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August-September 1987
Volume XXXVIII No. 4

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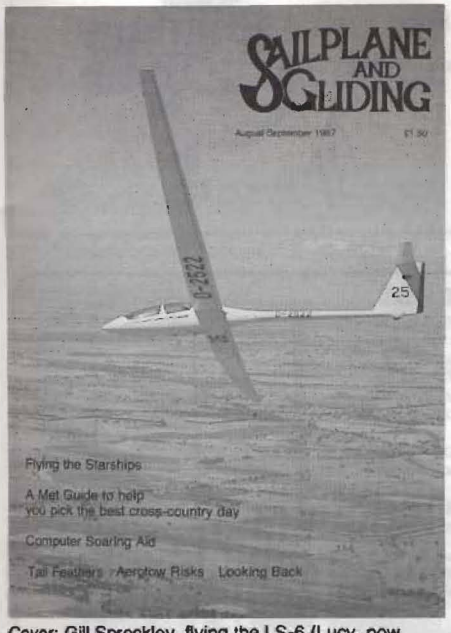
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Tel 0494 442423

PUBLISHER
British Gliding Association
(Barry Rolfe, BGA Administrator)



Cover: Gill Spreckley, flying the LS-6 (Lucy, now domiciled in Australia) from Tocumwal this February after the World Championships photographed her husband Brian in the ASH-25. (See p170 for Brian's impressions of the glider.)

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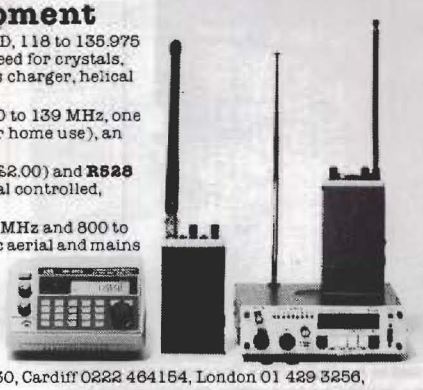
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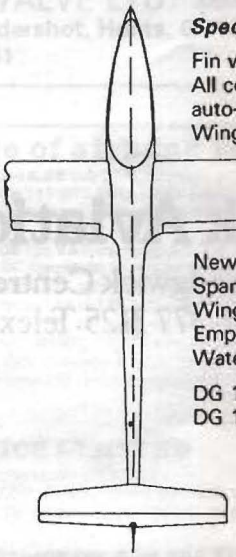
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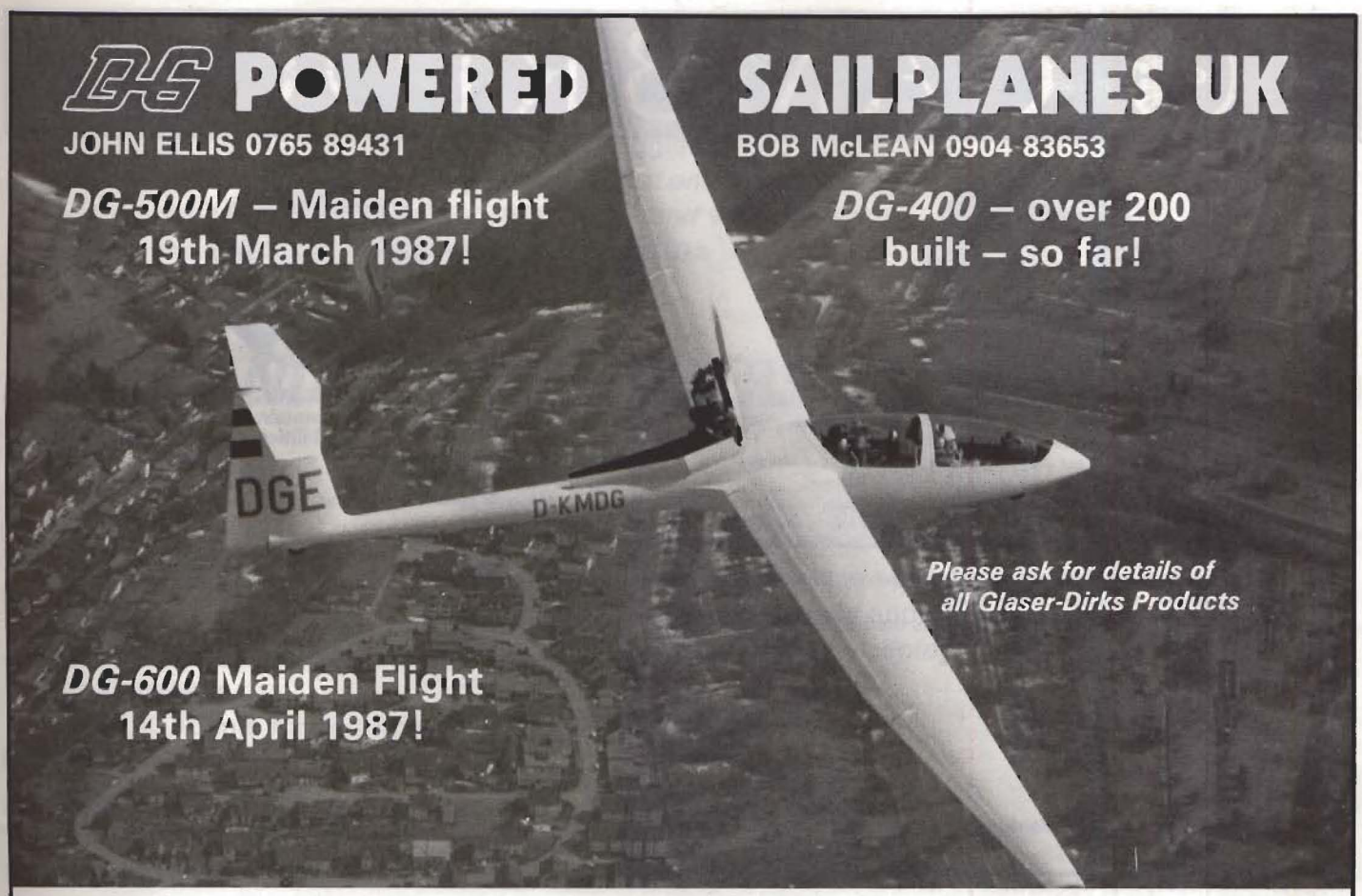
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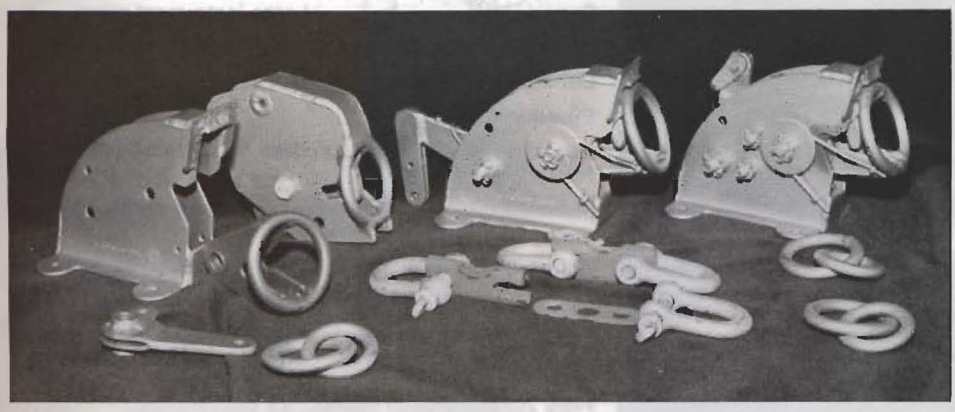
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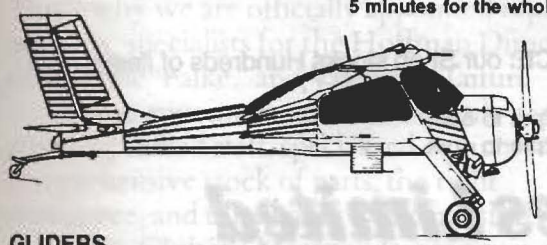
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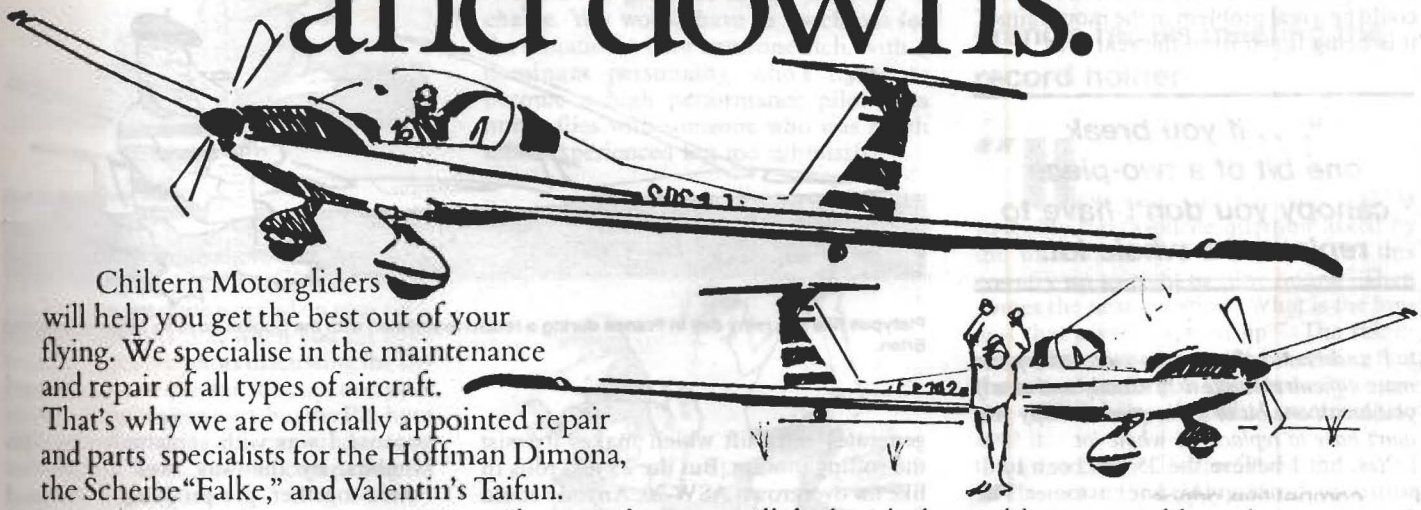
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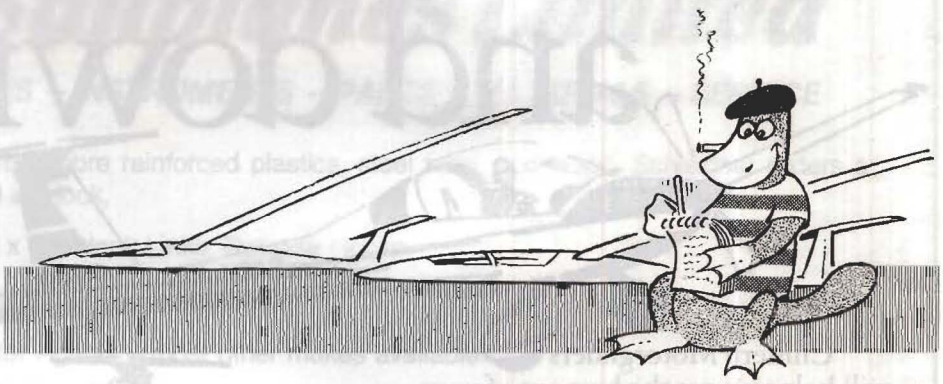
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FLYING THE STARSHIPS

Brian Spreckley talks to Platypus about the new super-two-pews, the Schleicher ASH-25 and the Schempp-Hirth Nimbus 3 two-seater



Platypus fills in a rainy day in France during a recent expedition with the Booker boys by cross-questioning Brian.

Platypus: *What were your very first impressions of the ASH-25?*
Brian Spreckley: It looks correctly proportioned: right length of fuselage, right degree of flexibility in the wing, lots of ground clearance, so small chance of a groundloop. The controls weren't anything like so heavy as one would expect from a glider of that size. The back seat was very comfortable, but the canopy hoop was obtrusive - exactly where you wanted to look, for instance at another glider in the thermal. I prefer the one-piece canopy of the Janus and Nimbus 3 which because of the fuselage shape seems also to throw up fewer reflections from the pilot's instruments, maps, hat etc. I found myself asking the front pilot to take his hat off in the 25. It could be a real problem in the mountains if it is being flown from the rear seat.

". . . if you break one bit of a two-piece canopy you don't have to replace the whole lot."

I understand that a one-piece canopy is more difficult to make to fit exactly and also if you break one bit of a two-piece canopy you don't have to replace the whole lot.

Yes, but I believe the 25 has been built with a single canopy for one customer. The 25 is extremely easy to fly, even easier than the 22, though it needs a gentleman's approach - nothing in a hurry. Rudder loads are small, and so are the flap loads if you change at the right speed. The flap position in the front is not comfortable - in fact I felt generally more cramped in the front (I am 6ft 2in) and there is hardly anywhere to stow things in the front.

No, but I flew in the back with Hans-Werner Grosse in the front: there was masses of space in the back filled with drinking water canisters, mainly. The rear pilot just has to pass things to the front pilot as he needs them.

The climb was quite good, felt a little heavy (two up and 100lbs of water) but was very easy to centre. In the run it has that beautiful Schleicher feel: you can gauge where the thermal is from the feedback the wings communicate to the fuselage. The ailerons and rudder are so well harmonised: some gliders are reluctant to start rolling, then hard to stop. Neither is a problem with the 25. There's very little lateral damping.

Sorry, what's lateral damping?

As the lower wing swings downwards its effective angle of attack increases so it generates extra lift which makes it resist the rolling motion. But the 25 just rolls in like an overgrown ASW-20. Anyone could fly it who had the common sense to realise that it's a big glider. You need plenty of room for your approaches; get everything settled down, then it's very easy to land.



Lateral damping

It's the whole concept of high performance two-seatering that is so phenomenal. We did three days in the Nimbus in Australia, one of them an 850km, in pretty mediocre conditions by Australian standards, and nothing special by English standards either. They were enjoyable only because I was with somebody else. This Nimbus, by the way, was a somewhat bolted-together pre-production model. I don't suppose the production versions will have such poor handling. Ailerons, rudder, flaps were all heavy, though I felt it climbed better than the 25. Anyway, the pure excitement for a pilot who has got all three Diamonds and isn't solely interested in the next Comp is staggering. There are opportunities for huge distances, marvellous flights in poor conditions, because you can go so far. It's great to have someone to discuss problems with and to give you encouragement.

(Platypus refrains from wondering aloud what problems the World 15 Metre Champ has or how much more encouragement he needs.)

For instance, Holighaus one weekend flew across the Alps to Italy from the Schempp factory with his son, and flew back the next day with his wife. It's the pure excitement of being able to share a soaring experience with someone else. I wanted to call this article something like "Starship 25" because in that machine, or the Nimbus, you get the feeling that you are being "beamed up": you just have to want to be somewhere and it beams you over there.

Even if you do land out late in the even-



Beams you over there.

ing, especially somewhere like Australia, it's less worrying because there are two of you. You can get quite worried on your own. Another aspect is that when you get back from the flight the pilots discussing the flying of the day at the bar shut out everyone else who hasn't taken part, but the P2s have experienced it and you can understand and benefit from all the comparing of notes that's going on.

Do you feel we should encourage two-seaters by creating more two-seater competitions?

I don't think we should artificially promote any trend, but let the market-place find its own level. What is important is that people who don't fly in competitions should know what the potential is in two-seaters of such performance. The economics of sharing the costs of such a glider are attractive. Two or four people can take it to a wave area for part of the winter, for instance, and know you are all going to get some good flying. They will also be able to do some great cross-countries. If you have such a machine and your syndicate does not contain a top class pilot, it won't be difficult to persuade such a pilot to fly with you and teach you a lot.

You've flown both these gliders in Australia. What do you think about their suitability for Britain?

I'd be sorely tempted to go for a turbo version. Chiefly for wave exploration. (I don't think such machines are much good for thermals, since the decision to use it is nearly always too late.) I would have some concern about relatively inexperienced pilots flying such big gliders cross-country and landing out in them. You can't rely on last-minute decisions and a bit of luck to get you out of trouble as you can with the little ships. But the sort of guys who will fly the 25 or the Nimbus will have to have done their time and have a lot of cross-country and field landing experience.

What about the psychology of flying two up cross-country?

I think that people fail to complete tasks because they are uncertain about conditions ahead, so they slow down and take every thermal. With someone else watching you, you would press on a bit more, so you should complete more tasks.

What about personality clashes between pilots of different experience and temperament?

There has got to be clearly someone in charge. You would have to watch out for the situation where someone rich, with a dominant personality, who's trying to become a high performance pilot in a hurry, flies with someone who was much more experienced but too submissive.



Too submissive.

At this point the dinner bell sounded. After five successive days of torrential rain in central France, even talking about gliding yields in importance to the menu and the carte des vins . . .

Platypus also had the luck to be P2 on two soaring flights in the ASH-25 with Hans-Werner Grosse when he visited the World Championships in Australia, though sadly in conditions that were a long way short of record breaking.

He recalls: An aerotow retrieve after the first flight had to be cut short as darkness fell. The sun just plummeted into the horizon like a boiled tomato and within minutes we were groping around in Stygian gloom. We are still not agreed whose fault it was that we missed the airfield at Jerilderie (a town whose sole claim to fame is that Ned Kelly robbed the bank there, in the intermission between two stupendous all-night parties at the kidnapped bank manager's house) and instead put down on a dirt road on the outskirts without any mishaps, though with some acute trepidation in the back seat. H-W G is an extraordinary pilot and one of the best reasons for encouraging two-seaters - other people can learn such a lot from him and pilots of his class.

THE LONGEST FLIGHT

Francis recalls meeting the record holder

"How long can you stay up?" is probably the favourite question asked by the uninitiated and we answer "In this country up to eight or nine hours!" Then comes the next question "What is the longest that a glider stayed up?". The standard reply may be "Over 50hrs", adding that the record no longer exists because someone killed himself whilst attempting to beat it.

Last summer Charles Atger, the record holder since 1952 (56hrs 15min in an Air 100) returned to Vinon where he used to live before emigrating to Argentina. There was no gliding at Vinon in those days and Charles used to fly at St Remy de Provence. This airfield, west of Vinon and south of Avignon, is just north of a ridge which works when the Mistral blows. The club installed electric lights on top of the ridge to mark the TP at night; apparently these lights were still in use a few years ago!

To practise for his record flight, Charles, a farmer, trained by driving his tractor for up to three days without dismounting.

The tragedy that put an end to the record occurred at Christmas 1954 when Bertrand Dauvin, flying a Kranich 3, killed himself during his record attempt. Previously there had been other incidents. There was a pilot who fell asleep in his Nord 2000, yet landed nicely in a field. He was found at daybreak, still asleep in his glider, after his crew had searched for him for some time.

The two-seater record, also in a Kranich, was less than an hour longer than Atger's - 57hrs 10min - and one of the pilots was the ill-fated Dauvin.

FRANCIS HUMBLET

A MET GUIDE FOR BEGINNERS

Are you relatively inexperienced and waiting for the right day to fly away from the airfield for the first time or to attempt Silver distance? Then this article by Tom will help you to pick the best day

These notes are for early cross-country pilots who (at present) are more interested in getting somewhere slowly than trying to win races.

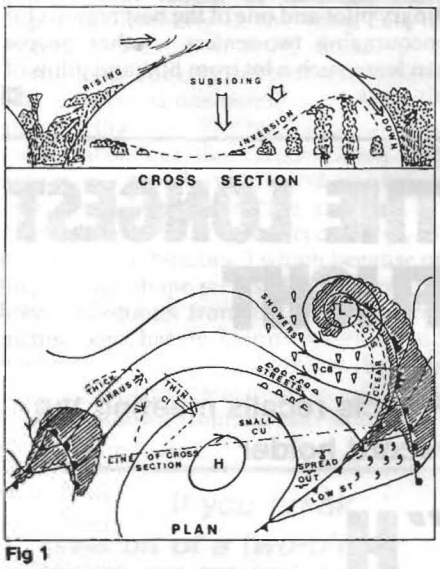


Fig 1

1. Picking a good day

Fig 1. The best conditions usually occur after the passage of a cold front when:

(a) There is a ridge of high pressure moving across the country (or at least anticyclonically curved isobars).

(b) The wind speed in the 2000-5000ft range is less than 20kt (preferably near 10kt).

(c) The forecast Max temperature is at least 10°C higher than the dew point. (As a guide one may use the TV chart for the night Min and next day's Max temperatures; if the difference is 10°C or more then the cloudbase will probably become high enough.)

There is a useful rule relating cumulus base and the difference between the surface temperature and dew point. While the temperature is rising each degree C between the air temperature and the dew point is equivalent to about 400ft in the base of convective cloud. For example a difference of 10°C should give a cloudbase of 4000ft. This rule is not valid once the temperature starts to fall.

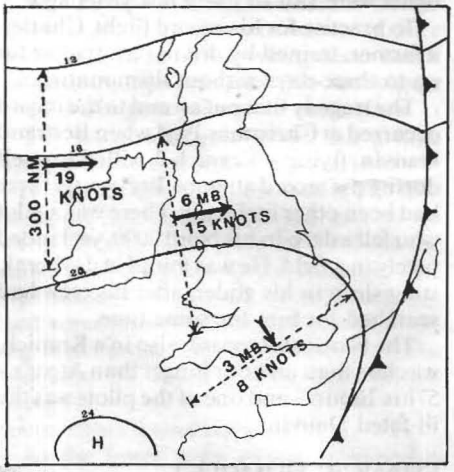


Fig 2

2. Route planning

The wind. The wind at flying levels is best obtained from an aviation forecast but one can get an approximate guide from large scale forecast charts like those in the *Telegraph*. (The *Times* alas no longer provides an adequate picture.) Measure off a length of 300nm (this is 5° of latitude). Draw a line of this length at right angles to the isobars on the forecast chart and note the pressure difference between the ends. Multiply this by 2.5 and you have the wind speed at about 2000ft. (This figure is strictly valid for latitude 52 ½ north but it is close enough for most of the central and southern parts of England.) (Fig 2.)



Fig 3

Wind speed is usually critical for into wind legs. Although pundits can achieve an average air speed of 50-60kt on a good day, less experienced pilots will rarely exceed 30kt. This obliges slower pilots to avoid into wind legs unless the wind is very light. If headwinds are unavoidable the into wind leg is best attempted during the afternoon rather than in the morning.

Even with light winds the choice of track and TPs is influenced by wind direction because it is usually essential to keep clear of windward coasts. Unsoarable sea air tends to spread long distances inland across large flat areas (such as the Somerset levels and the regions round the Wash). There are rare occasions when the air is so dry and unstable that good thermals can be found right up to the windward coasts, but it seldom pays to bank on it. These areas are best crossed early in the day before inland convection has started to draw in damp sea air. (Fig. 3.)

3. Timing

There is an urge to get in the air and away down track as soon as possible. Resist this urge if you are only after Silver distance. Unless it is known that poor weather is approaching one can expect soaring conditions to become easier later in the day. The cloudbase usually rises to its Max in mid afternoon and thermals, though further apart, seem to be smoother and easier to work during the latter half of the day.

High ground warms up sooner than wide damp valleys and good thermals can be found over regions such as the Chilterns. Berkshire Downs, Cotswolds and the bigger hills of Wales a good two hours before any lift appears over low ground. On days of restricted convection this delay may be much longer. (Fig 4.)

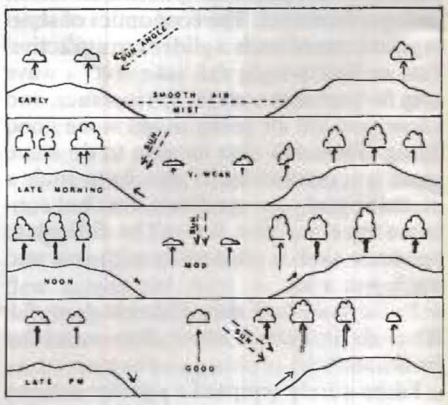


Fig 4

4. Variation of thermal strength

If occasions of cu-nims are excluded the average rates of climb seem closely related to the height of cloudbase, or the top of blue thermals. A survey carried out by the French showed that lift

in knots was (approximately) 1.2 times the height of cloudbase in thousands of feet, minus 1kt. Thus 2000ft produced a miserable 1.4kt, 4000ft gave 3.8kt and 6000ft 6.2kt. Almost every one finds stronger thermals than these during the course of a flight but they nearly always have to stop and accept much weaker lift too. These figures are a useful guide for planning but no indication of absolute values.

Spacing of thermals. If the depth of convection is shallow thermals are close together. As thermals extend higher the spacing becomes wider. There seems to be no exact relationship between depth and spacing because late in the afternoon the gaps between thermals continue to grow wider even though the depth of convection is no longer growing.

Sink between thermals. Early morning thermals usually produce weak lift with sink mainly confined to the immediate surroundings of the thermal. Later in the morning when convection is deeper and lift stronger the areas of sink often seem to extend much of the way across the gaps. When thermals become separated more widely (usually from mid to late afternoon) the inter-thermal sink is less troublesome although strong sink still occurs close to the best thermals. During the last hour or two of thermal activity the spacing is strongly dependent on isolated hot spots such as sun facing ridges. In between these isolated areas the air can become very smooth with negligible sink.

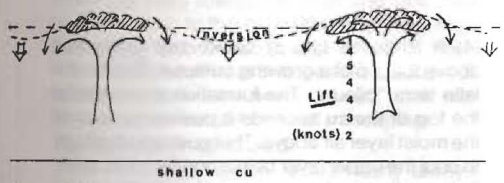


Fig 5

Variation of lift with height. Over level ground thermal lift is almost always weak below about 1000ft and does not develop its best strength until 2000 is passed. If the thermal is feeding into a cumulus which is at least 1000ft deep the lift may show a further increase close to cloudbase. However, on days when the only clouds are very shallow cumulus the lift frequently decreases rapidly just below cloudbase. On such days the cloud tops are restricted by a well marked stable layer. The cloud tops may protrude a small way into this stable layer due to the momentum behind the thermal. However, the rising airflow starts to spread out as it nears the inversion and as a result the lift ceases quite suddenly. Fig 5 shows the distribution of lift with height on such days, and why it is a waste of time to take the last few feet of the thermal. The same effect occurs when there are only blue thermals.

5. Looking for lift

Cloud reading. A major factor in the success of pundits is their ability to read clouds; it seems to be a skill best learnt in youth.

(a) Active cumulus clouds usually have well defined flat, (sometimes slightly concave) bases and crisp bulging tops.

(b) The larger the cloud the harder it may be to find the lift. Sometimes such clouds have a slight step down in the base, or a region of slightly lower

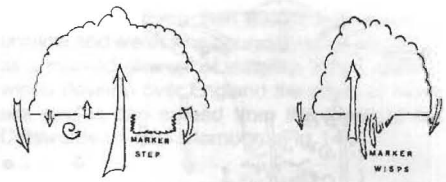


Fig 6

rather ragged cloud. The best lift is frequently very close to this step. (Fig 6.) Lacking such signs one may have to waste time searching round. The time will not be entirely wasted if one can establish a preferred location for the lift at that time of day.

(c) The core of the thermal is often on the windward side or the sunny side of the cloud; if wind and sun are on the same side there is a good chance that the lift will also be on that side. Do not be too surprised if the core is actually in quite a different spot.

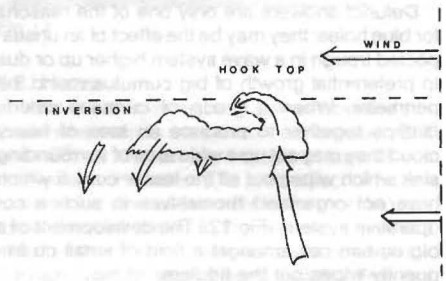


Fig 7

(d) Shallow clouds under a dry inversion sometimes show a curled over hook like shape on the top. (Fig 7.) This usually develops when there is a stronger wind above the inversion. The shear of wind takes the rising top and blows it over into the curling shape. Lift is almost always close under the windward side, with sink on the down shear side.

(e) Small clouds usually have a very brief life in the morning, but they are normally close enough for there to be working alternatives near by. The larger the clouds the longer their life cycles; when there are many large clouds (more than half cover) several will be slowly decaying without showing any clear signs of their weakness.

(f) If the lift is very strong (6-10kt on an average) it is almost certain that there will also be very strong sink not far away. Unfortunately the reverse is not always true.

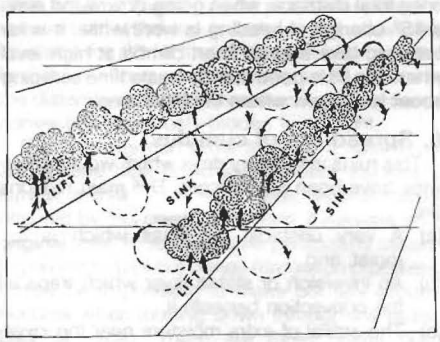


Fig 8

(g) While heading for a good looking cloud one may meet an unexpected surge of strong lift out in a cloudless gap. This is probably a vigorous young thermal about to form its own cloud. These often produce much better climbs than the older clouds nearby.

Cloud streets. Streeting is common, even on blue thermal days. Streets generally form when the wind speed is over 15kt and may be widespread with strong winds. Streets are aligned along the wind direction (within a few degrees). This makes them invaluable for making progress into wind. (Fig 8.)

A single line of cloud may have formed from a local hot spot on the surface but true streets do not depend on irregularities in the surface temperature. Streeting occurs over the sea as well as over land, especially when fresh cold air sweeps out over a relatively warm sea on the western flank of a depression.

Streeting needs a stable layer to limit the depth of convection so that nearly all the cumulus tops are on the same level. The spacing between streets is usually about three times the depth of convection. If the tops are around 5000ft the streets are likely to be some three miles apart. If the inversion rises the spacing between streets increases, usually by the disappearance of weaker streets. (Not by all the lines edging further apart.)

Over England one may go as much as 50 miles under a good cloud street without turning but the crossing from one street to another has to be made through continuous heavy sink.

Streets are much harder to follow on blue thermal days. On such a day an unusually prolonged spell of sink encountered when flying up or downwind probably means that the track lies between streets. Turn crosswind for a time.

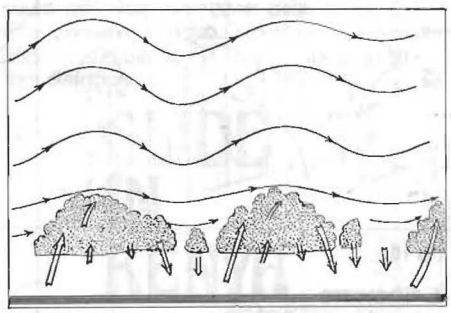


Fig 9

Waves above streets (Fig 9.) Lee waves may develop above and at right angles to cloud streets. Such waves are not always marked by lenticular cloud. The first wave often occurs at the upwind end of a cloud street.

If, when flying along a cloud street, there is a stretch where the usual lift is replaced by sink and then there is a small zone of unusually strong and rough lift it is quite likely that the street is being influenced by the waves above.

Waves have also been found parallel to streets of shallow cloud, the streets then seem to be acting as temporary hills.

6. Avoiding sink

The best instructors will tell you to "follow the energy", meaning to take a winding course under all the working clouds rather than heading out

directly on track. A common problem is how best to dodge the decaying clouds. Clouds have a limited life and the small clouds tend to stop working sooner than big ones, especially during the morning. Although the big clouds last longer they tend to leave a larger and more persistent area of sink.

When the moisture in a thermal condenses out as droplets of cloud there is a release of latent heat. This gives an added boost to the thermal. However once the lift ceases and the cloud starts to decay descent of air causes evaporation. Evaporation removes all the heat previously released by condensation and this air becomes colder than its surroundings.

This cold mass produces heavy sink; the bigger the cloud has been the more extensive is the sink when the cloud decays.

The signs of decay are:

(a) Loss of sharpness in the cloud top; it starts to look fuzzy.
b) The cloudbase ceases to be level.
(c) The cloud shadow changes from being solid to become a tattered area with holes. This is often the most reliable indication if you are near cloudbase and heading for the next good lift.
(d) Tall clouds which start to topple over in a wind shear usually decay. Never fly close under the over hanging part of such a cloud. Steer round on the upwind side if possible. The net loss in flying five miles in relatively still air is often less than taking a direct course and going two miles through heavy sink.
(e) A cloud may be still be growing on the upwind side while decaying on the downwind side. This is common with large clouds when there is an increase of wind speed with height. (Fig 10.)

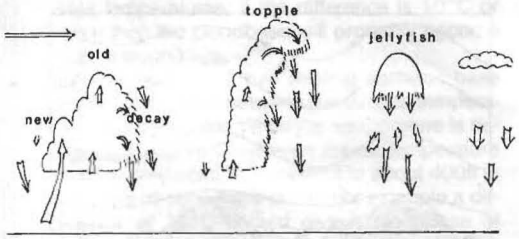


Fig 10

7. Showers

As a shower advances downwind there is often a region of particularly strong lift under the leading edge of the cloud. This can be used to gain or maintain sufficient height to fly round the end of the shower. It is usually wise to go round even the smallest shower. Flying straight through nearly always takes one into a large area of heavy sink.

Sometimes the lift continues right up to the shaft of precipation (Fig 11). One may even make a climb with hail rattling off the canopy, but be prepared for very sudden and often nasty surprises. Precipitation nearly always changes ascending into descending air, often very suddenly, sometimes within the space of a single tight circle.

Blue holes. A common problem in England is the short lived shower which dissolves to leave a blue hole. Although the cloud has vanished the

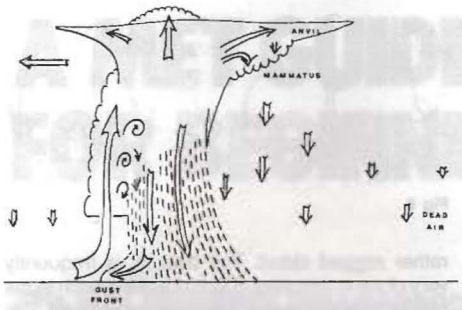


Fig 11

sink may still persist; it pays to avoid flying under such a decayed shower, or across the stretch of ground upwind over which the shower has passed. Even when the sink has died out the cooling effect of the rain and the recently moistened ground inhibit thermals.

Defunct showers are only one of the reasons for blue holes; they may be the effect of an unsuspected trough in a wave system higher up or due to preferential growth of big cumulus round the perimeter. When a group of cumulus clouds clumps together to produce an area of heavy cloud they may set up a wide area of surrounding sink which wipes out all the lesser cumuli which have not organised themselves in such a co-operative system. (Fig 12.) The development of a big cu-nim cell amongst a field of small cu frequently wipes out the tiddlers.

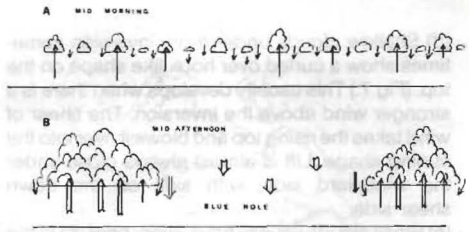


Fig 12

With so many reasons for blue holes it is wise to be cautious about setting out across one. The pilot of a Ventus recently set out into the blue from 3000ft. With tips to extend the span to 17 metres he was confident of reaching the other side. In fact he was on the ground seven miles downwind of the start.

A diversion of 30° only adds a small amount to ones total distance; when going downwind even a 45° change of heading is worthwhile. It is far better to take several short climbs at high level where the lift is good than to waste time scraping about low down where the lift is weak.

8. Spread out of cumulus

This ruins very many days which would otherwise have been magnificent. The main reasons are:

(a) A very unstable air mass which is too moist, and
(b) An inversion or stable layer which traps all the convection beneath it.
(c) The arrival of extra moisture near the inversion level, often from a very weak old front which has temporarily lost all its cloud due to subsidence.

It usually needs a depth of at least 2000ft from cloudbase to the inversion for spread out to become extensive. Each thermal takes up more moisture and spreads it out under the inversion adding to that already present until a solid layer of cloud is formed.

When such an overcast area appears one should try and stay high using any scraps of lift under darker patches of cloud. Until the sun breaks through there will be few if any thermals rising off the ground.

Warning Signs

(1) The morning starts cloudless and visibility is often very good.
(2) The first cumulus forms unusually early and the cloudbase is low. (If the first cu have a high cloudbase there is much less threat of spread out.)
(3) Some of the first clouds may shoot up as narrow columns with no proper bases. (The base decays before the top has finished rising.)

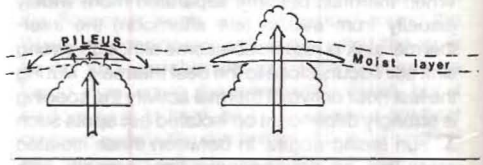


Fig 13

(4) A lenticular cap of cloud may appear just above the top of a growing cumulus. This has the latin term "pileus". The formation shows that as the top of the cu ascends it pushes up some of the moist layer air above. This push is just enough to cool the upper layer below condensation point; it shows that the layer was nearly saturated at that level before the cu formed. Pileus is an almost infallible sign of subsequent spread out. (Fig 13.)

The cycle of spreading out. When an almost total layer of strato-cu has formed thermals become very sparse or totally absent. Lacking a continued supply of moisture from below, the layer may break up in an hour or two. This allows the sun to set off more thermals so that the process is repeated. With a really thick layer the cycle is so slow that no worthwhile clearance develops until evening.

Two things can act to disperse such a sheet. Further subsidence may bring the inversion too low for a full cloud cover to develop, or the arrival of drier air may result in the cloudbase lifting up to within a few hundred feet of the inversion when the sheet will disperse. The two processes can occur together to bring about a rapid improvement in soaring conditions. The extra subsidence may be found near the axis of an advancing ridge, (which is one reason why ridges often give the best soaring weather in summer).

Spread out situations. The problem is most troublesome near to windward coasts especially when the air over this country has come round the perimeter of an Atlantic anticyclone and arrived over us from the north or north-west.

9. Blue thermal days

Competition pilots have to set off on blue days but they have the advantage of many other

gliders to find and mark the thermals. It is much harder for a beginner to succeed when there is no other glider in sight.

The most important factor, (after the wind speed) is the height of the inversion. With only 3000ft between ground level and the inversion unaccompanied cross-country flying is very difficult. If the convective layer extends up to 4000ft it is probably worth a try. With 5000ft to work in the prospects become quite good.

Possible thermal sources are towns, sun facing ridges, and areas of higher ground which are relatively dry.

Regions to avoid if possible are wide damp valleys. These may be devoid of thermals except where there is a large town. Even when some thermals do develop they are often weaker and do not go up as far as those over the high ground. The lack of thermals is due to the abundance of lush vegetation and the generally moist ground. So much of the sun's energy is wasted just evaporating the water that not enough is left to produce good thermals.

(See also the last issue, "Blue Skies" by John Williamson, p126.)

Slopes. These were the first resort of early soaring pilots and are now the last resort of most cross-country pilots. Windward slopes may save the day when all else has failed. Ridges work best when there is no high ground upwind. Upwind ridges may set off lee waves; if these are out of phase with your ridge the lift may be damped out. Notice that rapid alterations of lift and sink may be due as much to thermals breaking away from the slope as to the mean flow of air uphill. Thermals often come off from one area like a stream of bubbles and one may need to head back into wind several times before finally escaping.

10. Top cover of cloud

The arrival of a layer of cirrus nearly always reduces the strength of the sun. If the lower air is already full of active thermals the top cover tends to make thermals rather smoother and less strong. However, if it is early in the day, or there is a low inversion, (when the full power of the sun is needed to produce any thermals at all), then the cirrus often stops thermals completely. On such days a gap in the cirrus may allow a narrow zone of thermals to develop when most of the area has gone dead.

Thickening pre-frontal altostratus. Such cloud almost always has a disastrous effect on thermals, stopping them very quickly. Note the "almost"; there are occasions when the air is so unstable that even the arrival of this grey sheet of cloud does not completely kill off all thermals and on rare occasions one may still find lift (usually smooth and weak) persisting almost up to the time when the rain starts.

11. Fog and low stratus

These are signs of very stable conditions at the lowest level; it is useful to know about them when route planning. Some of the sun's heat is wasted in evaporating the fog before any thermals can develop. Even when the fog has been burnt off the area is apt to be lacking in decent thermals for many hours. In summer sea fog or low stratus often blows in again from the coast on blue days when sea breezes begin. Although the sun may continue to burn off the stratus as it comes inland the air will probably never develop useful thermals until it has spent three of four hours over warm ground. Even then the lift is likely to be shallow and weak. The boundary often shows up as a marked change of visibility. When easterly winds develop over England the effect of North sea stratus can spread from the Wash to the Cotswolds by mid afternoon. (Fig 14.)

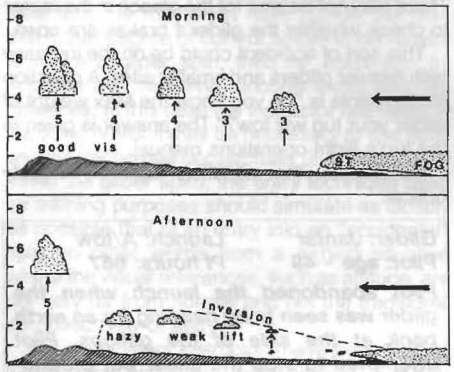


Fig 14

12. Haze

Most of our summer haze comes from the continent when winds over the UK are between ENE and SE. It is usually trapped beneath an anticyclonic inversion. The chief effect of haze is to delay the start of thermals in the morning, and to cut them off earlier in the evening. It is noticeable that thermals become weaker if one flies into the haze from an area of good visibility. Few long cross-countries have been achieved in really hazy weather.

Some of the haze particles are hygroscopic, that is they tend to absorb moisture by accelerating the condensation of water vapour. This makes the visibility worse in regions of high humidity, especially in the layer within two or three hundred feet of the cloudbase. Since gliders often fly in this layer the collision risk is increased.

Hot weather and summer haze often go together. The restricted visibility makes it next to impossible to see clouds ahead well enough. If thunderstorms break out (as they often do after a hot hazy spell), one cannot see the distant thunderheads until one climbs above the haze layer. Instead the storm's approach is marked by thickening gloom where the cloud shadow falls on the haze.

Haze tops and cloud tops. Strong thermals often reach the inversion with enough momentum to penetrate a short distance into the stable layer. On blue days it may be worth accepting the reduced lift at the top in order to get above the inversion for a brief time. The great improvement in visibility allows one to see any small cu tops in the distance and may reveal those active areas of convection previously hidden from sight.

Big cumulus can grow through a haze layer and extend high up to levels where visibility is almost infinite. The haze layer seems hardly affected by this deep convection; it remains at its original level. A cloud climb is particularly satisfying on such days but brings navigation problems; it may be impossible to make out any ground features when looking down through the haze.

Use of radio. There are three useful plain language broadcasts of airfield weather reports. They are updated every half hour. Reception is often difficult at very low level except near the transmitters.

The frequencies are:
London North 126.6mHz
London South 128.6mHz
London Main 135.375mHZ

A similar VOLMET broadcast consisting chiefly of RAF airfields is broadcast on 4722 and 11 200kHz. This can usually be heard on the ground but needs an HF receiver tuned to the upper sideband. Ordinary short wave receivers are inadequate unless they have a BFO (Beat Frequency Oscillator).

* * *

AIRMET

The new telephone AIRMET service gives three regional forecasts and are available between 0600 and 2300.

The numbers are:

Southern England	0898 500 436
Northern England and Wales	0898 500 435
Scotland and Northern Ireland	0898 500 434

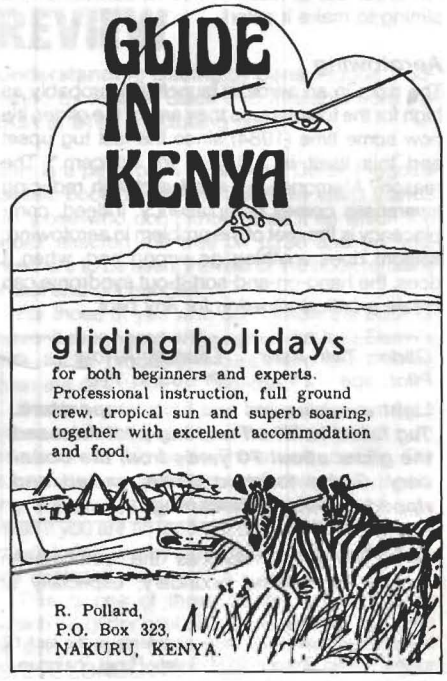
There is an equivalent night service from specified Met offices from 2000 to 0600.

The numbers are:

Heathrow	01 745 3103
Manchester WC	061 429 0927
Glasgow WC	041 221 6113

Forecast available	Period	Outlook to	Wind valid time
1600	0600-1400	2000	0900
1200	1200-2000	0200	1500
1800	1800-0200	0800	2100

These forecasts are not cheap. The BT rates are 66p for 3min at the cheap period and £1.01 at peak and standard rate time, plus VAT! The duration of the forecast may take 4-8min depending on the complexity of the weather situation so it could well cost over £2 at peak times. Clubs without routine forecasts would do well to make one call and pin up the forecast for all to see. - *Tom Bradbury.*



AEROTOW RISKS

In his second article on launch failure accidents Bill, BGA director of operations, warns that the risks in an aerotow launch are probably as high for the tug as they are for the glider

In the last issue, p131, I left you with two questions "How many clubs are still using 1000lb, weak links?" and "What is an acceptable proportion of cable breaks to launches - 1%, 2%, 5%?". From the flurry of correspondence generated (no letters so far!) I suspect that risk management is a matter of complete indifference. Yet improved launching facilities and training are the way forward for a significant improvement in flight safety.

I was pleased to see one measure to improve flight on an Olympia 463 at Lasham the other day - a nose hook! At last no problems in getting that glider airborne and the risk to the tug pilot removed. So, at least someone, somewhere is aiming to make it safer!

Aerotowing

The risks in an aerotow launch are probably as high for the towplane as they are for the glider. It's now some time (1984) since the last tug upset and this itself is a cause for concern.* The reason? Memories are short and with reducing awareness comes complacency. Indeed, complacency is the root of the problem in aerotowing; seldom does anything go wrong and, when it does, the hang-on-and-sort-it-out syndrome can create a critical situation for any pilot:

Glider: Twin Astir	***Launch: A/tow***
Pilot: age - 24	***PI hours: 110***

Light variable wind and high temperature. Tug failed to lift off and tug pilot released the glider about 70 yards from the boundary. Glider touched down, yawed and ripped out the undercarriage.

The critical decision as the combination reaches the upwind boundary, especially at smaller fields, may be left too late - as in this case. Although the tug pilot is in charge of the combination he may have problems:

- He will rarely have had to make a decision of this sort.
- In the final analysis the judgment of how much more distance will be used is a fine one.
- There may not be time for the glance in the mirror to check whether the glider's brakes are open.

This sort of accident could be on the increase with heavier gliders and smaller sites. A question for tug pilots is "do you know the Max weight of glider your tug will tow?" The answer is given in the tug's flight operations manual.

Sometimes the situation can be doubly critical:

Glider: Jantar	***Launch: A/tow***
Pilot: age - 49	***PI hours: 667***

Pilot abandoned the launch when the glider was seen to be heading for an earth bank at the side of the gallops. Pilot attempted to stop the glider but ground-looped with substantial damage.

Piper PA18 - Super Cub

The pilot was retrieving a glider from a field with available take-off run of 1000m and a pronounced slope. Take-off was made down slope with a slight tailwind component. As the aircraft became airborne a slight drift developed which the pilot was unable to correct. The main wheels struck an earth bank and detached from the aircraft which came to rest on its belly.

An expensive accident which might have been worse. Although the field was of adequate size the effect of slope was not correctly assessed. The pressures on the pilots in such a situation are significant and have to be considered:

- Having incurred the cost of the retrieve the tug pilot would do his best to oblige - maybe, even, against his better judgment.
- The glider pilot assessed the field as OK as, presumably, did the tug pilot. There may also have been a degree of reliance on the other pilot's view.

I remember vividly an accident at Sutton Bank in 1969. The object of the flight was a rating test and we were taking off directly into a north-westerly wind. Everyone involved was **very experienced**(!) and yet, with hindsight, I believe each person involved was to some extent influenced by the fact that the others were prepared to go flying. The upshot was that as the towplane crossed the ridge edge it flicked as it met the updraft and crashed on the very steep hill face - much to our consternation in the glider. No one was hurt which was little short of a miracle!

The critical point is that in this sort of situation no one is in charge. The decision is made by concensus when it should be made on the basis of "don't go if anyone dissents", but it still requires someone to be brave enough to voice their doubts.

Another risk related to flying from a small site is in dropping the rope. Expedition is the name of the game but this can, on occasion, become a licence to do beat-ups:

Piper PA18 - Super Cub

In gusty conditions the pilot dropped the tow rope on the airfield and pulled up into a right turn in order to position for landing. The right wing then dropped and the aircraft entered a spin from which it was impossible to recover in the height available.

What price expedition? Any manoeuvre not properly executed after dropping the tow rope incurs this risk. Matters are made worse if the pilot has a psychological problem!

The low turn can be equally critical for the glider pilot:

Glider: Club Libelle	***Launch: A/tow***
Pilot: age - 50	***PI hours: 65***

First flight on type. The pilot had successfully corrected for wing drop and some longitudinal oscillations but pulled off tow at 150ft and turned to attempt a reverse direction landing. After 90° of turn the glider lost height rapidly and cartwheeled . . .

Was there enough height and speed for the turn? We'll never know. Generally, though, the accident if you go straight ahead - even a controlled crash - will be nothing like as serious as a turn with insufficient height. How strong is your fixation to get back to the airfield?

Glider: K-6CR	***Launch: A/tow***
Pilot: age - 43	***PI hours: 20***

The rope broke at 200ft and a straight ahead landing was made into standing corn as no alternative was availalbe. The glider suffered substantial damage to the tailplane.

Another first-flight-on-type problem can be pilot-induced oscillations (PIOs):

Glider: K-23	***Launch: A/tow***
Pilot: age - 26	***PI hours: 168***

Pilot had difficulty in controlling the glider in pitch on take off. Oscillations resulted in repeated heavy contact with the ground. Launch was abandoned with some difficulty. Three other pilots all had similar problems but had no further trouble once established in the climb.

Generally the PIO is not divergent but this situation does carry the risk of divergence with the ultimate risk to the tug pilot:

Chipmunk

The glider got too high. The tug pilot released it but was unable to recover . . . the aircraft was substantially damaged.

Fortunately, in this instance, the tug pilot got away with it due to her presence of mind in releasing soon enough. But the real responsibility lies with the glider pilot to **release the in-**

(Continued on next page)

**In fact there have been three accidents in the last 12 months - John Shipley, BGA Safety Panel chairman.*

SPINNING

Ken, a national coach, emphasises that spinning is not just one simple exercise.

Spinning accidents don't form a large percentage of glider accidents but they have resulted in a number of pilots being seriously injured or killed. All pilots should be taught to recognise and recover from both stalls and spins. However when low, knowledge of the spin recovery procedure may be academic and the only answer is to fly in such a manner as to reduce the possibility of a spin.

It is all a question of training. A pilot who has had a thorough training in recognising and recovering from stalls (including wing drop) but has never experienced a full spin may be considered safe. However, should he find himself in a full spin which has developed quickly and unintentionally, he may not be able to assess or cope with the situation because he has not been trained to recognise it. Moreover, for many the first full spin may be an alarming experience and this in itself may delay or prevent the initiation of any recovery action. Such a situation may occur in a type of glider in which the pilot has little experience and which may not display the docile characteristics of the two-seater trainer used when the pilot was first taught spin recognition and recovery. Instruction must include **full** spin recovery. The failure to recognise the spin quickly in a critical situation may result in failure to recover from either the spin itself or the ensuing dive.

Recognition is therefore a necessary part of the recovery as any action depends on recognising the need for that action. Here again the way in which a pilot is trained to enter spins for the purpose of practising recovery may determine the degree to which he is aware of the symptoms of the approaching spin. The pilot who has been taught to enter all spins from wings level flight, by raising the nose well above the horizon and applying full rudder, may well be able to recover from a spin, but may not appreciate the symptoms of the approaching spin should it occur off a slow turn. He may even have gained the view that if that degree of control abuse is necessary to make a glider spin, then *he* won't spin by accident and may even unconsciously drop his defences. In this case the instructor has failed in his duty. Whilst it may be necessary to use such an entry technique occasionally (if all else fails to make the glider spin), the entry technique used for training purposes should simulate as closely as possible that of an entry into an "accidental" spin. In other words from a turning situation where the visual references, such as attitude, are not very far from normal and not the traditional aerobatic type of entry.

For many years instructors have been trained to teach spin entry from under-banked, over rudddered turns with gradual speed reduction. This results in little, if any, raising of the nose above the normal gliding attitude before wing drop occurs, and seems to simulate reasonably well how a pilot might accidentally spin when low and under a high workload. The advantage of practising spin entry from this technique is that it illustrates to the student the symptoms of the approaching inadvertent spin, hopefully increasing his chances of recognising the real thing should it threaten.

Like paying premiums on an insurance policy

The practising of spin entry regularly is as important as practising the recovery if the pilot is to enhance the chance of recognition of the approaching spin and its development, and should be part of a pilot's familiarisation on any new glider type, assuming that its C of A permits spinning. Indeed learning more about the way in which any glider responds when one explores the "unusual" aspects of its handling is like paying premiums on an insurance policy for the day when the unexpected happens. In this case the more premiums paid, the better the insurance against not recognising the onset of the spin before it develops.

Exploring an aircraft's handling can be both fun and educationally rewarding. Experienced pilots should try, for instance, a well co-ordinated turn entry, but don't reduce the rudder when the desired bank angle is achieved. Now control the bank and attitude as normal with the stick. Most gliders will spin before 90° of turn is achieved. The interesting point in this exercise is the way in which the banking movement into the turn develops rapidly and without warning into the spin. Instructors should demonstrate exercises like this to early solo pilots, and brief and monitor them until they gain confidence and experience.

Leaving rudder on in a turn is a serious bad habit for which instructors and pilots of all levels should watch. Many pilots may be unaware of the tendency to over-rudder turns and may only be safe, when low down, due to a large margin of speed during base leg and final turns. In this height region a spin will, at least, inconvenience the pilot in terms of circuit planning and is more likely to injure or kill him. This is because the chances of a successful recovery from an inadvertent spin which commences below 500ft are slim – even if recognition is swift. **The only answer is prevention.**

The only safeguards are accurate flying *(ie,* good co-ordination) and a safe speed. For this reason it is essential to adopt approach speed before reaching a point where spin recovery is unlikely to be successful due to insufficient height. As many spin accidents appear to contain the ingredient of a high workload it is best to increase speed before turning on to base leg *(ie* before the pilot workload increases due to the concentration caused by the imminent landing, which may even be in a strange field). Having adopted a safe approach speed it is important to monitor it by regular reference to the ASI and not just by attitude which may be misleading as a result of the perspective changing lower down.

Reducing the number of accidents due to spinning cannot be achieved simply by putting more emphasis on spin recovery, although obviously recognition of, and recovery from all stages of the spin must be taught. Spinning accidents are a more insidious problem in that, even with great conviction to avoid spinning low down, the most experienced pilot may still fall foul of aerodynamics whilst concentrating on other aspects of gliding flight. A reduction may be achieved if pilots are taught safe flying habits, not only when being taught spinning related exercises but from their first attempts at co-ordinated turns. *After all, spins have occurred whilst circuit planning, thermalling, and field landing, (to name but a few).*

(Continued from previous page)

stant the glider starts to get too high.

The risk management approach to this sort of accident is to ensure that inexperienced pilots being launched in gliders with belly hooks are checked in a two-seater on the belly hook. If you're not prepared to take that risk in the two-seater then should you be flying solo? Better still retro-fit the critical gliders (K-6, K-8, Oly 463) with a nose hook.

Footnote: It is interesting to note that a nose/forward hook is to become a design requirement in the near future.

BOOK REVIEW

Understanding Gliding by Derek Piggott. Published by A. & C. Black and available from the BGA at £12.45 including p&p.

This is a paperback re-issue of Derek Piggott's classic book. Except for the Yates effect (hands up those who don't know what it is) which the index assured me was on p238 and yet was nowhere to be seen, the rest of the book remains intact and unchanged.

For those of you who don't know the book or haven't even heard of the author (tut, tut!), Derek's little finger probably knows more about flying than the rest of us put together.

Derek has been CFI of Lasham for a million years, and his teaching experience has proved invaluable in this book. There is no posing. The explanations and diagrams of all aspects of gliding are always clear and straightforward, and even if you are an ignorant clod you are in no way made to feel one by long and esoteric mathematical explanations.

This is one of those quietly brilliant books which no glider pilot should be without. No need to say anything else.

STEVE LONGLAND

COMPUTER-AIDED THERMAL SOARING

Stanley has become a pioneer in the glider instrument world with his design for a Thermalyser which he describes in this article

Brennig James put his finger on the problem when he wrote in the February 1984 issue of S&G, p26: "Circling in a rough thermal you get a lot of information much of it conflicting, so you have to be discriminating in your decision as to what to do."

In such situations highly discriminating assistance can now be rendered by the ubiquitous silicon chip. The Thermalyser is a microprocessor based instrument (Patent application No. 8428382) which has been designed to take periodic readings of a variometer during one circle flown in the vicinity of a thermal. From these and time measurements, using correlation theory, it provides visual and audio indications of the optimum direction in which to move the circle to bring it into closer concentricity with the thermal. Photos 1 and 2 show the Thermalyser fitted to the Portsmouth Naval Gliding Club's Skylark 4.



Photo 1: Both photographs show the Thermalyser fitted to a Skylark 4.

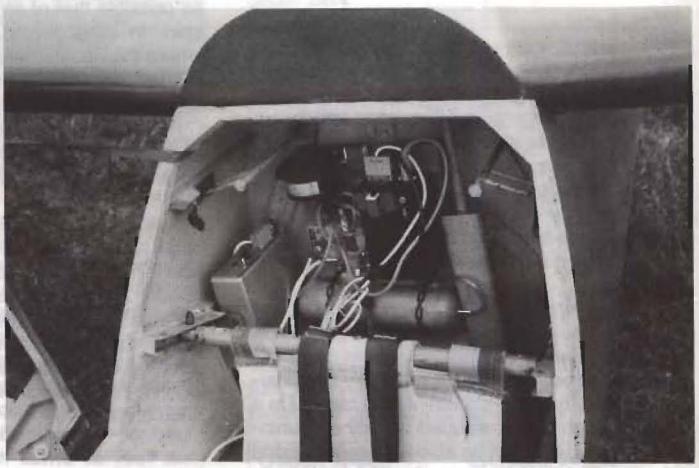


Photo 2.

To analyse a thermal all the pilot has to do is to switch on the Thermalyser and when he has settled into his circle he presses the button marked REF HDG as the glider passes through a chosen heading by visual reference to a convenient distant feature in the landscape. When the same feature reappears directly ahead he presses the button once again. In less than 0.5sec the digital display indicates the best relative heading on which to leave the circle measured in degrees in the direction of turn. Additionally a buzzer sounds when the Thermalyser reckons that this heading has been reached on the assumption that the glider has continued to turn at the same rate. After the buzzer has sounded the Thermalyser is ready to analyse another flight circle. Its accuracy is ±1° in ideal circumstances. When not analysing thermals it repeatedly digitises and displays the variometer output over a range of −12.0 to +12.0kt.

How is this analysis performed?

Thermal centring is usually explained by means of a diagram in which a glider circles on the edge of a circular area of rising air. Fig 1 is a more detailed representation of the situation showing the upcurrent contours of a "British Standard" Thermal" and the resulting wavelike signal (a) sensed by the variometer of a circling glider allowing a nominal 2kt for its rate of sink in still air.

Fourier Series tells us that wave (a) consists of the fundamental sine-wave (b) plus bias and a number of harmonics. Of these components only (b) is meaningful in terms of thermal direction containing as it does only one peak and trough in one revolution. If we therefore extract wave (b) and compare it with a reference sine-wave (c) which is accurately located with respect to our reference heading (0°) we see that the relative bearing (Ø) of the optimum turn-off point (P) is equal to the phase angle between wave (b) and wave (c).

Correlation theory provides a useful formula for this phase angle:

$$\text{Ø} = \text{Arctan}\left(\int_0^T V \cos\theta.\, dt. \Big/ \int_0^T V \sin\theta.\, dt.\right)$$

where in our case T is the periodic time round the circle and θ and V are the heading angle and variometer reading at time (t).

For an integral number of cycles (one only in our case) this mathematical process rejects all harmonics completely together with much of the noise in the signal and is equivalent to extremely narrow band-pass filtering. It can also be regarded as the "least-squares" fitting of a sine-wave to the data. As Ø is positive for a phase-lead we need to subtract it from 360° to make it positive in the direction of glider rotation, *ie* as a phase-lag.

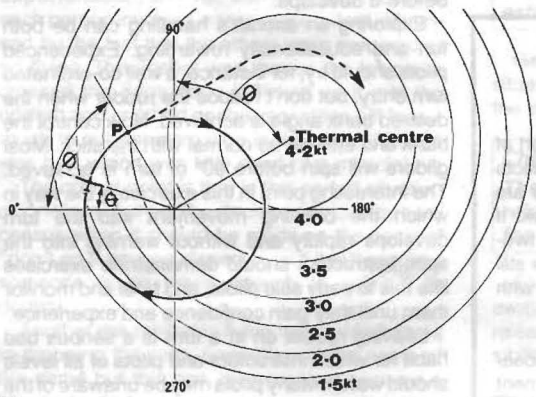
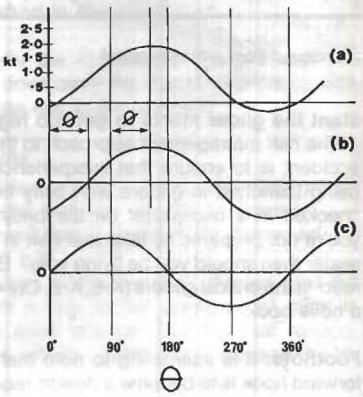


Fig 1





Stan started flying at Lasham in the 1950s and after a break of 25 years re-started in 1980 at Lee-on-Solent. A retired MoD officer, this article formed the subject for his MSc thesis in Control Technology in 1986.

Before presenting the angle we also take the opportunity to compensate it for variometer lag. If the variometer response is characterised by an exponential time-constant (τ) the resulting phase-lag (α) is:

$$\alpha = \text{Arctan } 2\pi f\tau$$

where f is the signal frequency.

As $f = \frac{1}{T}$ we have $\alpha = \text{Arctan } \frac{2\pi\tau}{T}$ and our best estimate of the thermal bearing (β) is therefore:

$$\beta = 360° - \text{Arctan } \left(\int_0^T V \cos\theta.\, dt. / \int_0^T V \sin\theta.\, dt.\right) - \text{Arctan } \left(\frac{2\pi\tau}{T}\right)$$

Any negative result from this calculation is rendered positive by adding a further 360° before displaying it.

The only problem remaining is that of obtaining the glider heading (θ). A very expensive gyroscopic or electronic compass would be useful here but fortunately we can get along quite well with the Mk 1 Eyeball and utilise the fact that θ varies directly with time in a constant rate turn.

$$\text{Thus } \theta = 360\,\frac{t}{T} \text{ degrees}$$

where T is again the time interval between our two push-button signals.

The Thermalyser has been programmed *via* 2165 bytes of EPROM to compute β in this way from readings of a Cambridge CVS 50D variometer taken four times per second. An average flight circle yields about 100 readings which are stored in RAM until computation is carried out immediately the circle has been completed. Once the angle β has been displayed it is a simple matter to convert it into a delay time (D) for the sounding of the buzzer when

$$D = \frac{T\beta}{360} \text{ seconds}$$

The audio signal is in the form of — · · — (X in Morse Code) and is arranged to terminate at the precise moment calculated.

A programme of flight testing

In spite of the sea breeze at Lee and the resulting scarcity of thermals several soaring flights have been made in the Skylark 4 during which the Thermalyser has rendered useful assistance. A programme of continuing flight testing in 1987 includes fitting it to Alan Purnell's Nimbus 3 (see Alan's comments at the end of the article) and to one of Mike Collis's hang gliders.

However, precise evaluation with real thermals presents obvious problems and for convenient quantitative testing we are forced into simulating the variometer signals. This can be done in a number of ways:

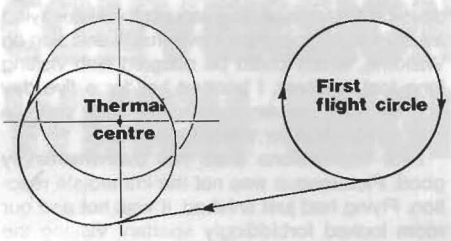


Fig 2

Fig 2 is the recorded output from an exercise carried out with the Thermalyser connected to a large electronic hybrid computer (EAL 231R) at Portsmouth Polytechnic just before they disposed of this in 1985. The analogue part of the computer was set up to simulate the thermal, glider and variometer combination and the glider is seen to be fairly accurately centred after only two cycles of analysis and correction of the flight path.

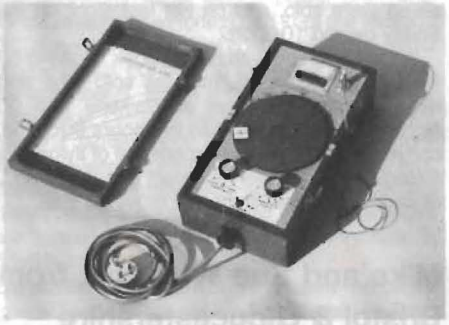


Photo 3: The electromechanical simulator.

Since then the electromechanical simulator in photo 3 has been constructed as an alternative and portable means of testing. In this a model glider circles on a motor-driven turntable and drives a slider-potentiometer *via* a piston and crank mechanism. The potentiometer wiper provides a simulated variometer signal which represents a thermal located at 0° on the scale provided and variometer lag is simulated by an interposed lag circuit in which $CR = \tau$. Tests carried out with this simulator have confirmed the theoretical ±1° accuracy of the Thermalyser.

A cruder but more direct method of testing is to use a hypodermic syringe to inject a pulse of simulated lift through the actual variometer at a pre-calculated time during an imaginary flight circle timed by a stopwatch. The pumping action can also be reversed to give a pulse of sink and a check made that the Thermalyser comes up with the "reciprocal" of the bearing obtained previously.

It will be apparent by now that the Thermalyser effectively "tunes-in" to the circling frequency in determining the direction of a thermal and readers may find it interesting to reflect on how ill-equipped we all are to attempt this unaided at such a low frequency of 0.03 to 0.1 Hertz approximately. If we consider most other cyclic human activities such as walking, running, swimming, etc in which we have an inbred feeling for phase, these all take place at frequencies a good bit higher, 0.4 to 4 Hertz approximately. Is this why so many of us find thermalling difficult?

Alan Purnell's observations on the Thermalyser: Let me say first of all that it works - not that I doubted it would - for theoretically it should have done!

I have been privileged to fly with the device during April and May over a period of 50hrs or so including five 300km+ flights. I have been telling people that it is a device that points to the nearest thermal which is roughly true but admittedly rather misleading.

I have been comparing it with my own thermal centring aid (not the device shown on "Tomorrow's World" but another) which works on an entirely different principle giving a quicker response but is subject to different problems. I will be writing about all these devices and some computer simulations in a later article and comparing them with the ultimate device - the SOP (seat of pants).

The comments I have made to Stan are:

1) To experienced soaring pilots it is an agonisingly long time to wait for a whole turn and then for the indicated direction to come round again. We are used to changing the bank maybe several times in one turn, especially when there is a positive indication of the centre based on the surges. (See John Willies' articles.)

2) The warning time of 2sec is too short for a water loaded sailplane and should be increased to 5sec. Even with a quick response sailplane the pilot prefers earlier warning to mentally prepare for the manoeuvre.

3) It seems to give a reasonably correct indication for about 70% of the time. This is good but it also means that it doesn't for 30% of the time. I think this is because a direction is always given, even when properly centred or when there are several weak lift areas around the circle. This means that confidence could be lost in it. I suggested that a confidence factor be shown on the indicator (letters A to E) so that the reading could be safely ignored if needed without losing confidence in it.

4) By its very nature it cannot tell you how long to straighten up for. I found that "momentarily" to be the best strategy.

I found that I could overcome the short warning by combining the device with my electronic compass (direction indicator) so I could start taking off bank before the bleep started. That way it becomes a useful aid.

"Seat of the pants" method

Early soaring pilots, however, must learn to rely on their senses only, utilising the device to learn the correct "seat of the pants" methods.

Theoretically it should be possible to continuously update the reading as the circle progresses beyond the first circle, *ie* include the effect of the latest information while discarding the effect of the earliest information. Combined with input from the electronic compass even the effects of changing angle of bank could be compensated.

That's a Mk 3 version I guess Stan. In the meantime here's looking forward to a Mk 2 that fits in the panel and includes some of the enhancements I have suggested so that many more people can utilise it to prolong their flights and enjoy their soaring even more.

AUSTRALIA

Philip Reasbeck went to the Gliding Club of Victoria, Benalla at the end of last year

It is not only the super-pundits who can sample the Olympian heights of soaring in Australia - even mere beginners (I only started gliding in July 1986) can try out their luck (and training).

The people at Benalla proved very friendly and the facilities are first class. They have five IS-28Bs for training, two Sparrows, three Hornets, two Kestrels and a Mosquito plus three Pawnee tugs. I was given three check flights by two different instructors before I was allowed to solo in an IS-28. The checks included a cast-off instruction from the tug pilot at about 500ft, no-instrument circuits and landing on tow.

After these hurdles, I went off searching for the much vaunted super lift which I had been given to understand was to be found everywhere in Australia. Unfortunately the weather had been particularly cool and wet but I found it good by English standards and usually flyable by 8.30am. Of my eight days there, seven were moderate and one was superb with +6 and occasionally +10 on the electric vario.

I did 22 most interesting flights and one day gained 5000ft and could have stayed up for five hours. I collected a great deal of new experience and had a thoroughly good time.

The flying charges were less than in the UK (petrol is about half our price), the accommodation, food and drink first class and much cheaper than the English equivalent. So not only is Aussie a good place for the World Champions, it is also a super place for us tyros.

Chris Hodgson also found that Australia welcomes the inexperienced when his daughter went from one to 10 000ft in eight months

Last year I asked my daughter Karina if she would like to try gliding. The prospect of soloing on her 16th birthday would provide a fitting climax.

She joined an evening course at Booker and then a one week course in the summer holidays which, coupled with casual flying, had her checked out for solo about a month before her birthday.

Autumn, winter and the school term conspired to reduce flying activities but she was keen to carry on, I started casting around for winter flying for an inexperienced pilot, eventually deciding on Waikerie, which could be coupled with visiting long lost relatives. I booked her for a five day course in February, complete with on-site accommodation for three, for £286.

First impressions were not overwhelmingly good. Picturesque was not the immediate reaction. Flying had just finished, it was hot and our room looked forbiddingly spartan. Visiting the clubhouse perked us up, especially on realising a reasonable three course evening meal for three was available for around £10.

On the Monday morning we were introduced to her instructor, Paul, a Pom from Nympsfield, followed by a full-blown briefing session. The Met forecast was interpreted, tasks were suggested and possible routes assessed. The whole set up was now starting to look highly professional, well rehearsed and promising success for all concerned.

Karina had 27 flights in the Twin Astir, of which seven were solo, and on her last flight on the Friday gained 10 000ft.

We left England with her logbook showing 63 flights, four solos, 39 minutes solo time and returned after five days at Waikerie with 90 flights, 11 solos, more than five hours solo time, conversion to glass, the experience of flying at a strange site under very different conditions and, of course, the final flight that crowned it all.

Mike and Sue Woollard, from Bristol & Gloucestershire GC, also visited Waikerie and Mike tells of his wife's dramatic experience as well as describing a wonderfully varied and challenging holiday

The Discus was pitching violently as Sue strove to guide it into the core. This thermal like the ten that had preceeded it, was a tight little blue'ee which defied all attempts at centring, appeared intent to shake the soul out of both pilot and sailplane and resolutely refused to bear them back to the 3500ft inversion level. Down below the bright orange paddocks shimmered in the heat of the Australian sun, with a promise of thermal sources that seemed to mock their present plight. The Discus, beautifully equipped with all the latest Borgelt instruments - the answer to a prayer - was all that had kept Sue from an out landing for the last exhausting hour. As she wheeled round and round, ever attentive to the howling vario Sue began to feel the onset of exhaustion and a rising feeling of nausea. Morning sickness or just the continual turbulence - who cared - it amounted to the same; she was getting low, failing to make progress and would have to land.

"Waikerie Base - Hotel Papa - do you read?". "Hot Pants - Waikerie base - go" came the reply.



Sue after a field landing in the Discus. Photo: Mike Woollard.

Sue smiled at the change of call sign and replied "Hot Pants landing out 15km SW Wonker Silos - request aerotow retrieve". "Roger, Hot Pants - 15km SW Wonker Silos - the tug will be sent for you - Waikerie base out". Happy in the knowledge that her position was fixed Sue set about choosing her field and made one of the smoothest outlandings ever.

With an overwhelming sense of relief at the onset of stillness after the violent motion of the preceeding hours, Sue climbed stiffly out of the cockpit clutching her water bottle and surveyed the barren landscape. Not a sign of life in any direction. Just an endless succession of enormous sand like paddocks and the temperature a cool 27°C. Thank heavens she had radioed her position and only had to wait for the tug to arrive.

An hour later the familiar buzz of the tug echoed across the landscape. Out of sight and coming in low the sound increased, past to the south and receeded. Sue grabbed the microphone and tried to call the tug but to no avail. The glider batteries which had been showing signs of weakening, were now completely flat. Time and time again the noise of the tug rose only to fade again into the distance. The sound of the tug faded for the last time and Sue began to feel a pang of uneasiness in the pit of her stomach as she turned to face the setting sun. "They'll come back - they won't leave me here - will they?"

A business commitment had provided Sue and me with the golden opportunity of an expenses paid trip to Australia and the chance of an early summer holiday before Sue's recently discovered pregnancy became too advanced. A friend and fellow club member - Paul Little - wintering at the Walkerie GC under the guise of course Instructor/tug pilot had booked us an ASW-20 and a Discus for the week, so we arrived at Walkerie confident that nothing could prevent us practising 300 and 500km tasks all week.

We were accommodated in a very comfortable family room with shower and toilet, overlooking the swimming pool and airfield. On the first day we were introduced to our gliders - immaculate

in every way - and told to "consider them yours for the week". Much to the amusement of his fellow instructors, Paul broke his golden rule of not flying the two-seaters at the weekend in order to check us out, ready for the coming week. Little did Paul realise that the ensuing week would involve him in more road and air retrieves on our behalf, than he had had during the entire season!

High above Waikerie, Paul pointed out all the principal features - the flat plain, flanked on two sides by the River Murray and the expense of dark scrub line that provide such prominent navigational aids, bordering as they do, the main task area. The clarity of the air, which enables both TPs of a typical 300km triangle to be clearly visible from a mere 4000ft; and the enormous paddocks - so different in shape and colour to the English landscape. Bright orange ploughed fields and olive green/grey pasture, most of which is landable but watch out for the rocky outcrops which appear like patches of fresh fallen snow, and avoid landing across the long low sand dunes which predominate the locality. A wonderful playground for the soaring pilot with few outlanding problems and at least 50% of the available fields offering the possibility of an aerotow retrieve.

But even in Australia one is dependent upon the weather as we began to find out. With limited thermal strength and heights predicted, our first day's task had been a cat's cradle providing the option of shortening if required - an option I had been forced to adopt after rounding the first TP. On my return to Waikerie I had heard Sue's landing out message and I arrived just as the tug departed to bring her home. Hours later saw Paul, myself and John from Enstone GC sitting round the telephone in the bar like some ghastly re-enactment of a Battle of Britain squadron dispersal scene, waiting for the call to scramble into action. The tug had returned empty handed - "Couldn't find her anywhere - Bloody Sheila wouldn't answer the radio" - the tug pilot had retorted. As one Fosters lager followed another we began to imagine a multitude of possibilities - poisonous snakes - venomous spiders - man eating kangeroos and just as we were becoming distinctly concerned, the phone rang.

Sue had walked south for nearly three hours, across hot sand paddocks, guided by the southern cross, clearly visible in the night sky, until eventually she arrived at a farm very tired and very relieved. The soft sand through which she had walked made the going difficult and it contained razor sharp weed seeds that cut her plimsoles to shreads and scratched her legs - and ever present the Australian fly that resolutely lands on your eye for a drink and has to be bodily removed! Fortunately Sue had taken with her a water bottle to avoid dehydration.

And so the week went on with difficult conditions but wonderful challenges and experience with the opportunity to fly some of the best gliders in the world including the unforgettable ASW-17. We had both landed out twice on various tasks, the best of which for me was a 246km struggle around a 300km task which featured a 30km/h crawl up the1st leg, the 2nd 120km leg completed in 1hr flat after a climb to 8000ft and 1½hrs spent grovelling at 800ft above a bubbling paddock - what a wealth of contrast.

PETER SALISBURY

CONVERSION OF WINCH ENGINES

Peter, the professional winch driver at the Midland GC, Long Mynd, outlines the merits and method of converting their winch engines from petrol to propane gas fuel (LPG)

The rapid acceleration and a useful margin of precisely controllable launch power preferable for cable retrieve winching had kept the Midland GC, despite the extra fuel cost, firmly in the petrol engine camp, contrary to the general migration towards diesel. When a source of high quality conversion systems became known four years ago, the Jaguar winch engines (and VW retrieve engines) were converted to propane gas fuel, providing a sprightly petrol-style launch at a "red diesel" cost. Operational and cost advantages are outlined, and the conversion system is described.

Operational benefits. At present red diesel (gas oil) and LPG prices are both about 15p/litre,, while petrol delivered in equivalent quantities (2000 litres) is 35p/litre. But additional operational benefits are obtained from a combination of LPG fuel and petrol engines. Purely mechanical examples are the virtual elimination of engine oil degradation, reliable cold starting and an odourless, colourless and less toxic exhaust. Operational advantages in the use of petrol engines are due to cheapness and lightness of the basic unit, ease of maintenance with familiar and cheap components, and to performance characteristics that we believe are the most suited to launching gliders.

Conversion to propane fuel. Propane has an octane rating of about 100 and therefore burns smoothly in any high performance petrol engine. A range of de-rated diesel industrial engines is available from Ford for use with gas, but conversion of petrol engines is fairly straightforward, though most suppliers would insist on at least inspection by an approved installer to ensure compliance with the LPG industry's code of practice.

The complete fuel system comprises a tank, and a fuel line kit:-

Tank. These are specially fabricated to a range of capacities and fitted with a number of safety devices. The propane is drawn from the bottom of the tank in liquid form to avoid a lowering of the vapour pressure and eventual engine failure that would result from vapourisation cooling.

Fuel line components. Liquid propane flows from the tank *via* a relief valve to the vacuum operated *fuel lock*. This is opened, on commencing to turn the engine, by the inlet vacuum, or by a solenoid actuated by the ignition switch. The liquid then enters a *converter* unit comprising a heat exchanger warmed by the engine coolant to supply the necessary heat of vapourisation, a pressure regulator and a primer system for cold starting. The vapourised fuel passes finally to a gas carburettor which may be attached directly to the manifold inlet, or if a petrol option is to be retained, ahead of the petrol carburettor, replacing the existing air filter.

Normally included in the kit are appropriate lengths and sizes of tubing, adaptors and elbows and steel Bundy tubing for the liquid fuel line.

The current cost of components for the conversion of a four to six litre twin carburettor engine is approximately £500, including the fuel tank. Added to this will be the installation of a storage tank at the gliding site, or adaptation of standard bottles for liquid offtake and filling at an LPG depot. At the Long Mynd our one tonne storage tank supplies fuel for all cooking and central heating of the accommodation block, as well as for the winch fleet. Maximum summer launching activity typically consumes 70 - 80% of the tank capacity in a month, which is about as low as it wants to get before a refil.

Dick Stratton, the BGA chief technical officer, adds: There are some gliding sites where launching operations would be revolutionised if they went to high performance winching with a rate of acceleration to ensure optimum use of otherwise restricted take-off distances, *ie* short runs.



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HITACHI MASTERS OF SOARING

Phoenix, Arizona, May 17-23

Gill reports on a competition where the world's top pilots are invited to compete for handsome money prizes. Her husband, Brian, the World 15 Metre Class Champion, came second.

The Hitachi Masters of Soaring sounds like an elite event and it certainly is. In May, 19 of the world's best pilots gathered in Phoenix, Arizona to compete in exceptional conditions, but over some of the most inhospitable terrain.

The competition, organised by the Soaring Society of America and generously sponsored by Hitachi, is a unique concept and was fantastic fun in reality. For the second year World Champions, past and present, and America Nationals Champions were invited to fly against one another in 15m gliders. Famous names included Helmut Reichman, George Moffat, George Lee, Marc Schroeder, Kees Musters, Klaus Holighaus as well as all three current World Champions, Ingo Renner, Markku Kuittinen and Brian Spreckley.

The gliders were kindly lent and mostly the owners crewed too. If some of the magic of their pilots rubbed off on them, it was repaid a thousand times by the hospitality we received. Everyone involved was so intent on "having a nice day" that the organisers were anxious that all this *bonhomie* would deter from the competitive spirit. They need not have worried!

The airfield at Estrella, 50 miles south of Phoenix, was remote, hot, surrounded by desert, cactus, inhabited by rattlesnakes, roadrunners, desert squirrels and turkey vultures. It is at the foot of the 4500ft Sierra Estrella and within the Gila River Indian Reservation. Soaring conditions were first class. Over the six days all tasks were in excess of 380km with an average of 421km flown each day at an average winning speed of 131km/h.

Biggest battle was at the bottom

Most days 8-10kt could be expected with cloudbases generally 10000 to 13000ft. We were told that normal temperatures for the time of year were 95° to 100°F and that conditions were normally blue. Actually it was rather cool at around 90° and only one day was totally blue. The first few days also brought thunderstorms. As you would expect with conditions like these and the fine soaring pilots present, competition was fierce. The biggest battle was not at the top of the results table, but at the bottom . . . someone had to be last!



George Lee at the briefing.

Probably 65-75% of each task was flown over terrain with no landing possibilities. The desert was littered with bushes and cactus, the mountains rocky and tree covered. On two days tasks were set into the 9000ft mountains. But each day John Lincoln would outline a few landing possibilities in addition to the airfields they would invariably be photographing. As it happened, there were only three outlandings, two at airfields and one on a dried up lake.

The most interesting tales were from the "Masters" placed last each day. On the first day the task was 450km with four TPs. Doug Jacobs (LS-6B) was the first finisher, 15min ahead of the rest of the field. It soon transpired that he had incorrectly marked his map, missing out the last TP. "I thought three TPs were enough." On the second day Klaus Holighaus (Ventus B) wafted back after a 7hr flight. It had been a day of thunderstorms over part of the task area - Brian Spreckley (Ventus B) won the day at 124km/h. Klaus had climbed to cloudbase, 13500ft, spent a long time high without using oxygen and thinks he became hypoxic. He actually flew right over the TP, recognised a valley, some masts and a main road but their significance didn't register.

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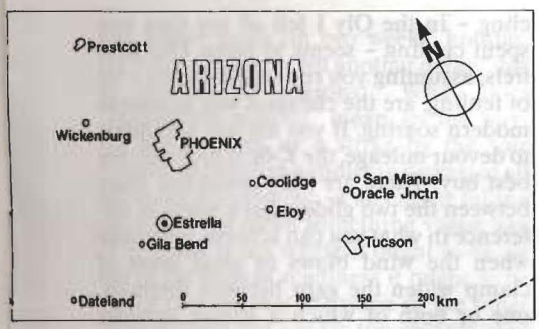
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He even began to doubt his compass until he finally realised he had gone too far!

Other pilots made unintentional detours (World Champions don't get lost!). George Lee (Ventus B) on the last day went the wrong side of a mountain (9500ft) close to the TP and had to fly an extra 25 miles to return to the right side. This cost him seven places, dropping from 4th to 11th. George Moffat (ASW-20BL) also came to grief in the mountains on another day, taking the wrong valley, thus stealing last place for the day easily.

Luckily the TPs caused no hassle. Rather than bisector angles the photos had to be taken from a designated angle different for each turn, which didn't change with the task. This proved sensible as all TPs, except for one freeway junction and a racecourse, were airfields. Yes, there are actually more airfields in the desert than freeway junctions.

There is also much more traffic in America than in Europe. On many days the tasks passed through the approach to Phoenix Skyharbour Airport, the seventh busiest airport in the USA. Pilots were simply briefed to look left and right and to keep a good look-out when crossing. Doubtless they all flew a little fast too. Airliners did take avoiding action sometimes as some pilots discovered after frantic flapping of wings.

American liberal minded about airspace

Thirty miles to the north was a cluster of airfields built during the Second World War to train fighter pilots and due to the ideal terrain for such training it is still extremely active and known as the home of American fighter pilots. The most active of the airfields has a restricted airspace eight miles by 12 miles where one must be below 2000ft msl or above 5000ft msl. The Americans are very liberal minded when it comes to airspace and the concentration of traffic in places like Phoenix is often very hectic. Why does the US Air Force have such greater powers at Upper Heyford?

(Gill mentions the serene atmosphere on the grid, the excellent organisation and the fine hospitality.)

The results? Well, as always they only tell half the story. Eric Mozer (Ventus A) flew very consistently throughout and was in the lead from the third day until the last when his speed was only



John Bird (USA) being launched in his Discus with the Sierra Estrella in the background. John finished in 5th place.

108km/h against Markku Kuittinen's winning speed of 135km/h in a Ventus B. Doug Jacobs also flew brilliantly, winning two days and but for the first day . . . George Lee was in the first five places from the second day and also slid down on the last day, while Ingo (LS-6), who had always been in with a chance and won a day in great style, had a good flight on the last day finishing 4th to clinch the competition. Brian, 6th on the morning of the last day, also benefited from a good speed on a day of diverse times to finish 2nd.

Our visit was also an opportunity to see the American soaring pilot in his own environment. Most USA gliding is organised for commercial gain rather than around a club structure, which makes it rather expensive and prohibitive as high performance single-seaters are in short supply. The choice at Estrella was an Astir ($36/hr plus $5/hr for a parachute and $20 for cross-country insurance), a Schweizer 1-26 or 1-36. Then come the rules. All pilots must pass a Biannual Flight Review before they are able to fly.

The practice day saw Ingo Renner, Kees Musters and Brian queuing for their BFR and site check. They had to successfully complete a 2000ft tow, stalling exercises and a "low energy" landing. This was followed by questions on airspace restrictions and rules of the air. If World Champions are subjected to this (the bill was $46 including $35/hr advanced instruction) what hope is there for the rest of us. I exhausted my spending money on four check flights just to fly the 1-36 locally (it had the performance of a K-6CR and the handling of a sardine can).

Our thanks to Hitachi and the Soaring Society of America for a unique opportunity - may there be many more. As to the cash prizes, Ingo Renner won $5000 and Brian $2500 for coming 2nd. In addition there were marvellous prizes such as microwaves, "boom boxes" and glider batteries.

Leading results: 1. Ingo Renner, Australia (LS-6) 5687pts; 2. Brian Spreckley, GB (Ventus B) 5616pts; =3. Stig Øye, Denmark (ASW-20) and Eric Mozer, USA (Ventus A) 5604pts.

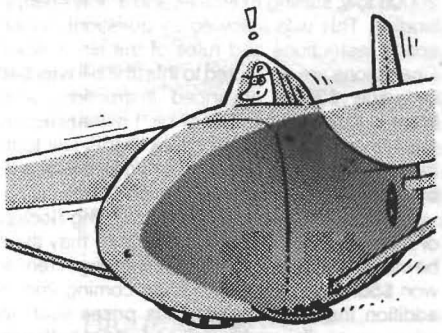
Brian Spreckley describing how he won the second day. Photos: Gill Spreckley.



TAIL FEATHERS

More TINSFOS: an end to tail-chasing

The other day I did a 90km final glide in a big glider, losing about 4300ft and doing



A big glider.

a fair amount of dolphining. It was quite a thrill for me, especially when I had less than 1000ft to spare some miles out and still could not see the site. Ninety kilometres final glides, even 100 and more, are something that the experienced Open Class boys take for granted. Doubtless when they deign to do anything as small as a 300km triangle the last leg is treated as a final glide as a matter of routine: stopping to circle is an admission that things have gone slightly wrong with the Grand Plan. No wonder they pour water in whenever there is a tug strong enough or a field long enough, since if you don't intend to circle it pays to be as heavy as the game laws will allow.

I am quite certain I could have done the last 90km faster if I had circled every time the computer told me to, and flown much faster between climbs, but that is not the point. What can be dafter than having to chase your tail like a dog for ages before being able to go anywhere near the direction you wish? I can't think of any other mode of transport that demands it, though tacking a yacht is slightly analogous. It must surely be the ultimate objective of glider designers to eliminate circling altogether in averagely good conditions.

One small cheer for the treadmill



Exciting leap in performance.

I was trying to think which was personally the biggest or most exhilarating jump in performance before 1987, and it must have been from the Dart 17 (36:1 claimed, probably 10% less) to the Kestrel 19 (44:1 claimed, fairly credible).

"Flies like a fighter" said one recently-converted Prefect pundit to us awed Tutor pilots . . .

The only pleasure of grinding one's way up the otherwise irksome ladder of promotion at our club in the distant past was the sudden, exciting leap in performance as one went from the Tutor to the Prefect ("flies like a fighter" said one recently-converted Prefect pundit to us awed Tutor pilots, by which he meant it had controls that actually worked) then to the Olympia, Skylark 2, Sky and ultimately - 99% of *ab-initios* having given up in frustration by this stage - to the Skylark 3, after three solid seasons during which my weekend days and holidays, winter or summer, were exclusively spent gliding. Nobody would put up with that now, and people go solo in a glider that is much better than the Skylark 3.

Once you get into the 40-plus league in glide ratio the number of times you can cover appreciable distances without circling - in the Oly I felt *all* my time was spent circling - seems to jump. Old Kestrels, assuming you're prepared to do a bit of fettling, are the cheapest way to sample modern soaring. If you are less ambitious to devour mileage, the K-6E is probably the best buy. There are only about five years between the two gliders but a world of difference in what you can achieve, especially when the wind blows or great areas of clamp widen the gaps between thermals, one or both of which a British summer afternoon pretty well guarantees.

Stop the presses!

Whenever I am asked how I get this stuff together for S&G issue after issue (that should read *if ever I were to be asked,* since nobody is the slightest bit interested, but I am going to tell you anyway) I have to admit that I still, in spite of promises to reform made each January 1st, do it all at the last minute before the mighty presses



The last minute.

roll. The cry of "Hold the front page!" cuts no ice with our ED: the only page she would hold for me might be the Situations Vacant. I bet she has set it up in type ready and waiting:

> ***Wanted*** - gabby pilot/columnist with capacious (or is it *capricious?*) *memory. Style preferred to accuracy. No knowledge of libel laws required: total lack of sense of shame a positive advantage. No pay. First job will be to rubbish previous incumbent. Second job, to ridicule previous incumbent's sacred cows: Open Class gliders, Dunstable etc, etc.*

Some day I will miss a deadline and a vast white space will appear, simply bearing that ad in the middle. Once I wrote the column in an airport lounge and posted it

just before going on two weeks' holiday, taking advantage of yet another delay "due to operational reasons". What does "operational reasons" mean, by the way? It's not weather, or a strike by the sole remaining baggage handler in protest at all his mates being in jail, or an engine falling off, so it must mean something vague like "The plane is not where it ought to be, or not in the state of readiness it ought to be in, for reasons that are none of the other three reasons but are far too complicated



Too complicated.

or embarassing to go into, Ladies and Gentlemen, so please don't ask."

You wouldn't guess, with all this last-minute panic going on as a matter of routine, that I have actually published a book on **Time Management**. Indeed, the idea of my writing a book on how to be organised struck Mrs Platypus as a gigantically funny joke. My only excuse was that it wasn't *my* idea: I had been invited to write it by my friend the distinguished ex-chairman of the BGA who should have known better but who was going to pay me actual money, by way of a refreshing change. (Crass hint ignored, ED.)

Has he a spelling bee in the bonnet, or is it a bat?

There is a poster at our clubhouse kindly sent in by another club, which shall remain nameless if not shameless, advertising in giant letters a grand party IN THE HANGER (sic) of the nameless club. I



For getting into cars.

thought professional printers – this was clearly a professional job – said to their clients "Are you sure that's right?" when they detected or suspected an error. A *Hanger* is a device for storing clothes on, the nasty wire versions of which can be used as substitute car aerials, or for getting into cars when you haven't got the key, like when it's someone else's car and you're stealing it. Another less well known meaning is *wood on side of steep hill* (**Concise Oxford Dictionary**). That might explain why some pilots, on being told to fly back to the hanger, have obediently piled into the trees on the nearest ridge.

A large shed full of bats, Piper Cubs, bird-droppings, gliders, old bicycles and cobwebs is a HANGAR, for Pete's sake. It comes from the French *hangar* (pronounced *'angar* when in that country) originally meaning, B.B. (before Bleriot), a large shed full of bats, carriages, bird-droppings, old carts and cobwebs.

Education is a wonderful thing: you can fill your brain with all kinds of fascinating junk till it resembles a perishing 'angar.

Why glide? One man's reason

Some years ago a woman writer, whom I've never met, before or since, sent me a letter asking me to contribute a short chapter on gliding to a book she was putting together about lots of different sports. The book never appeared, which doesn't surprise me because people aren't interested in sport in general. We all tend to specialise; people who love badminton don't want to read about billiards.

Nevertheless I described for her a day during what I believe was the only one Class contest ever flown in this country, the Dart Comp of 1968. It was a good day, and of course in my piece I threw in the usual descriptive guff about the joys of soaring. We fizzed round a 110km triangle in about 90 minutes (not bad for the old Dart) and having landed, we all said "that was fantastic, let's do it again straight away!" The second time round, however, the wind direction and cloudbase had changed, the thermals were working differently, the sun had moved round and the rolling countryside looked completely unfamiliar, so much so that I got lost in spite of having done the identical task only an hour before. I got horribly low, and eventually struggled home, but with a poor time.



Horribly low.

The point I was making was that gliding is like Cleopatra, "full of infinite variety." The same day, the same task, but two utterly different soaring experiences. A philosopher once said "you never step in the same river twice." Well, you never fly in the same air twice.

Faced with the usual question "what is gliding like?" or "why do you glide, why don't you fly power?" I find myself reciting this little anecdote because it really makes the point – for me anyway. There's no reason why two identical circuits in a power plane should not take exactly the same time and cover exactly the same ground. But not even Spreckley can make gliding uniform and predictable. And he wouldn't want to either.

If you really want to be exclusive why not buy a special limited edition white T-shirt with the Platypus "I Love Big Wings" Peter Fuller design. One size only, large, £5.25, including p&p from the BGA sales room.

BOXING CLEVER

Rolling a glider trailer and car into some remote embankment or ditch cannot be the best way to start, or finish one's day, especially if a little common sense, knowledge and preparation could have assisted in avoiding such a catastrophe.

Occasionally, the unfortunate victim of such an occurrence will recount his or her ordeal in our magazine; or at the gliding club bar where we can actually hear a first hand account from "one who was there". The point is, if you listen to, or read these tales of woe you cannot help noting the well worn phrases used to justify the outcome – the "tyre blew out unexpectedly" or "a lorry passed me and I started snaking", but perhaps the richest of all, "I just lost it – there was nothing I could do."

I am quite sure that if I were a loss adjuster processing your claim you would have to come up with better excuses than these. A defintiion of the word accident means "an unfortunate event -- the outcome of which is beyond our control", and if you agree with this then you cannot classify all trailer damage as accidental because with knowledge, good management and experience an awful lot of such incidents need never have occurred in the first place.

The choice is ours, we can either do something positive to curtail the problem, and lower those already high insurance premiums, or stick our heads in the sand like the proverbial ostrich and hope that the problem will go away.

Driving my trailer back to Dishforth, after my first outlanding of the year, I was distressed to see a motor car totally covered in grass and mud – and all the wrong shape. Close by were large chunks of white plywood, and the odd wheel which half an hour earlier had been used to house a Kestrel. The visiting driver who had set off to retrieve his pilot had not even managed to travel more than ½ mile along the A1 before he "lost it". He was "only doing 40" and "the trailer was empty" and "this truck came close and started me snaking. What could I do?" was his cry.

Most people were sympathising with the driver, with lots of head shaking, followed by "bad luck old boy". Fair comment at the time I suppose, the driver was feeling bad enough as it was, but before you, dear reader, begin to join in mass sympathy, let's have a look at the details:

Trailer	– Kestrel – the longest you can get.
Car	– Ford Orion – No I'm not joking!
Weather	– 30kt head wind – oh dear.
Driver experience	– Obviously not a lot.
Reason	– Wagon came too close and started unit snaking – they do!

When the details are written down and studied it becomes obvious to all, except a moron, that the outfit was an accident waiting to occur. I have left one vital piece of valuable information – spotted it? Got it in one – the trailer was empty. But does this factor make the outfit more stable or less so? In this particular case it had an enormous bearing on the outcome – read on if you are keen – ostriches adopt status quo.

Identifying the problems are simplicity itself; if we know what we are looking for, but whether a unit is stable or not depends on the compatibility of the car trailer/driver. So let us consider each one for suitability and see what transpires.

Cars

When we chose the motor vehicle of our dreams, then considerations affecting our choice are many. The lady of the house has her input; will the hatch back version have enough room for the pram, will it be comfortable and is the colour right etc. Then we males have our say, go faster stripes, extra loud cassette player, sun roof, GTI version wheel trims – you know the kind of thing. But do we really ever stop to think, "Is this vehicle suitable for towing the longest non-commercial trailer in the world?" Sounds awesome doesn't it? Funny though, it's true. So just what does make a good towing vehicle. Well for a start, TINFOS, mate (THERE IS NO SUBSTITUTE FOR *SIZE*). Bigger and better – bigger they are – harder they roll – got the picture?

". . . the wider the wheel base the more resistance the car will offer in the rolling plane . . ."

However, what is critical is the distance between the axles (wheelbase) relative to the distance between the rear axle and the tow ball hitch, (Fig A). The more times (b) will divide into (a) the more stable the unit becomes, because once the trailer begins to snake dimension (b) becomes the lever with the rear wheels being the fulcrum. The longer the lever – Hmmm! If we could only mount the tow hitch on the axle itself, just like big articulated lorries do, we could then get rid of the lever altogether. The width between the wheels is also important, because the wider the wheel base the more resistance the car will offer in the rolling plane, consequently, the flatter the triangle ABC between the rear wheels and the tow hitch the more stability achieved (Fig B). What price a set of quality wheel spacers?

Are there any more deciding factors? Well yes there are. A front wheel drive vehicle is far more stable for towing because it pulls the whole unit from the very front, as opposed to a rear wheel drive unit which pushes the first ⅓ of the outfit, and pulls the second ⅔. If the theory blinds you somewhat, go to your local Sainsbury store, get two shopping trollies and try pushing one and pulling the other simultaneously – the picture will become crystal clear. Cross-ply tyres are ideally suited for towing because there is far less rolling action as a result of the stiffened side tyre walls. A computer controlled anti-skid braking system would be nice, but we are now going a little overboard. But it certainly is worth remembering to throw all of those heavy tools and junk out of the car boot where possible. It helps tremendously in the pitching plane.

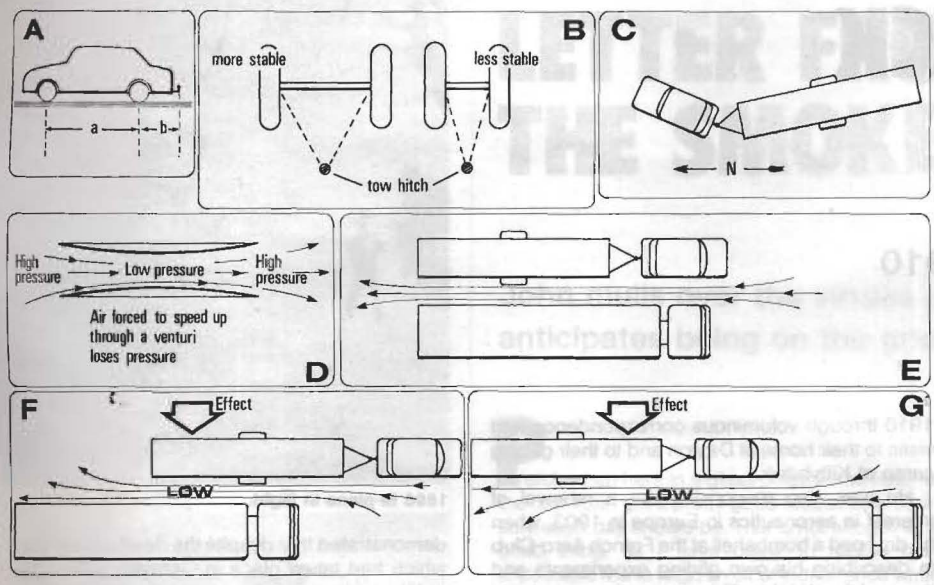
Finally, when you have selected the correct car, and seemingly done all the right things, why don't you pop down to your local caravan shop and invest £30 odd pounds in a stabiliser bar. They do work, and I bet we all at some time or another have considered purchasing one. They are as cheap as a John Willy Dolphin unit, and will certainly increase your cross-country speed!

The ideal vehicles to tow with are Ford Transit Bedford CF/Volkswagon vans. You would not know you were towing anything if you were so fortunate to own one of these vehicles. Another superb piece of towing tackle is "yer Ackney Cab mate", and if five syndicates of four persons were to club together, and purchase such a vehicle the outlay would be peanuts. I recall Frank Pozerskis arriving at Dishforth towing his ASW-17 behind his Rolls Royce. When he stopped to greet me I asked him how he liked his Rolls. He shrugged and replied "It's OK for towing a trailer." Ah well. (Incidentally, the towcar of the year is the Citroen B.X.)

Drivers

You know we really ought to be a little more choosy who we trust to drive a total cost outfit of £20 000 plus. Certainly we should not be quite so eager to lend our cars and caravans with such gay abandon. So why are we all guilty of letting someone we usually don't know drive a car he she may never have driven before let alone towing a trailer that they have never had experience in towing. To be honest, we are simply mad! Usually, the reason is that there is a shortage of known and experienced drivers when weather conditions are good, then all Silver C plus pilots are keen to fly cross-country, so their car keys are left on the front seat of their cars and nothing matters to them except the flight. Therefore the onus to be collected rests fairly and squarely on the shoulders of the poor non cross-country types – you know the ones – keen – never done it before – sort of chaps – well intentioned – relatively new to the sport – anxious to please.

Now with a little planning these keen types can really be good value, but they require a certain amount of grooming by ourselves. So when the weather is duff why don't we hitch up the trailer, and *teach* them how to do it in a nice steady unhurried manner. Far better than subjecting them to a 100 miles dash on a dark, wet night in a strange vehicle etc. Show them where the pre-drive safety check list is, (what? you don't have one – tut, tut), show them the knack of reversing, you know – sticking your head out of the driver's window and looking along the line of the trailer – teach them the little ditty "to bring the trailer into view, turn the wheel away from you". Works an absolute treat – sorry – what? Do you mean you've never heard that before? Teach them to hold the wheel at twenty past eight and **relax**, and feel what is happening to the outfit through the steering column. Tell them that gripping the wheel in a vice like manner and locking the arms rigid is sudden death. In short, show them all the ropes, it could very well be to your advantage and will certainly give you a little peace of mind when



you are in the middle of a muddy field contemplating your navel, as night draws in.

Trailers

Well to be fair there is not enough room in this magazine to cover what I, and others could say about the design, maintenance, and appearance etc of trailers. So I for one am going to bite my tongue and concentrate on the stability aspect only, always presuming of course that the tyres and brakes are totally legal and fully operational. Perhaps if we had a look at the reasons why trailers snake, we could possibly do something about it.

A. Driver Induced

Failing to read the road ahead, and being forced to make a somewhat violent change of direction is one of the most common factors of trailer accidents. Keep thinking about Newton's Law "For every action etc etc". Over-correcting when a minor upset has occurred is another cause. You'd be amazed how *little* corrective steering action is required to return to the straight and narrow. Usually just a flick of the steering wheel and back to centre is adequate.

Braking once snaking has started is fraught with danger. If your outfit is a dead straight line when you apply the brakes you will probably get away with it. The problem arises when your car is facing NE, and your trailer NW (slightly exaggerated – but You get the picture). Try braking now Sunshine and you are in trouble with a capital T.

The theory reveals all (Fig C) – pushing on the brakes makes your car want to travel in a direction somewhere between due north and north-east (it still retains some inertia from travelling in a straight line). However, the trailer wants to go somewhere between north-west and north. Newton's Law – "A body moving in a straight line will remain in that state" applies here, and when you slam on the anchors – that's just what the trailer does (but it takes the back end of the car with it, roly poly time). Why not try accelerating – it feels all wrong but it does pull the trailer back into a straight line.

B. Design Induced

Not a great deal can be done to rectify this problem apart from totally redesigning the trailer, but you may be able to tidy up one or two areas.

You could begin by making sure that you have cross-ply tyres (they are the ones which don't have the wobbly side walls), and of course that they are correctly inflated! If you're not sure what the correct pressures are **don't guess** – go to a proper tyre fitting bay, and tell the expert what all-up-weight you are carrying and he should put you right. Having found out the necessary pressures, you could be *really* intelligent and write it on the mudguard – we'd all know then. If you can't obtain this information from a tyre bay, consult the RAC or the AA and pick their brains – that is of course if you are a member – I mean, nobody in their right mind would tow a trailer hundreds of miles at night without some kind of back up, would they?

You could make sure that your brakes are working properly – and by that I mean together – by the same efficiency. One wheel more efficient than the other is I'm afraid lethal to say the least. Dwell upon the theory again; if the offside wheel wants to stop and the near side can't be bothered the car will still want to travel north again as you brake but the trailer wants to go east. This will tend to push the boot of the car in an easterly direction and the nose in a westerly direction – oh dear – it's roly poly time again. The answer is quite simple – maintenance – and on a regular basis.

You could halve the trailer mortality rate by fitting a double axle and throwing your old single axle on the tip. It does make for somewhat more difficulty when manoeuvring on a muddy field – but at least you will have a trailer to struggle with.

You could rearrange your trailer so that the axle is *aft* of the centre line; the further aft, the more stability. If it were possible to position the axle under the back doors we could have total stability! Whilst you were doing this, you could make sure that the balance was unequal by 25-50lb biased on the tow hitch side of the axle. But most people know that – don't they?

You could buy a stabiliser bar from . . . (sorry, I've flogged that one to death).

Third Party Induced

This is where those inconsiderate heavy goods vehicle drivers get too close to us and muck up even the most orderly trailer outfit. If you want to know the reason why then best we have a short spell of theory again I'm afraid. If you remember, it's the venturi effect that causes our glider to soar on high, and for those not too well up on the principles of flight, consult Fig D. Now quite honestly, there is not much difference between Fig D and Fig E. There is a reduction in pressure between the vehicles as they pass each other. Not all that significant you may say – but let's look again at Fig E but this time five seconds earlier (Fig F). Have you spotted the problem?

Top marks this time, the low pressure between the lorry and the rear end of the trailer causes the back end to want to travel east, the front west and so on. Of course, one second later the lorry will be alongside your trailer front end and sucking that east (Fig G) and so on, and the wiggles have well and truly started. Just as you are managing to right the situation, his back end leaves your trailer front end and the suction stops – so the front of the trailer now goes east, and oh dear we are near roly poly time. Of course, if the trailer is **empty** – the wagon can have a field day – no weight inside to dampen the snaking do you see.

Just supposing you were "doing 40" as they say, and the lorry was "doing 70" as they very often do. The sudden effect on your rear end would be suicidal. You would be far better off driving at 69mph (no I'm only joking) because the effect would not be so traumatic.

Just cast your mind back to our Orion driver, pulling his single axled unstabilised empty unit against a 30kt headwind at 40mph down the A1 with a big container lorry overtaking at a great rate of knots, got the picture?

There is not a lot you can do about inconsiderate lorry drivers, although you might try a trick I use. When towing in the slow lane I keep the unit almost on the white line that separated me from the middle lane. The overtaking lorry gives his usual clearance, but just as he overtakes the rear of my trailer I move slowly and carefully back to the centre of my lane, thus giving a greater clearance between the two vehicles. It helps.

Environment Induced

Did you know that Billy Wind can blow a sailing ship from here to America at a steady 15kt? Now the only difference between the ship's sails and the glider trailer walls is the material used in their construction. The surface area is about the same, so if Billy Wind is blowing best you have some respect for him because he will have you over as soon as look. Crosswinds on motorways are *not* good, because one moment you are driving along shielded by an embankment, the next you are not, and subject to his fury. You must *anticipate* what is going to happen and be ready.

If you are driving against a 30mph headwind the venturi effect is horrendous when a heavy goods vehicle passes you. If you can recall the principles of flight again, "Venturi effect increases by the square of the airspeed", you can now finally understand why our gallant friend lost his Orion and outfit. Make sure *you* don't. ■

LOOKING BACK

OCTAVE CHANUTE 1832-1910

Chanute was born in France and moved to the USA when he was six. He was trained as a civil engineer and had a distinguished career in the development of several American railways.

It was in 1878 that he became interested in aeronautics and not until 1896 that he conducted test-flying of gliders of his own design. Already 64 at the time, he invited younger men to fly them.



Octave Chanute

Birth of aviation. He made substantial contributions to the advancement of gliding and to the birth of aviation. In addition to his own gliding experiments, in which he introduced a well-engineered method of rigging biplanes, he acted as a benevolent broker of aeronautical information. His book **Progress in Flying Machines**, a critical review of almost all previous attempts at heavier-than-air flight, was published in 1894. Many papers on bird flight and gliding appeared from 1895 onwards and he was the chairman of the International Conference on Aerial Navigation held at Chicago in 1893. He was widely read and his work well respected.

The Wright brothers. Perhaps his greatest contribution was the direct encouragement that he gave to the Wright brothers between 1900 and 1910 through voluminous correspondence and visits to their home at Dayton and to their gliding camp at Kittyhawk.

He was also responsible for a renewal of interest in aeronautics in Europe in 1903, when he dropped a bombshell at the French Aero-Club in describing his own gliding experiments and those of the Wrights. This was well reported and awakened the French to the fact that the Americans had forged ahead in aeronautics while they had been playing with balloons. From that moment they stirred themselves into frantic activity, but it was too late! The worst had happened: although at first disbelieved, the Wrights had already achieved sustained and controlled flight!

Camp Chanute. For his gliding experiments Chanute set up camp at a secluded area near Chicago where sand dunes provided elevated launch platforms. The first machine was a copy of a Lilienthal monoplane with which glides of about 100ft were made. His young pilots had neither the experience nor the acrobatic ability of Lilienthal for safe control of the hang glider in the air, particularly in gusty conditions, so they turned to a new Chanute design.

Chanute glider. Chanute's first machine was a multiplane hang glider designed to maintain stability in pitch by swinging the wings backwards and forwards about a vertical axis. Stability in roll was helped by a low C of G, but it was still necessary to swing the body to keep the wings level.

This machine passed through a long series of modifications until Chanute arrived at the simple bi-plane design which is often associated with his name. This had a 16ft span and a Cayley-type tail attached by a boom and elastic devices, giving it some flexibility which it was hoped would dampen out effects of gusts.

With these machines hundreds of glides were made, the best being over 100 yards with angles of descent between 7° and 10°. Body movement was much less than with the Lilienthal copy.

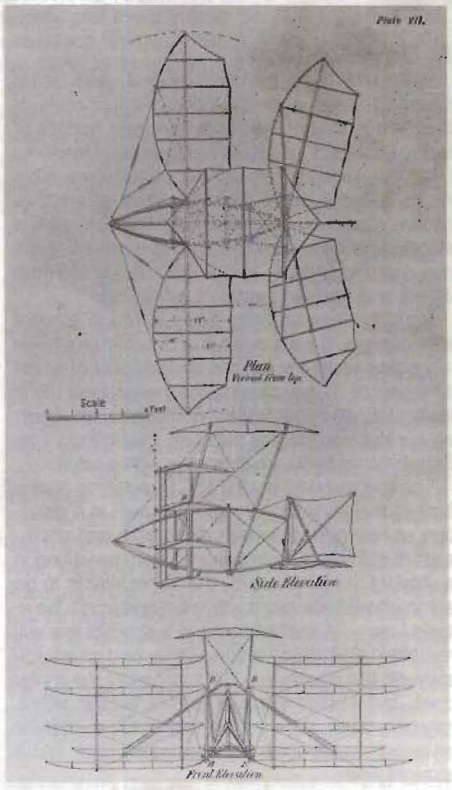
The technique was much the same as with modern hang gliders and after many flights over many weeks at "Camp Chanute" no one was hurt. Even the cook, employed by Chanute to feed his hungry young men, was persuaded to have a go!

Pointing the way. The results look meagre today, but Chanute was able to draw certain conclusions that pointed the way ahead. He had demonstrated that despite the death of Lilienthal, which had taken place in Germany while Chanute's camp was in progress, within certain limitations it was safe to experiment with lightweight gliders. He predicted that stability in flight would be possible by using moving parts instead of acrobatic movements by the pilot, but it would require a long series of experiments to learn how to do it.

It is comforting to know that while Chanute gave much to aeronautics without actually achieving sustained and controlled flight himself, at least he lived to see it all happen and to know that the vehicle he had chosen, the lightweight glider, had proved to be the right stuff! ■

1896 bi-plane in flight.

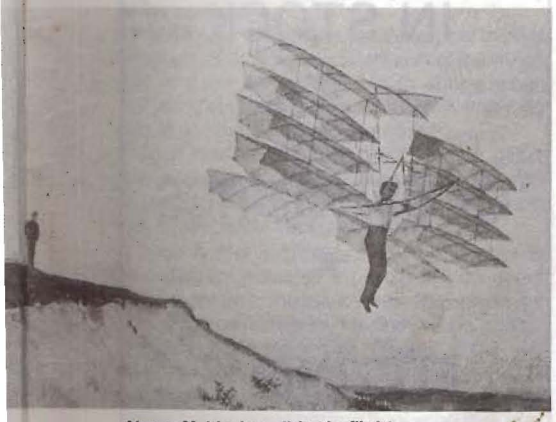
Drawings of what was described as a "multi-wing gliding machine", 1896.



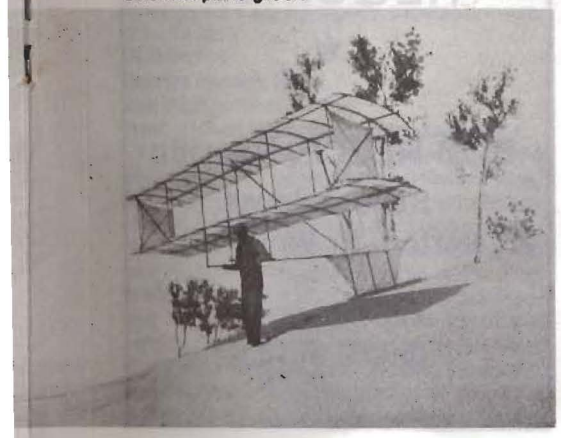




Chanute with multi-wing glider.



Above: Multi-wing glider in flight.
Below: Bi-plane glider.



JOHN BRIDGE

LETTER FROM THE SMOKE

John mulls over the virtues of the task week and anticipates being on the grid again this year

Perched up here in a glass office in the heart of the city, I can get a pretty good idea of how soarable each day should be. This is not altogether a good thing, as I have come to realise how impossible it is to feign an air of indifference while outside the venetian blinds thermals are off the clock to 6000ft. My ability to con the boss into allowing yet another day off is directly related to the plausibility of my excuses, and believe me, I'm fast running out of good ones.

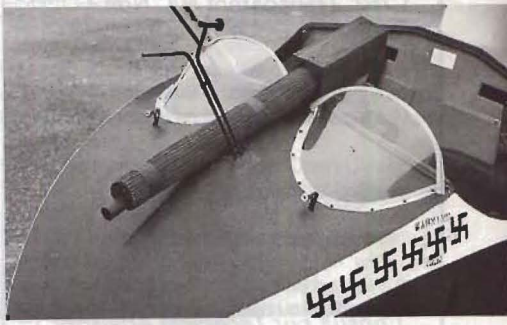
What I find rather uncanny is that whenever a Comps or task week looms up, nature knows instinctively that it's time to pull out the stops; either a "system of lows unusual for the time of year" gears up to hurtle its way across the land, or a high pressure system establishes itself for the rest of the summer. Neither prospect intrigues me to any great extent, so I make my annual resolution not to have any dealings with week-long gliding holidays.

It is therefore all the more remarkable that as autumn approaches I find myself preparing for yet another week's worth of hope and despair down in task week territory. I drag my trailer on to that merry-go-round known as the M25, to be spat out in the general direction of South Wales. Through the storms and rain, windscreen wipers at VNE, I forge a path through the mud tracks until in the distance I see the glimmer of clubhouse lights and hear the unmistakable sound of laughing Welshmen and the gentle murmur of indignant sheep.

Unhitching the trailer and leaving it up to its axles in the driest bog I can find, I emerge from the storm to encounter old friends and faces new, all eager for the coming week's flying. Over in the corner, Desperate Dan is pouring over maps and Met books, eager to get that Silver before the season ends. Under the table is the CFI (known as Cyclops because whenever you think he isn't looking, there he is with his eye on you). And lo! – a superpundit, Mike Slick, ticking off his collection of National records, looking forward to completing the set. Meanwhile at the bar are some representatives from some social club near Coventry, noisily performing the most impressive displays using odd-shaped balloons – well, they look like balloons to me.

In actual fact, the task week proper starts here. First establish who the main competition is and hint that perhaps the next day isn't going to be fantastic. Offer him a beer, and another and a scotch or three. Keep it up until he falls over, and let nature take it's course the following morning. Alternatively, use the more direct approach of bribing the task director. To date, as all my rivals appear to have achieved a fair degree of success, it is quite clear that I don't pay enough. However, it shortly becomes apparent that my approach is backfiring, as once more I fail completely to give up the beer. The last two things I remember are John Wallet-Smithe listening to "WW2 Greatest Hits – Spitfires Over Germany" on the cassette deck, and a strange feeling of cautious optimism for the following day's weather.





Readers may be surprised to learn of the lengths to which today's pilots will go to give that extra competition advantage.

Next day I awake to the sound of one of those road-workers' power tools which destroys tarmac. The headache persists as strange visions appear. White tubes ... planks sticking out the sides ... what's the word? ... Gliders! That's right. Got to fly today. The noise transforms itself into the splash of rain as I gather the enthusiasm to stagger into the briefing room.

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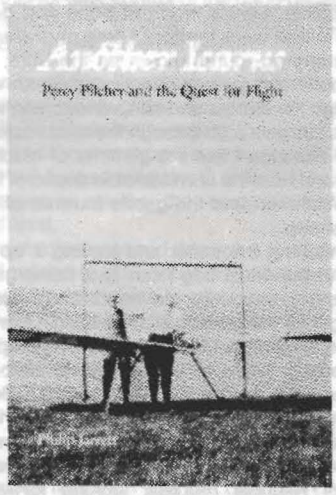
Percy Pilcher and the Quest for Flight

Philip Jarrett

Four years before the Wright Brothers first manned, powered flight at Kitty Hawk, British aviation pioneer Percy Sinclair Pilcher had constructed and was planning to test his fifth glider-a triplane he intended to fit with an engine. Pilcher's work was cut short when he perished in a glider demonstration in 1899.
Jarrett, a long-time aviation writer and editor, spent over twelve years researching Pilcher's progress toward powered flight. This first complete record of the aviators life and works includes the innovative research undertaken by Jarrett and provides aviation enthusiasts and historians with a welcome contribution to the story of the men and machines that led to man's conquest of the earth.

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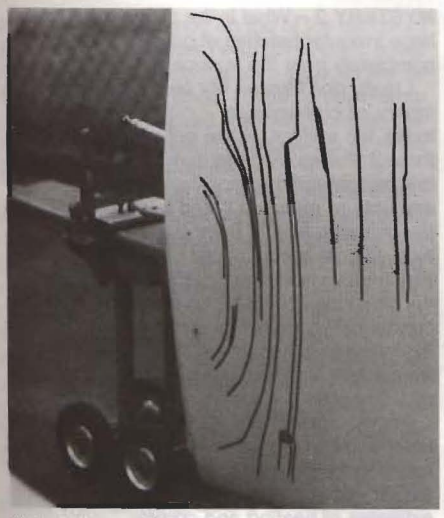


Photo 3: Concentric fractures – right wing root. (Example 3.)

tracks trying to figure out what happened. It has to be associated with the fact that this glider has been twice above 40000ft. The gel coat is excellent and it looks like almost any other except for a series of concentric fractures that appeared after one high flight. (Photo 3.) This is the only visible damage to the ship, and is only under the right wing root. There is nothing wrong with the other wing, or the upper surfaces. As with Example 2, these are definitely structurally-produced fractures of unknown depth into the structure which leads us to . . .

MYSTERY 1 - Why do the cracks appear to be in what must be the very strongest part of the wing? And why are they concentric in shape when everything else would lead us to think that they should go straight across the cord?

On at least one occasion our sample glider was subjected to temperatures that probably exceeded −80°F (−60°C) and was then flown into an absolutely ferocious rotor.

Some further explanation of the photos is necessary.The fractures are wider and are more pronounced up to the point where they cross the spar, then they narrow to "hairline" width, widening again on the other side. Several of the outboard cracks stop entirely at the spar.

This one had me stumped. Roger Frank suggested that the drag spar and front wing pins may have some effect on the distribution of loads as the wings move around slightly, especially in very turbulent air.

EXAMPLE 4

Damage history: None.

Use: Racing, cross-country.

Type: Medium floppy wings, Standard Class.

My own sailplane is one example of the relationship of the spoiler box to a flexible wing. My partner, Chuck Fisher, was flying with George Moffat in the Standard Nationals at Hobbs a couple of years ago, near some thunderstorms into what they described later as some of the most turbulent air either had ever experienced. Running at manoeuvring speed, Chuck heard this bang and felt a heavy oscillation of the left wing. That spoiler had come open allowing the spoiler cap, which is spring loaded, to cavitate above the surface of the wing. Quickly pulling up, he was able to re-lock the spoilers and continue the flight. On landing, the spoiler handle was readjusted to a firmer setting, but the real culprit was the spoiler fence (photo 4) which was forced upward by the lower wing skin, during heavy wing flex, popping it out of its locked position. Later I had John Sinclair angle the bottom of the metal to accept a certain amount of flex without losing too much surface area. In this case the spoiler box flexed substantially with the wing but, of course, the main portion of the spoiler didn't.

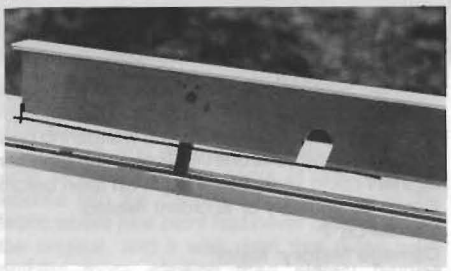


Photo 4: Spoiler fence with the original shape. (Example 4.)

In another instance, Mike Koerner told me an interesting story about opening spoilers when he was above 30000ft only to find that despite using all of his strength he couldn't close them fully to the locked position. The glass-fibre wing contracted a great deal in the extreme cold, but not as much as the metal spoiler mechanism.

I'm sure all of you at one point or another have seen glass-fibre sailplanes with fractures radiating outward from the corners of the spoiler box. Let's explore what is going on here. If the wing was without spoilers, ailerons, flaps or attachment points for all of the above, it would flex uniformly. However each of these things stiffens the wing locally, so that rather than having a constant flex certain points will have more resistance to bending. (Photo 5.)

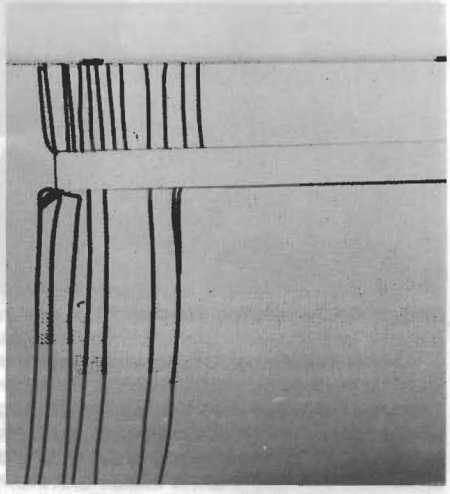


Photo 5: Stress cracks radiating from the spoiler box area. (Example 4.)

In the past little was done to gradually spread bending loads outward into the rest of the skin. My old sailplane was a case in point with recurring cracks at the spoiler box corners. When we ordered our new ship, Wilhelm Dirks assured us that they were now wrapping the edges of the box with rovings, and that this should not happen again. With three years of more stressful usage, there has been no cracking whatsoever. Most newer ships seem to be better in this regard as the designers learn how to better distribute stress loads and use the new materials that are incorporated in their designs.

Why doesn't the underside of the wing crack below the spoiler box? Generally because the lower wing skin closes the bottom of the box and helps distribute whatever torsion, compression, or tension that occurs there - unlike the top where the cracks radiate away from an opening.

EXAMPLE 5

Damage history: None (to start with).

Use: Wave flights.

Type: Metal sailplanes, Open and 15m Class.

I can just hear the guys who fly wood or metal gliders out there giggling. You know - "If God had meant for there to be glass-fibre sailplanes, He would have planted glass-fibre trees." Or . . . "Plastic pilots fly plastic airplanes" . . . etc. Well, let me put you straight. Carl Herold told me a story about two metal sailplanes flying in successive years in the 1960s at Truckee, California. The first was a Schweizer 1-23 that went to 35000ft when the pilot elected to pull the spoilers, move over into the "down" of the wave, and as Carl described it "land immediately" back at the airport. Unfortunately the new paint job on the glider was totally wrecked, the aluminum skins at the seams lifted substantially, the wing skins pulled oblong holes at the rivets and many rivets had to be replaced. The next year the same thing happened to a HP-14. These were perfectly good gliders that were damaged by the spar and structure staying very cold while the skins were rapidly warmed.

We're all in the same boat guys. This applies to you too! Differential expansion of the skins and structure are a problem no matter what the sailplane is made of.

EXAMPLE 6

Damage history: Moderate to heavy damage in several groudloops.

Use: 25 to 30 times above 30000ft with vast numbers of high-speed cross-countries - raced usually only one time per year. Left tied out 2 to 3 months yearly.

Type: Relatively floppy wings, Open Class.

From my viewpoint this is probably the most interesting sailplane I have ever seen. Because of its usage history, this ship tied together many of my theories about what is going on with cold floppy wings and reinforced some hunches that I have had about the interaction of stiffeners and the flexure of wings. It is like looking at the lines in an old man's face to see where he has been. Surprisingly, I would rate this sailplane's original gel coat as excellent, exhibiting none of the problems I described in earlier articles.

Let me explain the photos at length, starting with No. 6. At the wing root of the underside of the right wing, the circular concentric cracks straighten into linear fractures going straight across the cord. The area of the inner portion of the wing marked with a long arrow and an outline of the spoiler box contains regular chord-wise hairline cracks spaced about 2in apart. Further



Photo 6: The underside of the right wing showing the areas of the fractures. (Example 6.)

out, wider cracks appear in a swarm near a flap drive or connections. Regular chord-wise hairline cracks resume again going out to the wingtip, again spaced every few inches. The top of this wing exhibits about ½ to ⅓ of the cracking that the bottom does, mostly being chord-wise fractures regularly spaced, especially aligned with flap or aileron hinges, drives and spoiler attachments. The other wing is pretty much a mirror image of this one.

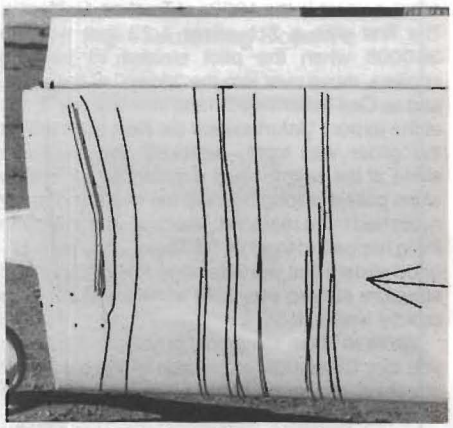


Photo 7: Concentric cracks at the wing root. (Example 6.)

Detail photo 7 shows some of the concentric cracking at the wing root that we saw in Example 3. Again note how the fractures gradually straighten out going towards the middle of the wing.

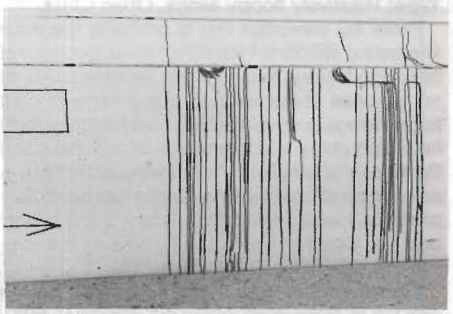


Photo 8: Mid-wing fractures on the underside of the right wing. (Example 6.)

Detail photo 8 is of the centre-section of the wing and shows a highly cracked area which is heavily influenced by structural elements inside – probably flap drives or hinge mounts.

What was so special about seeing this sailplane was that after finding bits and pieces of these things on other gliders and wondering how they interrelated, this one tied everything together so that I could verify that what I had seen before wasn't an anomaly or accident related.

EXAMPLE 7

Damage history: Minor.

Use: Long distance cross-country, many hours of wave flying.

Type: Medium flopping wings, Open Class.

Of the two glass-fibre sailplanes I've seen that, in my opinion, have been flown until they're worn out, both share a common trait. The first, though I've seen it many times, was put in a museum before I ever found out about its problems. It had a vast number of hours flown in contests, an incredible record of cross-country mileage and probably more time in wave than any other sailplane in the world. It was reported that one characteristic was that large patches of gel coat would literally fall off of the ship, and despite re-coats, this kept happening – mostly in the same areas.



Photo 9: Gel coat spalling. (Example 7.)

Another sailplane with a very similar record is pictured here (photo 9) and exhibits the same problem. The owner says that once on landing after a wave flight he got out and found a 6in patch of gel coat on the ground that had just fallen off the wing. He glued it back with super glue. On this example ship the photo shows some grey areas (with tape arrows point at them) that have been filed with "white lightning" that has discoloured. In each of these spots the gel coat fell off the rudder. Some more areas are beginning to lift at the base of the vertical fin and on the wingtips.

MYSTERY 2 – What is the process that causes large irregular patches of gel coat to delaminate completely from the surface of a glider?

I really don't know. My best guess is another theory of convenience – moisture either penetrates the surface of the gel coat or comes up through the epoxy-glass matrix to lodge between the gel coat and the upper layer of cloth. Even tiny amounts of moisture could be involved to start the process. At this point the glider is flown to high altitude and is super cooled; the moisture then freezes wedging the gel coat completely off the structure. The moisture source could be from condensation or residual moisture. In geology this process is known as "frost heaving," where even a very small volume of water, by freezing in rock crevices, can break up a mighty boulder.

Another possibility is that irregularly mixed batches of epoxy resin may not have bonded totally to the gel coat in the areas of peeling, and the surface coating simply pulls away with extremes of heating and cooling.

I don't have a clue – your ideas are as good as mine.

EXAMPLE 8

Damage history: None.

Use: Rental.

Type: Two-seater glass-fibre trainer.

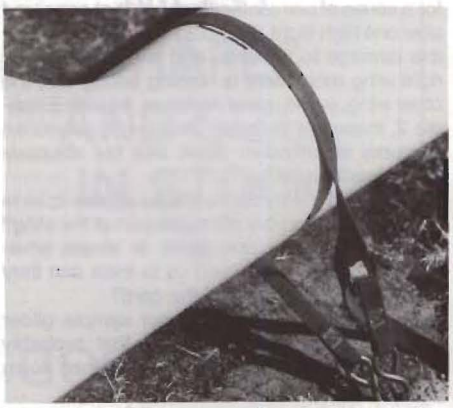


Photo 10: Tie down strap and crack. (Example 8.)

The day I was out at the airport photographing my spoiler fence one of the guys asked me to look at a small fracture that had developed on the tail boom of one of the rental ships. We looked at it for a time trying to come up with ideas of what was happening. A small crack had appeared on

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each side of a static port on top of the tail boom just in front of the rudder. I was still trying to figure it out, until we pushed the ship back to the tie down. As you see in photo 10 the tie down strap provides a rigid stabilised area next to zones that may flex (while moored) in strong winds, or move during tie down procedures.

Refer back to our section on stiff spoiler boxes versus freely flexible sections of the wings. No matter the cause, glass-fibre will break at the point where flexibility suddenly becomes rigid, whether the source comes from the inside or the outside. An obvious solution is a wider collar on the tie down strap to spread the loads outward, though my opinion is that those particular cracks are very minor in nature, and not worthy of a great deal of concern except as an illustration of things to consider when designing tie-down systems.

Summary

After the gel coat articles, some of my old friends were barely speaking to me. They said there was nothing wrong with their sailplanes, but that I had made **them** totally paranoid. This one ought to make me completely *persona non grata.* In my defence, most of the major problems described here involve a small sample of gliders that have experienced extreme conditions of usage. These are much less prevalent problems than gel coat crazing.

Maybe I should, at this point, say that I am not an A+P (Airframe and Powerplant mechanic) and have no opinion as to the airworthiness of the sailplanes I have described here. There is far too little known as to how what I am seeing effects the basic glass-fibre load bearing structure.

It is hard enough to ask someone to inspect their sailplane, lay tape all over it, photograph it, and publicly describe what I've seen. (I was turned down in a couple of instances.) But to show up with an electric grinder under your arm, peering with a steely glint in your eye at the cracks in their glider, and saying "Let's find out how deep these babies go," is pushing things a little too far. There is a great deal I don't know – especially how deep these "fractures" are. My best guess is that most of what I have shown goes completely through the gel coat and into at least the first layer of glass cloth. Some cracks could go deeper and may be more serious.

My years of experience with glass-fibre tell me that mechanically produced fractures have a physical cause deeper than the surface coating and that that structure is also affected to some degree. For example, a simple re-coat of a fractured area will usually have a re-occurrence of cracking. This is certainly the case with spoiler box cracks. I am open to suggestion as to the causes of the concentric rings or the gel coat spalling off.

Care in wave flying, or other situations where rapid temperature changes are present, is very much recommended.

Summary of the summary

If you have been out doing some things that are wild and crazy, or are buying a used glider, the first place to look is **under** the wings.

Thanks are in order to Bob Harris, Mike Koerner and Carl Herold, some very special people, who also gave me a great deal of help with this article. Others (also neat people) who were of assistance are Paul Sasse, Roger Frank, Andrew McFall, Rolf Hertenstein and Doug Armstrong.

THE AIRCRAFT

The best glider, Terry maintains, is the one in which you're actually thermalling

In the beginning there were the Bocians, four of them lying slumped on their wingtips and looking like a small colourful school of beached whales.

Closer to, you were able to see the fine network of scratches that years of polishing had worked into the canopies and patches in the fabric where new paint had never quite matched the original, and it was plain that these were nothing more exciting than elderly training machines. Then a sudden gust moved across them shifting the control surfaces and the long, heavy wings shuddered, starting to lift like old hawks rousing. After that you felt different about them.

When you landed from your first flight your impressions were confused and you were still unsure whether you liked it or not. The only clear feeing was the need to fly again as soon as possible. Very quickly, however, you became caught up in it and flying came into your life as a major force. It was almost like getting religion.

"... the lust for something sleeker in glass-fibre gripped you."

At that stage you flew Bocians and nothing but bloody Bocians until you developed a loathing for their massive inbuilt stability which seemed designed to frustrate your early efforts to control them. Some time later, perhaps with a few short solo flights behind you, you became affectedly blasé about all two-seaters and older machines. Your conversation was tricked-out with half-understood technicalities inserted as artificially as candles on a birthday cake. And the lust for something sleek in glass-fibre gripped you.

It took a little while for this fever to fade. Only as your flying began to improve did you start to realise that all aircraft are essentially magical, and you learned to value them for their different features and to enjoy those differences.

The glider enabled you to become part of its medium, rather than just a traveller through the air, in much the same way that a fishing-rod is an angler's means to merge into the landscape. You flew in the manner of a bird, and were sometimes accepted as such when you were lucky enough to thermal with a gull, seeing it on the far side of the turns watching you with its dead, yellow eyes – everything about it pure and beautiful except for the eyes.

As your understanding of the principles of flight grew you could appreciate the glider as a work of modern sculpture, something peculiar to this age. You saw that the shape, cunningly fashioned to conform to the pattern of the wind, was as simple and elemental as a pebble polished by the sea.

Inevitably, you wanted your own glider. There's a pleasure of ownership, difficult to define but real none the less, which enables you to ignore the dubious economics of the private syndicate, and the regular chores of rigging and maintenance.

Private ownership, however, gave you time to examine the aircraft, to become familiar with the detail of its construction, and to understand the thinking of the designers when they assembled its components in just the way they did. On quiet days it was satisfying to sit contemplating this wonderful machine – which could actually defy gravity and soar – amazed at your good luck in being so closely associated with it. It's as if you had the power to summon a wild bird from the sky.

In the way of all new obsessions you found every attribute of your first aeroplane marvellous – its shape, the strange summer smells of fabric and warm dope, the texture of the moulded ply curving tensely beneath your hand, the tiny rustling sounds as the controls reacted imperceptibly to the breeze. It was like the early days of a love affair before you discovered imperfection and long before you learned about compromise.

Eventually, of course, you decided you must have glass for the promise of the performances that goes with it. Any last vestiges of economics were now thrown, literally, to the winds. But in the pursuit of greater heights, longer distances and more endurance it was all too easy to forget that the primary object of gliding should be pleasure. Like love, it's not the duration but the intensity of the experience that matters.

The modern glider, however, is such a beautiful device that it's easy to become side-tracked into a passion for the means rather than for the end. We've all seen aircraft that are obsessively maintained and cared for, to the point where they rarely seem to fly. This sort of onanistic devotion to the machine is as pointless as that lavished on the *concours* sports car which is taken to meetings on a trailer, lest it become travel – stained.

The glider exists only to fly, and the best glider is the one in which you're actually thermalling. Or perhaps the one you've just sold.

When the day's soaring is over, however, and the glider washed and packed into its trailer, there's always a feeling that you ought to be able to do something to express your graititude to the machine for the pleasure it has enabled you to have. But there is nothing. How can you say "thank you" to an aeroplane?

HONOURS FOR DEREK AND MICHAEL



HRH the Duke of York with Derek (above) and Michael (below). Photos: Simon Ward.



Two glider pilots, Derek Piggott and Michael Bird, were presented with Royal Aero Club awards by HRH the Duke of York, the Club's president, at the Banqueting Rooms, Whitehall, on May 21. The Royal Aero Club Diploma went to Derek, who is CFI of Lasham and has 4000 power hours on 110 different types of aircraft. He was described in the citation as "the world's best known gliding instructor whose lifetime dedication to the sport has been quite outstanding and beyond the normal call of duty." Michael, awarded the Certificate of Merit, was praised for giving up his entry in Nationals to be the task setter, as Platypus for "using his brilliant humour to make pilots laugh at themselves" and for his creative and organisational skills which have turned the BGA AGM from a boring afternoon into a full weekend conference. Derek had further recognition of his tremendous services to gliding by being awarded an MBE in the Queen's Birthday Honours list.

NATIONAL LADDERS

OPEN LADDER

Leading pilot	*Club*	*Pts*	*Flts*
1. N. Hackett	Coventry	4471	4
2. G. Corbett	Essex	4454	4
3. T. Macfadyen	Cotswold	4244	3
4. N. O. Dee	Cotswold	3032	4

CLUB LADDER

Leading pilot	*Club*	*Pts*	*Flts*
1. C. G. Starkey	Lasham	2865	2
2. P. Johnson	London	2029	3
3. J. Walker	Coventry	1332	3

FATAL ACCIDENT

The pilot of a Pirat, "Harry" Lenard, was killed on May 13 at Kenley Airfield, Surrey, when the glider crashed at the start of an autotow launch.

At about 50ft the glider was seen to drop a wing or roll to the left. The roll continued until the glider was inverted. From this position it dived into the ground vertically.

Investigations so far eliminate medical and airworthiness causes.

John Shipley, *BGA Safety Committee chairman*

NEW NATIONALS CHAMPION

Ralph Jones, flying a Nimbus 3, won the Open Class Nationals, held at Lasham from June 20-28. He gained 2457pts during the four competiton days with Robin May (ASW-20) close behind with 2408pts. Ralph was in the first three places on each day. (There will be a full report in the next issue.)

OBITUARY

E. A. "Ted" Moslin

When Ted Moslin died in an aircraft accident on May 10 we lost one of the finest engineers in the country. He was considered to be the greatest authority on the repair and testing of magnetos for there was nothing in his field he could not accomplish. His reputation had become worldwide and his trade-mark sticker is on the magnetos of historic racing cars as well as many Merlins in Spitfires, Lancasters and Mosquitos.

Ted started gliding at Lasham in 1966. Later he had a share in a Skylark 4 and then an Astir CS. His drift towards aeroplanes was probably inevitable, given his engineering background, and for many years he enjoyed a share in a Tiger Moth. His engineering ability was probably not fulfilled in anyone's employ and he eventually started his own business; at the time one wondered at his prospects in his chosen field. It is a measure of his remarkable engineering ability that he became so suc-

cessful and that so many people came to depend on him. He was a modern "Royce", no less, and this is reflected in many a sweet running engine.

He was one of those nothing-is-too-much-trouble people whose gentle and loving nature will be missed by many. For me he will always be remembered for his perfection in standards of maintenance in much the way of Richard Bach's **School for Perfection.** He leaves a wife, "Phyl", to whom he was devoted.

BILL SCULL and DUDLEY STEYNOR

GLIDING CERTIFICATES

With an increasing number of our pilots gaining badge legs overseas, may I remind British readers that the standard procedure is for flights to be observed by official observers (OOs) of the country in which the flight commences; claims must then be submitted to the National Aero Club of that country, with a request for the BGA to be notified if the badge claim is approved. The same procedure applies to British National records abroad.

However, for the British Forces clubs in Germany and Cyprus, the BGA will process badge claims direct, when certified by BGA appointed OOs. Exceptionally, and by prior arrangement only, the BGA may act likewise for club expeditions to the Continent, provided BGA OOs are present to certify all aspects of a flight and subject to the local National Aero Club having no objection.

Gordon Camp, *FAI certificates officer*

BGA ACCIDENT SUMMARY –

Compiled by JOHN SHIPLEY, Chairman, BGA Safety Panel

Ref No.	Glider Type	BGA No.		Date Time	Place	Pilot/Crew Age	Pilot/Crew Injury	Pilot/Crew Pl/Hrs	Summary
PHASE OF FLIGHT - LAUNCH - WINCH									
28	K-8	2653	M	24.1.87 1130	B-G-B Farm, Clwyd	29	N	32	During pre-flight control checks full back stick could not be obtained. A broken front skid mount allowed the housing to restrict the controls. The previous pilot after "full and free" checks, had asked that the wingtip be moved back 2ft to line up. The skid was not raised clear while this was done and the pilot then flew with restricted controls.
29	Spatz 55	2972	W/O	1.2.87 1430	Middleton	54	N	14	After a fairly long ground run into a very light wind the glider climbed slowly until, at about 50ft, the winch failed. The pilot pushed the stick fully forward but did not do so quickly enough to prevent the aircraft entering a spin to the left from about 30ft. The glider was written off as it hit wing first but the pilot was uninjured.
32	K-13	1523	N	8.2.87 1250	Old Sarum P2	58 30	N N	183 -	After a cable break on initial movement the canopy was opened while the cable was repaired. On the 2nd attempt the canopy was closed and the airbrakes checked closed and locked. At 2-300ft on the launch as P1 signalled "too slow", the canopy opened. He then landed the glider ahead with no damage. Pre-flight checks had not been repeated.
40	Bocian 1E	1668	M	21.3.87 1322	Arbroath P2	46 ?	N N	453 -	Early Solo. On a winch check flight for an early solo pilot the cable back released at 500ft as P2 pulled back too hard. The nose was lowered and the drogue chute flew over the left wing of the glider damaging the leading edge and airbrake. P1 descended rapidly using full brake and landed safely. This glider was known to back release in an over steep climb.
41	Skylark 4	1137	W/O	19.4.87	Dallachy	26	F	120 approx	This **fatal** accident occurred when the tail fin fell off at about 200ft on a winch launch. The pilot managed to level the wings then start a shallow turn to the right positioning for an emergency landing. The aircraft was then seen to enter a spin to the right from which it did not recover.
42	Cirrus	1473	M	15.4.87 1636	Long Mynd	19	N	140	About 20 yards into the take-off ground run a loud bang was heard as the undercarriage collapsed. The rope was released and the launch abandoned. The undercarriage lever was down and locked. The gear over-centre locking cable had broken and the turnbuckle had been fully adjusted to, unsuccessfully, take up slack.
PHASE OF FLIGHT - LAUNCH - AEROTOW									
30	Bocian 1E	2013	N	7.2.87 1010	Husbands Bosworth P2	33 35	N N	210 0	At about 50ft on the aerotow the starboard airbrake was sucked open. The instructor continued the launch and the tug pilot, seeing this, towed the glider back to the site. At 700ft the glider released and the other airbrake was opened and a safe landing made. On inspection it was found that an airbrake cable had frayed through.

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ALL THREE DIAMONDS

No.	Name	Club	1987
223	Judkins, M. B.	Lasham (in Australia)	18.12.86

DIAMOND DISTANCE

No.	Name	Club	1987
1/341	Weston, J. S.	Ulster (in Australia)	28.1
1/342	Oddy, D. C.	Avon (in Australia)	4.3
1/343	Judkins, M. B.	Lasham (in Australia)	18.12.86
1/344	Upton, W. G.	Culdrose (in Australia)	13.2

DIAMOND GOAL

No.	Name	Club	1987
2/1515	Duncan, Rachel	Bicester (in Australia)	4.3
2/1516	Oddy, D. C.	Avon (in Australia)	4.3
2/1517	Hughes, M. I.	Bicester	4.5
2/1518	Fairston, B. A.	Booker	4.5
2/1519	Swain, C. R.	622 GS (in Australia)	13.2
2/1520	Harber, J. E.	Chilterns (in France)	24.7.86
2/1521	Lacey, T. A.	Chilterns (in France)	24.7.86
2/1522	Constable, O. H.	Chilterns (in France)	24.7
2/1523	Neild, J. R.	Chilterns (in France)	1.8
2/1524	Fellows, L.	Chilterns (in France)	1.8

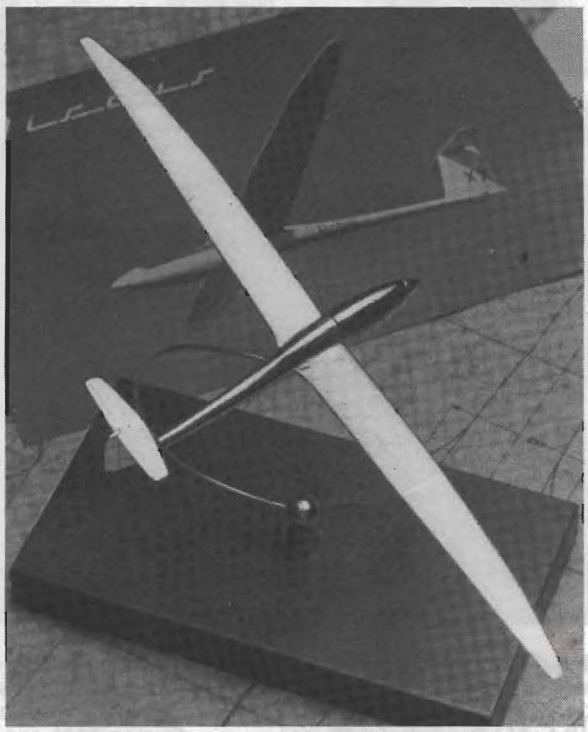
DIAMOND HEIGHT

No.	Name	Club	1987
3/789	Harris, A.	Pegasus (in France)	12.4
3/790	Critchlow, M.	Pegasus (in France)	12.4
3/791	Ruskiewicz, J. S.	in USA	3.4
3/792	Smith, D. M.	Derby & Lancs	19.4
3/793	Duncan, J.	Phoenix (in France)	11.4
3/794	Burston, P. J.	Two Rivers (in France)	11.4
3/795	Morton, M.	Two Rivers (in France)	12.4
3/796	Cooper, E. K.	Pegasus (in France)	12.4
3/797	Greenwood, M. J.	Booker	23.10.86
3/798	Davidson, M. G.	Angus	5.5

Ref No.	Glider Type	BGA No.		Date Time	Place	Pilot/Crew Age	Injury	Pl/Hrs	Summary
38	Skylark 4	1095	S	29.3.87 1230	Usk	28	N	66	The glider was rigged and DI'd prior to this flight. In his pre-flight check the airbrakes were checked closed and locked but **not checked open.** After lift off the right airbrake extended causing control problems. The tug pilot was called on the radio and cast off over the field. Adverse yaw and the airbrakes caused the pilot to undershoot.
PHASE OF FLIGHT - OFF CIRCUIT									
31	Pilatus B-4	1820	W/O	14.2.87 1600	Rhigos	54	S	151	While ridge soaring in the late afternoon the pilot turned out from the ridge heading west. The low sun blinded him so that he could not see the horizon or his instruments. Feeling the speed fall off, he tried to turn out of the sun and away from the ridge but entered a spin to the left. The pilot regained speed but could not pull out before impact.
PHASE OF FLIGHT - ON CIRCUIT									
34	K-8	2154	M	1.3.87 1200	Milfield	30	N	22	After soaring in wave to 3800ft the pilot lost sight of his airfield so decided to descend. Emerging at 700ft he found himself over another airfield with which he was familiar so he decided to land there. He did not make a proper circuit and landed nose down, with drift, bounced and hit a water pipe. The skid was broken and the glider groundlooped.
43	Skylark 3B	813	M	14.4.87 1315	Currock Hill	23	N	2	After returning to the airfield the pilot decided to start a circuit to the north giving a launching glider more time. He experienced strong sink and, rather than landing across the field, tried to complete a final turn, too low and slow. The glider hit hard nose first and then groundlooped. He had taken off with no permission or briefing.
PHASE OF FLIGHT - APPROACH									
33	K-7	2218	N	14.2.87 1625	Woodford P2	? ?	N N	- -	On an Air Experience Instructors' Course P1 gave P2 a low approach exercise to get him to demonstrate the proper use of airbrakes, not seen on an earlier flight. At 150ft in the final turn P2 fully opened the brakes then shut them. A building near the airfield was overflown with less than 10ft to spare. P2, in the rear seat, had not initially seen this.

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Ref No.	Glider Type	BGA No.		Date Time	Place	Pilot/Crew Age	Injury	Pl/Hrs	Summary
36	K-13	2610	N	15.2.87 1500	Challock P2	26 30	N N	210 0	While demonstrating a full sideslip and airbraked approach the canopy flew open. A safe landing was made with the canopy restrained by the strap. The catch had not been pushed fully home and had been held by the tapered section of the pin. This had not been noticed in the pre-flight checks.
37	Sport Vega	2685	M	14.3.87 1551	Aboyne	24	N	300	The glider was positioned high for a steep, full airbrake approach. At about 100ft and 55kt the airbrakes were closed and a flare commenced. The very steep approach combined with the slow roundout resulted in a hard nose down landing which damaged the area around the wheel box. This area had been subject to a previous repair.
44	K-8e	2338	M	11.4.87 1432	Dallachy	25	N	2.75	Gliders were landing and taking off in opposite directions as there was a light wind directly across the strip. This pilot started his base leg too high and close to the airfield. In spite of full airbrake he did not touch down until he was only 40 yards from the boundary fence. He groundlooped the glider but was unable to avoid the fence.
46	Std Libelle	1671	M	28.3.87 1615	Nympsfield	30	N	157	The pilot turned on to baseleg at 500ft and opened the airbrakes to lose height. On finals the rate of descent increased as curlover was encountered and the airbrakes were closed to prevent an undershoot. The aircraft was landed well into the field with some difficulty and hit nose first. Control would have been aided by airbrake on finals only.
PHASE OF FLIGHT - OTHER (INCLUDING: - TECHNICAL: MOTOR GLIDERS AND TUGS)									
35	Super Cub	G-ARAM	M	21.2.87 1430	Kitson (Ringmer)	44	N	- 350pwr	The tug pilot landed after the 15th aerotow on a moderately turbulent day. At the end of the landing run he retracted flaps and, with the stick fully back and to the right, turned left. As this was done the right wheel lifted off the ground, followed by the tail and the propeller was bent as it hit the ground. The engine was then switched off.
39	Falke M/G	G-BKVG	M	29.3.87 1400	North Hill P2	47 36	N N	1330 275pwr 2.7	After a normal touch down the motor glider apparently hit a bump and became airborne. P2 closed the spoilers but then pushed the stick forward, resulting in a heavy landing that damaged the main wheel structure. The wind conditions (25kt crosswind) were considered to be unsuitable for training.
45	K-7	1634	S	2.5.87 1645	Rhigos	?	N	-	The glider was parked with the into wing down and well weighted with a number of tyres. There were also two tyres on the tail and a man in attendance. Flying had ended due to an approaching squall and the other gliders were being put in the hangar. A sudden severe gust lifted the wing and overturned the glider. Ground anchor points to be provided.
47	K-8e	1563	N	6.4.87	Dallachy	42	N	62	The aircraft was test flown to confirm reports of a right wing drop during straight and level flight. This was the case and when right roll was initiated this was very dramatic. After landing this was investigated. During its C of A the aileron bellcranks had been disconnected and the right one had been incorrectly assembled.

F=fatal; S=serious; W/O=write off; M=minor; N=nil.

NEW SPEED RECORD

Denis Campbell now holds the UK (Standard Class) 200km triangle speed record (subject to homologation) with a Discus flight of 205.85km in 1hr 57min 46sec, at 104.87km/h, on September 9, Booker, Moreton-in-Marsh, Olney

FUND FOR DISABLED GROWS

Robert English, who is trying to raise £15000 to buy a Motor Falke to be used to give flights to the disabled, is encouraged by the way the fund has swelled over the winter. With contributions and firm promises the total is now £11000.

If anyone would like to contribute or help in any way, contact Robert at The Waldernheath Hotel, Flat 9A, Cornwall Road, Harrogate HG1 2NE, Tel 0423 521383.

More sites

"The previous five years have seen the purchase of more gliding sites than had been acquired by the movement since its beginnings". - John Holland, chairman of the BGA Development Committee, in his annual report.

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GOLD BADGE

No.	Name	Club	1987
1196	Bagshaw, D. R.	Mendip	13.1
1197	Hughes, M. I.	Bicester	4.5
1198	Fairston, B. A.	Booker	4.5
1199	Jones, D. M.	Phoenix	10.4
1200	Lincoln, A. K.	Black Mountains	21.2

GOLD HEIGHT

Name	Club	1987
Collin, W.	Lasham (S Africa)	13.11.86
Griffiths, I. C.	Booker	9.10.86
Mills, W. R.	South Wales	15.3
Letts, G. W.	South Wales	15.3
Backes, N.	Midland	15.3
Critchlow, M.	Pegasus (in France)	12.4
Butler, P.	Kent	14.4
Pacey, S.	Heron	14.4
Gillin, J. W.	SGU	20.4
Carver, S. J.	Derby & Lancs	21.4
Clarke, Sheila	Fulmar	22.3
Burston, P. J.	Two Rivers (in France)	11.4
Morton, M.	Two Rivers (in France)	12.4
Cooper, E. K.	Pegasus (in France)	12.4
Holt, D.	Pegasus (in France)	12.4
Jelden, A.	Booker	19.10.86
Greenwood, M. J.	Booker	23.10.86
Pike, C. C.	Shalbourne	20.4
Bagshaw, D. R.	Mendip (in Australia)	31.1
Davidson, M. G.	Angus	5.5
Jones, D. M.	Phoenix (in France)	10.4
Ilidge, R.	Derby & Lancs	18.4
Lincoln, A. K.	Black Mountains	21.2

GOLD DISTANCE

Name	Club	1987
Bagshaw, D. R.	Mendip (in Australia)	13.1
Duncan, Rachel	Bicester (in Australia)	4.3
Oddy, D. C.	Avon (in Australia)	4.3
Hughes, M. I.	Bicester	4.5
Fairston, B. A.	Booker	4.5
Swain, C. R.	622 GS (in Australia)	13.2

SILVER BADGE

No.	Name	Club	1987
7431	Stark, M. S.	Ouse	19.3
7432	Westgarth, J. D.	Borders	21.3
7433	Hampshire, P. J.	Southdown	29.3
7434	Penrose, P.	Highland	10.4
7435	Whitworth, P. D.	Bicester	10.4
7436	Gibson, W. R.	Bicester	12.4
7437	Burch, A. J.	Wyvern	12.4
7438	Nash, I. R.	Lasham	23.4
7439	Burgoyne, P.	Coventry	21.4
7440	Healy, P. T.	Imperial College	21.4
7441	Jones, M. L.	London	25.3
7442	Gray, P.	Pegasus	31.3
7443	Jones, D.	Ouse	12.4
7444	Garrity, A. J.	Four Counties	12.4
7445	Bennett, S. J.	London	23.4
7446	Maleham, D. G.	Shalbourne	26.4
7447	Kelsall, T. A.	Phoenix	25.4
7448	Davenport, M.	RAE	23.4
7449	Phillips, M.	Bristol & Glos	12.4
7450	Brimfield, R. J.	London	2.5
7451	Hartfield, L. J.	Portsmouth Naval	2.5
7452	Watson, A. F. W.	Cranwell	9.5
7453	Morgan, D. J.	Cotswold	6.5
7454	Innes, M. A.	Trent Valley	5.5
7455	Balcombe, K. W.	Kent	13.5
7456	James, R.	in Australia	3.3
7457	Spirling, A. A.	Wolds	4.5
7458	Middleditch, R. J.	Bristol & Glos	21.4
7459	Young, S.	Booker	22.10.86
7460	Turner, N.	Oxford	4.5
7461	Livings, G. E.	Two Rivers	9.5
7462	Kitchener, D. W.	Southdown	10.5
7463	Fleming, A. C.	Connel	12.5
7464	Quigley, T. A.	Lasham	16.5
7465	Shoukris, L.	South Wales	10.5
7466	Bell, K.	Bristol & Glos (in Australia)	25.11.86
7467	Price, C. J.	East Sussex	10.5
7468	Hutchings, A. R.	London	13.5
7469	Le Marechal, S. H.	Cotswold	13.5
7470	Gresty, M. L.	Cotswold	16.5
7471	Bell, M. A.	Aquila	16.5
7472	Robson, T. J.	Derby & Lancs	16.5
7473	Holliday, R. W.	Wyvern	10.5
7474	Turner, C. A.	Marchington	20.5

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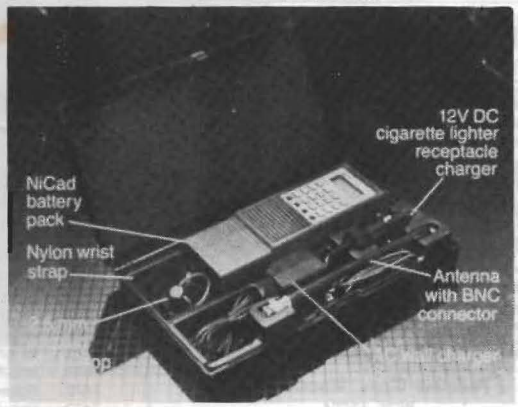
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YOUR LETTERS

A NEW KIND OF TASK - CAKE FLYING

Dear Editor,

Often you turn up at the gliding site without very clear cut objectives other than to have a jolly good fly. You don't want to land out and the forecast is good but uncertain, so what you want to do is cake flying - legs like a sliced cake, each about 100km long.

From Booker my goals are Tarrant Rushton, Nympsfield, Husbands Bosworth, Leicester East and Waterbeach. Generally the first leg is into wind so if the weather turns grotty I can fly home ahead of it. TPs are ideally gliding clubs so if I am in trouble there may be other gliders there to mark the lift or I can get a relight or aerotow home. My task is about 600km and takes me over numerous gliding clubs.

In practice it works very well as the ground covered is interesting and variable and the uncertain nature of the weather throws up a lot of daunting problems which must be solved in the air and to my mind are a more searching test of one's flying abilities.

BRENNIG JAMES, *Marlow Common, Bucks.*

ARMCHAIR PILOT - NEW GAME

Dear Editor,

Armchair Pilot's Challenge correspondence (February-July issues) has become something of a Cambridge "benefit" and is now wandering like the top of a petering thermal!

Let's have a new game: add together the numbers of your Silver, Gold, and first Diamond and see how low your score is. Mine is 102. Can any Light Blue pilot beat that? (How about Charlie Wingfield?)

I. C. PURPLE

MORE ABOUT TOWING

Dear Editor,

Humphry Dimock will probably consider me unqualified to comment upon his high tow versus low tow query in the last issue, p147, since I have never been a tug pilot and my only experience of low towing was with an Olympia-Tiger Moth combination using a 100ft rope. My recollection of events is that although the tug pilot reported favourably, commenting upon the stability both in level flight and in medium turns, the main reason why we did not adopt this system over 30 years ago was the fear of intanglement if the weak link (at the tug end of course) broke, or the rope was jettisoned by the tug pilot in an emergency.

This trial used only the Oly's nose hook. Had we used the belly hook as is so common today, I'm sure this hazard would have appeared even more obvious, as it would also have been if the rope had been of the abnormal length used for dual tows.

Incidentally can anyone suggest any part of an aeroplane, apart from a wingtip, that is a more interesting place to attach a tow rope than the tail? One advantage of the tail-tug arrangement, however, was brought to my attention during a visit to Poland in 1954, when I was briefed to direct the tug pilot towards my favourite course by using the 20m tow rope to yaw him in that direction. On a previous visit to Poland in 1937 I examined a tug then in use that obviously had been designed to avoid the lethal "tug upset" that today gives so much concern!

It was a two-seater parasol monoplane with a big radial engine and over the rear seat there was an inverted U shaped frame, the lower ends being pivoted transversely to the bottom longerons. From the apex of this inverted U protruded a flexible rod that extended beyond the top of the rudder and, to avoid contact with that control, a fixed guard rail behind the rear cockpit limited the downward and sideways movement of this outsized fishing rod. To the tip of this the tow rope was presumably attached.

It appeared that by this means all loads upon the tow rope were intended to pass through a point close to the tug's C of G. At that time, like many other pilots, I had been towed behind a tug with the cable attached to its tail. What I should like to know, before the event becomes lost in the mists of time, is: Who, when and where was the first tow performed with the rope attached to the tug's tail?

CHARLES ELLIS, *Ilford, Essex.*

WEATHER FORECASTS

Dear Editor,

Your correspondent, Mike Fairclough, suggested in the April issue, p76, that people should write to Telephone Information Services and plead for an extension to their telephone weather service. He is correct in saying that these services are now handled by private companies.

However, there are other Telephone Premium Services in operation so as well as writing to TIS may I suggest that your correspondent contact Megaphone International, 8 Herbal Hill, London EC1R 5EJ, which provide a frequently updated forecast for the four main conurbations under the name "Weatherwatch"; Mrs Pauline Marks, Audiotext plc, Pembroke House, Campsbourne Road, London N8 7PT, which provides a "live five day forecast for the UK, Europe and the USA under the name "Weatherwindow" and Mr Ian Parkinson, Broadsystem, 12 Hawley Road, London NW1 8NP, which provides city and airport forecasts for Europe, the UK and the USA.

The important thing about these weather forecasts is that they require sufficient volume to make them economical. Apart from the cost of supplying the weather there are much greater costs involved in the hardware and the promotion. These costs are reflected in the standard day time charge of 38p/min.

ARTHUR BLACKHAM, *Noble Denton Weather Services Ltd, London.*

CAN ANYONE HELP?

Dear Editor,

I am compiling a history of the pre and post war Croydon GC, and would apppreciate any assistance in the way of recollections, anecdotes, etc, from readers. It may also be possible to revive interest in re-forming the club, which ceased operations in the late 1940s.

All contributions will be gratefully acknowledged, and any photographs, etc, will be returned. Letters *only*, please to c/o 67 Shaxton Crescent, New Addington, Croydon, Surrey CR0 0NW.

MALCOLM MACDONALD

FOR GOODNESS SAKE STOP BOTHERING

Dear Editor,

At very regular intervals there are letters and articles in S&G full of gloom about the lack of young people being attracted to gliding. These good intentioned, and I suspect mature, writers should stop wasting their energy and get on with their own flying.

It has never been cheap getting aircraft into the air and if young people are really keen to fly they will make sacrifices and go without more necessary things, as most of us did in our youth, or they will just have to wait until their income is sufficiently high to include flying as one of life's essentials.

I can hear you all muttering "What about the loss of youth to gliding?" For a start the dedicated, and these are the people we really want, will find the money somehow. Youngsters spend a vast amount on clothes and music and some of this would more than pay for their gliding. If they have to economise they will value the sport all the more.

The others who decide to wait until they have established themselves, may well be able to afford it by the time they are in their thirties and this isn't old. True they might be past making the World Championships, whatever their latent talents which might have been spotted had they been given a chance in their teens, but then few of us aspire to those heights.

However well meaning the "let's help the young" brigade are, it all comes down to the basic fact that help means that the rest of us are expected to increase our own flying costs by sponsorship. Most of us are doing it already, with clubs giving reduced subscriptions. This is fine but let's leave it at that, and forget about age.

A POOR GLIDER PILOT

(name and address given to the Editor).

THOSE CABLE PROBLEMS

Dear Editor,

Colin Aldridge is dismayed (the last issue, p147): clearly this can not be a pretty sight. However, I beg to be excused as the cause of his consternation.

In his article, "Solving Cable Problems" in the February issue, p25, half the space describes the details of his improved winch rollers. In only one short sentence does he say "Since we introduced these measures our incidence of cable breaks has dropped to negligible proportions."

I notice that his "four roller box design swivels to take up sideways movement of the wire due to crosswind launches etc." On reading this, some may feel that he uses four rollers to do the job of one.

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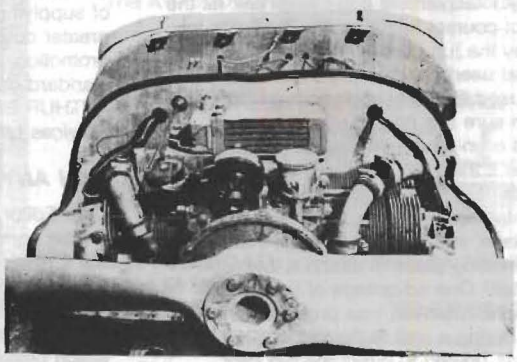
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He gives a price for a piece of steel 16in in diameter and 2in thick. Is this billet the starting point for his rollers? Although Colin tells us that his firm has these rollers available for sale and in stock, he does not give us the cost. I would like to know his price for a set of his rollers in a mounting frame ready to fit to a winch.

Mr Aldridge surmises that the "ATC could not use mild steel ... due to the nitriding process." I'm not sure where his information comes from, but the nitrided rollers are used after a very long experience with other forms of roller. That experience has shown that the nitrided rollers last longer. Case hardened mild steel rollers are not so durable.

The BGA annual statistics record that the Shalbome Club carry out 3700 winch launches a year, so assuming that the winch has two drums, his rollers are good for about 10000 launches per set for he says that after five years they are in need of refurbishment. At Sutton, the swivel pullies were made in 1976, and we do 2900 launches per year on our two drum winch. The swivel pulley design have each sustained some 14500 launches and are still going strong, but are in need of a coat of paint. From some thirty years experience of winch building, I know which design I prefer.

A correspondence section of a magazine is for the airing of views and the sharing of experience, and if it's is not for that then I don't know what it's purpose is. Good luck Colin with your winch improvements.
J. C. RIDDELL, *Wetherby, Yorks.*

(The actual cost for one ready to bolt on roller is £325 plus VAT.)

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Wilhelm Dirks flew the DG-600 on its maiden flight on April 15. This 15m Class racer will be delivered with 17m wingtip extensions as standard. A distinctive feature is the extremely thin (12% cord) wing section designed by the Horstmann and Quast team, at DFVLR Braunschweig. Further aerodynamic benefits will result from the one piece flaperons, the small diameter rear fuselage and the new tailplane. The wings are carbon-fibre. The quick rate of roll, 45°-45° (only three seconds with 17m span) is impressive as is the efficiency of the airbrakes.

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CLUB NEWS

Copy and photographs for the October-November 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 August 11 and for the December-January issue to arrive not later than October 6.

GILLIAN BRYCE-SMITH
June 10

AQUILA (Hinton Airfield)

Congratulations to Martin Bell on completing his Silver C with a good distance and height flight – an inspiration to us all.

CFI Ken Jarman displayed the cups to be won for achievement during the season at the well attended annual dinner.

J.R.

AVON (Bidford Airfield)

After a soggy winter and early spring when the main highlight was foiling a caravan thief one dark snowy night when he little thought there would be a dozen people in the clubhouse, we're back in full swing. Most evenings are booked with trial instruction parties and weekdays are filling with courses and task weeks, many for visiting clubs. Five are coming and we have room for a couple more.

Our two cross-country courses were pretty well washed out but a party of 20 had a fabulous week in France.

We have a steady increase in members as well as a new home-grown band of tug pilots.

D.S.B.

BANNERDOWN (RAF Hullavington)

The Inter-Club League produced four flying days in three meets at Hullavington, Odiham and Sands Farm, with us in the lead. The weather was good enough at recent *ab-initio* courses for some first solos.

During our annual trip to Talgarth, jointly with Cranwell this time, flying was mostly in rough thermals and poor visibility, though wave was contacted up to about 10000ft.

Our K-18, with us for 11 years, has been replaced by a new Discus.

D.C.F.

BATH & WILTS (Keevil Airfield)

The ladder, organised by Bob Hitchen and Malcolm Smith, is working very well and our congratulations on going solo to Dave Pengilley, Dave Batty and Chris Moore; to Mick Gilder, Colin Hitchen, Tony McBride, Ron Lexty, Ken Hawker and Dave Morgan on their Bronze Cs and to Graham Callaway and Ron Bevan on Silver Cs.

Our thanks to the Mendip and Wyvern GCs for making us welcome when the RAF were using our airfield for exercises. We are still looking for that elusive site.

Bob Hitchen missed his Gold distance by 18km. We began two starter courses in June, one running for six Saturdays and the other on Sundays. It's a novel idea which seems to meet with approval.

T.K.

BICESTER (RAFGSA Centre)

Congratulations to Bill Gibson (Silver C), Ruth Brown (5hrs) and Mike Hughes on his 300km.

The patio area is finished and decked out with chairs, barbecue etc. Although bad weather followed our pundits to Austria, the expedition went well.

C. & G.

BORDERS (Galewood)

Congratulations to John Famílton on his 5hrs. There were good soaring flights in April and May with Alistair Scott going the furthest, landing near Darlington on a 300km attempt.

Full time flying starts at the end of June. If successful in getting the club signposted with the new tourist information white on brown signs we think we may be the first, unless, of course, you know better!

A.B.

BRISTOL & GLOUCESTERSHIRE (Nympsfield)

The residential courses got off to a fine start with our two full time instructors – one a regional coach – providing *ab-initio* and advanced tuition. With three tugs there is no shortage of launching facilities.

The new Std Jantar 2 is popular and we plan to replace one of our Super Cubs with a Pawnee type D.

Our club ladder has some high scores with Mike Strathern just in the lead with 2808pts.

M.G.W.

BURN (Burn Airfield)

Congratulations to Dave Clarke, Sue Wilson, Alison Jepson and Vivien Robertson on going solo; to Bill Jepson on his Silver height and to Bill Shaw and Ken Brown on completing their instructor courses.

We have a new Pawnee and it's good to see the K-8 and the K-10 in the air again.

We hosted the Yorkshire Inter-Club League over the Spring Bank Holiday weekend and managed some cross-countries. The annual CFI's meeting was also held here and we had another successful barbecue during the same weekend.

S.W.

CAMBRIDGE UNIVERSITY (Duxford)

Congratulations to Terry Slipper and Mick Allen on their Silver distance flights and to Richard Maskell on his Diamond height in Italy over Easter.

It was a pleasant surprise to have a good weekend for the East Anglian Inter-Club League at Duxford. We are in the lead but it is only the half way stage. The Saturday competition was followed by an enjoyable barbecue and Ceilidh – our thanks to the social committee.

G.K.F.

CHANNEL (Waldershare Park, Nr Dover)

We have acquired extra land and with a new winch now have launches of 1500ft or more, and a new clubhouse is being built.

Our Spring Bank Holiday open day coincided with our third birthday celebrations at Waldershare Park. On the Sunday, May 25, we intended flying from dawn to dusk to break last year's record of 98 but although the weather didn't clear until mid morning, we managed 111 launches.

Congratulations to 17 year-old Jeremy Griggs on going solo, our youngest solo pilot, and Dave Jones on his MGSL PPL.

G.G.

CHILTERNS (RAF Halton)

We have a marked increase in membership, mainly due to the Malcolm Club Scholarship, with an encouraging crop of solos and K-8 conversions including Steve Monk, Andy Armson, Andy Luke, Alan Forkingman and Bob O'Connor. Vince Fitzgimons and Richard Andrews have gone solo, Geoff Freeman has his 5hrs and Ralph Seddon completed 43km of his Silver distance.

We have another K-8, owned by Mick Wilshere, and after a major overhaul the twin drum winch is doing a van Gelder impression.

Our soaring week was instructive, especially for the early Bronze C pilots who flew dual cross-countries.

While pleased to have visitors, we would appreciate it if you use the Chilterns' circuit and landing patterns and not the Air Cadet Venture runway.

T.S.

CLEVELANDS (RAF Dishforth)

Simon Harris completed his Bronze C in record time before taking his infectious enthusiasm to Germany. We have enjoyed some gentle wave from both easterly and westerly winds. Thermals have been difficult but Andy Causer managed her 5hrs while the pundits fell down. Julie Packham went solo as the sun went down.

P.W.

CORNISH (Perranporth)

Congratulations to Dave Uren and Nigel Davey on their 5hrs and to Bill Lewis and Dave Clouder on their AEI rating.

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We are building a new winch and refurbishing the clubhouse. Members of Albatross GC and Plymouth Polytechnic visited us recently and the new K-6E syndicate and the club K-6E are going on an expedition to the Long Mynd this summer.

G.A.H.

COTSWOLD (Aston Down)

On our successful open day on April 20 we gave 154 trial instruction flights, gained two members and recruited many others for our mini-courses and holiday courses. They run every week until mid September and there are usually last minute vacancies - for information Tel 045 383 2061.

Our clubhouse has been superbly refurbished, the bunkhouse is near completion and we have an extensive choice of food on weekend evenings.

Congratulations to Pete Barnes (Bronze C), Martin Gresty (Silver height) and Robin Atkinson and Simon le Marechal (Silver distances). We welcome John Higgins back to instructing after many years' lay-off, and our newest assistant Cat, Martin Burlock. John Holland is recovering nicely from his heart attack and we hope his doctor will give him a "C of A" for the next season.

G.M.

CRANWELL (RAFGSA)

We are installed in our new hangar and have a super new bar, thanks to the hard work of members.

Congratulations to Mick Lee on his PPL and tug pilot rating and to Peter Robinson, Dave Bullock, Mark Wilson, Trevor Cook and Paul Hawksworth on going solo; to Mark Dixon, Cecilia Griffin, Phil Parsons and Peter Retzer on Bronze legs and Matt Hocking, Angie Tapson and Angus Watson on Silver distances.

Our motor glider is having a new engine.

S.J.H.

CRUSADERS (Cyprus)

Congratulations to Steve and Philip on their 5hrs in Cyprus and hard luck to Floyd on 4hrs 42min with 4hrs 48min the following week. John flew Silver distance while on an instructors' course.

Shortage of cable has made operations difficult and we hope the new supplier will be better. The 720 channel radios are most helpful and the Falke is being well utilised with Avro leading the K-13 repair team.

T.J.D.

DARTMOOR (Brentor)

We are steadily progressing with about 30 members and enjoyed magnificent waves and thermals in the spring when the north-easterlies blew over Dartmoor. John Bolt (K-10) was the first to achieve a 5hrs flight from our field.

The local press gave Dick Toop, our ex Mayor, a great write up when he soloed at the age of 69. Sue Bolt, (John's daughter), Chris Mattin and Fred Johnson have also gone solo. The number of experienced pilots is building up and thanks to our CFI, Peter Williams, there is no shortage of instructors.

Our trial instruction sessions are showing results with ten joining after the Morgan Owners' Club visited.

F.J.M.

DEESIDE (Aboyne Airfield)

The new hangar should be ready for use by late summer. It is so big that ridge soaring should be possible in a good north-easterly. There has been little proper weather lately but this is by design as the best weather is being saved for Competition Enterprise and the wave season.

L.E.N.T.

DERBYSHIRE & LANCASHIRE (Camphill)

A large expedition to Aboyne with six gliders resulted in Diamond height for Dave Smith and Gold height for Steve Carver.

The Vintage Glider Club enjoyed a week's soaring at Camphill as did Carol Taylor when he managed to extract his trailer from our notorious hairpin bend.

Some Booker members and friends from Darmstadt GC in Germany came to our club week when W. Horne, J. Bancroft and A. Pritchard went solo and T. Robson completed his Silver C.

We welcome our new steward and stewardess, James and Judith, who are coping well catering for our courses.

K.H.

DORSET (Old Sarum)

Andy Cunningham won our Easter task weekend in the club Skylark 4. The weather was dreadful but morale was kept high by the social committee whose Saturday barbecue continued well into Sunday morning. Our thanks to Nigel Pitcher, Roy Jarvis, Pat Connolly and others who contributed.

Congratulations to Terry White and Nick Antcliffe (going solo); Andy Cunningham (Silver distance and height) and Hugh Stewart (Silver distance).

A new committee took over at our AGM in May, headed by Ray Witheridge as chairman. Trophies went to Terry White (best *ab-initio*); Julian Rees (best height gain and distance); Gerald Dale (cross-country); Ken Thompson (behind the scenes); Jill Burry (Ladies' trophy) and John Martin (best flight in a club glider).

J.R.B.

DEVON & SOMERSET (North Hill)

We are using the new field extension which gives increased manoeuvring space, particularly on the SW runway.

A northerly wind in May produced wave in which Ron Johns climbed to 7000ft and Martin Fisher over 5000ft. Roy Hadley gained Silver distance and height on a 105km flight to Salisbury. Congratulations also to Alan Rappaport, Philip Hickman, Alan Thorougate and Tim Towers on going solo.

D.A.R.

EAST SUSSEX (Ringmer)

We are putting a greater stress on training and safety. Both K-7s have been serviced and repainted and we are adding a T-21 to the club fleet to use for the summer courses.

We decided at the AGM to sell the Super Cub

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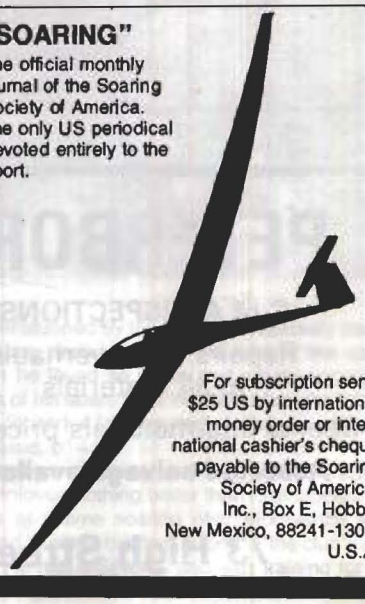
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A barbecue is planned for July with another expedition to Talgarth in the autumn following the successful visit by several members in April.

F.H.

ENSTONE EAGLES (Enstone Airfield)

At last we have a licence from Oxfordshire Sportflying to continue our use of the main runway and can now positively encourage new and old members. We welcome Tom Miller as an instructor and after a year off instructing, Eric Giles. Karen Thompson, Peter Bailey, Brian Casey, Andrew Parry and Robert Wondrak have gone solo with David Bell resoloing after *ab-initio* training at Booker.

Congratulations to Martyn Wells for his efforts and results Down Under.

Those completing our introductory course have become full members with many more starting the course this year. Our Regionals in August are well booked.

The AGM produced a new secretary, Karen Thompson, and three new committee members – Frank Burgess as vice-chairman, Richard Bell and Robert Wondrak.

After a number of years without change the annual subscription was raised to £75 to help meet the runway charge together with a modest increase to the launch and flying fees.

R.V.P.B.

ESSEX & SUFFOLK (Hadleigh)

Les Marshall, Steve Hornung and Brian Hill have their AEI ratings and Peter Joslin has been for squad training at Lasham. Peter Codd and Les Marshall have bought an IS-29D.

Congratulations to Phil Duffin, Pauline Allin and Nigel Richardson on going solo and to Pete Wilby and Alan Hall for being the first to complete our new club 100km triangle, Bury St Edmunds' silos, Six Mile Bottom. The old triangle was affected by the new Stansted airspace regulations.

The Spring Bank Holiday flying week had better than usual weather but no tasks were completed. The Inter-Club League at Tibenham was rained off but there were tasks on both days at Duxford.

V.H.

FOUR COUNTIES (RAF Syerston)

We continue to be the foremost RAF regional club with a Std Cirrus and an LS-4 joining the private fleet.

In spite of the awful weather there have been some creditable cross-countries in thermals and wave and our efficient winch launching system ensures our students plenty of flying in between the showers.

We say goodbye to Paul and Anne McLean and Bic Smith and welcome John Armstrong and Chris Milton.

Visiting gliders are always welcome at weekends but stay well away from the Air Cadets. A 'phone call to the club on 063685 300 will clarify the normal, amicable split operation.

P.J.S.

HEREFORDSHIRE (Shobdon Airfield)

We had three competition days when hosting the first meet of the Rockpolishers Inter-Club League over the May Bank Holiday. Our thanks to Howard Bradley for the extra tug. The weather held for the BGA field landing course.

A lot of preparation, ably directed by Ken Martin, has been put into the summer activity. We will again be a seven day operation through to September with wave flying after that for clubs wanting a rest from thermals.

D.J.

HIGHLAND (Dallachy)

Robert Tait completed his Silver C within one year of going solo on his 16th birthday and Phil Penrose with distance and duration legs in one flight. There have also been large quantities of Bronze legs during this busy year.

Big G, our faithful winch, is starting to feel its age, so Bill Hill is getting to grips with our new mobile winch, the Pink Panther.

Steve Y.

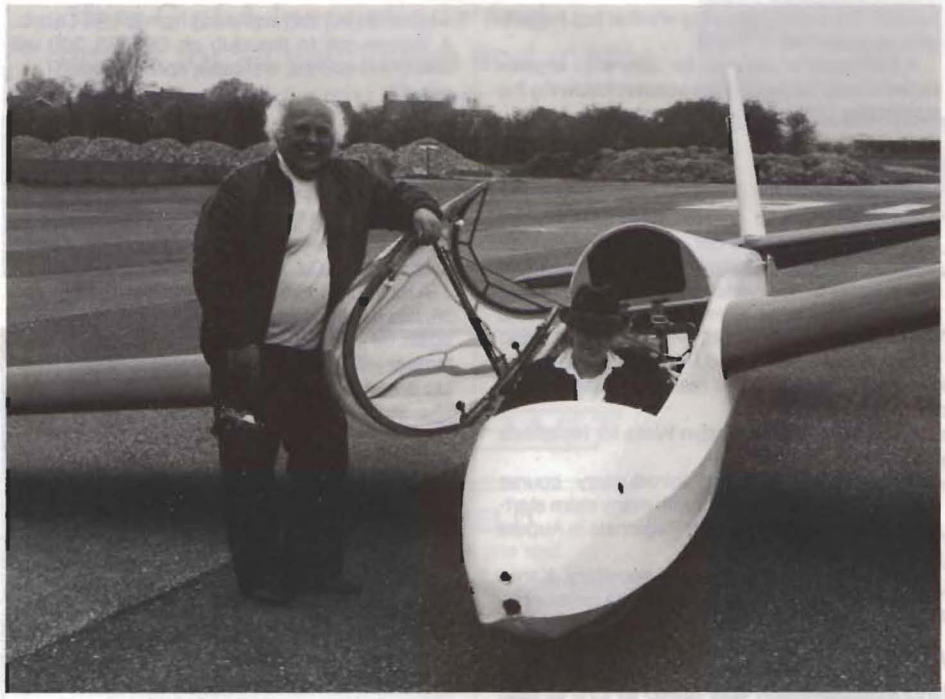
Please note that the next deadline is August 11. Regretfully late copy cannot be accepted. Ed.

Obituary - Stuart Youngson



We are stunned by the tragic and untimely death of Stuart, participating at the time in the sport which he loved so much and which occupied much of his spare time. He died when the tail fin of his Skylark 4 failed during a winch launch (see last issue, p144).

Stuart was a young pilot of outstanding ability who enjoyed nothing better than to disappear for hours at a time soaring over Morayshire and beyond in either his own or one of the club's aircraft. He had a Silver C and was training for an AEI rating.



Stuart was active in club affairs, being a member of the committee and a BGA inspector. This latter duty involved him in the inspection and repair of club and privately owned gliders, a task at which he excelled. He demonstrated great skill and meticulous care in this intricate work and was expected to have a senior inspector rating later this year.

Stuart was one of the most enthusiastic and popular members - his cheery presence will be sorely missed.

Steve Young

Jane Hepworth, Ouse & Hambletons GC, who went solo on her 16th birthday is photographed with her father Paul who soloed last September.

KENT (Challock)

Our open weekend over the May Bank Holiday was again hampered by strong winds but the trial instruction flights were popular and produced some new members.

Invicta Radio, a local radio station, are holding a 3hr "road show" from the club and broadcasting live from a glider, plus interviews with members, which should be good advertising for us and the gliding movement.

We are converting our single drum winch to two cables so we should soon be operating four cables.

Congratulations to Arthur Bull and Mike Pearce on going solo; to Ken Balcombe (Silver C) and Peter Butler (5hrs and Gold height).

J.G.

LAKES (Walney Airfield)

David Hannah had a good soaring flight close to the airfield while further away Keith Butterfield reached 15000ft, this time with a barograph.

Members recently had a week at the Coventry GC. The weather was poor but the welcome, as ever, was very warm. Our grateful thanks to HusBos.

M.S.

LONDON (Dunstable)

New regulations place us within Luton's controlled airspace but give us control over hang gliding activities, and it all seems to be working out reasonably so far.

We are keen to see our "rights of access" fully used and so visiting pilots and those using our club as a TP or goal are still very welcome. The new rules aren't complicated but if in doubt, ring up and you'll be given a simple briefing.

A highly enjoyable Easter Comp gave flying on all days under the benevolent goading of Trevor Stuart. We have a series of courses covering the BGA AEI syllabus and participants from other clubs are welcome - contact our office for details.

You will no longer be able to test your trailer suspensions to destruction on our access path. A team of pilots-turned-navvies under the leadership of Keith Millar, vice-chairman, set about our potholes using wildly vibrating machinery and seven tons of concrete. They levelled the lot, throwing in a high-tech drain in the process, all in a weekend, and a flyable one at that.

T.G.

MARCHINGTON (Marchington Airfield)

In spite of the weather pupils enjoyed our first course week, especially Chris Stoke who soloed - well done. Congratulations also to Chas Turner on completing his Silver C with a gain of height reaching the top of the climb nine minutes after take-off.

The task week started well with a number of pilots leaving the site (and landing out) but the weather soon returned to "normal"

P.A.W.

MIDLAND (Long Mynd)

Several *ab-initios* have taken advantage of our accelerated evening training sessions.

New syndicates have intensified competition on the club ladder and hundreds of kilometres have been flown despite the indifferent weather.

N.B.

NENE VALLEY (Upwood Airfield)

Before Chris Hook had climbed out of the club K-8 after a field landing at Doddington a man arrived with a mobile telephone and invited him to phone home. An hour later Chris was back at the airfield. For our next trick, perhaps a meal for two with tablecloth, silver service and waiter will instantly appear at the landing-out site.

R.E.

NEWARK & NOTTS (Winthorpe)

Our new winch is giving 1500ft launches on most days and sometimes higher when the wind is down the strip. The other winch is being modified so that we will have four cables.

Congratulations to Leslie Harrison and Nick Hobson on going solo, Nick converting to the K-



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SGU's flying evening for the disabled. Photo: Iain Munro.

8, and to Dave Parker on gaining his second Bronze leg and Silver height in one flight.

We had disappointing weather for our first flying week and hope it is better for the second from August 31 to September 4.

N.A.C.

NORFOLK (Tibenham Airfield)

Now that we own our runways an enormous amount of work has been done clearing up the clubhouse and its surroundings.

It is useful having members with professional skills such as John Gammage who has spent hundreds of hours renovating the clubhouse. Another is the Rev David Macpherson who conducted a most moving service dedicating a memorial to members of the USAF who died flying from Tibenham. Several of our American guests flew in our Falke and in Dave Page's Grob.

The Oly 2B we knew so well is back after two years at another club, having been bought by John Davey and Peter Lewey. There were several good flights on May 31, with Jeremy Moore (IS-29) flying to Stratford-on-Avon.

M.T.R.L.

NORTH WALES (Bryn Gwyn Bach, Nr St Asaph)

The income and interest generated by our new site is putting the club in its soundest financial position for years, primarily due to the vastly improved soaring potential.

A site first was bagged by Graham Mitchell when he flew Silver distance to Sleap on May 10. Bill Wynstanley and Brian Sedgewick have their AEI ratings.

D.J.

OUSE & HAMBLETONS (Rufforth Airfield)

The task week at the end of May was dogged with bad weather but we had a lovely warm summer evening for the barbecue and disco in the new hangar.

We wish Keith Taylor well as our first airfield co-ordinator. Congratulations to David Adamczyk, John Colwell, Steve Hammond, Steve Horsley and Jane Hepworth on going solo, Jane on her 16th birthday, and to Andy Todd, Howard McDermott and David Jones on their Silver distances.

G.Z.A.

OXFORD (Weston-on-the-Green)

Our May trip to Talgarth gave nearly 60hrs flying with a variety of interesting conditions. Our thanks to Black Mountains GC.

The Inter-Club League at Enstone had one good day's flying with us provisionally in the lead.

"Tulip" Porat has Silver height and Neil Turner completed his Silver C with a 5hrs. Phil Hawkins, who has a talent for locating wave from winch launches, achieved a 300km O/R to Lincoln in a Min 20kt headwind.

C.S.O.

RATTLESDEN (Rattlesden Airfield)

I must admit I had to read Platypus' article (last issue, p135) on after dinner speaking twice to realise that he was paying our members a compliment. However, I would like to put it on record that our club is no different from any other and our Saturday-after-flying-evenings prove it – cheers Platypus!

Our new winch should be with us by the end of the season and a Sport Vega joins the syndicate glass giving us two LS-4s, a Hornet and possbily an Astir to follow.

RAF Wattisham collected the Pegasus trophy after a lapse of two years and later we remembered the trophy was for wooden ships, not glass, and as according to the visitor's calculator he only needed a 900ft launch to make it back and got 1200ft, we'll either have to insist the rules are adhered to or chop them at 850ft to make it interesting. Our weekend introductory courses have proved popular and gained us some new members, not to mention the financial advantage. We thoroughly recommend them.

R.W.

SCOTTISH GLIDING UNION (Portmoak)

On May 19 a flying evening was organised by Lesley Freeman, our retiring secretary and member of the Monica English Memorial Trust, which exists to provide air experience flights for the disabled. (See BGA News "Fund for Disabled Grows".) Twenty-three people with muscular dystrophy, multiple sclerosis or who were blind were given flights by the SGU. It was an enjoyable evening in ideal conditions followed by a lavish buffet provided by the ladies of Scotlandwell and Kinnesswood; many thanks to all who helped.

Roy Howse and Joe Hall joined the Board at the AGM and Mike Richardson became the new secretary. Stan Milne is chairman and plans are in hand to continue the development and improvement of facilities.

Congratulations to Jim Mclean, Andrew Duncan and Jonathan Pryce on going solo. Spring thermals and wave days were exploited by visitors from Shalbourne, Pocklington and RAF Fenlands and many enjoyed a return to nostalgia with the Ailsa GC's T-21B which spent two weeks with us.

M.J.R.

SOUTHDOWN (Parham Airfield)

Throughout the winter Dave Connoway has been rebuilding our winch and it's back in action. We have several new gliders on the site including a Nimbus 2C and the club Vega has been repaired.

Our leg of the Inter-Club League resulted in a home win over Kent with two competition days despite the poor weather.

Congratulations to Derek Kitchener (Silver C); to Andy White (Bronze C) and to Tony Foote (Bronze leg).

P.C.F.

SOUTH WALES (Usk)

In spite of the poor soaring weather we have been very active with many new members. Congratulations to Lyn Bennett, Maureen Cornwell, Janice Phillips and Gregg Scott (Bronze Cs) and to Bill Mills and Graham Letts (Gold heights).

On April 11 there were several flights to 16000ft. Our professionally built winch roller gear is proving a good investment with improved launches and much reduced cable breaks.

We are looking for a second tug to cope with our expanding private fleet.

K.A.B.

STAFFORDSHIRE (Morridge)

We had a vintage crop of new solo pilots – Maxine Willmore, Bill Conlin, Chris Harris and John Cooke, but pride of place goes to Bob Crinean, aged 73. This was a fitting reward for his contribution to the club in fund raising, fettling equipment and so on.

Thanks to our technical genies, a crop of equipment breakage has meant little lost flying. Dick Bowyer's May course didn't provide much soaring but we flew every day. Our congratulations to Peter Gill, our first member to have an AEI rating.

M.J.P.

STRUBBY (Strubby Airfield)

Our annual dinner was a great success. Allan Ely (an instructor) was presented with the Founders' cup for tremendous time and energy given to the club, and Phil Trevethick the Raydot trophy (greatest height). Reg Brown, our oldest pilot, was made an honorary life member.

At the AGM in March Eric Hughes took over from Phil Trevethick as secretary – our thanks to Phil for his hard work.

Eric Hughes, Bert Barker, Colin Watmough and John Kitchen have a syndicate K-6E which John flew for the first hour flight of the year. John Storry, chairman, has his AEI rating and Roger Partington (Fauvette) both Bronze legs.

L.M.T.

TRENT VALLEY (Kirton-in-Lindsey)

Good spring soaring days gave Silver distance to Linda and Tim Woollard, Wayne Dewick, Vin Geraghty, Roy Dell and Ted Crooks and a Silver C to Mark Innes, Steve Slater, Brian Guest, Andy Cullum, Steve Crust and Mark Innes have AEI ratings.

Easterly winds didn't give much chance to fly the Twin Astir on site over the Spring Bank Holiday. We had an enjoyable "late, late" Christmas party in May, complete with Father Christmas. Our thanks to Georgina James, Sandra Williams and the other cooks. Social club finances are much healthier thanks to the committee's efforts.

L.W.

ULSTER (Bellarena)

The Easter camp was a success with Ken Stuart and Ron Davidson coming over with the BGA Super Falke, which was well used on field selection and other exercises, while William McNair and Joe Irwin obtained their AEI ratings.

Former chairman and PIK 20E pilot Gordon Mackie has bought an ex-Austrian Dornier Do-27 artillery observation post, a phenomenally STOL aeroplane with a lot of poke. A useful stand-by tug, perhaps?

The dramatically improved clubhouse was inaugurated on Easter Monday with a buffet supper and slide/video show of the World Champs at Benalla, by the then recently returned Jim Weston (Standard Class pilot) and Dublin CFI Dan Bagley (crew).

The presence of classical musicians in our membership – the Willis brothers, who can put the bit on one or two more – resulted in *Light Airs*, an evening of classical music in the hangar on June 6. An intended fund raiser, with a buffet supper, the idea was Alan McKillen's and an "air test" with a violin proved the hangar acoustics were very good. This may be a first for the British gliding movement – it is for the provincial northwest.

R.R.R.

VECTIS (Sandown Airport, Isle of Wight)

Intermingled with the gales we have had some good flying. John Kenny flew to 7800ft in wave above Ventnor, setting a local record, Les Tuppen and Andy Noctor gained Bronze legs, Peter Tuppen Silver height at Waikerie and Maurice Colson put his recent field landing course to use after finding super sink.

The second Blanik will soon be ready to fly after its major overhaul.

J.E.P.

WELLAND (Middleton)

Thanks to Barry Chadwick, Alan Bushnell, Heydon McEvaddy and many others we have a rebuilt winch based on a torque control governor and a Fludex coupling. It's working well now we are used to the new techniques involved.

Congratulations to Heydon McEvaddy and Dick Bachler on their Bronze Cs.

R.H.S.

WYVERN (RAF Upavon)

Congratulations to Steve Welch (300km); to "Zac" Zackery (Bronze legs); Rik Malane (Bronze leg and Silver height); Peter Bradley (Silver height); Roger Holliday (Silver C) and to Sarah Deck and Pat Farrelly (converting to the Cirrus).

D.B.

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OVERSEAS NEWS

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NORWEGIAN NATIONALS

Birger Bulukin (LS-6) won the Norwegian Nationals, held during the last week of May at Elverum. Sixteen out of 17 pilots completed a 520km task, collecting ten Diamonds and taking from 5hrs to 7½hrs, the last landing at 8.30pm with thermals to 7000ft. - *Angus Munro.*

WHO PAYS THE BILL?

The French aviation magazine *Aviasport* contained the following report concerning the cost to the French Gliding Association of sponsoring their national team in the recent World Championships.

"What was the cost to the French Gliding Association (FFVV) of our national team's participation in the World Championships in Benalla? This was the question we asked of the national coach, Jacky Clairbeaux. His reply was 'not a penny!' The sea passage for the six gliders and their trailers, the voyage to Australia for the French pilots and their crews, their five week stay, competition fees and various associated expenses, amounting in all to about 800 000fr (£80 000) were wholly paid for by a subsidy from the Ministry of Youth and Sport.

"It seems that no other national team benefited from such generous official support. Most other teams had quite a problem finding sufficiently generous sponsors and, often, had to reduce the number of team members or ask them to make a financial contribution themselves." - *Translated by Les Fellows.*

GLIDING STATISTICS

W Germany accounts for one third of world gliding, Piero Morelli, the Italian representative on CIVV, discovered when he asked pilots from 28 countries during the World Championships for details of their gliding activities.

While Piero stresses that the statistics are only rough estimates, they do give some interesting pointers. He says the world's total is about 120 000 active pilots with 24 000 gliders in 50 countries.

THE RELAUNCH OF THE RF-5

René Fournier, who in 1968 launched his RF-5, one of the world's most popular two-seater motor gliders, is planning a new production run of both the RF-5 and the RF-4.

This decision is announced in an article on the RF-5 in the April edition of *Aviasport.* Bernard Chauvreau writes of this much loved aircraft: "For us French, the RF-5 remains the two-seater motor glider *par excellence* which, with its cruising speed of 190km/h and best glide of 22:1, with prop stopped, can be used for a tremendous diversity of flying. This variety, which is peculiar to the RF-5, makes possible the famous 'harmony of contrasts' of the Greek philosopher Heraclitus in which resides the very richness and poetry of flight."

René Fournier has continued over the years to provide an after sales service and repair facility for the RF series at his works in Nitray. But because of cost, the new series production will be in Spain in co-operation with a new aircraft company. However, the commercial side will remain in Nitray.

It is interesting to note that the second-hand price of the RF5 is now about four times its original selling price in 1968. The engines of later RF5s were upgraded to 80hp without any weight penalty.

More details of the new series should appear soon. - *Translated by Les Fellows* from *Aviasport.*

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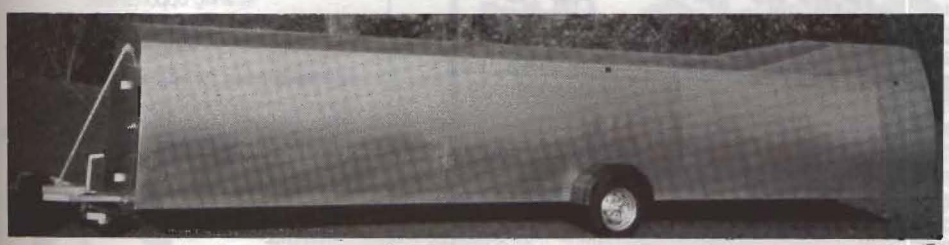
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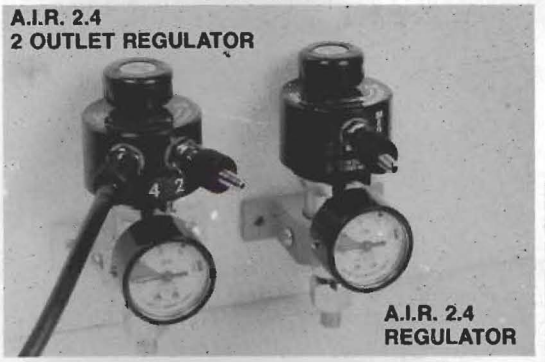
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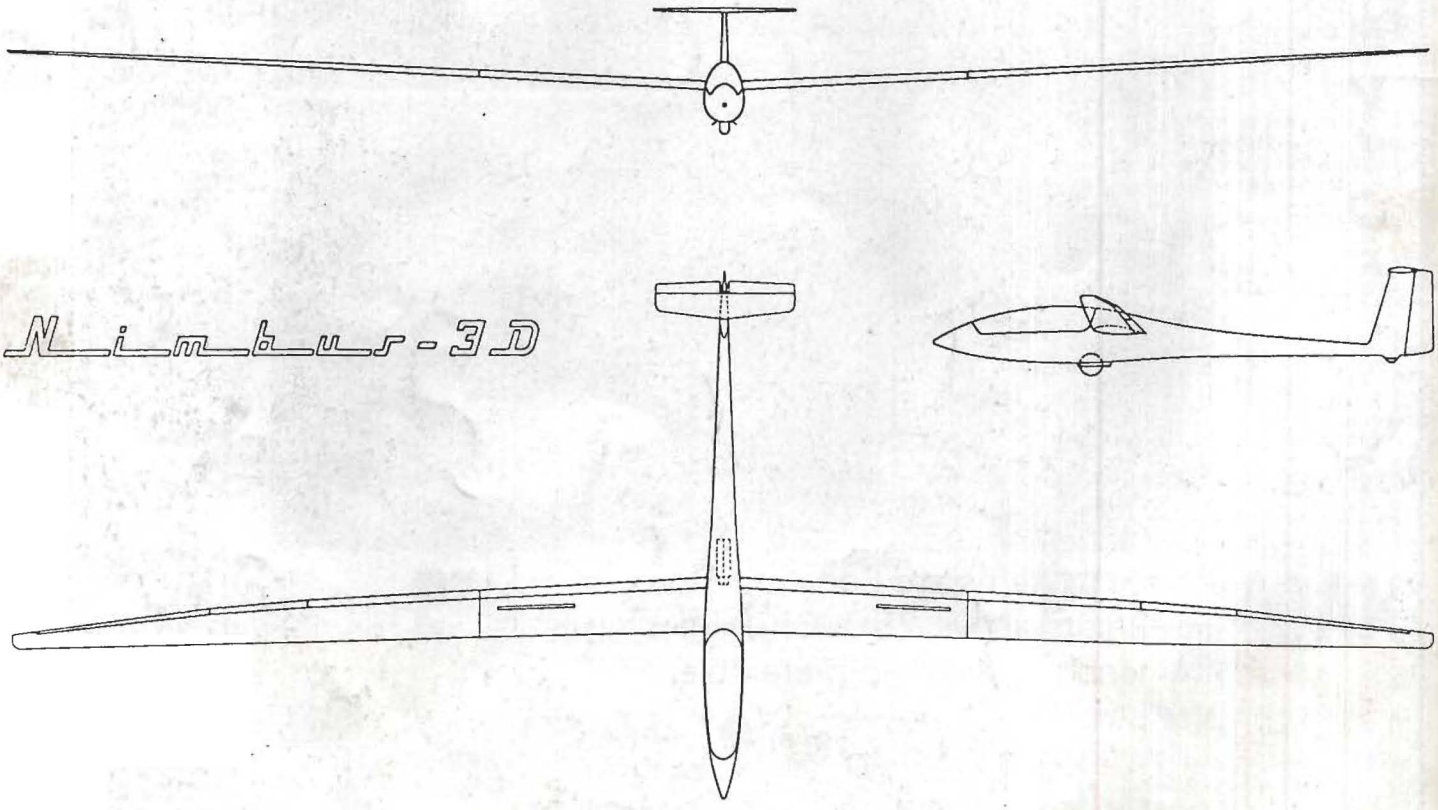
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