tuition in contest flying techniques.

Probably the most successful day's flying in the Scheme so far came on the day of the Royal Wedding, when a third year pilot won the task for the day in his Class and, flying "*hors concours*" and uncoached (apart from a personal briefing) two second year pilots followed him into 2nd and 3rd places.

Each of this year's basic courses will be held alongside a contest — at Lasham, Nympsfield, Sutton Bank, Colerne and Saltby — and will follow the pattern set in 1981.

Potential new entrants to the scheme will be required to make their claim in the autumn, for selection for a 1983 place. So, if you are young and ambitious, watch out for the posters!

John Williamson, *manager of the Training Scheme.*

GLIDING HOLIDAYS

Students, teachers and engineers make up the bulk of members on gliding holiday courses. At least, this is what the Scottish Gliding Union found after analysing their 1981 courses. Students and teachers made up 15% each and engineers a further 22%, making a total of 52%.

The remaining 48% revealed a wide cross-section of the public from doctors, solicitors and university lecturers to civil servants, surveyors, machinists and even a shuttlemaker.

The profile of a typical member on a gliding course is a single man, aged between 21-35, with professional qualifications.

A substantial minority (33%) had either been on a gliding course before at the SGU or on one elsewhere, while 45% were members of other clubs. Most heard about the courses through friends (63%).

Ann Shaw, *SGU's Press Officer*

BUILDING FROM KITS

The BGA Technical Committee advise potential purchasers/importers/builders of gliders from so called "kits" to be aware of overselling, over-optimism, under engineering and generally poor quality of much which is tempting.

In other words you need to be a capable engineer with plenty of time and resources to safely attain the minimum standard of airworthiness thought to be desirable by UK standards.

R. B. Stratton, *BGA Chief Technical Officer.*

STRUCTURE OF THE BGA

The membership structure of the BGA is now made up of 82 full members, three of whom have affiliated clubs as follows: Army Gliding Association with two clubs, RAF Gliding and Soaring Association with 11 clubs and the Royal Naval Gliding and Soaring Association with three clubs.

Operations. During the year ending September 30, 1981 (1980 figures in brackets), member clubs (civilian and combined services) flew a total of 159 836 (124 021) hours and 786 642 (654 139) kilometres cross-country from 398 649 (387 703) launches from club sites. Club owned gliders totalled 425 (411) and privately owned gliders 1205 (995).

Certificates. Certificates were issued as follows: A endorsements 2003 (2014), B endorsements 331 (225), Bronze C 459 (532), Silver C 261 (321), Gold C 57 (42), Diamond goal 79 (52), Diamond height 31 (29) and Diamond distance 16 (7).

A certificates were applied for by 1253 (1223) holders of the ATC proficiency certificate.

WHITBREAD AWARDS 1982

I am delighted to announce that Whitbreads have once again this year donated a sum of money to us through the Sports Council which will enable us to make cash awards during the year of £25 each to promising young pilots.

The awards are available to any members of BGA or RAFGSA clubs (not ATC) who managed to achieve the Bronze badge endorsement to their gliding certificate before their 19th birthday. The only stipulation is that an application for the award must be made to the BGA office in writing and must accompany the application for the Bronze endorsement to the certificate.
Barry Rolfe, *BGA administrator*

BGA ACCIDENT SUMMARY

We appreciate the trouble readers have taken in writing to request the reinstatement of the BGA Accident Summary we carried during 1980. This feature will now start again in the next issue as it was obviously widely read.

GLIDING CERTIFICATES

FAI 1000km

No.	Name	Location	Flight	1981	FAI No.
1	W. E. Malpas	USA	O/R	28.9	36

ALL THREE DIAMONDS

No.	Name	Club	1981
122	J. F. Mills	Crystal (USA)	23.8
123	M. J. Saunders	612 GS	5.12

DIAMOND DISTANCE

No.	Name	Club	1981
1/184	J. F. Mills	Crystal (USA)	23.8

DIAMOND GOAL

No.	Name	Club	1981
2/1084	P. W. Johnson	Sebring (USA)	7.12
2/1085	B. J. Szulc	Polish	28.7
2/1086	M. S. Finn	Airways	27.12

DIAMOND HEIGHT

No.	Name	Club	1981
3/512	D. B. Alney	Cranwell	22.11
3/513	S. Cervantes	Deeside	15.11
3/514	M. J. Saunders	612 GS	5.12
3/515	A. Durbin	California A/F	1.1.82

GOLD C COMPLETE

No.	Name	Club	1981
860	V. F. G. Tull	London	3.11
861	M. S. Finn	Airways	31.12
862	M. J. Saunders	612 GS	5.12

GOLD C DISTANCE

Name	Club	1981
P. W. Johnson	Sebring (USA)	7.10
B. J. Szulc	Polish	28.7
M. S. Finn	Airways	27.12

GOLD C HEIGHT

Name	Club	1981
J. Grainger	Yorkshire	5.6
P. Butcher	Essex	29.9
H. D. Colton	Kent	21.10
G. Martin	Culdrose	27.10
R. Lovell-Butt	Bicester	30.10
F. A. Wright	Kent	22.11
A. R. Bradley	Kent	22.11
T. J. Trolley	Hambletons	22.11
V. F. G. Tull	London	3.11
G. Horsecraft	Essex	7.10
E. Rigby	Airways	30.10
M. S. Finn	Airways	31.12
M. J. Saunders	612 GS	5.12

SILVER C

No.	Name	Club	1981
6078	A. R. Bradley	Kent	22.11
6079	W. B. S. McIvor	Bannerdown	6.9
6080	P. M. Kirschner	Bannerdown	3.9
6081	J. Garner	Bicester	16.8
6082	J. J. Russell	Thames Valley	3.9
6083	M. A. Eaton	Surrey & Hants	18.10
6084	D. Cumisky	Derby & Lancs	22.11
6085	M. T. Cummins	Hambletons	22.11
6086	M. S. Finn	Airways	31.12
6087	M. J. Hanwell	Swindon	16.8

BRITISH SOARING YEARBOOK

A 1982-83 edition of the **British Soaring Yearbook** is being published by Gordonair Ltd, with the assistance of the BGA office in supplying most of the reference data contained in the Yearbook. This second edition has been improved by the inclusion of numerous photographs plus articles by Derek Piggott, Justin Wills, Chris Garton, Barry Rolfe and the editor, Gordon Camp. A useful complement to S&G, the Yearbook is advertised elsewhere in this issue and can be obtained from the BGA, club shops or the publishers.

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BGA MAIL ORDER

April in Paris, April showers, April may . . . and then again she may not — April Fool! Anybody who rambles like that deserves to be taken advantage of so when I make the OFFER OF THE MONTH — copies of Ray Stafford Allen's classic book 'Theory of Flight for Glider Pilots' for only **£2.00** (inc. post and packing) during April instead of the normal £2.85 — don't miss it. Send us only two greenies and the book is on its way to you.

Spring into the new season with a set of B.P. Cloud Charts. Over 100 full colour pictures of cloud types and formations on two jumbo-size wallcharts. Send only **£4.50** for the set.

Looking ahead in Old Camp's Almanac I foresee that the 1982-83 BRITISH SOARING YEARBOOK will be even more popular this year — a treasure trove of gliding information for only **£2.25** from the B.G.A. by post. Looking further ahead I see the eagerly awaited publication in May of John Delafield's book 'GLIDING COMPETITIVELY' containing all the secrets of cross-country success — our pre-publication offer is order before June sending only the cover price of **£8.95** and we shall despatch to you without any charge for postage and packing!

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FESHIEBRIDGE FATALITY

BILL SCULL, BGA director of operations, reports on the investigation into the fatal accident at Feshiebridge on September 28 when Gordon Muir was killed having bailed out of a Skylark 4.

The cause of the accident is likely to remain a matter for speculation. However, there is evidence to suggest that physiological factors for the pilot were contributory if not actually the cause of the accident. It should be noted that the investigation was undertaken by experts in their fields — AIB, an aviation pathologist and a parachute specialist without whose work the following comments would not have been possible.

Summary of Accident

1. The glider took-off from Glenfeshie (Feshiebridge) at 1140hrs and was airborne for 2hrs 40min. During this time the height was generally between 5000 and 6000ft, although at one stage it had been to 9000ft. During the last ten minutes or so of the flight the glider climbed to 14 000ft; after a short time at this height there was a rapid but controlled descent (600-700fpm) to 7000ft. It is believed that the outer 12ft of the starboard wing, which has not been recovered, broke off at this height from which the glider descended in a steep dive to crash into the forest approximately one minute later.

2. The structural failure can only have been due to the speed/manoeuvring limits being exceeded. The glider had recently had a C of A and the modification state was in accordance with requirements.

3. The pilot's body was 130ft away from the wreckage of the glider having fallen vertically. The 'D' ring had been pulled and the pack flaps had been retracted by the parachute elastics which had freed the auxiliary parachute and the folded parachute canopy, but no rigging lines had been extracted from the stowage loops.

4. There is evidence to suggest that the parachute, which had not been re-packed for 17 months, would require a greater force to extract the rigging lines than in a regularly re-packed parachute but subsequent tests suggested that the required force may have been provided by the drag chute.

5. However, there is no evidence to indicate whether the 'D' ring was pulled at a height which would have allowed time for the parachute to open; given that it may have taken longer than a regularly maintained chute, but it seems reasonable speculation that it wasn't.

6. The pathologist's report revealed other and, cumulative, effects;

a) Inadequate clothing results in loss of body heat; more oxygen is required to maintain heat production *ie* hypothermia. The weather conditions at the time of the accident were cloudy and none-too-warm. The winds were generally westerly and the temperatures at the relevant heights were: 5000ft, +3°C; 10 000ft, −5°C and 14 000ft, −14°C.

b) Altitude hypoxia: although many pilots have been to 14 000ft and higher, it is not possible to monitor oneself for ill effects. At sea level the partial pressure of oxygen is 103mmHg and at 14 000ft the pressure reduces to 40mmHg. The minimum adequate supply (pressure) of oxygen is 60mmHg.

c) The effects of hypothermia and hypoxia were made worst in this accident by an asthmatic attack. "It is quite possible the pilot may have been temporarily unconscious . . . but on reaching lower altitudes recovery would have been fairly rapid" says the pathologist. This relates to the extent to which the pilot was suffering from respiratory distress at 7000ft which . . . "might have impaired his physical ability to escape, prolonged his reaction time to the emergency and perhaps lead to delay in pulling the ripcord handle".

7. In summary it can be said that very few accidents have a single obvious, identifiable, cause. This accident was almost certainly due to the combined effects of several factors — some of them relevant before the glider even took to the air.

8. In terms of accident prevention ask yourself:

a) When was your parachute last re-packed? Your life may depend on regular re-packing; comply with the manufacturer's recommendations.

b) Do you make your own assessment of your physical fitness? If in any doubt whatsoever consult your doctor.

c) Recommended Practice 26 says for flights above 12 000ft amsl a serviceable oxygen supply system with the contents gauge visible to the pilot should be carried: its use above 10 000ft is recommended. In the event of illness in the air from any cause whatsoever the airbrakes should be extended and the descent made to below 10 000ft.

Treasurer's Report — 1981 World Gliding Championships

MIKE POPE

The great majority of active glider pilots believe that Gt Britain should continue to enter a full team in future World Gliding Championships. There is however, less unity concerning the financing of teams. We all want our team to win — providing somebody else will pay!

The treasurer's task is to obtain sufficient funds to provide the money to send a well equipped and supported team to the World Gliding Championships which are held about every two years.

Even begging!

There are numerous ways of raising money and many were tried during the last three years including begging! (requesting donations), collection boxes in clubs, selling merchandise, raffles, auctions and sponsorship.

Donations were gratefully received from 17 people for a total of £224. Collection boxes, raffles and auctions produced £1213 and Kitty Competition entries produced a significant contribution of £1868.

Selling T-shirts, stickers and other merchandise is hard work, frustrating and barely profitable, unless all items are sold. During 1980/81 allocations of material were sent to all clubs. Some responded superbly and sold their entire allocation while others sold little or nothing. Top prize for effort went to the club which sold one 25p sticker, returned the balance and demanded £2.50 for the postage costs!

Sponsorship, *via* Arctic Lite, generated a contribution of £15 000 which was a generous donation. Unfortunately gliding is not a good proposition for a sponsor. It is not a spectator sport, TV coverage is virtually non existent, and press coverage is generally very sparse. George Lee's victory in Paderborn was reported only in the *Daily Telegraph* and some weeks after the event, in the *Times*.

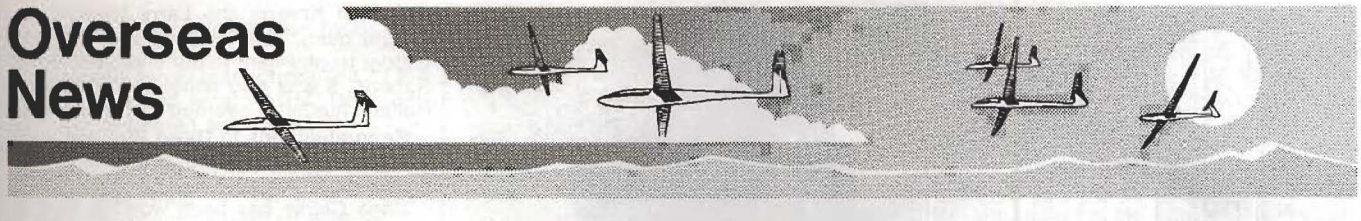
Sponsors need more for their money, not only from media coverage but also from members of the gliding movement who generally express suspicion, apathy, or opposition to them.

The cost of entering a team has escalated rapidly. The funds paid to send teams to Paderborn in 1980 and to the Championships in 1981 amounted to over £16 000. Had it not been for the generosity of Mike Carlton who paid for team uniforms, cross channel tickets and many other items the cost would have been over £20 000.

Getting money out of the British Gliding movement is like trying to get blood out of a stone! I wrote an article in S&G offering a magnum of champagne to be drawn at the Nationals at Greenham Common. Entry was simply a £1 note and a piece of paper with your name and address. The response was electrifying — a beautiful girl was selected to make the draw — she placed her hand in the bag and with great difficulty found the one entry! Congratulations and thanks to the winner: David Stevens of High Wycombe.

The answer to the question *posed by Mike Jefferyes in his article on p74 is: – 30kt achieved speed at point C on Fig 3, where the tangent from a 4kt climb onto a polar depressed by 2kt airmass sink would cross the airspeed axis – 20% worse than the 37.5kt achieved from a 4kt climb cruising at 69kt in still air.*

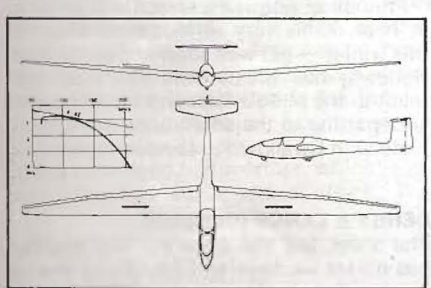
Overseas News



France

Centrair 101 Flies. Centrair's new Standard Class glider, the 101, made its maiden flight at Le Blanc on November 20, 1981, with managing director Marc Ranjon at the controls. No attempt was made to evaluate the aircraft's performance as the finish was incomplete and temporary ailerons had been fitted which had not been balanced. The flying characteristics at speeds of up to 150km/h proved very satisfactory according to the manufacturer (well-harmonised controls, light and effective ailerons, good stalling characteristics, excellent rate of roll — 45° to 45° in 3.5 seconds at 90km/h.) Comparison flights with an LS-4 were due to be carried out in December. The maiden flight was made with an ASW-20F fuselage, but the production model will have a redesigned fuselage with a less pointed nose and a different shaped canopy. Wing dimensions: aspect ratio 21.4; area 10.5m²; relative thickness 15.5% at the root and 12.6% at the tips. Aerofoil section based on a computer study and derived from Wortmann FX 61 — 147.

Marianne Project. In response to the FFVV (French Gliding Association's) wish to revive the production of French-designed gliders — in particular of two-seaters suitable for *ab-initio* and advanced training — two companies (Centrair and Siren) have put forward a joint project for the design and construction of such an aircraft. If the project receives government financial support it could become a reality within two years. Centrair would be the major contractor, but CARMAM and Issoire Aviation would manufacture certain parts of the fuselage and control system. The proposed design is along classical lines (glass-fibre construction, 19m span, cruise flaps, top surface airbrakes, wing section derived from Wortmann FX 62-K-131 and 60-126).



Other data: aspect ratio 20.1; wing area 17.95m²; empty weight 370kg; max AUW 580kg; max wing loading 32.3kg/m²; best glide angle 42 at 90km/h; min sink 0.7m/sec at 70km/h; VNE — 250km/h.

Please send news and exchange copies of journals to the Overseas Editor: A. E. Slater, 7 Highworth Avenue, Cambridge, CB4 2BQ, England.

Germany

"Bow-wave Thermals" — A New Phenomenon? Dr Klaus-Dieter Zink reports in *Aerokurier* on a curious meteorological phenomenon which he has observed repeatedly since 1973 when he first encountered it. On leaving a 6kt thermal at cloudbase he pushed forward into a SW wind and, instead of hitting the usual sink, found an area of smooth, gentle lift. By circling in it at min sink speed he was able to climb some 200ft above cloudbase in front of the cumulus before cloud started forming *underneath* him and threatening to engulf him from below. Again he pushed forward into wind and encountered precisely the same effect — weak lift which he was able to exploit until the cumulus started forming underneath him. In stages, he eventually climbed over 1000ft above cloudbase in clear air using this effect, and remained above cloudbase for over 1½hrs.

Compresses the air

The theory he proposes to account for this phenomenon is as follows. The first pre-requisite is a constant pulsating thermal source (*eg* a SW facing slope). Secondly, the wind must increase markedly with height so that the cumulus clouds are blown away as they form. The thermal must be intermittent because otherwise a permanent cloud would be formed, which could not be blown away by the wind. As it rises, the thermal bubble compresses the air above it which, before flowing away to the sides, is pushed slightly upwards as a bow-wave. (The ice anvils above many large cu-nimbs show this clearly.) This bow-wave can — for a short time only — be strong enough for a glider to climb in before it is engulfed by the cumulus forming below.

Dr Zink thinks this phenomenon is often mistaken for thermal wave and would welcome correspondence from other pilots who have shared his experience. His address is: Holdergasse 26, 7141 Schwieberdingen, W. Germany.

(Footnote: In the January issue of *Aerokurier* Dr Manfred Kreipl, the German team meteorologist, dismisses Dr Zink's theory and attributes his experiences to thermal wave, well documented since 1972.)

New Two-Seater 500km Triangle Record. Erwin Müller and Karl Senne have established a new 500km triangle world speed record in a modified Janus. The flight occurred during a gliding expedition to Namibia, and started at Bitterwasser. Their speed of 146.7km/h beat the previous record by over 6km/h.

Grob's 2000th Aircraft. A G-109 motor glider rolled off the assembly line at Mindelheim in December to become Grob's 2000th aircraft (not including the 200 Cirruses produced in the early 70s under licence from Schempp-Hirth). To date 1455 Astirs in their various versions have been produced and 470 Twins. About 50% of Grob aircraft have been exported.

Obituary — Georg Eckle. Georg Eckle, holder of the world 750km triangle record, died on December 19, 1981. He suffered a heart attack when flying his Nimbus 3. He established his world record in 1978 at the age of 64.

Kenya



BBC Man Takes to the Skies. While reading the Overseas News I was inspired to recall my experience with the "Voice of Kenya". Ben Mureithi of the BBC Swahili Service ended his secondment from "Voice of Kenya" by taking a gliding course. Ben left England determined to encourage gliding in Kenya and has now been dubbed "The Flying Broadcaster" by his colleagues. The photograph shows Ben and myself in the T-21. Dennis T. Wright.



CLUB NEWS

Sandy Lindsay of the Cairngorm GC thinks he made gliding history on January 10 when he was winch launched in his Swallow from frozen Loch Morlich, nine miles away from the club site. He did a circuit and landed back on the Loch two minutes later, realising his ambition to be the first man to do this in Britain. Sandy, who was given permission for the flight by the Forestry Commission, was photographed with his crew by Aviemore Photographic.

Copy and photographs for the June-July issue of S&G should be sent to the Editor, 281 Queen Edith's Way, Cambridge CB1 4NH, tel 0223 247725, to arrive not later than April 13 and for the August-September issue to arrive not later than June 8.
February 10, 1982 GILLIAN BRYCE-SMITH

AVON SOARING CENTRE (Bidford Airfield)
The end of last season saw Alison Beamish, Phil Pardoe and Colin Jeffrey going solo and Jeremy Fleetwood achieving his first Bronze leg, well done everyone.

Having survived the second ice age, we have now put away the skis and check flights have been the order of the day. Already the weather has shown promise of an early spring with several days of near soarable conditions and also visible signs of wave.

We are presently co-opting club members for help with the forthcoming non-rated competition which we are holding from May 22-30.

D.J.C.

BATH & WILTS (Keevil Airfield)
Stuart North and Richard Grundy are now full rated instructors. The Long Mynd expedition in October had a good week with bungy launching and wave to very modest heights while the Aboyne visit at the same time was also successful for those lucky enough to stay for a second week.

It was interesting to read the article on wave interference by Julian West in the December issue, p256. Two of our pilots flying a DG-100 and a Libelle at more than 22 000ft over Lake Muick on October 22, 1979, the day mentioned by Julian, were intrigued to be joined by another Libelle when they thought they were the only gliders airborne. It had taken several hours to find wave which took them any higher than 10 000ft. They consequently nicknamed him the "phantom glider pilot!".

J.L.

BUCKMINSTER (Saltby Airfield)
Our new clubroom is now fully furnished and was christened with an Italian supper party in December. Various other "do's" are planned.

We are hosting the East Midlands Regionals (August 20-29) and from May to September will be operating for seven days a week with weekly courses.

Our tug is having its wings recovered and the K-13 a respray and a new canopy.

Brian Spreckley, BGA national coach and a founder member of Buckminster, is running an advanced soaring course here in mid-July, and it is already booked up.

T.C.M.

COTSWOLD (Aston Down)
Fortunately the club sustained no damage during the recent arctic conditions and subsequent thaw. Flying has started with check flights for all.

The social event of the year, the dinner-dance, lived up to its reputation, continuing well into the next day. The trophies were presented as follows: the Harry Daniels cup (best cross-country), Mike Pirie; the Erica Holland cup (best pre-Silver performance), jointly to Geralyn Macfadyen and Paul Kevern; the Larry Bleakin cup (height gain), John Holland and the Club Ladder trophy went to our chairman, David Roberts. It was also announced that John Holland has been awarded a BGA Diploma.

Congratulations to David Bird and John Hodgson on going solo and to Mike Hajdukewicz on his 300km.

Chris Clarke has been working hard to introduce a new towcar with greater acceleration for low crosswind days. The vehicle has been fitted with a LPG conversion for economy. We will be watching the trials with interest.

P.K.

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COVENTRY (Husbands Bosworth)
Brian Lecomber was the guest of honour at the annual dinner-dance, which was a sell out despite the arctic weather conditions. Brian presented the following awards: Founders' trophy (best progress by a woman), Dianne Spalding; *Coventry Evening Telegraph* challenge cup (best progress), Pete Beardmore; first Silver leg of the year cup, David Booth; Migration cup, Nick Hackett, Jeremy Landrick and Frank Pozerskis; best points total by members of a syndicate, John Westley and Jeremy Landrick (5141); best two-seater performance, Norman James and Wally Mason; Barge trophy (most meritorious performance), James Cooper for his 228km flight to Taunton in an Olympia 1; best performance during the task week, Trevor Brigden and Peter Mason; challenge shield, Frank Davies; Club trophy (best position on club ladder), Roger Goodman who was also thanked for his work on the winch; trophy for the longest closed circuits, Frank Pozerskis; the award for the best position on the National Ladder, Nick Hackett and Frank Pozerskis and the President's cup, Les Crawford.

We had a record number of launches, over 7000, in 1981. There are tentative plans for a clubhouse extension and for replacing one of the K-8s.

N.B.

DEESIDE (Aboyne Airfield)
The severe winter meant that little flying or work on the clubhouse was done. Occasional wave flights in January and February helped to dispel the gloom.

The club has bought a Sport Vega and the local fleet grows — "Black Jack" Harrison has bought a Cirrus and Bruce Cooper hopes to complete his DG-202 soon.

Friends of Angus Patterson will be sorry to hear of his very serious road accident this winter — get well soon Angus. Graham Holloway has left us on a year's secondment to the Middle East and Pete Andrews is departing to the south once more, complete with Swallow . . . London look out!

J.R.B.

DERBY & LANCS (Camphill)
The snow, ice and generally bad weather has meant we have had little flying during the last two months or so. It also affected the social scene with the Christmas party being delayed until mid January. However it was a great success with the usual

number of UFOs orchestrated by ex CFI, Eric Boyle.

Some new blood was introduced to the committee at the recent AGM. Dave Salmon was re-elected as chairman.

New aircraft are arriving, the first being a long winged LS-3 for the Illidge family. It will be interesting to see how it fares against the recently stretched ASW-20.

The courses are filling well with much interest generated by the cross-country course to be run by John Willy in June.

A.M.

DEVON & SOMERSET (North Hill)

Surprisingly some days have seen a good number of gliders out for an airing. Working parties have been concreting the hangar floor and extending the water supply. There are rumours of schemes for hangar doors and the club Capstan for sale.

The dinner-dance and post AGM social were well attended. Sadly, at the AGM, our president, Francis Bustard, retired and was thanked by the chairman, David Minson, for all his hard work and support through the years. Francis joins our distinguished band of vice-presidents. Eric Shore was unanimously voted as successor to the presidency.

Annual trophies awarded were: best progress, Duncan Babington; best gain of height, Steve Frank; club ladder leader, Chris Dobbs; best cross-country, Eric Shore; task week winners, Chris Dobbs and Ian King and the maiden winner of the Wily Old Bird trophy was Eric Shore for his Gold distance and Diamond goal behind our backs in Austria. The trophy, skilfully executed in clay depicting a WOB, was presented by Ken Andrews for the perpetrator of the most meritorious event achieved through guile, skill and/or low cunning.

Diary notes: task weeks, May 31-June 5 and August 9-14 with six training course weeks scattered through June to September. Write or phone 040484 386 (weekends). We are again hosting Enterprise, June 26-July 3. Come west and share our sky awhile.

I.D.K.

DONCASTER (Doncaster Airfield)

After air experience flights, Cudworth Sub-Aqua Club invited our members to one of their training evenings, which was most enjoyable.

The Christmas dinner and panto were great successes with more than enough food (and sauce) for all. This was no mean feat by our chairman and helpers as all the water had to be transported to the club for the sub zero temperatures had frozen the clubhouse water supply.

The prolonged bad weather, which stopped flying, has had beneficial effects. The club trailers have been fully refurbished and many of the outstanding jobs on the tractors and winches completed.

The end of the big freeze was celebrated with 1½kt thermals on January 10 and our Falke did its first 1982 field landing on January 11 — can we claim these as UK firsts?

The club has a new telephone number, Doncaster (0302) 536066 — note the extra 3.

V.F.F.

DUNKESWELL (Dunkeswell Airfield)

The weather has severely hampered us and we have only had two flying days since Christmas. However, we look forward to the new season and to seeing instructors Mike and Barbara Fairclough flying their new PIK.

Our reverse pulley system is proving itself a sound investment with greatly improved launch height — the record is 1800ft. Many thanks to Ian Davison for modifying the cable drum and to John Street for overseeing the whole operation.

We are running full-time courses from May and anyone interested should contact the secretary, Dunkeswell GC, "Meadowcroft, Christow, Exeter EX6 7NQ.

R.P.G.

ESSEX & SUFFOLK (Hadleigh)

Congratulations to Barry Clarke and David Ringrose on going solo and to our chairman, Geoff Thurtle, for gaining his Bronze C and converting to the B-4.

Syndicate reshuffles are taking place — John Ballance has joined the K-6E and John Gilbert the ever-popular Oly. Cs of A are in progress on tugs and gliders and plans are well advanced for our Easter expedition to Portmoak. We are taking six syndicate and two club aircraft.

V.H.

EAST SUSSEX (Ringmer)

Peter Gresham has taken over as treasurer from Andrew Nopper, whom we thank. The tug and winch were out of action during January but flying has started again this month, though our field is a mud bath in places and we have been filling holes to keep the tug operational.

We are working with Southdown and Kent to join the Inter-Club League. Graham Reve, Maggie and Dave Clews, Guy Palmer, Tony Challoner and John Johnson have gone solo and Dave Hopkins and Guy Palmer have their Bronze Cs.

G.P.

HAMBLETONS (RAF Dishforth)

We have kept flying as best we could through the worst of the winter, though work in the hangar has been difficult due to lack of light.

At the end of January members arriving for the weekend from up to 220 miles away were surprised to find the hangar locked and our gliders incarcerated, along with those of our friends in Clevelands. This was because of problems between the clubs and RAF Leeming who control the site.

We hope to be flying again by the time this statement is published.

J.P.

HEREFORDSHIRE (Shobdon Airfield)

We had dramatic snow and frost and the airfield was closed a lot. Our 1982 tug pilot is Dennis Johnson, a Shobdon trained full Cat who should know where to drop us. We have a Sport Vega on order instead of another two-seater.

On January 23 Mike Costin spent five hours-plus in his big carbon Nimbus with wave to around 6000ft. January 30 brought wave with spectacular rates of climb ("off the clock honestly!") but a lot of cloud and turbulence. Peter Wulff (304) went to over 13 000ft and Graham Mason (DG-100) to 11 500ft, with many gliders around 8000ft. Tugging stopped for three frustrating hours mid-day because of turbulence but there were some good evening climbs.

R.P.

HERON (Yeovilton)

OBITUARY
Trevor Johnson



It is with great sadness I record the death of Trevor Johnson, aged 31, on November 23 from cancer. Trevor started gliding with us in 1972 and spent most of his free time since then at or working for the club.

From going solo in 1973 Trevor progressed steadily and became one of those pilots who seemed to stay airborne when everyone else had "fallen out". He completed his Gold distance and Diamond goal in 1978 in our syndicate Skylark 4 and gained his Gold C in 1979 with a wave climb at Aboyne.

Trevor was thoroughly competent in all the tasks necessary to the running of the club and in a calm determined way did much to ensure the club's survival in latter years.

He became an assistant instructor in 1978, a full Cat in 1981 and deputy CFI in December, 1980. Sadly he was only to hold this position for a few months although he continued flying until three weeks before his death.

Trevor will be remembered for his flying ability, the quiet way he got on with the job and for his long courageous fight against cancer. His death has left a vacuum in our club it will be difficult to fill and he will be missed by us all.

John Wiseman

INKPEN (Thruxton Airfield)

Our chairman, John Francklow, and CFI, Roy Hunt, have resigned after devoting

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many hours of their time and much energy to the welfare of the club. Tony Gordon takes over as CFI and intends running three day intensive courses.

The club will be open every day of the week except Mondays and Tuesdays.

P.P.

KENT (Challock)

We were snowbound for much of December and January but it didn't stop the enthusiasts from flying and children and adults bravely battled up the track to the club for their respective Christmas parties which were a great success.

On collecting their Sport Vega from Slingsbys, having had some mods done, Tony Bradley and Alex Wright stopped to test fly it at Sutton Bank and ended up with Gold heights.

We would like to claim the first cross-country of 1982 when on January 3 Nick Singer landed out some two miles away in the club K-8 on a hangar flight! Nick has since emigrated to Australia along with Dave Bell.

Despite many mutterings of new syndicates, the only new aircraft on site is a Kestrel to replace our CFI's syndicate Astir.

A new Inter-Club League has been formed between the Kent, East Sussex and Southdown GCs. Our full social calendar starts with a "start of season" dinner on February 27 and the AGM a month later. Our open weekend in May has turned, due to our treasurer's greed, into a three-day event and anyone wishing to visit us, especially with a two-seater, will be welcomed with open arms!

J.H.

MARCHINGTON (Marchington)

The winter has passed quietly apart from the annual dinner-dance in November and an interesting club outing to the RAF museum at Hendon.

The training facilities have been extended, thanks to Philip Hextall who has bought a Falke which is available for club use, and work has started on extending the hangar.

The sale of the site has been put back once again but we think that we now have a firm date for the auction in September.

S.D.B.

MIDLAND (Long Mynd)

In spite of mountainous snow, we have had a very social winter with plenty of visitors — principally from the Coventry, Essex and Norfolk clubs.

We tasted the first 1982 thermals in January and there have been several good wave days. We are much more cross-country orientated as a club and it is good to see so many new Bronze pilots itching to go for their Silver Cs.

M.A.

NEWCASTLE & TEESSIDE (Carlton)

Congratulations to Dave Wood on going solo, Denise Marshall and Brian Boyes on completing their Bronze Cs and Bill Irving on gaining his Silver C. Mark Stokeld and Peter Irving successfully completed instructors' courses.

Sadly, after a complete engine overhaul, our Auster Aiglet was damaged making a forced landing so we are deprived of aerotowing.

Following a two month non flying period due to the snow, we held our annual presentation dinner in January, ably organised by Mark Stokeld. Norman Revell, our former CFI, was a guest and presented the trophies.

Our Easter course is being run by Brian Richmond and Peter Irving.

W.R.I.

NORFOLK (Tibenham)

Our nearly completed clubhouse extension has revolutionised the *apres*-gliding side of our activities. Our thanks to the hard working types who did the building and decorating.

On being told he was overweight, George Day, a senior instructor, decided to have a sponsored slim. He lost 14lb in four weeks and raised nearly £70 for club funds.

A small group took the K-18 to the Long Mynd in January. No wave unfortunately but an enjoyable trip which gave us a chance to try winch launching. Thank you, Midland GC.

On the syndicate side, an LS-4 is on order, a large group is buying a Hoffman motor glider and Malcolm Harris snapped up the last of the new Vegas from Slings and is busy fettling.

We are again having two task weeks and an almost continuous run of courses, so the Super Falke should be kept busy.

M.J.R.L.

NORTH DEVON (Eggesford)

Winter rain and blizzards turned the winch end into a paddy field but the landing area remained flyable. During the gales our toilet sustained Cat 4 damage on its first solo. However we are pleased to congratulate our first solo pilots from the new site, Terry Bennett and John Ellis.

Our CFI, Barry Pearson, and winchmaster, Owen Hill, are running summer courses for Dunkeswell GC and it is hoped this will encourage our members to do some mid-week soaring.

B.P.

NORTHUMBRIA (Currock Hill)

At the annual party and prizegiving, Andy Townsend won the ladder with 1700pts, which is a club record, as well as the wave trophy and the speed prize. Other trophies were presented as follows: cup for the longest distance, John Greenwell who was second on the ladder; winner of League 2 and the Rick Walton trophy, Craig Lowry; Northumbria cup for the best flight in a club glider, Elaine Townsend, who has also completed her PPL, and the two-seater award, Rob Thompson who gained Silver height in the new SHK on November 15.

There were several other good flights on November 15. John Greenwell went to 15 000ft, Ron Davies to 9000ft, Derek Staff to 10 000 and John Westward to 12 000ft. Andy Townsend became the first member to complete his Gold C last summer.

Wave returned again on February 7 when Graham McAndrew flew a 100km triangle at 9000ft in the SHK, John Greenwell got to 12 000ft as did John Westwood who broke off over Durham Cathedral still going up at 4kt. The best flight was by Bob Nichol who at 12 500ft got his Gold height and did five hours.

Craig Lowry, Lyn Greenwood and Graham McAndrew are going on an instructors' course at Lasham in April.

J.W.

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OUSE (Rufforth Airfield)

Once again the annual dinner was a great success with the awards going to Graham Bennie for the longest Silver distance flight, Mark Thompson for the longest handicapped flight and to John Stables for the best new member.

Wave visited the site during the latter end of 1981 with Pete Ramsden having the best flight to 12 000ft. We welcome the ex NationGlide Sport Vega to the club and expect great things from the new syndicate. The Skylark 2 and K-7 have been refurbished and are back in operation.

Pete Ramsden has retired as CFI. He had done an excellent job over the last four years, probably the most difficult in the club's history. John Cheeseborough takes over as CFI.

Our ski trip to Switzerland was a great success and enjoyed by 16 of the 17 who went. The 17th was Graham Bennie who broke his leg in two places on the last day. We had to leave him behind with all those Swiss nurses — poor Graham.

S.R.L.

OXFORD (RAF Weston-on-the-Green)

The original Olympia 460 took to the air again at Weston last year after being stored as wreckage since 1966. This is the prototype, built in 1960, from which the production 460s and 463s were later evolved. In its early days it was flown by leading figures such as Derek Piggott, Tony Deane-Drummond and Andy Gough, and it passed into private ownership in 1962. It crashed in 1966 when it was pictured in S&G suspended from power lines.

Club members Graham Barrett and Martin Nickolls found the wreck in 1979 dangling from a hangar roof at Farnborough. They started on a two-year rebuilding programme with the help of John Halford, CFI of the Enstone Eagles, and Martin Hastings.

Both main spars had to be replaced from the root out to the point where the aluminium spar cladding stops, and the

fuselage also required substantial reconstruction. The original ailerons extended to the tips, and it was decided to modify this to the conventional form with solid tips in the hope that this would improve the spinning characteristics and the problem of control reversals at high speed. Both of these faults were noted down in the logbook during the early years. A new wing-root fairing was also made to replace the old rather crude design.

The glider was finished in silver and green with the original registration letters G-APWL, and it flew 500km in cross-countries during the last part of the season. Its proud owners are to be congratulated for restoring it to flying condition.

P.H.

PETERBOROUGH & SPALDING (Crowland Airfield)

Last year's East Anglian Inter-Club League between Cambridge University, Essex & Suffolk and Peterborough & Spalding GCs, produced some 8160 cross-country kilometres from nine out of ten competition days, and the League will be even more fiercely contested this year.

To help competing pilots our CFI organised a series of evening talks throughout the winter on various topics including dolphin techniques, field selection and thermal centring. Bronze C lectures preceded these for early solo pilots.

We completed most of the C of A work on the club aircraft ourselves and we have a new ceiling in the workshop and clubhouse interior enlargements.

Our annual dinner-dance was very well attended and heralded the usual batch of "silly" awards, notably the Toyota trophy to Lesley Aurther for going on three retrieves in one day! Congratulations to David Johns and Freddie Login who also received awards for 1981.

M.S.C.

RATTLESDEN (Rattlesden Airfield)

When it didn't rain it snowed, and when it snowed it froze, thus December's weather put us firmly on the ground. However we had a thoroughly enjoyable day at Challock on New Year's Eve with the Kent GC. Our thanks to Mike Moulang and his men.

At the AGM in January the outgoing committee were thanked as well as Jim Barge for stopping the leaks in the clubhouse roof, Bob White for warming it up, Mike Arnold and Rob Smith for refurbishing the winch, Bob again and Mike Moyes for looking after the aircraft and Colin Hinchman, CFI, and his instructors. Congratulations to Pat Smith on completing his instructors' course.

R.H.

SCOTTISH GLIDING UNION (Portmoak)

The first flight of the New Year was on January 2 when Colin Appleyard returned from Hogmanay and dragged a K-13 (accompanied by Malcolm Shaw) from the snowbound hangar. It is in weather like this that we see the advantage of our northerly runway. The day gave a chance for Graham Smith, CFI, to check-out our new tug pilot, Rory Ellis from Dunstable, who replaces

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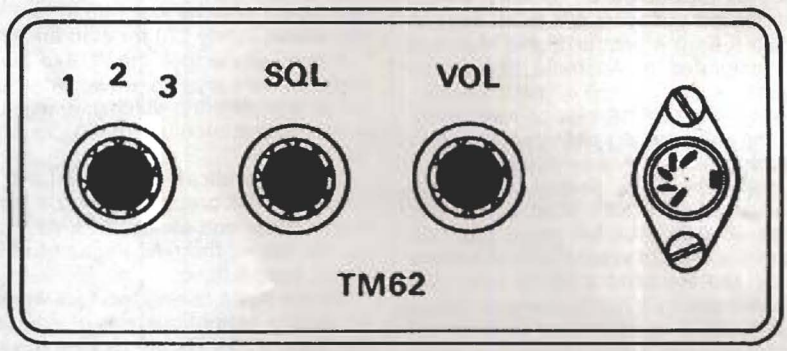
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At the annual dinner Brian Scougall was presented with three trophies including the Club Champion for outstanding flights; Tom Docherty took the O/R and the cross-country trophies, the latter for a 651km flight to Challock; Simon MacIntosh was awarded the Handicap cross-country cup for a Diamond goal flight at 66.1km/h in a K-6E, this being only the third wooden glider to make such a flight in wave from Portmoak; Mike Munday gained the Thorburn Two-seater Cross-country trophy and the Service salver went to Roy Howse for his stirling work with the summer courses.

A.S.

SHALBOURNE SOARING SOCIETY (Nr Hungerford)

The north winds are avoiding the weekends, so some impromptu weekday flying enabled Jane Adams and Ken Porter to gain their five hours and John Garrett to complete his Bronze C on our ridge in January.

Julie Adams has just gone solo to become a full member of the "famous" flying Adams family.

Our winter lectures got off to an excellent start with 50 enthusiasts listening to John Williamson's talk on "Cross-Country Flying", and over 30 people each week attending our non-guest speaker evenings. We are looking forward to future evenings with Derek Piggott, Chris Rollings and Dave Watt.

B.C.M.

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SOUTHDOWN (Storrington)

After many months of negotiation we have finally obtained an agreement with our landlords for a new and wider runway, which will allow better winch launching in the prevailing westerly winds.

We are pleased to have Don "Tiny" Irving as our new CFI following the retirement of Keith Mitchell after two years of enthusiastic and effective office.

We are pleased to welcome Mary and Dick Dixon from Usk and hope they enjoy vast amounts of flying in their new Astir syndicate.

Syndicate moves have been taking place with extraordinary rapidity. The long loved Swallow has moved on, the Kestrel has three new members, as has the Astir and the new Blanik syndicate has eight members.

Winter flying has been poor with January 27 the exception when our 70km ridge was working well and attracting pundits from Lasham. John Ward and Angus Buchanan used the day effectively with fast times on O/Rs to Petersfield.

Following a pilot experiment last year which was highly successful, we are planning a series of midweek air experience days for the public.

A bleak point for the future is the inexorable march of controlled airspace. The extension of the London TMA has reduced our ceiling to 4500ft from 6500ft. Perhaps eventually **they** will expect us to fly underground.

B.A.B.

SOUTH WALES (Usk)

Before the snow and floods, the end of December produced some classic wave. At what must have been the coldest AGM on record it was decided to buy a second barograph with the Ken Gardiner memorial fund and name the first the "Danniel Roberts" barograph.

Peter Storey is our first full-time employee and will be putting his inspector's skills to full use. Meanwhile our thanks to the winch builders, tractor repairers and C of A workers for all their efforts during the winter. Amazingly the only victim of the hard frosts was the cable retrieve tractor with a cracked block.

Peter France has stepped down as CFI after several years' hard work and Ken Councell has taken his place.

P.A.C.

STAFFORDSHIRE (Morridge)

Our beautiful K-18 was flown from our site for the first time on Saturday, February 6, by DCFI, Colin Ratcliffe. To speed up the launch rate for our enlarged fleet we are building a flying retrieve winch similar to the Midland GCs whose assistance we greatly appreciate.

We have our social and AGM in March. High on the agenda is what flying and subscription charges we should levy to clear our overdraft. Courses planned for this year include Whit club week, an *ab-initio* week in early July, a cross-country safari from Saltby in late July and the Portmoak wave camp in late October.

P.F.

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STRATHCLYDE (Strathaven)

Our instructor shortage has been relieved by Martin Rogerson gaining his assistant Cat and two members going on courses this spring. Congratulations to Graham Carson on going solo.

We have our usual expedition to Feshiebridge in May in search of badge flights. After the success last year we are again running the "200 Club" to inject much needed capital into the club funds. The club newsletter has appeared again after a two year break, being published professionally by Leslie Madden.

P.A.

STRUBBY (Strubby Airfield)

Despite the loss of about half our runways, dug up for road making materials, flying continues unabated. Our new two drum winch, built by ground engineer Ray Bourner with the help of club members, is a complete success and giving consistently good launches. Ray has now started constructing a standby winch.

The club T-21 had an interesting flight recently, remaining at the top of the launch in a strong wind for 47min at 2000ft. The instructor spent the time discussing field selection with his pupil. The winch driver later complained of a stiff neck.

We have had eight solos and a number of Bronze Cs this winter, which isn't bad for a club with a membership of only 50. The club fleet consists of a T-21, Bocian and Skylark with plans to buy a better glider.

Visitors by air or road are always welcome and we fly every weekend.

C.McD.

ULSTER (Bellarena)

We escaped the worst excesses of the arctic spell. Flying continued without interruption from a frozen but snowfree field. The year opened with a succession of sunny Sundays with wave, ridge lift and some short-lived but stonking winter thermals. In the evenings the *gratis* barrel which Coventry's John Cadman had Guinness deliver to our local hostelry as a Christmas remembrance of his August visit was emptied at an alarming rate. What a smashing gesture!

Mark Stewart, aged 16, quickly followed his twin, David, into the solo ranks and Alan McKillen has also soloed with plans to monopolise the club Skylark all spring.

The winch which Gordon Mackie built was never fully debugged before being badly vandalised. With great dedication throughout January Ruth Hall restored it more or less single-handedly, shaming us all.

At Easter we're having a nine-day fly-in, with Mynd, Hus Bos and Dublin contingents expected. If your plans are still fluid feel free to come. Phone me on 0232 654366 for the dope.

R.R.R.

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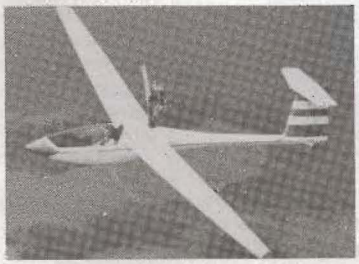
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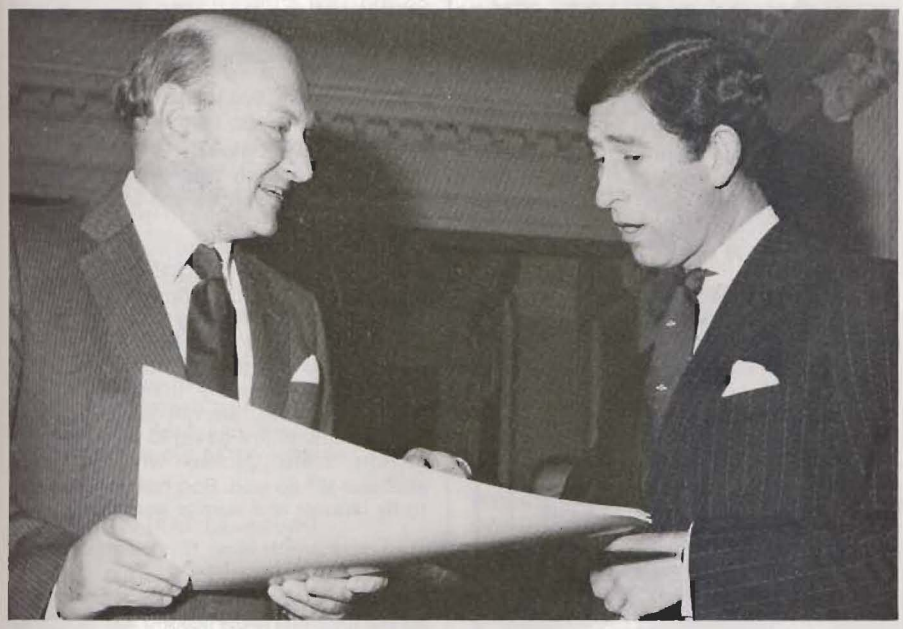


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Chris Wills, president of the Vintage GC, is photographed accepting the FAI Diploma of Honour from The Prince of Wales, president of the Royal Aero Club, at a recent reception. The Diploma was in recognition of the club's remarkable success in restoring historic gliders, amassing considerable documentation on the subject and organising rallies.

VINTAGE NEWS

Two more gliders have joined the growing fleet in Britain. A 1936 Grunau Baby 2A (BGA 270) was restored around its original fittings by John Smoker and Ken Harris and the 1935 Kronfeld Drone motor glider (BGA 273) had its first flight for 44yrs during November in the hands of its owner, Mike Russell, at Duxford. It climbed to 2000ft in 6min and made two flights of 17 and 33min.

A further two Grunau Baby 2Bs, a Rhönbussard, two Kite 1s and the King Kite and Falcon 1 replicas are likely to fly this year. David Jones (King Kite) and Southdown Aero Services (Falcon 1) have been making great progress.

There are another 12 pre-1945 vintage gliders either being, or will be, worked on. The Vintage Glider Club in Britain now has approximately 18 pre-1940 built gliders airworthy as well as 12 more built before the war and a further 25 built after 1945. We now have about 400 members.

Members at the London GC are organising a Rodi Morgan commemorative rally in early September, open to British and foreign members.

In Germany our member, Klaus Heyn at Goeppingen, is continuing to build his 1935 Rhönadler. The fuselage, tailplane and wing ribs are finished.

In Hungary our members have flown their replica Vocsok nacelle primary and have started to build a 1934 Rubic Cimboro two-seater.

In Holland Neelco Osinga has just finished and successfully flown his Grunau Baby 2B.

C.W.

WELLAND (Middleton)

The weather ended flying for us at the end of November and we are now waiting for the field to dry out. The tractor now has "go-faster" rear wings (actually to prevent the launching of mud and other nasties by the rear wheels). It is being overhauled and painted, together with the trailers and winch, for which we now have a turbo engine.

We welcome several new members together with a syndicate EoN Baby. Belated congratulations to Don Martin on completing his Bronze C and to Jim Gardner on going solo.

R.S.

WOLDS (Pocklington)

At our annual dinner-dance Bill Young was presented with two awards for coming top of the club ladder (for the second year running) and for the longest flight. Colin Milner gained the trophy for the most meritorious flight and Clive Porter the award for most progress. We were presented with a beautiful brass model of a Hampden bomber by Pat Flude in memory of her husband Roy, which will be awarded annually to the hardest working member. This was very much appreciated.

Congratulations to Ann and Harry Lofthouse who went solo on the same day. We have an expedition to Portmoak at Easter.

Preliminary negotiations have started to buy a new site a mile south-east of here.

H.N.

WOODSPRING (Weston-Super-Mare)

We are changing our name from March 1 to the Mendip Gliding Club. When we were formed in 1975 we wanted to adopt the name of our local ridge but there was already a RAFGSA club of that name which has since disbanded.

Angelos Yorkas and John Bridge have been accepted for a course at the French National Centre at Saint Auban for two weeks in March. Congratulations to David Bagshaw on going solo, to Ken Buckingham on gaining his Bronze legs and welcome to Ron Perry on joining our instructors.

C.B.H.

WYCOMBE AIR PARK (Booker)

The "Oxfordshire highlands!" produced enough wave on February 2 for our CFI to fly the first cross-country of the year from Booker and thermals on January 6 gave excellent winter soaring.

The newest club glider to appear is an SF-34, bought by the BBC club for its members. The main runway and (of more direct concern to gliding types) the hangar roofs are being resurfaced and many of the buildings are due for a facelift.

A.C.

SERVICE NEWS

BICESTER (RAFGSA Centre)

We flew despite the snow, partly thanks to a few stalwarts making an ingenious snow plough adapted to fit the hydraulic hoist at the rear of a tractor. Andy Gough had our first soaring flight of the year, reaching cloudbase at 2700ft in a K-8 on January 6.

Last year we gained CAA recognition as an approved BGA agency for tug C of A renewals and were highly placed in competitions. Peter Saundby was second in the Enstone Regionals' Open Class and Andy Gough won the Kingshurst Silver trophy for the best score by a Serviceman and the Tinsley cup for the best score by a RAFGSA member in the Inter-Services Regionals. High scores also by Ken Hartley and Steve Hymers contributed to Support Command becoming the RAF Inter Command Champions and winners of the Goodbody trophy.

At the AGM in December Whitsun Bush was awarded the Daniels trophy for his contribution to the Centre and Garry Buckner gained the Novices trophy after progressing from *ab-initio* to Silver C in three months. Our thanks to Ken Stephenson for organising the enjoyable Christmas dinner-dance following the AGM.

The latest addition to the fleet is an LS-4, on loan from the agents, and our Nimbus 3 is due soon.

C.L.B.

FENLAND (RAF Marham)

Despite the bad weather we have flown almost every weekend, including Christmas and the New Year. Our *ab-initios* have taken advantage of the winter and Carol Reeves, Chris Thomas, Chris Fowler, Andy Reed, John Mulcahy and Roger Bazzoni have gone solo.

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Congratulations to our DCFI, Ralph Dixon, on being awarded the Kinghurst Gold trophy for most meritorious flight by a Serviceman in the Nationals (he was 14th in the 15m Class). At the same time he collected the Roderick Salmond memorial prize for the top Service team of three pilots.

Membership has increased considerably with new members and some transfers, bringing a welcome influx of expertise. We also have a large number of Americans in the club.

Work is proceeding on the new bus winch. We will soon have three and then the old Wild winches can be retired.

We have an expedition to Portmoak and on our return Ian and Sue Smith will be leaving us for Harlton. We send them our best wishes and thanks. We have also said goodbye and good luck to Simon Ludlow who left for Cranwell to train as a fighter pilot.

R.R.J.R.

FULMAR (RAF Kinloss)

First, a welcome to Tony and Kate Killingray from Four Counties and Mick Orr from Bicester.

The only wave soaring so far this bleak winter was by Ron Jackson who had to leave the lift at dusk. Congratulations to Pete Whittaker on going solo, Kev Parikh on converting to the K-8 and Shirley Stewart who stepped up into the K-18.

Goodbye and many thanks to Al and Rose Thompson, aircraft and clubhouse members, who are going to Germany, and to Ron "Slurp" Jackson who has looked after our MT so well. Ron has gone to learn to fly heavier and noisier aeroplanes.

P.G.

HUMBER (RAF Lindholme)

By the time this goes to print, we should be ensconced in our new home at RAF Scampton. Unfortunately, it looks as if we shall have to say goodbye to Lindholme, which has been our home for many years. Mrs Thatcher has decreed that everything not in use goes back from whence it came! So we have to go! However, we are hoping that our new home will allow us to fly midweek, Waddington permitting, which means we will be able to invite other clubs for soaring weeks.

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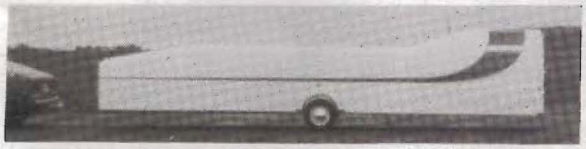
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The Station Commander's wife presented the following prizes at the AGM in November: the Worker's trophy, Dick Gibbs, MT member, for all his hard work put in with the help of our previous winner, Tony Smith; the best progress in the year trophy, Sheila Gildea, who went solo and completed her Silver C in under a year and the CFI's trophy for the fastest time round a 100km triangle, Dave Cockburn.

There was little flying during December due to the weather but on January 9 Dick Gibbs managed 25min and Bernie Shaw 17min in the K-13 with a pupil. Then on the 31st Bernie soared for 28min and Conrad Wace scraped 18min. Saturday, February 6, produced wave which Bernie contacted from a 1200ft winch launch. He climbed to 6400ft in the Astir and flew for an hour before running out of daylight.

K.M.G.

TWO RIVERS (RAF Laarbruch)

Our aircraft and MT workshops have been busy with our K-8c being given a major and our Astir a mod. We have fitted our winch with two new cables which should reduce the rate of cable breaks.

Dave Mintey got our soaring season off the ground with a half hour flight on January 31. Simon Hutchinson and Sandy Powell are going on assistant Cat instructors' courses and planning has begun for an expedition later in the year to Romorantin in Central France.

At the AGM in January members were pleased to hear that launch fees are not going to increase! The presentation got a bit repetitive with Simon Hutchinson taking away four trophies — and deservedly won too! The AGM was followed by a social evening and buffet in the bar.

Malcolm Norris has resigned as CFI after nearly three years and with his wife Sue is going to Brawdy. We thank them both for all their efforts. Mick Mahon has arrived from Gütersloh to take over as CFI.

D.R.M.

WREKIN (RAF Cosford)

Our AGM went down well with Dave Wakefield gaining three trophies. John Lambert presented Grp Capt Mullen with a cheque for £325 on behalf of the Nation-Glide appeal.

Phil Morgan just missed Gold height the day after, proving again that we do get wave at Cosford, and well done to Ray Weston on going solo.

Our New Year's party was well attended by members from Fulmar, Cranwell and Marham but the weather limited the flying. Our aircraft workshop is being well used as we complete our winter servicings.

Spike

WYVERN (RAF Upavon)

A very successful *ab-initio* course was run at Waterbeach for Army Air Corps members. The brunt of instruction was taken up by the CFI, Howard Jarvis, assisted by Graham Russell and Gerry Sturgess. Flying has otherwise been very disappointing with only 11 flying days throughout December and January.

We have now exchanged a K-13 for a K-21 which has prompted many pilots to suddenly request dual checks, instructors included.

Ian Moss has retired after three very busy years as chairman and was immediately elected vice-president. His place has been taken by Howard Jarvis and Grahame Sharpe is the new CFI.

J.R.H.

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50 YEARS AGO — The Nyborg Glider

A. E. SLATER

In 1932, 50 years ago, there appeared upon the British gliding scene a tall Swedish inventor, Mr T. G. Nyborg, who told us that our sailplanes were too big. He had extrapolated from birds of various sizes up to man, and in 1931 he started building his idea of a glider for humans.

It was small and heavy, with a span of 34ft, wing chord of 18in and empty weight of 274lb, and it was kept mostly at Dunstable where it was occasionally rigged. The wings looked thin and narrow and rather flat, and those who helped with the rigging said that the main spars were of solid oak.

Hefty launch

The machine never flew, let alone soared, until Nyborg persuaded Eric Collins to test it. Collins had joined the club as an *ab-initio* in early 1932 and made spectacular progress, soon putting up British distance and height records. The Nyborg needed a hefty launch because of its heavy wing loading, the result of Nyborg's extrapolation from birds. It never got much above the ground there and its flying speed and momentum were such that it once went right through a fence without showing any sign of damage to itself.

Eventually it was taken to Duxford where Ralph Slazenger, a founder of the Cambridge University GC, had some aerotows in it (I went to watch) in order to test its gliding angle after release. The angle came out at only 1:8; but Nyborg was not dismayed: he brought up a phenomenon known as a "high speed stall" and explained away that awkward 1:8 figure to his satisfaction.

In 1934 Collins had a crash in it and damaged it beyond repair; he also damaged himself, but he and his wife tried in vain to get Nyborg to pay the doctor's bill — that might have implied an admission of faulty design.

One evening, during the 1934 Nationals at Sutton Bank, Nyborg gave a talk in an hotel in Thirsk on his aviation career, and gave me a typescript of it for publication in S&G, but it was so long that room for it could never be found; he also gave a technical paper claiming that current aerodynamical ideas on wing drag were all wrong; it was far less than supposed, especially at high speeds.

A correspondent in Warwick is now building a replica of the Nyborg sailplane and has asked for information, so I looked up the file and in the very first paragraph lighted upon what now seems the obvious source of Nyborg's unorthodox ideas. A Norwegian friend had been observing the flight of the albatross, evidently from a ship, and from his description Nyborg concluded that "the flight of this bird seemed to vary widely from that possible in accordance with the laws of resistance then known to me . . . If the accepted laws of air resistance were correct, then the albatross could not fly without doing work, but as this bird did fly without working . . . the accepted laws . . . were wrong."

It is obvious to us now that he completely ignored the possibility of the bird soaring — an activity which hardly anybody in those days, however intelligent, seemed capable of understanding, and the whole of Nyborg's subsequent work was evidently based on this attitude.

But there was more to it than this. Nyborg's fuselage was unbelievably crude: the front part was hardly more than a box with the corners and edges rounded off. I once tried to point out to him that this must have an adverse effect on performance. But he would not have it: he said the performance would be exactly the same whatever the shape of the fuselage. A man who can say that must believe that his wings have magic properties, and cannot be regarded as rational.

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Make their mark in the space they share
Ripples ripples, waves spreading out
Buffet and jostle, swirl deep and shout

A being created, a cloud takes on form
Capping a mountain with thin fabric torn,
Used up and finished it wanders from view
Boldly by marching, or just changing to blue

Men in their shells glide on the peace
So little holds them, white shell then space
Wonder, Oh wonder! Floating above
More room for laughter, strength, fear and love

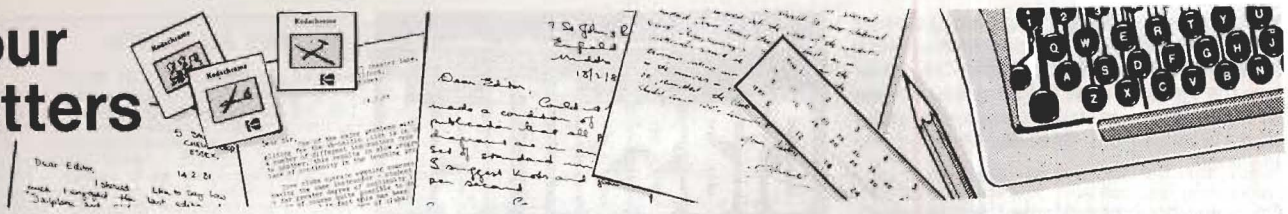
Old sun starts gliding, red streaks appear
White birds know that night time is near
So hard to leave so Golden a sky
Soft landing, smooth stop, handshake, goodbye

Donald A. Loucks

FORTHCOMING EVENTS

MAY 9-20: Hahnweide International Contest, Kirchheim-Teck, W. Germany.
MAY 17-28: Dutch Nationals, Terlet, nr Arnhem.
MAY 20-29: Swiss Nationals, Buttwill.
MAY 20-31: Belgian Nationals, St. Hubert. Open to visitors.
MAY 22-JUNE 6: German Nationals, Bayreuth.
JUNE 4-20: European Club Class Championships, Lager Hammelburg, Nr Frankfurt, W. Germany.
JUNE 5-13: Nationals, Open Class, Lasham GC, Lasham.
JUNE 13-July 4: Trans-European Rally, Angers, France.
JUNE 19-27: Western Regionals, Bristol & Gloucester GC, Nympsfield.
JUNE 26-JULY 3: Competition Enterprise, Devon & Somerset GC, North Hill.
JUNE 28-JULY 4: Inter-University Task Week, Duxford.
JUNE 29-JULY 8: USA Nationals, 15 Metre Class, Harris Hill, New York.
JULY 3-15: French Nationals, Chateauroux, France.
JULY 10-18: Nationals, 15 Metre Class, London GC, Dunstable.
JULY 20-29: USA Nationals, Standard Class, El Mirage, Adelanto, California.
JULY 20-30: 1982 World Cup for Mountain Gliding, Vinon, France.
JULY 24-AUGUST 1: Northern Regionals, Yorkshire GC, Sutton Bank.
JULY 29-AUGUST 10: European Championships, Rieti, Italy.
AUGUST 3-12: USA Nationals, Open Class, Caddo Mills, Texas.
AUGUST 17-26: Inter-Services Regionals, Colerne, Nr Bath.
AUGUST 7-15: Nationals, Standard Class, Wycombe Gliding School, Booker.
AUGUST 21-30: Enstone Regionals, Enstone Eagles GC, Enstone.

Your Letters



WHY HAVE CLASSES?

Dear Editor,

With regards to Simon Redman's letter in the December issue, p296, may I ask the question "why have Classes at all?" If all gliders were suitably handicapped and windycapped then surely they can all compete together. If the reason for having Classes is to give each competitor an equal chance then this is an admission of failure of the present handicapping system. The argument that Classes were introduced in an effort to limit costs also holds no water if it was made possible for an old glider costing £2000 to compete equally with a £15 000 glider. In fact the present artificial restraints could be increasing costs by splitting production runs and demanding sophisticated technology at exorbitant costs in order to achieve the ultimate in that Class. A return to a realistic handicapping system could have the following beneficial effects:

1. Freeing constructors from introducing artificial handicaps into glider designs.
2. Removing the need to design racing machines thus allowing designs to be concentrated on safe cross-country machines.
3. Enabling rich and poor to compete equally in competitions.

VIC FIELDING, **Doncaster.**

COMPETITION NUMBER FEE

Dear Editor,

I feel I must register my complaint about the change in the competition number fee. It is my opinion that us owners are a somewhat captive audience — increasing the fee by over 200% is in very poor taste.

If a similar increase were to be levied on everything, an aerotow would cost about £25, a Libelle £21 000 and club subscriptions £350pa. There would be no one left in gliding. Have I made my point?

M. BREEN, **High Wycombe, Bucks.**

A NEW METHOD OF SOARING SOLITARY WAVES

Dear Editor,

We all know about standing waves but in the September 3rd, 1981 issue of *Nature*, p46-49, waves which moved are described. They moved cross-country at about 10m/sec, *ie* almost 20 miles per hour, and were just a few hundred metres deep and a few hundred metres wide, reaching from horizon to horizon. The lift was about 16m/sec and the wave was tracked for eight hours. Flights of 1500 or 2000km in these waves appear to be possible, after which you might cover another 500km in ordinary cumulus. They have been described in Australia and the clouds marking the waves can easily be seen in satellite shoe, however the authors (Christie, Muirhead and Clarke) suggest they may be common elsewhere.

The scheme as I see it is to set up camp north of Alice Springs and watch the satellite shots until you see the wave. You then get an aerotow to one end of the wave and fly to the other end, a distance of about 500km while the wave itself moves about 500km, more or less as one might fly along a cold front.

Although the phenomenon resembles a cold front in fact the temperature rises quite a lot, 2.5%, and seems to be associated in some way with the break-up of the morning inversion.

This phenomenon will be extensively studied as it is obviously a serious hazard to aviation and no doubt satellite shots will be studied by glider pilots world wide to find the habits of their local waves (if any). I think North Africa or rather the Sahara is the best place to try. Obviously you will study a lot of satellite film from Met stations until you know the habits of the beast. You start at one end of the wave and fly to your first TP along the wave then back along the wave to your second TP, finally flying by conventional thermals back to your start.

Those interested are recommended to see the original paper in *Nature*. L/Ds of 55 and now this! Gliding is soon going to be too easy.

BRENNIG JAMES, **Marlow, Bucks.**

THE LOSS OF GLASFLÜGEL

Dear Editor,

I am sure Rhoda Partridge was mistaken when she reported Dieter Fuerst laughing cheerfully as he advised her that Glasflügel had closed. (See December issue, p269.) Bitterly, more like. Dieter was known throughout the world for his helpfulness to customers and his loyalty to the company in which he had invested 15 years of his life, and for the last three months of which he had not been paid.

The whole gliding movement is poorer for the closure of a company which produced such well engineered products, but to those directly involved it represented their loss of livelihood as well.

JUSTIN WILLS, **Kidlington, Oxon.**

IS THIS A RECORD?

Dear Editor,

Roy Procter took 34 years between A and Gold C. It's not so easy when you own a two-seater as qualifying must be done solo — I offered to jump out the fourth time he raised the Bocian over 3000 metres! He may even have broken another record at the same time by finally achieving it not only solo but in cloud without variometers — they went u/s before the qualifying climb started. Any takers to beat either record?

ANN PROCTER, **Camberley, Surrey.**

HANGAR THERMALS

Dear Editor,

I noted, not without a modicum of awe, that Dunkeswell GC's statistics in the last issue, p30, give them an average flight time of 8hrs 55min. If it is such good weather in this part of the country, why have they only managed 500km?

Or are their pilots glued to their seats and the gliders hung from the hangar roof by a length of stout rope until they suffer from swollen statistics?

Statistics rule OK.

ERIC HAMILL, **Doncaster.**

Barry Rolfe, BGA administrator, replies: Sorry — it was not those south-west thermals but a typing error that inflated the Dunkeswell statistics from 267.30hrs to 26 730!

IDENTIFYING THE CENTRESPREAD

Dear Editor,

My gliding heart was stirred by your centrespread in the last issue. Picture E shows one of the Wright brothers, probably Orville, flying Model No. 5 at Kill-Devil Hill, Kittyhawk, sometime during October, 1911.

Picture G is of the Wien, designed by Alexander Lippisch in 1929 as a development of the Professor (1928), also known in Britain. The Wien has a 19.10 span, an aspect ratio of 20 and a Goe 549 (altered) wing section. It was flown brilliantly by Robert Kronfeld who made several world records; in 1929 he flew distance records of 102.2km, 143km and 150km and a year later 164km, crossing the Channel in July, 1931 and flying 156km on August 5, 1931, one of his last thermal flights.

Picture L shows the 18m D-19 designed for performance by Franz Gross in 1928 and built in two months with a Joukowsky wing section of moderate curvator. It is known as the Darmstadt II and the photo shows a rubber cable launch on the Wasserkuppe in August, 1928. The pilot was probably Johannes Nehring who was associated with the glider.

HUGO van EYSSELSTRYN KUMMER, **Dorchester, Dorset.**

Mr J. T. Satchell of Waddington, Lincs, writes that picture K was the slipway built on Bury Hill, Whiteways from which José

Weiss launched his model gliders. Later he launched man-carrying gliders from a trolley leading to the edge of a slope. The glider was then pushed over the brink and on one such occasion in 1909 Gordon England flew 1½ miles from Amberley Mount, gaining 400ft.

On going to press **Stanley Billington of Lytham St. Annes** filled in more gaps with an almost complete list coming from **Peter Fletcher of London.** Peter identifies them as follows: B: a Prüffling, about 1930; C: Slingsby Kite, probably 1937; D: probably a modified Zögling; F: Gordon England flying his No. 13 at Itford, 1932; H: a Zögling: I: a Lippisch Stork; J: the José Weiss glider flown by Gordon England at Amberley Mount; M: the BAC III with revised wings: N: a Dangling and P: a Franklin PS Utility, 1931.

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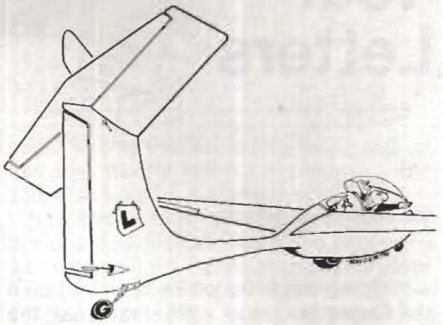
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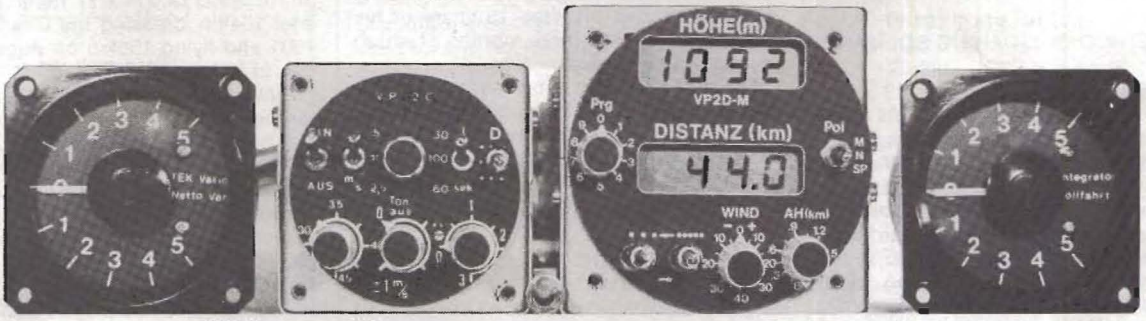
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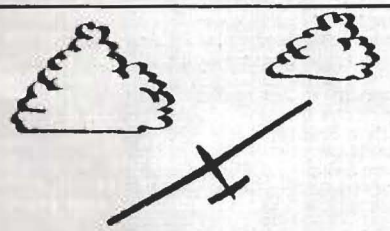
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MAR	24,000 ft	SEP	23,000 ft
APR	12,000 ft	OCT	19,000 ft
MAY	THERMALS AND RIDGE	NOV	26,000 ft
JUN	12,000 ft	DEC	14,000 ft

3 out of 4 flying days in 1981 were soarable

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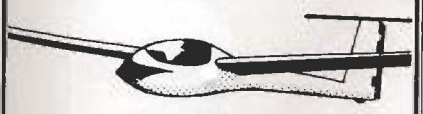
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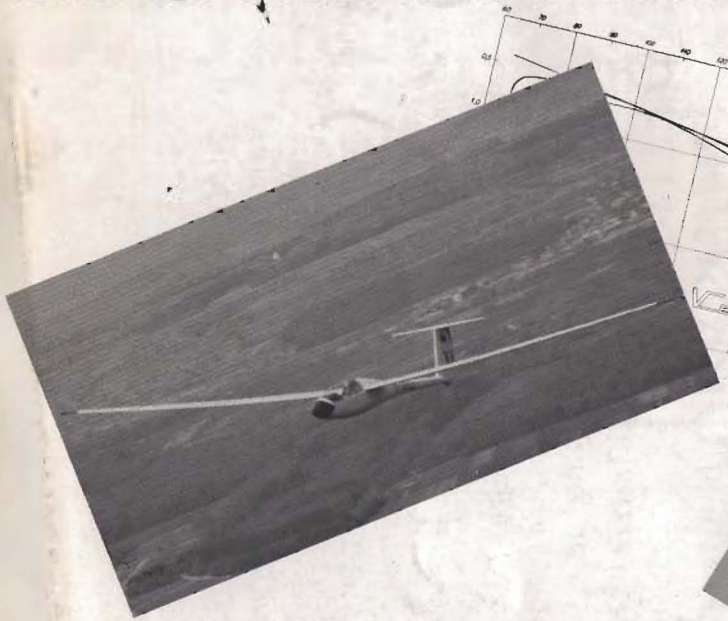
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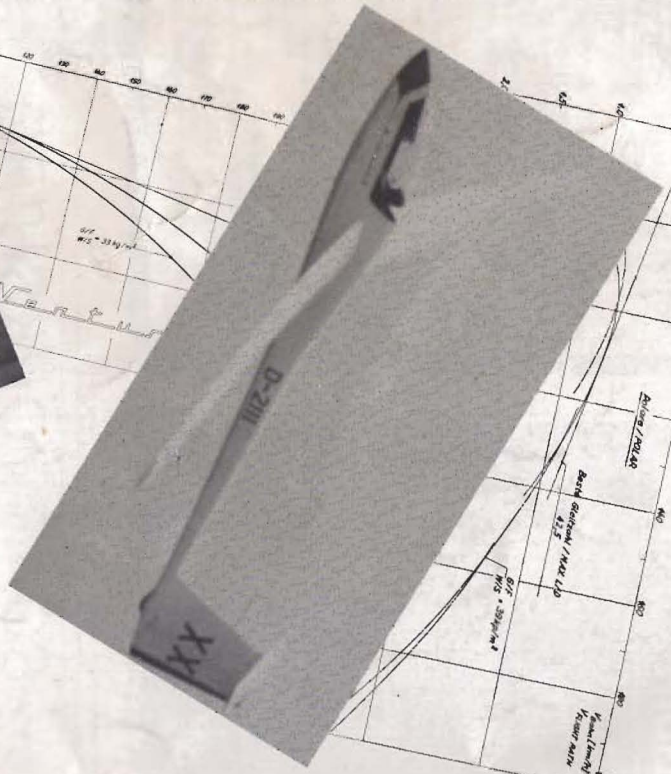
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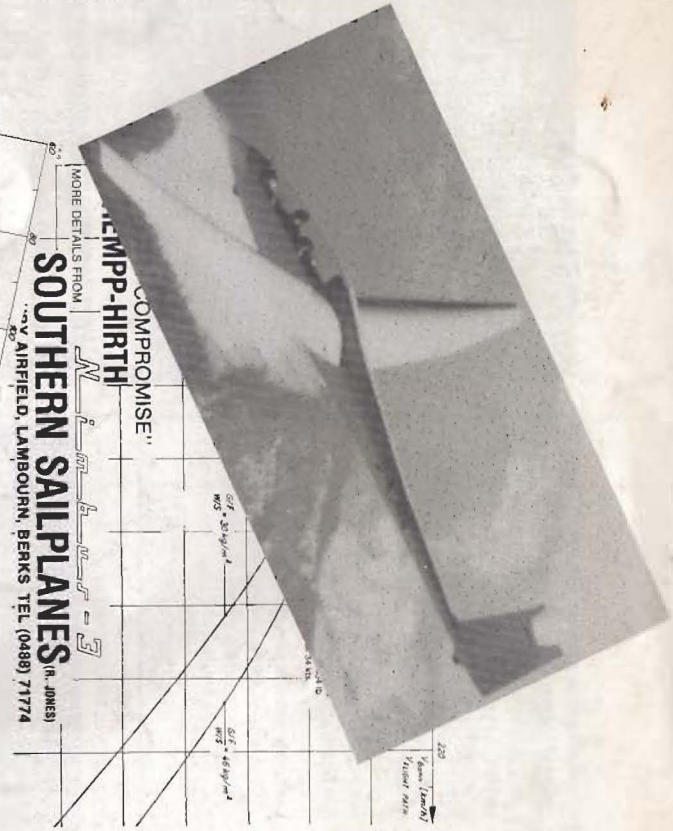
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