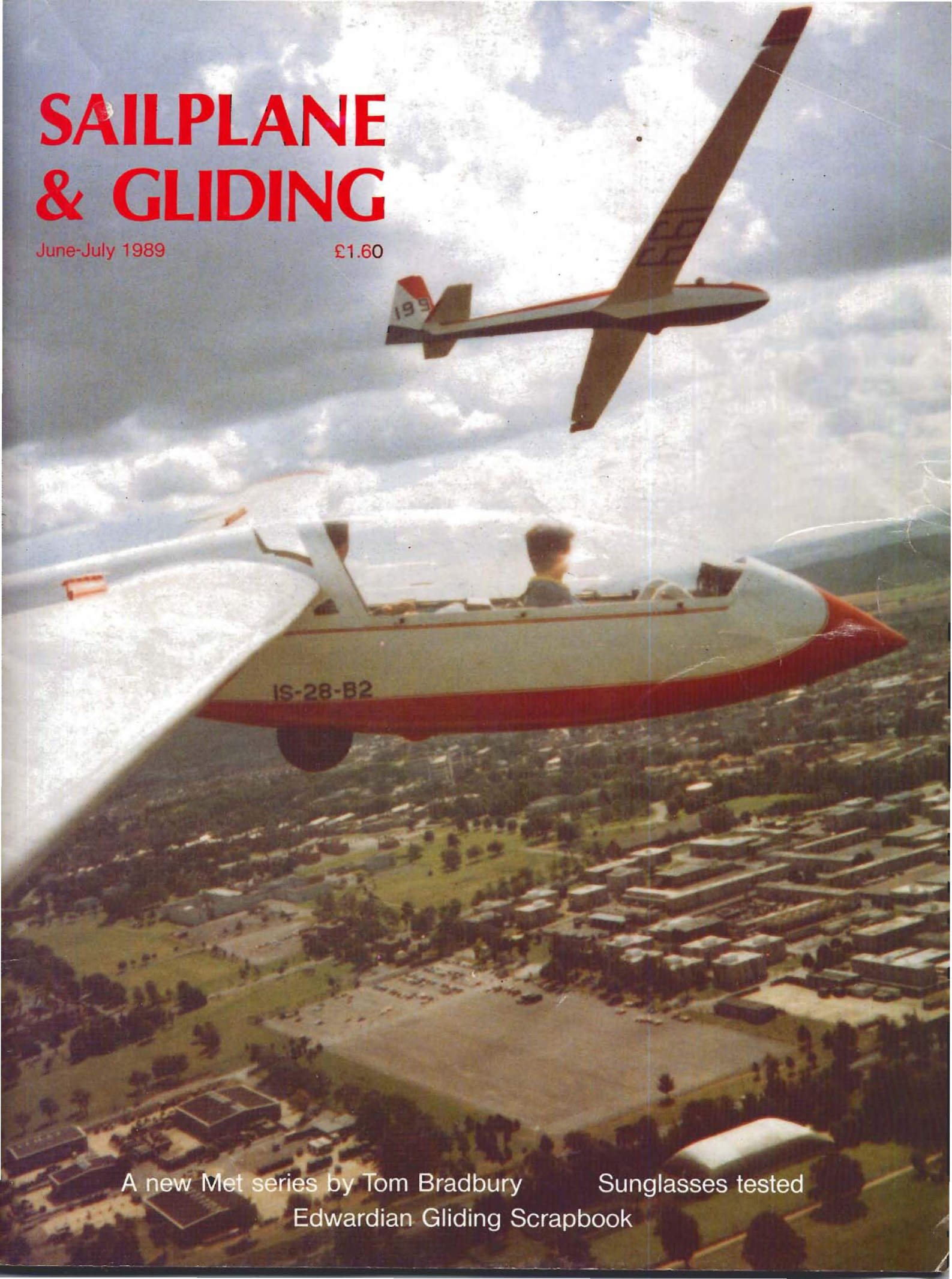
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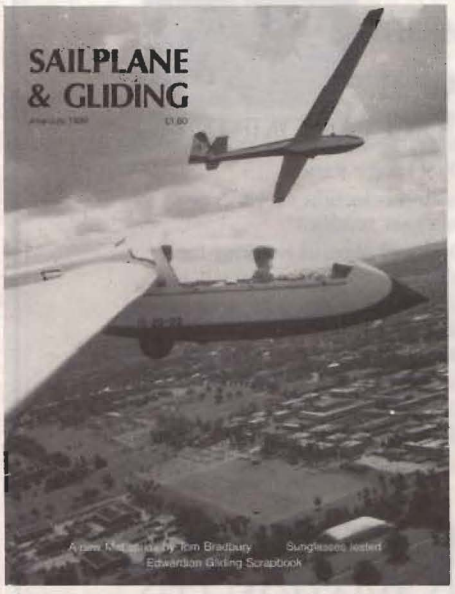
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YOUR LETTERS

WHY A RESTRICTION ON SPAN?

Dear Editor,

Delighted though I am that Paul A. Schweizer feels that "there is a need for a simple low cost glider", I am intrigued by the International Gliding Commission's decision to restrict the span to between 12m and 15m (see last issue, p88).

As a subscriber to TINSFOS* I should expect the span to be restricted only by IGC requirements on cost, ease of rigging and transportation, and handling in flight. Could it be that IGC feels intimidated by the prospect of a simpler low cost glider of more than 15m having a performance equal to our latest Standard Class Gliders?

CHARLES ELLIS, *Ilford, Essex*

**There is no substitute for span.*

IS ANOTHER CLASS NEEDED?

Dear Editor,

I notice that the only Nationals entry list not to be over-subscribed this year was the Open Class. Maybe potential entrants have noticed that in recent years any glider with less than 25m wingspan is unlikely to finish in the top ten of this Class. If rumours are to be believed, this problem is about to be compounded by a new generation of gliders of even greater span.

It has been known for many years that lift/drag ratios can be improved by building gliders with longer, narrower and thinner wings. Unfortunately, due to the need to use exotic materials to achieve the necessary strength and stiffness in such wings, the cost probably goes up with the square, or even the cube, of the wingspan. If these trends continue, only a few eccentric millionaires will be contesting the Open Class in years to come. The rest of us mere mortals will be forced to compete in one of the 15m Classes (ideal for the short, safe outlandings bigger gliders don't have to make, etc!).

What I am leading up to are the following questions:

1. Should an upper limit be placed on the wingspan of Open Class gliders? This might force designers to look at other ways of improving performance, while keeping costs within reasonable bounds.
2. Should there be an intermediate Class between the 15 Metre and Open Classes? I would suggest 20m, which would give a reasonable compromise between performance and cost. This would also allow some older designs such as Kestrels to compete with at least some chance of winning.

Perhaps a member of the BGA Competition Committee would care to comment.

DEREK COPELAND, *Rickmansworth, Herts*

John Taylor, chairman of the BGA Competitions Committee, replies: "The International Gliding Commission recently conducted a study to determine whether any changes should be made to the future Class structure for World Championships. A 17/18 Metre Class was part of the study and was supported by the UK. However, many countries voted to retain the Standard and 15 Metre Classes and attention is now focussed on a lower performance, cheaper Class.

We support the current IGC position that the Open Class should remain true to its name, even though this does mean that to win you not only have to be good, you also have to fly with large (expensive) wings. Since the latest breed first appeared in 1982, the average entry in the UK Open Class has been 37 with a slow, downward trend. This may reverse as the big wings find their way on to the second-hand market. A feature of the Open Class is that any glider can compete. Large numbers of small wings continue to enter and compete for the 19m and 21m cups offered in the UK, occasionally causing upsets amongst the big wings!

In summary, we believe that the Open Class still produces a worthy Champion and the competition is an enjoyable one for those with no realistic chance of winning.



The new look Skylark 2 photographed by Ian Tunstall.

NEW LOOK FOR SKYLARK 2

Dear Editor,

In reference to the S&G Classic in the February issue, p19, "A Flight in a Thunderstorm", readers may be interested to know that in spite of the efforts of Derek Piggott and others, including, I am ashamed to say, myself, the Skylark 2 (BGA No. 724) is still airworthy. But it has a very different profile from a standard Skylark 2 and may be seen airborne on almost any flyable day at Dunstable.

Following an accident in 1964 when it was seriously damaged, though fortunately the pilot was unhurt, Martin Simons rebuilt it with an entirely new fuselage profile forward of the mainplane trailing edge. He also reshaped the nose and cockpit section with the addition of a Skylark 4 type canopy.

The wing centre-section was lowered some 5in which involved modifications to formers 1-7 inclusive and some new framework. There was considerable washout incorporated in the wingtips which were of a revised shape. This resulted in an increase in span to 15m compared to the original of 14.63m.

This much modified machine was test flown at Dunstable on March 27, 1967 by Cedric Vernon, following which a C of A was issued.

The glider was syndicated since 1967 and David Jason, the actor, once had a share. It has now had 4300 launches totalling some 2400hrs.

As to its performance, whilst the reshaped profile gives her a racier look, tests have indicated that the glide ratio is about the same as a standard Skylark 2.

JOHN RICHARDSON, *Shrewsbury*

STALLING AND SPINNING

Dear Editor,

Bill Scull's article on stalling and spinning in the February issue, p14, will stimulate thought and discussion on this vital aspect of flying safely. Whenever one hears of a fatal gliding accident one can be pretty sure that the verdict will be "it spun in", more often than not due to flying too slowly, failing to "feel" a stall developing and when it arrives – probably with a wing drop (it is rare for both wings to stall at the same time), then having insufficient height to correct the situation. An instructor's responsibility is to make sure his pupils never fly too slowly when near the ground and if they are ever caught out by an unpredicted wind gradient during an approach, that they know through their training how to save their lives.

At what minimum height from the ground can a wing drop at the stall be corrected? This will of course vary with different aircraft. In the case of the K-13 I would suggest about 50ft if the pilot's reactions are instinctive, but considerably higher up if he has got to think the matter out before acting. Can this instinctive reaction be taught? As an Elementary Flying Training School instructor throughout most of the last war, training (chiefly) Army men of the Airborne Division (men who were not designed by their Maker for flying or they would have joined the RAF!) I can assure you the answer is **YES!** The training entails a considerable amount of flying at minimum speeds until the ➡

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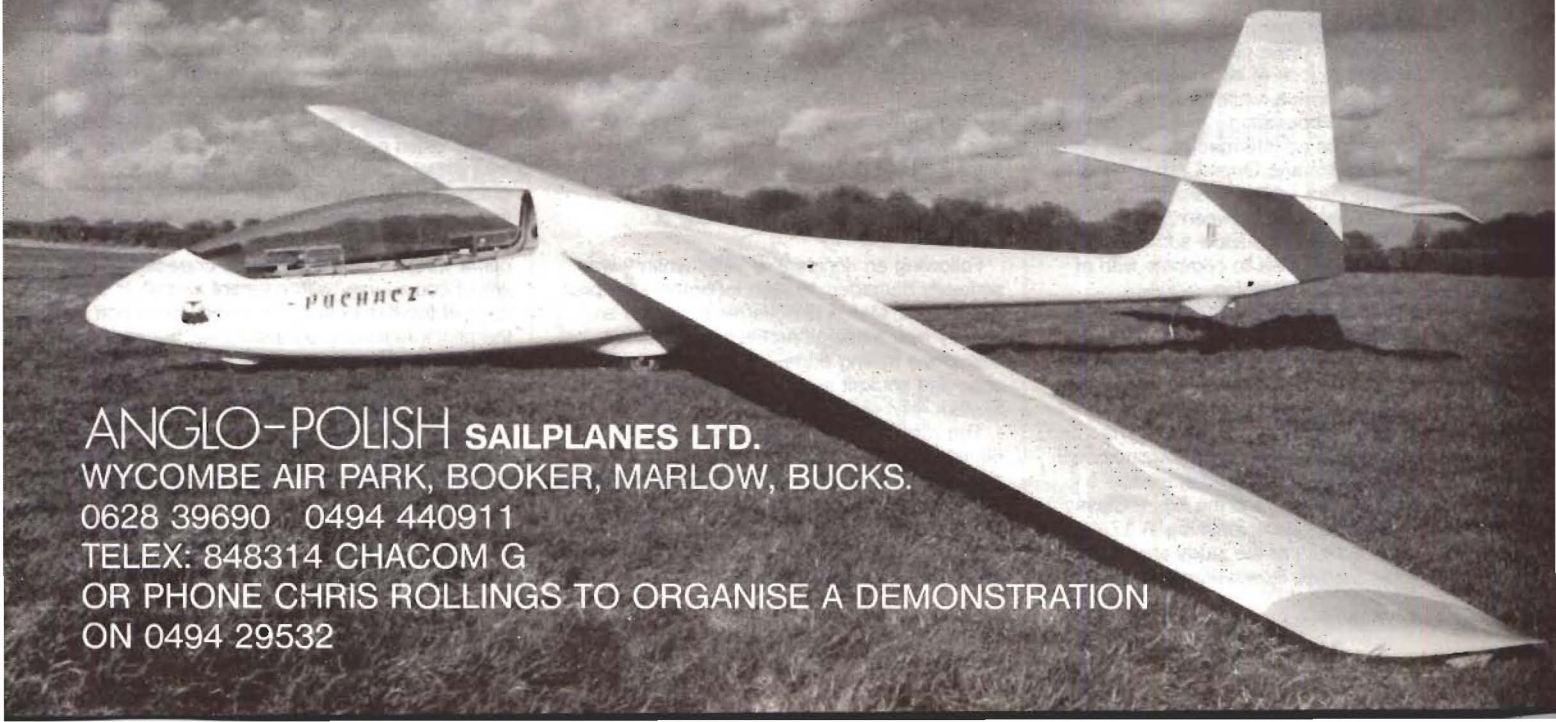
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"feeling" of the stall and its correction is part of the pupil's mental and physical equipment.

What are the control movements in the hypothetical (we hope) situation 50ft from the ground? They are: stick forward and away from the dropped wing together with full opposite rudder. There just isn't the available height for a "stick forward only" followed by a "wing level correction when enough speed has been built up". And this correct instinctive reaction is not difficult to teach; after all, in normal flight any wing drop requires a rudder with ailerons correction and this reaction will naturally carry on to when the glider is stalled – the only added requirement here being to lower the nose in order to unstall. **I can think of no situation where the above solution does not apply.**

But let us take the matter a stage further to the point where an accident is unavoidable – if the glider stalls with a wing drop at 20ft from the ground. Here, again, correct instinct should be full opposite rudder and ailerons with just enough stick forward to give some increase in speed before impacting with the ground with stick right back – most likely a broken glider and a sore bottom, but the pilot still alive.

At 2000ft one can get away with almost any method of recovery, and one cannot do too much experimenting at this height to find out what happens, when . . . In fact it is only after these experiments that one really discovers the secrets of flying safely.

To the theorists who point out that the use of the ailerons at the stall only intensifies a wing drop, in practice this effect is negligible. At the stall aileron drag has almost disappeared while the rudder is still extremely effective. We are endeavouring to build up a simple, safe and instinctive reaction and should avoid details that don't matter.

I have no doubt that the overall standard of pilotage will be raised if Bill's suggestions are adopted – a manifestation of a law propounded by Darwin long ago. "The survival of the fittest" is usually a process only to be measured over thousands of years. Here, we may be able to see the process in action over an observable lifespan.

DUDLEY STEYNOR, *High Wycombe, Bucks*

BEST INSTRUCTORS FOR EARLY FLIGHTS

Dear Editor,

Harold Dales's excellent article "I Have Control" in the February issue, p28, reminds me of an incident in my early learning days:

A slow learner and very tense pupil in a totally strange environment, I was talked through a landing by a very experienced professional instructor. Everything went well until touchdown when the instructor shouted "Full brakes now". I was on the ground and obviously reverting to driving my car as I lifted my right foot, then whacked it down on the right rudder!

The resultant groundloop was alarming but fortunately resulted in no damage to the glider. If that professional learned nothing from the result, I certainly did.

Every pupil is an individual and their fears and tensions are very real to them and may not be so obvious to the instructor. Thorough briefing and de-briefing with no nasty shocks in the air during the early learning stage will make life easier for the instructor and instil a certain confidence from the pupil. This in turn will lead to his more relaxed state and a notably increased learning curve.

Those first few flights can make or break a pupil and I trust that CFIs generally will entrust them to only their best instructors, amateur or professional.

DENNIS NEAL, *Wimborne, Dorset*

LEAVE WOLDS OUT

Dear Editor,

Referring to the exchanges in *S&G* about the ASH-25/Equinox film (February issue, p5, and the April issue, p65), I would like it to be made very clear that the fact that Simon Parker quite correctly gave his address as the Wolds GC merely means that he lives here and does not mean that he speaks for the club. I hope this will mean that the protagonists in this most interesting (?) exchange can snipe merrily away at each other *ad nauseam* without making our club the butt of their amusement.

LES COOPER, *chairman of Wolds GC*

A PLEA TO PLATYPUS

Dear Editor,

About the only funny things in *S&G* are Platypus and the BGA Accident Summary, so please Platypus keep going.

I would also like to extend an invitation to Platypus to fly in our Two-seater Competition. You will recognise Simon Parker immediately (see the last issue, p65). He'll be the one grovelling by the gate for a ride in your ASH-25.

MIKE USHERWOOD, *Huntington, York*

NEW GLIDING FILM

Dear Editor,

Simon Parker's letter in the February issue, bemoaning the elitist nature of the recent Channel 4 "Equinox" programme comes at an opportune moment.

Aardman Animations have recently completed a 52min documentary, "Liftin' The Blues", shot during the Standard Class Nationals at Nympsfield last June. The project grew out of my dissatisfaction with the tone of recent gliding films. It sets out to reflect the mixture of people and attitudes in the sport rather than proclaim the feats of a rather exclusive "Gentleman's Club". This does not mean that the film does not celebrate the achievements of many of the top pilots in this country, but it places the development of their skills firmly within a context, namely that of the gliding club. This seems to me to be a far more effective way of encouraging people to take up the sport than the token "My First Flight" approach of several previous programmes.

Due to the vagaries of television scheduling, the film has not yet been given a transmission date and may even end up being shown abroad before it reaches our own screens. It is however now available on VHS cassette (see advertisement on p154). Maybe Simon Parker would like to buy his club a copy!

DAVID SPROXTON, *director of "Liftin' The Blues", Bristol, Avon*

THANKS FROM FILM MAKERS

Dear Editor,

In reply to Simon Parker's letter I agree, a film about the less highly technical aspects of gliding which concentrated on club activity and the camaraderie of the gliding fraternity would be very interesting – but that's another story.

The one I was trying to tell was about the beauty of free flight and the advances in aerodynamics that have so increased the performance of the modern glider. The Equinox Series is science-based and perhaps the film Simon wants would be better placed in another documentary slot.

May I thank him for his interest and at the same time thank the many gliding enthusiasts in England, Germany and Holland, "plummy accents" and all, for their kindness and helpfulness to me and the crew during the making of the film.

JOHN METCALFE, *Producer and Director of "Free Flight"*

GEL COAT DAMAGE

Dear Editor,

In connection with George Thelen's article "How High How Fast?" in the February issue, p29, the following experience may be of interest:

On March 16, 1987 I had a remarkable wave flight in my DG-400 in the French Alps. I took off from Gap-Tallard and after foolishly trying to get through to the rotor lift against the very strong mistral under power (5-6m/s sink with full throttle!) I retracted the engine and climbed the ridge to the south-east of the airfield. From there it was easy to get into the secondary wave, which took me eventually to about 5000m, and thence to the primary wave between Gap and the Céüse, which I reached at 3200m msl.

After a little searching I soon found smooth, strong lift, which took me to 8000m in only 20min. I spent 30min between 7000 and 8000m and then descended to 3200m to warm up and remove the ice from the canopy. I used neither airbrakes nor excessive speed for this descent, but simply flew downwind into the descending part of the wave.

Since I still had plenty of time (and oxygen) I went back into the wave and 40min later found myself at 9000m over the Pic de Bure in perfectly clear air. I took my time coming down (45min to landing). Again, I kept well below the maximum speed, allowing for altitude correction, and made no use of airbrakes, except of course for the actual landing. There was quite a bit of turbulence at low altitudes, but no ➡

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more than is usual under the prevailing conditions. The flight had lasted 4hrs.

Unfortunately this exciting flight had disastrous consequences, which I did not discover until doing my pre-flight check the following day. The whole surface (above and below) of both wings was covered with exactly the same type of cracks as shown by George Thelen in his article. Not all areas were equally badly affected, but there was definitely *no concentration around the airbrakes.*

The manufacturers were at a loss to explain the damage. They told me that there had been some similar cases with carbon fibre motor gliders, but none as bad as mine. There were two conjectures: (a) moisture (in agreement with George Thelen's theory) and (b) different thermal expansion coefficients between the gel coat and the skin. Personally, I am more convinced by the second explanation. I also suspect that the gel coat may become brittle at very low temperatures (probably below −60°C on my flight). Freezing water would be expected to start causing havoc soon below zero.

One consequence has been a revision of the DG-400 manual. The manufacturers disclaim any responsibility of gel coat damage if the glider is flown at temperatures **below −20°C!**

I haven't yet decided whether to sell my glider or my oxygen equipment.
PETER RYDER, *Bremen, W. Germany*

IT'S AN ILL WIND

Dear Editor,

We keep hearing about the greenhouse effect and a February day at Sutton Bank highlighted the change in classic patterns, giving us a day which would have been regarded as superb in mid summer.

During January and February we had strong westerly winds ensuring the ridge was flyable on most days and excellent wave was contacted as low as 600ft with members electing to break off at 26000ft plus.

On February 22 I intended sitting on the ridge for my duration but a small cu gave me 2000ft and then conditions improved tremendously with averages of 5kt, frequent bursts of 8kt and one brief period of 10 up. Streeting was coming off the Pennines and I was beneath it, singing (badly and flat) at 5200ft asl. And this was February.

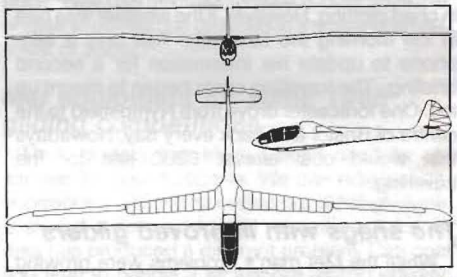
Being a novice, I would assume a duration in thermals at this time of year is something of a rare bird. If this is a portent of the coming summer, good.

If this is a by-product of the greenhouse effect, then we should recall that it is an exceedingly ill wind that doesn't blow at least one of us some good. If it is neither, then my insincere apologies for exhausting all the 1989 thermals in one foul swoop.
CHRIS CLARK, *Scarborough, Yorks*

PETREL 3 OR DREADED DART

Dear Editor,

I had a sneaky feeling that Platypus was about to pull my leg when I saw the Fafnir outdistancing the glass ships, at least in age, on p13 of the February issue. The problem is it would be impossibly costly to build a single "ASW-20L Fafnir look alike" from carbon fibre to prove the point, but if you did, and used modern aerofoils, flaps and brakes, I suspect the performance would not be that many points down on the modern ship!



Actually, some little time ago I tackled things from the opposite direction, so to speak, and "modified" a Dart 17R towards the shape of my cherished Petrel (don't worry Dick, it was only a paper exercise!). The modifications only involved increasing the dihedral at the root, putting a quite unnecessary kink in the wings, adding pretty tips, a prettier canopy and a shapely rudder. I doubt all this cosmetic nonsense would spoil its performance much, and it would thus go much better than the dear Petrel.

I called it the Dart 19DD - "DD" because I reckoned that someone (not me - I seem to have got stuck at a 1950 Silver badge!) could probably do the height in it and get round a declared 300km, but probably not the 500. In fact you can do this to almost any glider - making Platypus's point that they really all do look quite alike, though it does rather fit the Dart better than most!

What is perhaps of more interest than such re-creations is to wonder how well the top modern pilots could go on a good day it they really tried with modern skills in some of the older machines. How well could the Fafnir or the Nemere be made to go? Or come to think of it, if one sealed all the gaps behind one's head, and fitted a thinner trailing edge . . .? We did rather throw away performance years ago. Anyone for a 500km triangle in the Petrel?
MIKE RUSSELL, *Henham, Bishop's Stortford, Herts*

POOR DESIGN LED TO ERROR

Dear Editor,

Last April Denys Jameson and I took our Astir CS on the Booker GC expedition to Challes les Eaux in the foothills of the French Savoy Alps where we fly from Chambery Airport. We rigged in quick time as the anabatic winds were making the windsock stir and point to the mountains which reach heights of 7500ft close to the airfield.

A feature of the trailer design is that the total energy tube must be removed from the tail fin before the glider will fit into the trailer. I fitted the tube into the top one of the two probes, Denys taped it in place and I carefully DI'd the glider.

After a steady tow at 52kt to 2000ft, I went to trim out at my usual soaring speed of 45kt but nose down or up, the airspeed remained constant at 52! What was wrong with the ASI? I thumped the dashboard to no effect - the two varios were out of sync. I detached the cover on the left of the binnacle and all the pipes felt secure.

What had been wrong? I had put the total energy in the pitot, both probes being of the same diameter. The ASI was on its back stop which happened to be 52kt. Denys has now painted a small total energy tube on the tail fin by the correct lower probe.

Gliders need to be designed so there is no possibility of making this sort of error. This incident cost me a large round of drinks that evening and Denys and I are still arguing about whose fault it was!
JOHN DENNE, *Oxford*

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THE PROBLEM OF GLIDING FORECASTS

Life for the competition forecaster has changed drastically as Tom Bradbury, who begins a new *S&G* series on Met, explains.

Most people have heard of Murphy's law and quite a number are familiar with Parkinson's law but fewer are aware of Hutber's law, summarised as:

"Improvement leads to deterioration"

It is surprising how often modern developments seem to follow this law. Costly efforts have been made by the Met office to improve their service; indeed most people would agree that weather forecasts are superior both in content and presentation to those issued several years ago. This is particularly true of forecasts for several days ahead such as the weekly farming forecast on Sundays. Yet a member of the British team recently said: "I don't think forecasting is getting any better; in fact I think it has got a bit worse now".

For many glider pilots this comment is (sadly) only too true. This is an account of how things have changed from the point of view of a competition forecaster.

How it was long ago

More than thirty years ago, in the golden era of Wally Wallington, John Findlater and Peter Wickham, National gliding contests were well supported by the Met office. They provided one or two forecasters and an assistant to plot the charts. The Met staff had a purpose built WW2 Mobile Met cabin which arrived at the gliding club on a big four wheel trailer. The GPO installed a teleprinter and laid a telephone line connecting it to the Channel One Met broadcast.

Practically all the available weather reports for the British Isles came through this single channel. The gliding forecaster could learn as much about weather over the British Isles as the senior forecaster at CFO (Central Forecast Office). In order to extend his charts over Europe and the Atlantic he plotted special messages from CFO which gave the co-ordinates of pressure systems, fronts and isobars. A similar message enable him to draw up a forecast chart for 24hrs ahead.

The gliding forecaster, by concentrating on a smaller area and a shorter time span, could do at least as well as the senior forecaster who drafted the BBC forecast, and often did rather better. He was not always exactly right but this did not matter so much when competition tasks were mainly variations of free distance.

In those days closed circuit races were almost unheard of. There were no designated launch times; pilots selected their take-off times by hanging numbered discs on the start board. Once in the air it was up to each pilot to make the best of the weather. If the pilot fell down a few miles away the crew would hurry the glider back for a rapid rig in time for a second or even a third launch.

Crewing was exciting then, especially when hardly anyone had radio. During a contest at Aston Down Ann Burns had to take a second launch. Several hours later she landed in Cheshire. Unfortunately her crew, not realising she had changed her goal since the first launch, had hurtled off to Devon.

The "improvements" begin

The Government decided it would improve the general efficiency if the GPO confined its activities to delivering the mail. A new authority was formed to handle telecommunications. So we got British Telecom.

The effect on the gliding Met was not long in appearing. The old GPO used to charge a fee of about £100 to provide a teleprinter and line. British Telecom found it necessary to raise the rental. After a few years the cost of renting a Met teleprinter rose to about £1000 and even the most prosperous clubs declined to pay that much just for basic Met data.

So the forecasters had to change their routine. They began their day by travelling to a nearby Met office to pick up copies of charts and tephigrams. This saved the Met man a lot of effort in chart plotting. However, if the weather was bad in the morning the forecaster had only a telephone to update his information for a second briefing., The travelling costs began to mount up too. One forecaster drove from Nympsfield to the centre of Bristol and back every day. Nowadays that would cost almost £200 just for the travelling.

The snags with improved gliders

While the Met man's problems were growing the performance of gliders was becoming much better. It was no longer funny to send scores of expensive gliders to land far away in tiny fields in Wales or the tip of Cornwall. Quite apart from the risk of damage, the retrieving costs alone amounted to hundreds of pounds. So the old free distance tasks were replaced by closed circuit racing. As a result the Met man could now ruin a contest day. If the forecast was too pessimistic the competitors would be set a small triangle which would be completed so soon that the day would be devalued. If the forecast was too optimistic and the weather deteriorated over the first TP nobody would score at all and the day would be a total washout.

Improvement continues

The introduction of computers then began to make a fundamental change. The competition forecaster was no longer on equal terms with the forecasters at Bracknell. The computer output slowly began to make a significant difference. At first this didn't matter because most of the essential information could still be obtained by visiting a nearby airfield. However the RAF was contracting, more airfields were closed and there were fewer left to help the competition Met.

First steps in the radio world

So we began to turn to radio. The first step was taken after "Tomorrow's World" televised a small self-contained radio and facsimile set. One of the BBC presenters said the importers might lend us one of these new sets. Sure enough they did and we used it for the next competition at Dunstable. This set provided the Met man with a magnificent series of charts including three-day forecasts.

The competition director, struggling to set tasks through a week of stormy weather, was less enthusiastic about these three-day pictures of continuing gloom. "If that's all that modern science can do for us then I would rather not know!"

However radio-fax was such an interesting new toy that some people bought or made their own sets for receiving both weather charts and, a few years later, the equally important observations which were sent out by RTTY (Radio Teletype). A receiving licence was very cheap for those who were not running a commercial enterprise. Alas, new problems soon arose.

More improvements

Radio reception in the HF (short wave) bands is not 100% reliable. The user has to change frequency as conditions alter between day and night. National Met services soon found it better to send their messages by land lines or cables; many useful radio transmissions ceased including some extremely valuable broadcasts from Paris. Previously if you missed some data from Bracknell there was a good chance of picking it up from Paris soon afterwards. Now this was no longer possible.

We are lucky that cables do not yet reach everywhere. There are still some people such as mariners who are obliged to rely on "wireless" reception. Without them the radio broadcasts we need would cease.

The latest improvements

Every few years the Met office acquires more powerful computers. The earliest computers could only produce predictions of the patterns of isobars at sea level and the contours of airflow in the upper levels where airliners travel. This made a significant improvement to forecasts of winds across the Atlantic but did not tell us what the weather would be like near the ground. The computer provided an invaluable framework but human beings were needed to describe the

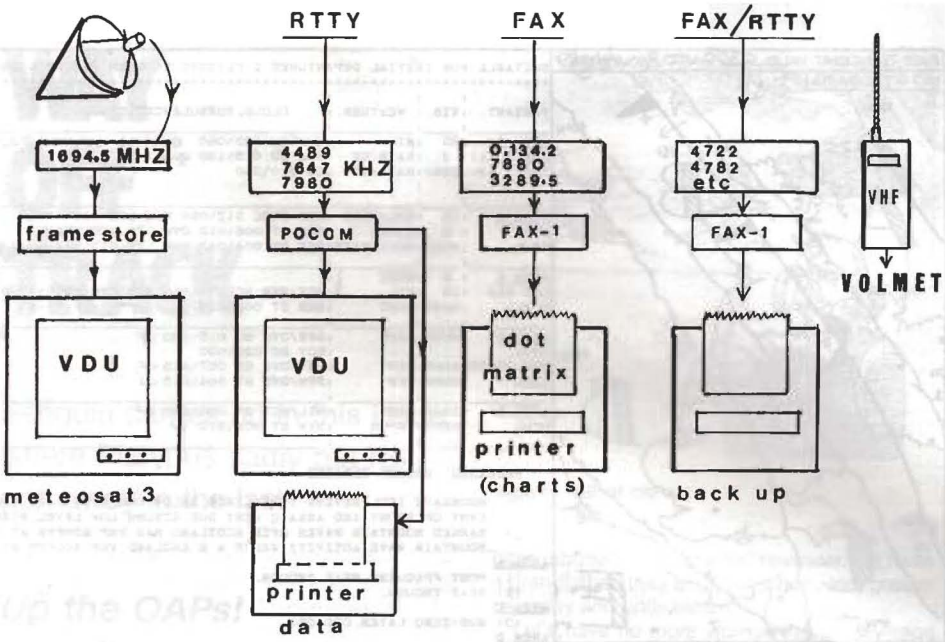


Fig. 1. Some of the equipment used at competitions.

actual weather.

With the latest machines we are approaching the stage when the whole process can be carried out by the machine and a forecast "untouched by human hand" could be issued. The latest computers can now produce not only the familiar maps of isobars and winds but also maps of rainfall, cloud cover, temperature and a description of the weather. There is far too much information to be put in an old style written or spoken forecast. To list all the weather items available from the computer would be as laborious as describing all the details on an Ordnance Survey map, and just as useless. The only way of getting the details across to the user is to present them pictorially on a series of charts or diagrams.

Big computers are expensive; their cost is supposed to be (partly) balanced by making economies in the number of staff. Why duplicate the forecasting effort if it can be done better at a single centre? So Met staff were withdrawn from civil airfields and even London Airport lost its forecast office.

Now Hutber's law struck again. There is hardly anyone left for an ordinary pilot to talk to. Gone are the days when pilots could make a casual telephone call to a co-operative Met man, discuss the weather and perhaps get a free lesson in meteorology too. This is now officially banned. You must dial the old fashioned Airmet forecast instead. It is frustrating to think of all the magnificent new developments which cannot yet be made available to us.

Competition Met in 1988

The Met office can still help us for major competitions. However, we have to make an effort and acquire some more up to date methods of receiving data. If all we needed could be given in writing the data could be passed *via* Telecom Gold. Anyone with a home computer and a telephone Modem can rent a "mailbox" on Telecom Gold. The Met office send data to your mailbox where it lies until you collect it with your PC. This is much cheaper than renting a teleprinter but it is still rather expensive and does not provide any charts.

A better system is to acquire a telephone facsimile machine. There are many models available now; most of them cost about £1000 but they will become cheaper and may be available at half that price. With FAX you can receive almost any kind of data which can be reduced to the size of an A4 sheet of paper.

Met equipment for some 1988 gliding competitions

Lack of data has always been used as an excuse for poor forecasts. We can now get an enormous mass of information but although there is always a demand for still more the volume of data has produced a different problem. Can one find time to handle it all without relying entirely on computers?

Fig 1 shows some of the equipment used at various competitions in 1988. It was put together over the years in a forlorn attempt to gather enough information to make an adequate gliding forecast. On the left is the Meteosat receiving system consisting of a satellite dish, receiver, decoder, framestore and a TV display. Next come three communications receivers, each feeding a black box which converts the radio signals into a form which will put up a display on a video monitor or run a dot matrix printer. The most cost effective black box (FAX-1) is made by ICS Electronics of Arundel; this will either print out the various weather charts or the radio teletype messages which contain the basic data.

To get sufficient data one set has to be devoted exclusively to teletype messages, another for the charts, while a third is a back up tuned to alternative broadcasts of FAX or RTTY in case one of the primary transmissions is suddenly cut off. (Don't forget that Murphy's law still holds good.) The third receiver can also be used to monitor Volmet plain language reports on the HF bands. A separate VHF set is needed to pick up the half-hourly airfield reports broadcast by the London Volmet service. Although this is really meant for aircraft in flight one can usually hear these broadcasts on the ground at places like Lasham, Booker and Dunstable. Occasionally conditions allow one to get the data on top of the hill at Nympsfield too.

The need for telephone fax

Even with all this radio gear one cannot get all that is needed. Upper air soundings are vital but reception is often difficult. This is because the data is broadcast by Bracknell at 0100 and 1300 GMT. The 1300 broadcast is too late for us; the 0100 broadcast occurs at a time when radio propagation conditions are changing. Signals from the transmitter follow different paths. One path comes direct as a ground wave which seems to travel much further by night than by day. Other paths are reflected back by layers in the ionosphere. The multiple paths followed by radio waves degrade the clarity of the signal. Instead of a single crisp pulse the receiver picks up a series of fuzzy blips. Fax charts appear with lines blurred or doubled. The pulses of radio teletype are so jumbled that large chunks of data are unreadable. Distance is important. One can sometimes get good results from Moscow when signals from the UK and Germany are hopeless. The Moscow charts are interesting but not always suitable for us in the UK.

Recently we have got round this nocturnal problem by asking Met Bracknell to send us extra data by telephone fax. Since most of the data is wanted in the early hours of the morning the fax machine can share one of the normal club telephone lines. (Installing a dedicated line is expensive.) In 1988 National competitions could have up to six A4 sheets a day free. At other times a club can have Met data sent by fax for a charge of £1.20/A4 sheet.

With all this equipment the competition forecaster should be a lot better off than Wallington and his men. Have we at last got the better of Hutber's law? No! The solitary Met man is sometimes so busy handling three radio channels and the satellite receiver that he can hardly spare a moment to answer a casual inquiry from a competitor.

Non-Competition Gliding

The elaborate set up used for some major competitions is far too unwieldy for general club purposes but pilots want something better than Airmet when planning cross-countries. For one thing the early morning Airmet does not cover the afternoon period adequately. Here are some methods which have been found helpful.

Radio reception

For a number of years Lasham has had equipment for receiving selected Met charts from the German transmitter at Offenbach. This uses the very low frequency of 134.2kHz (2235m wavelength). the advantage of such a low frequency is that there are none of the problems which make short wave reception so tiresome. Offenbach sends both actual and forecast charts for the surface and upper levels together with three-hourly satellite pictures. The broadcast is almost continuous and, since much of it doesn't concern glider pilots, a time switch is needed to cut out unwanted material. For club use a method of ➡

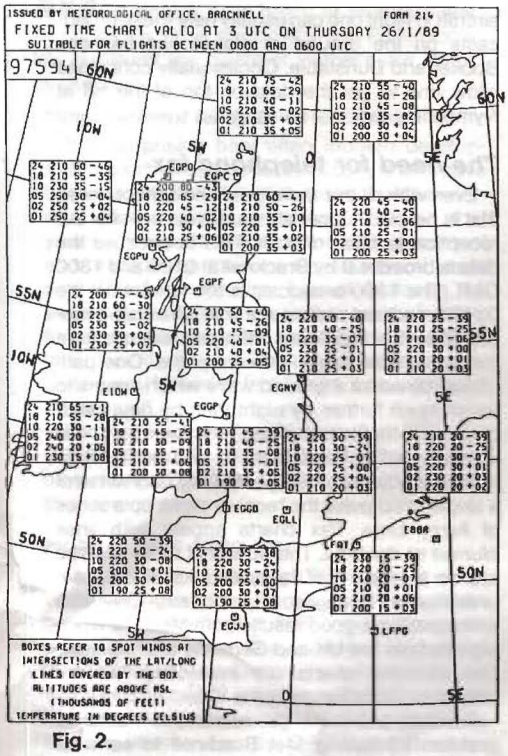


Fig. 2.

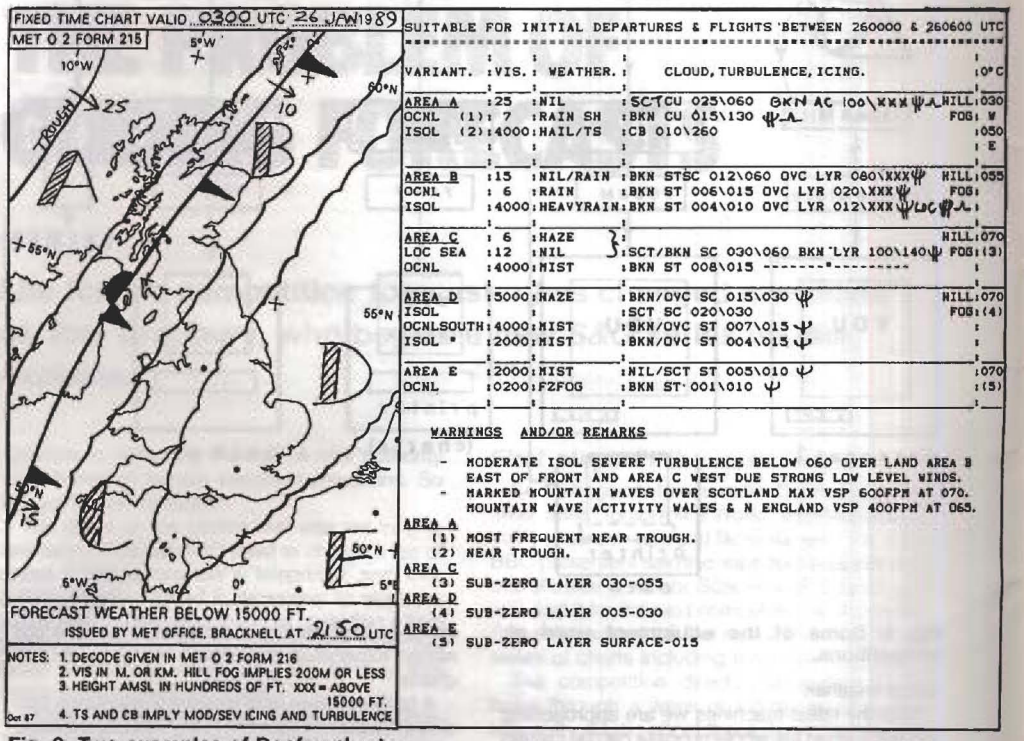


Fig. 3. Two examples of Docfax charts.

"member-proofing" the set is essential. Properly used the combination of a satellite receiver and radio-fax can supply most of a glider pilot's Met needs.

Satellite pictures

For less than the cost of a single instrument panel one can get the simplest form of Meteosat equipment. This will provide half-hourly pictures of the cloud cover. More costly sets store a series of pictures to make a time lapse movie loop. With this, together with a weather map (even the *Daily Telegraph* map will do) you may be able to see which routes are not worth attempting. If it is a miserable wet day the set can at least provide some entertainment to grounded pilots. You can see how much better the weather is over Spain or the south of France, inspect the monster thunderstorms over equatorial Africa or contemplate the curving cloud patterns on the borders of Antarctica.

A number of radio amateurs have built their own receivers and used a home computer such the as BBC B to display satellite pictures. Software is now available on floppy disc which enables one to zoom in on part of the picture. This is far the most economical way of getting cloud pictures.

Television

TV is an ideal medium for presenting weather inforrnation but unfortunately neither ITV nor the BBC consider it is worth showing more than brief snippets of information. ITV seems to believe that all viewers want is a glitzy presentation containing scanty information. BBC is far better and some of the presentations are almost adequate.

What we need is a slightly larger slot every morning, especially at weekends. In this slot there should be time to show a series of satellite pictures and the accompanying surface charts as is done after the TV news most evenings. Then could come a series of forecast charts at three hour intervals (say for 0900, 1200, 1500 and 1800hrs) showing predicted patterns of wind, weather, cloud cover and temperature.

This would give much more information than the viewer could absorb in the short time available. That need not be a problem now that video recorders are so common. The weather slot could be recorded automatically for play back with "freeze-frame" used to allow longer study of individual pictures.

The normal BBC response to such a suggestion is to say the audience would be far too small to make it worth while. However if the series showed the winds over both land and sea it would be attractive to the yachting world too (a much richer and more influential group of people). The morning forecast might come to be viewed by lots more people who enjoy outdoor activities.

New Met office plans for Docfax

There are plans to extend the charts which can be received by Docfax. At present the output is only intended for powered aircraft. Figs 2 and 3 show examples. One can have the standard charts showing isobars and fronts too. In the future it is hoped to have a sort of "Answerphone" system. Dialling up the system would allow anyone with a fax machine to get a series of weather maps and forecasts. The precise menu has yet to be decided. Alternatively a number of clubs could join a scheme which would automatically send data out to all subscribers at the same time using a multiple addressing system.

Can the club afford a fax machine? Well once you have one there are lots of other items which can be sent or received by fax far quicker than relying on "Snail mail".

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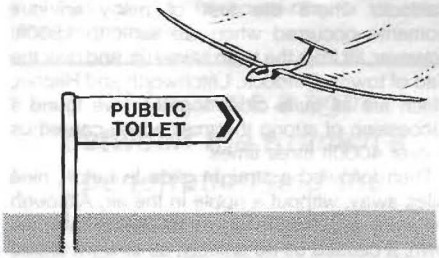
C

WAY OFF TRACK

Penguin carries on in this issue where Platypus sadly put his pen away in the last

Up the OAPs!

As one in whom the bloom of youth has long given way to crows' feet and fallen arches - and to whom the length of a cross-country is more likely to be determined by reduced bladder



Reduced bladder capacity.

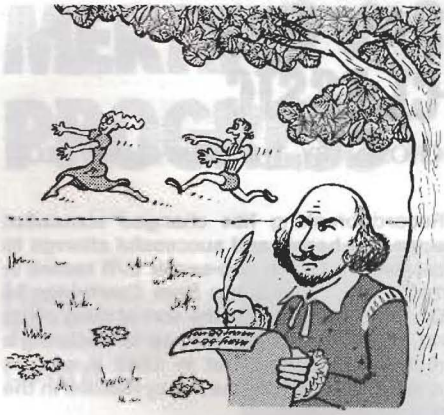
capacity and creaking joints than the continuation of convection - I welcome the BGA Development Committee's new recognition of the virtues of mature age.

It is only in line with the recent well-publicised switch in recruitment policy of a nationwide retailer away from its previous insistence upon youth - which still characterises the computer, data-processing and related whiz-kid industries.

Tesco has found that not only for such mind-deadening tasks as shelf-stocking and checkout-manning but for such virtues as punctuality, reliability, grooming, honesty and the willingness to help customers with a ready smile, the mature (which means 50 and above, like me) win all the way to its booming balance sheet.

Shakespeare - who only made it to 52 himself but pontificated frequently on the benefits of having a few decades' service in - poetically opined: "Youth is full of pleasance, age is full of care."

So let's hope Humfrey Chamberlain's note in the last issue, p91, presages a greater concern than hitherto for those more likely to have the spending power and the leisure time that gliding requires. Even if I've only felt this since I first had a



Age is full of care.

pass rebuffed with a pointed reminder that I was a grandfather, they bring with them, too, greater reliability and enthusiasm.

Let's have no more worries that the average age of glider pilots is creeping up a notch or two and less agonising about the need to attract insouciant and flightly youth. Look around your club and I bet those most frequently laying the hardcore, fixing the tug, balancing the books or even cleaning the loos, are the older members. Such enthusiasm as the younger element manifests is more likely to be accompanied by Porsches in the car-park, ghetto-blasters at the launch point and outrageous hairstyles at the bar.

If the foregoing provokes youth to mutter "Silly old sod", so be it. I'll own up happily to reverse "ageism" and am merely hitting back at contemporary society's inordinate concern for youth.

Even Shakespeare, of course, wasn't immune. In the same work I quoted earlier he also wrote: "Age I do abhor thee; youth I do adore thee."



Youth I do adore thee.

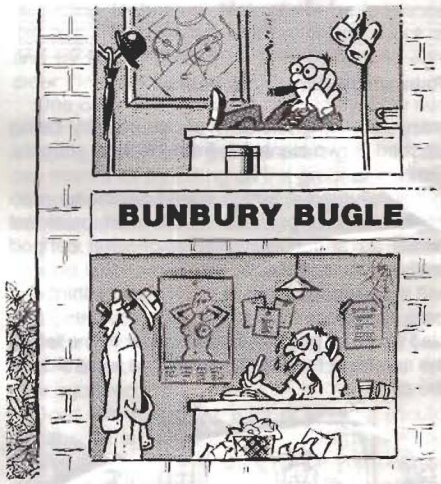
Of mice and Maxwell

As a professional journalist - unpaid in this instance, I hasten to add - I have to commend the departing Platypus for summarising the main attributes of my fellows so perfectly in his valedictory piece in the last issue, p65.

It is, I admit, nice to be able to turn venting one's spleen into earning one's bread on occasion - particularly if it is one's irritation over Mrs Thatcher's voice. But old Plat himself was guilty of the press hack's besetting sin - hyperbole. No one, regrettably, has ever paid me £1 a word.

Now the people *I* really envy are not professional jounalists but their publishers. Look around any grotty newsroom and the paper-strewn floor and the fading calendars on the walls give way to Picassos and plush carpets on the managerial floor above.

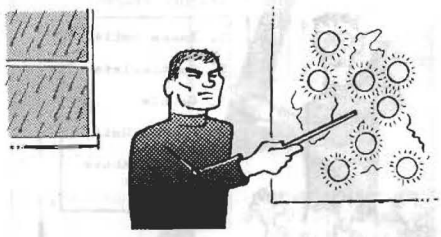
If I were Maxwell, Murdoch or even a well-placed executive in periodicals maybe I could have a slice of something like the ASH-25, if not the whole cake. And whether it cost £18000 or £80000 would become like most journalistic "facts" - merely academic.



Plush carpets on the managerial floor above.

The depression now centred on Acacia Avenue . . .

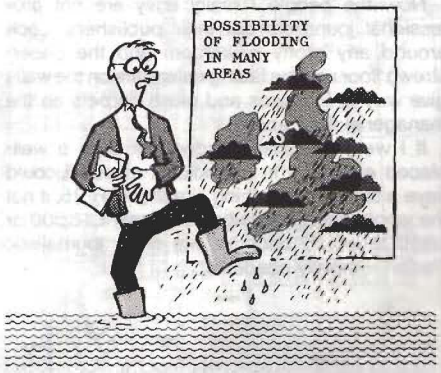
As we waited 34 years for commercial TV to begin a nationwide weather forecast - ITN proudly call it "people's weather" which suggests it is compiled by the KGB - we all have a perfect right to feel aggrieved about how appalling it is. It's a classic case of the medium being more important than the message - an oppor-



Compiled by the KGB.

tunity to use clever gee-whiz graphics rather than to impart useful information that, obviously, the square-eyed thickies sitting before the screen can't be expected to understand. ➡

So we are deprived of essentials like an isobaric chart in favour of glitzy gimmicks like rain which actually appears to fall - and a sum-



Rain which actually appears.

mary which permits only of the country being slashed in two slantwise from Wick to, roughly, Penzance.

It is delivered in a high speed gabble so, mercifully, we can proceed to the next breakfast cereal ad and contemplation of what catfood really washes whiter.

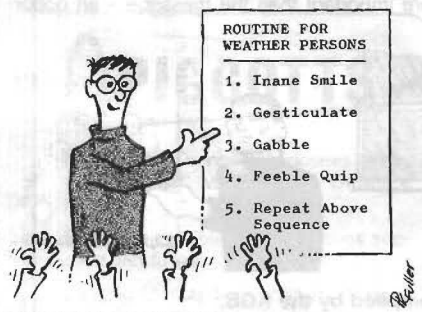
It is depressing, too, that ITN - with a third of a century to learn from the Beeb's mistakes - has also opted to position its forecaster to the left of the screen in front of the windward west side of the chart.



West side of the chart.

Since most of our weather arrives from the Atlantic, rather than from the Ruhr, the upshot is usually to blank out what we poor benigned blighters in the wet and windy west are about to receive.

If we eventually get a Channel 5, perhaps it can have forecasters trained to gesticulate with their



Trained to gesticulate.

right hand, standing before the continent and thus depriving us of the somewhat more dispensable information of what Dusseldorf, Dresden and the Dneiper are about to get, instead.

S & G CLASSIC

CHOSEN BY THE ARM-CHAIR PILOT

Record breaking has changed somewhat since this heroic and successful attempt to establish a British two-seater O/R record in 1949. Nowadays a trip from Cambridge to Dunstable and back is the sort of thing pilots do when the weather isn't up to declaring a real cross-country, but in 1949 it was an ambitious target for the heavy Kranich in the middle of August.

The late John Pringle had been a founder member of the Cambridge University GC in 1935 (appropriately enough, the club was founded by some undergraduates who had tired of driving to Dunstable and back!), and was its mainstay after the war, holding the office of president for many years. Jimmy Grantham upheld the traditions of the club in numerous ways, not least in the following year when he rounded off his Gold C height with a sea-landing near Felixstowe. He was the author of the article, which appear in *Gliding* (No. 1, 1950), pg54-6.

A NEW BRITISH RECORD

Early in the morning of August 12, John Pringle, president of our club, rang me to suggest that it was a good day to try and fly to Dunstable and back in the Kranich. We had been thinking about this flight for some time, seeing that as yet no British two-seater O/R record had been established, and Dunstable seemed our obvious TP. The distance was far enough to set up a reasonable figure for the initial record, and yet not too far, under fair conditions, for a first cross-country attempt in the Kranich. It only remained to wait for suitable weather.

The forecast for Friday, August 12, promised a hot, almost cloudless day with light variable winds - ideal weather for an O/R - and there was a possibility of a south-west breeze later in the day which would help us on our way back from Dunstable. Accordingly, an aerotow was laid on at Marshall's aerodrome for noon. As so often happens when all the preparations for a flight like this have been carefully made, our first attempt was a failure. After struggling at 2000ft for some time in various weak patches of lift we landed ignominiously after half-an-hour, but owing to the influence of the president, who was flying from the front seat, we were towed off again almost as soon as we had touched down!

Shortly after releasing at 1300hrs, 1900ft above Marshall's, Pringle handed over to me, and luckily for my reputation we ran straight into a strong thermal averaging about 10ft/sec, in which we climbed to cloudbase at 4500ft. At this time there were one or two isolated, flat-looking cumulus above Cambridge, but elsewhere the sky was perfectly clear.

Being unable to get higher than the base of our particular cloud we set course for Royston, which seemed to be the next most likely source of thermals. Throughout the flight we stuck to the practice of hopping from town to town, and because the route to Dunstable is well marked in this respect, very little map reading was necessary. This policy was also justified by the fact that we found all our best thermals over towns, while the open country was very unproductive.

Over Royston the controls changed hands several times while we searched for lift, and after coming down to 2000ft, where we debated the advisability of returning to Cambridge, we eventually got back to 3700ft. Our next objective was Baldock, where the first of many anxious moments occurred when we sank to 1500ft. However, lift from the town saved us, and over the triad of towns, Baldock, Letchworth and Hitchin, which are all quite close together, we found a succession of strong thermals which carried us to over 4000ft three times.

Then followed a straight glide to Luton, nine miles away, without a ripple in the air. Although we were once again down to 2000ft over the town, it caused us no anxiety, as straight ahead three columns of smoke from the chimneys of the Vauxhall works converged and rose vertically into the air. It was a dead safe bet, and sure enough when we got there the lift hit us with a bang. The green ball reached 15ft/sec several times in a turbulent and exhilarating climb. In no time at all we were back at 4400ft and Dunstable Downs seemed to be almost at our feet.

When we reached the London GC's site we were surprised to see three gliders on the ground. Those on the ground were apparently also surprised to see us, because we afterwards learned that they considered it to be unsoarable! We discovered the reason why when we began the regulation 360° turn over the clubhouse. The whole area over the site appeared to be one enormous down-draught! Before we could get away we lost 1500ft and were down to 1700ft above ground. Luton seemed much further away than it was when we left it, and the chances of getting back looked poor. At the time, however, I was much less concerned than I ought to have been, because I was happily taking photographs and leaving the flying and worry to the man in the front seat.

It was a grim struggle over Dunstable town, where finally a small climb of 800ft gave us enough height to get back over Luton, but here

the town seemed to fail us. Even the Vauxhall works refused to help. With one eye on Luton airport and despair in our hearts we sank lower and lower, till the altimeter showed 1200ft. This was actually 800ft above ground. At this point we were somewhat relieved, to put it mildly, to strike lift and soon climbed to the more reasonable height of 3400ft asl. During all these anxious moments the only support I was able to offer was moral, but I amused myself by picking out likely looking landing places in the middle of Luton.

The situation was still not too bright, as time was getting on and the lift was obviously getting weaker. Once again, between Luton and Hitchin we found nothing. Over the latter town there seemed to be little but delayed sink, and this time it really looked as though we would be forced to land. But with the altimeter registering 800ft - 600ft above ground - Pringle spotted smoke rising from the railway station and circled in it for a full six minutes without gaining or losing height. Gradually the lift increased and we drew away from the unwelcome proximity of the ground. The thermal petered out at 2300ft and we were soon down to 1000ft over Baldock.

It seemed like a case of "this is where we came in" all over again, but after a few tentative circles in weak stuff, Pringle found the centre of what appeared to be a large area of smooth, slow lift at 3ft/sec. It was possible to vary the rate of turn considerably without appreciably affecting the rate of climb. What was still more surprising was that lift continued steadily to 5000ft, well above the tops of our previous climbs in much stronger thermals.

"It became a fight between the Kranich's penetration and the distance - 22 miles . . ."

Looking at the map, I made a rapid calculation, and decided we needed 600ft to make Cambridge in a straight glide. There was no wind to help us, as the expected south-westerly had not materialised. So we squeezed the last drop of lift out of our thermal up to 5250ft. From here we set course for Cambridge *via* Royston, hoping that the latter might provide a little more lift. But apart from a few patches of no sink the air was calm. It became a fight between the Kranich's penetration and the distance - 22 miles - to Marshall's.

Over Trumpington, at 1200ft, it looked pretty hopeless. Over Long Road at 400ft with two miles to go, it looked still more hopeless. Here the green ball gave a flick and we did a quick circle in which as much height was lost as was gained. There was nothing for it but to press on and hope for the best. It was now obvious that nothing short of a miracle would enable us to reach the aerodrome, but there was still a chance of getting within the necessary 1000m; and there was also a suitable field just behind the cement works. At 100ft with a quarter of a mile of houses to cross I had visions of ending up in someone's bedroom, but the matter was now out of my hands and I was merely a passenger sitting in the back seat wishing he had been left behind. However, by flying round the last house instead of over it ("below the top of my television mast," the householder said afterwards) we reached our field and thankfully plumped down with full brake. The distance from Marshall's, measured on a 6in map, was 950m!

The flight lasted exactly 4hrs (2hrs each way) for a distance of 77 miles, giving an average speed of 19 miles/hr. I think the lessons to be learned are as follows:

(a) We should have started earlier. if we had got away at 12 o'clock or before, we would have had less difficulty in getting back, because there would have been more lift about on the second half of the trip.
(b) In cloudless, anti-cyclonic weather, look for the lift over towns. This is borne out by numerous other flights around Cambridge.
(c) Never give up hope close to the ground, so long as there are plenty of landing fields within reach.

MERRI'S PROGRESS

How To Learn



Since I've been writing this column, several things have happened. People have begun coming up to me with comments (always welcome) and questions. While I must admit that I find this somewhat bemusing, I thought this would be an ideal opportunity to deal with some of the questions which have cropped up.

Most people want to know where I get some of my ideas, having fathomed out that I'm not anywhere near perceptive enough to have sorted them out on my own. There is no really simple answer. I try to draw on experience, and with only two years gliding under my belt the experience has to come from sources other than myself. If you are pre-Silver and wondering how you can improve, there are several things you can do. One is to talk to your local pundits. Find them sober and ask them questions. Tell them what you're having trouble with and trust them to guide you towards a solution. Don't worry if you can't do what they tell you, they might just be pitching the lesson far enough ahead of you to give you something to work on.

There are loads of books on the market, though you might have to search as I did for something like **Winning on the Wind** by George Moffat. Your instructors will direct you towards the real classics. Read them: they are invaluable as guides for improvement. Do you have access to old copies of *S&G*? Read them, if you can get your hands on them, especially those from the era pertaining to the glider you're currently flying. They contain an enormous amount of information regarding technique, Met, glider performance, the "lot". Read the glider's handbook - look at and try to understand its polar curve and consider the manufacturer's suggestions.

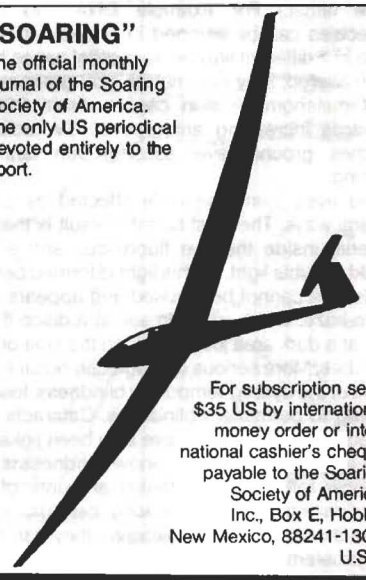
One other thing you can do is to fly. Stay current! Fly anything you're qualified for - if it's going begging and you've got the cash, get in it. You can learn a lot by sitting on the ground watching other gliders and the way the clouds are forming, but you can learn a lot more by getting in and getting up. While you're in the air, don't just sit around lazily swanning about. Put what you've read, been told, observed, into practice. An instructor told me that I should try to get the most out of every flight, even if it's only a circuit. That was the most important piece of advice I've ever received.

Does this sound like a lot of work? It should, because it is - at least for someone like me. You've got to want to do it. Once you become determined, it really pays off, if only in terms of an appreciation of what, as an individual, you can and can't do in a glider compared to what can and can't be done in a glider. In my case there is a big difference between the two which I'm trying to make smaller!

* * *

NB. The BGA hold a stock of back issues of S&G.

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SUNGLASSES- A SCIENTIFIC VIEW

John Wright has tested several types of sunglasses with some surprising results

In recent years several makes of sunglasses have appeared on the market with advertisers claiming improved haze penetration, increased cloud contrast, etc. The proud new owners of the different makes all claim their particular sunglasses are a vast improvement over the previous ones used. But people like to justify spending vast sums on new toys. And unfortunately the human senses, although very sensitive and covering incredible dynamic ranges, are not actually very good at measuring exactly the relative magnitudes of stimuli. In short, swapping sunglasses or taking a pair off and on doesn't usually give you a good picture of the relative light intensities and colours they transmit. This is partly due to the persistence of "after images", the eye trying to accommodate by opening or closing the iris, and also due to tricks the brain uses to achieve reliable colour vision. However the spectrophotometers I work with are less easily confused. I have tested several types of sunglasses to assess their true usefulness, with some surprising results.



John flies a Libelle at RAF Bicester and has about 650hrs gained over the last 7½ years, going solo with Oxford University GC. He has a BSc, a PhD and many years' research experience on spectroscopy which he lectures on at Oxford Polytechnic and Warnborough College, and has published several articles on spectroscopy in scientific journals.

The UV hazard

Solar radiation incident on the earth's upper atmosphere ranges from the far vacuum ultra violet (wavelengths less than 100 nanometers (nm), very high energy per photon) up past the far infra red (wavelengths over 3000nm, low energy per photon). The most intense single region to reach ground level is the small section from about 400nm to about 670nm which the human eye detects as visible light. Fortunately for life as we know it, all wavelengths up to 240nm are absorbed by the atmosphere at very high altitudes, while most of the radiation in the 240-300nm range is absorbed at altitudes of 20-60km by ozone, O_3, which is mainly present (at concentrations of less than 10ppm) in a layer between 15-30km up.

Some UV radiation in the 290-320nm band does reach ground level. This is the very dangerous UV-B (B for biologically active), with enough energy per photon to break the chemical bonds in the substances living things are composed of. (The shorter wavelengths are even more lethal.) For example DNA and RNA molecules can be snipped in two and then reunite in a different way, *ie* your cells' genes have been altered, they can mutate, you get a malignant melanoma - skin cancer. From 320nm upwards increasing amounts of UV radiation reaches ground level causing sun tanning/burning.

The eyes themselves are affected by UV in several ways. The least harmful result is that the material inside the eye fluoresces and emits, weakly, visible light. As this light is formed behind the lens, it cannot be focused and appears as a white haze, which you can see at a disco if you look at a dark area just slightly to the side of any UV tubes. More serious damage can occur to the retina of the eye, *eg* temporary blindness, lesions leading to permanent blindness. Cataracts and various other problems have also been linked to long-term exposure to UV. Snow blindness is due to snow reflecting substantial amounts of UV radiation into the eye for long periods. Think about those shiny glider wings - they can be a real problem.

As well as there being much more UV at ground level in summer than in winter, its intensity also increases with altitude - at a mere 1500m (about 5000ft) there is twice as much UV radiation. And the proportion of the dangerous short wavelengths has increased as well. As for Diamond height flights . . .

Fortunately the perspex of glider canopies absorbs some UV, as does the glass or plastic lenses of ordinary spectacles, but they still transmit substantial amounts from about 350nm upwards. With all the extra UV at altitude, if your sunglasses absorb more visible light than UV, then your iris will open up to compensate for the lower visible levels, and your retina could receive more UV than at ground level, even allowing for the canopy's absorption. I'm emphasising all this in case there are any pilots who think they don't need sunglasses.

As can be seen from the various spectra, most of the sunglasses give excellent protection from UV and effectively absorb all radiation from 400nm downwards. The green and grey Raybans and the glass Reactolites do let through some UV but under a perspex canopy they should give good protection. The RAF Mk14s let through more UV (at about 360-400nm) than visible light, and if the cut off point had been at a smaller wavelength, they would have been very poor. Many manufacturers are now quoting how little UV their glasses transmit, with terms like "UV 400" implying all UV below 400nm is absorbed - be very cautious if they do not say something like this.

Haze penetration

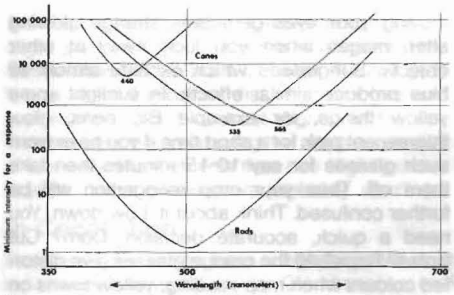
Light travelling through the atmosphere undergoes interactions with the electrons in molecules in the air which results in sideways scattering of the light. The amount of scattering depends on the wavelength (colour) of the light, with UV and blue being scattered quite significantly and yellow, orange and red not being affected very much. Blue light scattered downwards makes the sky appear blue, while sunsets are red due to the blue being scattered away from us.

Looking into the distance, through lots of atmosphere, scattered blue light comes at us from all sorts of angles and cannot be brought to a proper focus. The result is the familiar bluish-white haze over distant objects. (Artists always represent distant objects as bluish.) UV is also a source of haze due to the fluorescence it causes inside the eye. For good haze penetration, sunglasses should remove UV and, more importantly, most or all of the violet (400-450nm) and blue (about 450-490nm) and transmit lots of yellow, orange and red (about 590-670nm). Photographers use a yellow (or orange or red) filter in B+W work to improve haze penetration - especially if its a TP they're photographing.

Suntigers are clearly first class at haze penetration, transmitting no UV or blue at all while transmitting yellow etc almost unattenuated. The orangey Visions are very good as they too transmit no UV or blue, but don't transmit as much yellow as Suntigers. Cloudmasters and IFR are also very good, absorbing much more blue than yellow, with IFRs having the edge over Cloudmasters by transmitting more yellow (their maximum transmission is near the eye's maximum sensitivity). Differentiating towns, fields and forests through haze was easier with the above glasses. Carreras, although absorbing UV and blue very well, simply don't transmit enough yellow (or any other colour) for good visibility in haze. Green Raybans and Strikeblue don't absorb enough blue light, while Primetta Flyers, glass Reactolite, RAF Mk14s and grey Raybans transmit almost as much blue as yellow and orange, so haze penetration by these will be much poorer than the first four.

Visual acuity (image sharpness)

Light of different wavelengths is focused at slightly different distances behind a lens - this is known as chromatic aberration. The coloured fringes seen through cheap magnifying glasses or binoculars are due to this effect. As some colours will be focused perfectly on the retina and some will be slightly out of focus, there is a slight blurring of the edges of images, reducing visual acuity - the eye's ability to resolve fine details. By removing all or most of the blue light, giving the eye fewer wavelengths to focus, sunglasses can improve image sharpness (which will also improve haze penetration). Cloudmasters, IFRs and orange Primettas do this very well giving sharper images which are quite noticeable on a bright day; most of the others, though not quite as good, are acceptable. Carreras, however, let through so little light of any colour, especially if it is dull, that the iris opens up very wide, past its optimum size and, as with camera lenses, the image quality decreases a little from what they could achieve. Suntigers let through so much



Spectral response of the eye.

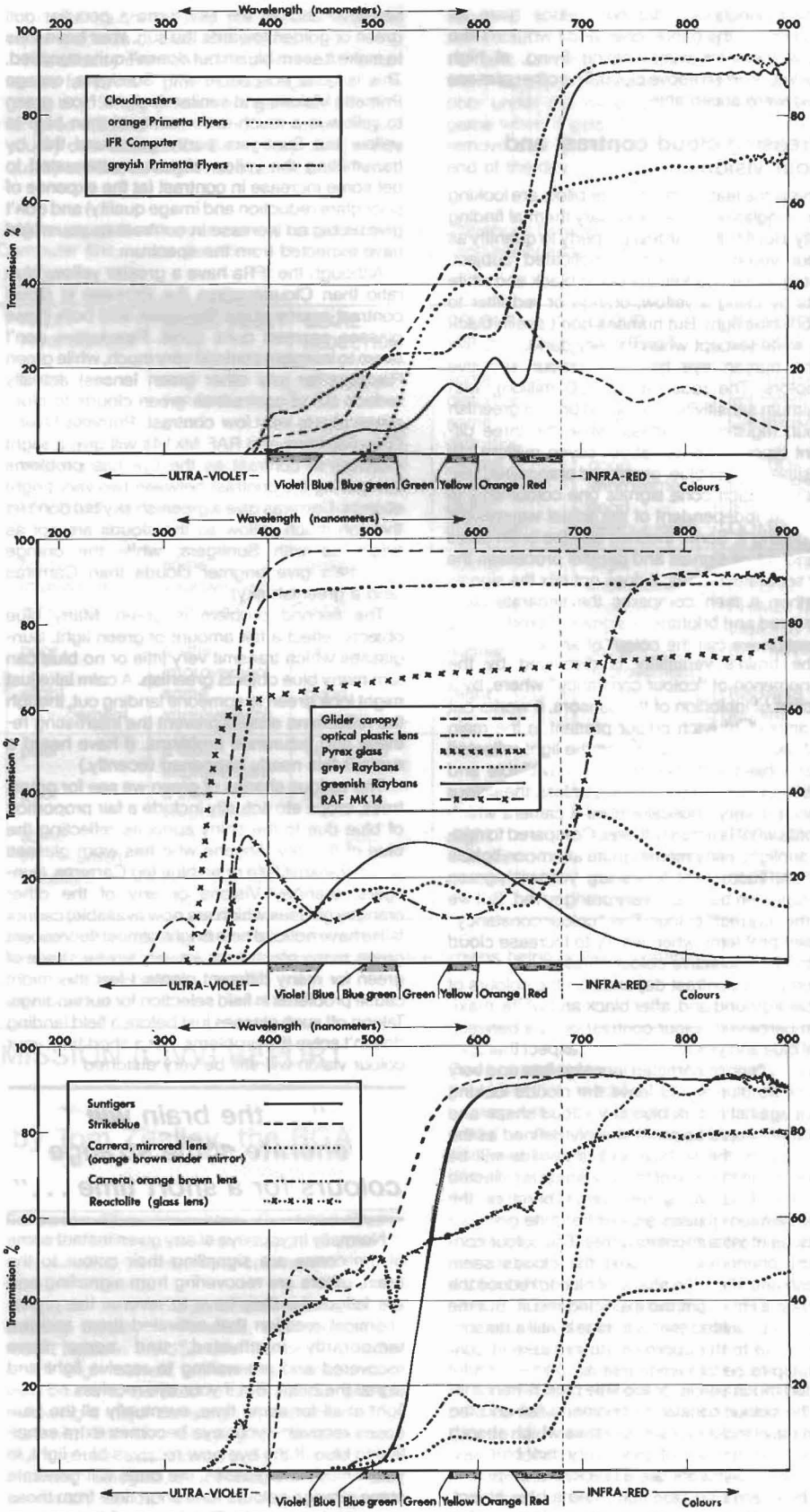
light (more than plain glass at some wavelengths!) that under bright conditions the iris closes down past its optimum and this also decreases the sharpness, even though they absorb all the blue and would otherwise have been very good. Under dull conditions, however, they are very good. Strikeblue let through too much light at all wavelengths. Manufacturers use terms like "blue protection" to imply this reduction in blue light transmitted.

Glare and flare reduction

When the light level is very intense, the iris cannot close down enough to prevent excess light reaching the retina of the eye and the melanin behind the retina cannot absorb all of it. This light then reflects around inside the eye and reaches the retina from odd angles, out of focus, causing a whitish haze, especially if the sun is near the line of vision. This haze degrades the overall image quality, reduces contrast and causes us to squint. Fluorescence induced by the extra UV radiation will also be more likely to occur, though not as noticeably as the other, brighter haze. The receptors in the eye can receive so much light that they continue to signal to the brain for a short time after the light source is removed - the familiar "after images" we see after looking at the sun or a bright light. All these problems constitute glare and flare. Finally, with the iris closed down a great deal the image quality will be degraded due to diffraction of the light by the small aperture.

Clearly we require sunglasses which significantly reduce the intensity of all colours of light (though not necessarily by equal amounts) for adequate protection. The Carreras, Cloudmasters, grey Raybans and RAF Mk14s are all very good, reducing the intensity quite a bit. The Cloudmasters were very pleasant to wear for long periods. The Carreras in fact reduce the intensity too much for typical British conditions (and see also Visual Acuity). But people with very sensitive eyes might find them acceptable. Alpine pilots might find them helpful for reducing the brightness of large snow fields in winter.

The IFRs, although good, could do with being a little bit darker (their maximum transmission is close to the eye's maximum sensitivity), But I did find them very acceptable to wear for long periods. However, I feel that the Strikeblue and Suntigers let through too much light for comfort. Plain glass absorbs more yellow, orange and red than these do! Reading a newspaper on a bright day, I found the glare to be quite bad, as did several other people I gave these glasses. Looking at glider wings was also a bit unpleasant. The eye isn't particularly sensitive to blue light so removing only blue doesn't reduce the overall impression of brightness. In general these



Three diagrams showing the transmission spectra of sunglasses.

brighter sunglasses did not reduce glare as effectively as the darker ones and I wouldn't like to use them for winter alpine flying, at high altitudes, or when above cloud. The other glasses tested were acceptable.

increasing cloud contrast and colour vision

This is the feature most glider pilots are looking for in sunglasses - the legendary thermal finding ability. But it is the hardest property to quantify as colour vision is a very complicated subject. Photographers darken the sky in black and white shots by using a yellow, orange or red filter to absorb blue light. But humans don't see in black and white (except when its very dark).

The human eye has four colour sensitive receptors. The rods (about 120 million), with maximum sensitivity at about 510nm, a greenish colour, register brightness, while the three different types of cones (about seven million) are sensitive to royal blue, green and orange/red respectively. Each cone signals one colour only to the brain, independent of the actual wavelength stimulating it. Some theories say the brain takes the individual signals and parallel processes the four separate images; it does not mix the signals together. It then compares the separate blue, green, red and brightness signals to produce the sensation we call the colour of an object.

The brain's versatility is displayed by the phenomenon of "colour constancy" where, by a process of inhibition of the sensors, it works out the amount of each colour present in the main light source. It then compares the light reflected by an object with that generally available and works out its "correct" colour, unless the colour balance is very unusual (unlike a camera which records what is actually there). Compared to midday sunlight, early morning/late afternoon light is reddish, fluorescent tubes are yellowish-green and tungsten bulbs are very orangey red. But we see the "correct" colour. This "colour constancy" causes problems when we try to increase cloud contrast by selective colour filtration.

Perceived contrast depends on the colours of the background and, after black and white, maximum perceived colour contrast occurs between royal blue and yellow. You would expect that sunglasses which transmitted lots of yellow and very little or no blue would leave the clouds looking bright against a dark blue sky. Cloud shape and structure should be more sharply defined as the shadows on the surface and underside will be darker when the blue of the sky which is reflected into the shadows is removed. Therefore the brown lensed glasses should be quite good for pilots, as most authorities agree. The colour constancy phenomenon makes the clouds seem whitish and alters the shade of blue to reduce the contrast a little from the expected result. But the ratio of transmitted yellow to blue is still a reasonable guide to the approximate increase in contrast. Up to certain limits that is.

If too much yellow or too little blue is transmitted the colour constancy begins to fail and the brain plays tricks on itself. Glasses which absorb all the blue light do not give a very dark blue sky. Your eyes don't work like a black and white film. The brain says no blue light - no a blue object. But after blue, the sky scatters down a fair amount of green light to which your eyes are very sensitive and so the sky turns a peculiar dull green or golden towards the sun. Your brain tries to make it seem bluish but doesn't quite succeed. This is quite noticeable with Suntigers, orange Primetta Visions and similar designs. Now green to yellow is a much lower contrast than blue to yellow but Suntigers partly get round this by transmitting the yellow almost unattenuated to get some increase in contrast (at the expense of poor glare reduction and image quality) and don't give as big an increase in contrast as you might have expected from the spectrum.

Although the IFRs have a greater yellow/blue ratio than Cloudmasters the increase in cloud contrast seems about the same, and both these glasses seemed quite good. Reactolites don't seem to increase contrast very much, while green Raybans (or any other green lenses) actually reduce cloud contrast as green clouds to blue-green sky is very low contrast. Primetta Flyers, Grey Raybans and RAF Mk14s will give a slight increase in contrast as the eye has problems comparing the contrast between two very bright objects. Carreras give a greenish sky but don't let through much yellow so the clouds are not as bright as with Suntigers, while the orange Primetta's give brighter clouds than Carreras (and a greenish sky).

The second problem is green. Many blue objects reflect a fair amount of green light. Sunglasses which transmit very little or no blue can turn many blue objects greenish. A calm lake just might look green to someone landing out, though the reflections should prevent the interesting retrieve and insurance problems. (I have heard a rumour this nearly happened recently.)

The various shades of green we see for grass, trees, crops etc actually include a fair proportion of blue due to the shiny surfaces reflecting the blue of the sky. Anyone who has worn glasses which transmit little or no blue (*eg* Carreras, Suntigers, orangey Visions or any of the other orangey glasses which are now available) cannot fail to have noticed how bright, almost fluorescent green, many plants look - a very similar shade of green for many different plants. I feel this might cause problems in field selection for out landings. Taking off such glasses just before a field landing doesn't solve the problems. For a short time your colour vision will still be very distorted.

". . . the brain will generate some strange colours for a short time . . ."

Normally in your eye at any given instant some of the cones are signalling their colour to the brain, others are recovering from signalling and are fatigued - they have to reverse the photochemical reaction that activated them and are temporarily inactivated, and some have recovered and are waiting to receive light and signal the brain. But if your eye receives no blue light at all for some time, eventually all the blue cones recover - your eye becomes extra sensitive to blue. If the eye now receives blue light, *ie* you remove the glasses, the brain will generate some strange colours for a short time from these exaggerated signals. This is one of the reasons why staring at bright coloured objects without moving your eyes generates strange glowing after images when you look away at other objects. Sunglasses which exclude almost all blue produce similar effects. In sunlight some yellow things, for example Bic pens, glow fluorescent pink for a short time if you have worn such glasses for say 10-15 minutes then take them off. Thus your crop recognition will be further confused. Think about it. Low down. You need a quick, accurate decision. Corn? Cut grass? Rape? All the orange glasses give distorted colours when map-reading, yellow towns on yellow paper being one example.

To maintain a reasonably recognisable set of colours, glasses on or off, it seems they must transmit all colours, but yellow more than blue for good cloud contrast, etc. Consequently brownish lenses are recommended for pilots in preference to other colours.

Depth perception

There is an optical illusion where equidistant areas of even colour, especially if set against a dark background, seem at different distances from the viewer. The even green of plants produced by removing all blue light might cause this effect. A letter from S. Young in S&G, February 1987, p40, complained of difficulties in judging height while wearing orange lensed glasses. If he was flying near an area of shadow or close to a runway/perimeter track, and target fixated on the ground as well, this could have caused the illusion of different depths to have occurred. The target fixation and associated tunnel vision effect are almost as much to blame. I must emphasise that I personally haven't experienced this in normal flight, but it might arise under the stress of a field landing. I have, however, experienced this effect when wearing bright, orangey glasses and entering a dull hangar. When walking under wings, I (and some other pilots) had to reach out to be sure of their distance.

Other sunglasses

Most sunglasses are not designed with pilots in mind, so don't assume expensive ones will necessarily be the best. Check the colour by holding them about 6in above some white paper while outside. In general brownish lenses are best for pilots, although if all you want is haze penetration, the orangey-yellow lenses are very good, if you can stand the colour distortion. Mirrored lenses usually transmit very little light (but with the bonus of no IR either) so your iris opens very wide and image quality decreases - they are best for skiers (or possibly alpine pilots) who look at vast areas of snow. Distinctly blue lenses transmit the light which is scattered most while excluding the unscattered yellow, orange and red! Haze penetration is poorer with than without them. Cloud contrast will also be reduced as bluish clouds against a blue sky tends to be low contrast. They might transmit UV as well, so look carefully at what the manufacturer claims.

Gradual tints (darker at the top than the bottom) are not as good as normal lenses. Light from the clear area will always reach the eye causing glare, reducing contrast, even if you are looking up through the darker area. Glancing around you might get a bright flash from the wings or the sun if in a turn for example. In my opinion they are more suitable for ground based (fashion conscious) types, though some people say looking

into the cockpit is easier. Lenses which have a slight graduation and are only a little lighter at the bottom than the top are a bit better. Neutral grey lenses solve the colour distortion problem and can increase cloud contrast slightly as the eye has more trouble measuring the relative intensity of two very bright objects than two slightly duller objects. Haze penetration probably won't be improved much as they still transmit roughly equal amounts of blue and yellow.

I've already mentioned the problems of green lenses for pilots - green clouds against a blue-green sky. Skiing glasses are generally too dark for good visibility when flying, except perhaps if you fly over snow a lot. Being very dark, image quality suffers, as might haze penetration. Tinted canopies suffer the major problem of being somewhat tricky to remove during flight if it gets a bit dark. Landing when it's dull could be very tricky as depth perception of moving objects is poor under dull conditions - ever played a ball game when it gets dull? This is why you must remove dark glasses when hangar flying at the end of the day.

In Conclusion

Don't expect miracles from sunglasses, but do think before you part with your money, because there are differences between the various types. As for recommendations, I'd say try Cloudmasters or IFR Computer (the colour distortion with the latter is slight and easily adapted to).

SUMMARY TABLE

PROPERTY GLASSES	APPEARANCE	UV PROTECTION	HAZE PENETRATION	VISUAL ACUITY	GLARE REDUCTION	COLOUR VISION	CLOUD CONTRAST	PROPERTY GLASSES
CARRERA*	mirrored orange brown	excellent	good	poor see text	very good	some distortion	improved	CARRERA (mirrored)
CARRERA*	orange brown	excellent	very good	good	very good	some distortion	improved	CARRERA
CLOUD-MASTERS ('88)	brown	excellent	very good	very good	very good	normal	good improvement	CLOUD-MASTERS
IFR COMPUTER	yellowish brown	excellent	very good	very good	good	slight distortion	good improvement	IFR COMPUTER
PRIMETTA FLYERS	greyish brown	excellent	some improvement	some improvement	good	normal	slight improvement	PRIMETTA FLYERS
PRIMETTA VISIONS**	orange	excellent	very good	very good	good	distorted	improved	PRIMETTA VISIONS
RAF MK14	grey	below average poor	poor	a little improvement	very good	normal	slight improvement	RAF MK14
RAYBANS***	green	very good	slight improvement	some improvement	good	slight distortion	worse	RABANS (green)
RAYBANS	grey	good	poor	a little improvement	very good	normal	slight improvement	RAYBANS (grey)
REACTOLITE (glass)****	light brown	adequate	poor	a little improvement	poor	normal	slight improvement	REACTOLITE (glass)
STRIKEBLUE	light yellow orange	excellent	some improvement	poor	very poor	slight distortion	slight improvement	STRIKEBLUE
SUNTIGERS	bright orange	excellent	excellent	poor, but see text	very poor	distorted	good improvement	SUNTIGERS

* Only Carreras had big enough lenses to prevent stray light entering from the side of the frames.
** Available in grey, graduated colours, and various browns, without the colour distortion problems, the browns being quite reasonable.
*** The brown Raybans I briefly examined seemed to be quite reasonable.
**** The plastic Reactolites I briefly examined were a little darker.

INTERNATIONAL GLIDING COMMISSION (CIVV) REPORT

Paris, March 16-18

Extracts from the report written by Tom Zealley, the BGA delegate

Motor gliders. Rule changes now permit badge flights to be made with sustainer motor gliders as well as self-launching motor gliders. Information was given on the World Motor Glider Championships in 1990 at Issoudon, France.

World Class Glider. Piero Morelli (Italy) said the project will be split into two phases - the design competition and the building of the prototypes.

World Championships. The 1991 Championships will be at Minden, USA from June 29 to July 14 with the pre-Worlds in 1990 called Ameriglide. Elaborate and detailed bids for the 1993 World Championships were presented by France, Sweden and Bulgaria. In secret ballots. Sweden was chosen, narrowly favoured over France.

European Championships. The 1990 Championships in Poland are from May 26 to June 10 with six pilots permitted per country (no restrictions on Classes).

Airspace. Judy Lincoln, board member of the Soaring Society of America, reported on the recent battle in the USA over Notice 88-2 under which high current consuming transponders would have to be fitted to all American gliders. Following a major campaign by the whole of the SSA with intensive lobbying of Congress and FAA the rule was substantially amended. The Australian delegate, Bruce Brockhoff, described an equally serious threat to their gliding with plans to require radio communication with ATC throughout the country above 5000ft.

Badges and awards. Ingo Renner was awarded the Lilienthal medal. The Commission also approved the Polish proposal to establish a new medal in memory of Pelagia Majewska - the "feminine Lilienthal".

World badge. Bernard Smith (USA) circulated details for a world gliding badge. This would require a multiplicity of flights with a total distance exceeding 40000km, approximately the circumference of the world. Only flights after the introduction of the badge would count. TPs would not have to be pre-declared, but proper photographic and other evidence of each component flight would be required. It is likely to be voted on at a future meeting. There appears to be enthusiasm for it in the USA but the main objection is it would be a considerable administrative burden.

Elections. Peter Ryder (W. Germany) was elected president in place of Bill Ivans (USA) who is retiring with Piero Morelli, Ed Makula (Poland), John Roake (New Zealand), Alvaro de Orleans Borbon (Monaco) and Bernard Smith as vice-presidents.

THE GLIDER PILOT AND ATC

With world-wide airspace problems we thought readers would be interested in this address given by Philip Wills at the 1961 annual dinner of the Guild of Air Traffic Controller's London Lodge. It was reprinted from the Guild's journal in the February 1961 issue of *S&G*, p16

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

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

During the war I was second in command of Air Transport Auxiliary, and in four years we ferried over 400000 aircraft of all shapes and sizes, in all weathers, without radio or navigational aids of any kind, and without collisions. At one time, with everyone else round London, night after night we would hear 1000 aircraft over London alone, half trying to find the other half and shoot it down, with earnest chaps on the ground indiscriminately pumping 30000 shells a night up into the lot. No collisions, either with aircraft or shells. Then indeed our skies were "overcrowded". Nowadays we use this damnably maligned word if we have more than four aircraft in the whole corridor between London and Manchester.

After ATA I followed my boss, Gerard d'Erlanger, to the newly-formed BEA, which for a short time consisted of him and me and our two secretaries, peering over the top of a pile of 30000 unopened letters in two rooms in Berkeley Square.

". . . perhaps they couldn't see the wood from the trees."

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

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

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

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

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

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

What you have lacked in equipment, our joint masters have tried to replace by restrictions on the use of the air, and look what we have lost! In the United States we see over 100000 small aircraft flying happily around. France is dotted with airfields stiff with small aeroplanes; whilst here we have about 500 all told, mostly completely obsolete. A movement which we pioneered in the late 'twenties has been entirely lost to other nations, the industry, the pilots, the enthusiasm and all that goes with it.

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

". . . we must be left freedom to fly . . ."

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

There is a curious law of Nature called Wills's Law. This states that *the severity of Air Traffic*

Control varies in inverse proportion to traffic density. At an airfield in Outer Uist, on Tuesday before the weekly aeroplane arrives the controller gets up early, bolts his breakfast, tears out to the airfield, and grounds all the seagulls two hours before its ETA. In New Zealand, where there is one airway and a handful of aircraft, cloud flying is forbidden without radio throughout the length and breadth of both Islands. The restricted area round Salisbury, Rhodesia, is vast, so is the Manchester Control Zone, which has permanent IFR to boot. London, with perhaps twenty times the traffic, has at least a smaller zone than Manchester. When we come to busy places like Little Rock, you can (or could, when last heard of) arrive unannounced and land on a green light from the control tower.

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

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

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

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ANOTHER IMPRESSION OF BRENNIG'S BIGGIE

Richard Lowndes gives his version of Brennig's exploits at Fuentemilanos, Spain. See the February issue, p22

I was there and saw it – quite remarkable. Brenda (from Lasham) and I were in the line early having pushed our gliders to the launch point at the far end of the airfield. Pretty clever, I thought, beating all the natives to the top of the queue, especially as the second tug was out again. Clever I might have been, but Brennig was smarter. Not for him the long push out. I watched enviously as Brennig was towed off in his Nimbus 3 by special arrangement with the tug pilot, downwind straight from the parking area. That's how biggies are begun.

It was my first cross-country abroad and I was nervous. Brenda and Brennig had been extremely helpful, being old hands at Fuentemilanos. With their help, I slipped through the check flight, field landing exercise and three closely observed solos. Now Oerlinghausen had entrusted me with an Astir for a shot at 300km.

Brennig announced the first cloud over the mountains

I was scratching at my first blue thermal over the clubhouse when Brennig announced the first cloud over the mountains. We were going the same way but I decided not to race him and Ingo – makes me feel flash being on first name terms with a multi World Champ but he really is that friendly.

I went over to Brennig's cloud and found out why he writes so enthusiastically about Spain. A narrow rough 4m/sec thermal whisked me up to 2800m from where I followed a solid street along the ridge for 30km. Visibility was fantastic and at this point I was at 3200m. If I had been over Swindon at this height I would have had no qualms about beetling on at VNE but here this height isn't far above the ridge and the rocks and forests loom large.

The trouble was I wasn't used to thinking in metres. My altimeter was indicating 3 and that to me means 3000ft. Similarly, at 4m/sec I was used to watching the clock wind up but this doesn't happen when the altimeter is calibrated in kilometres. Thus, I didn't think I was high nor climbing fast and I flew slowly and carefully until the street ended.

This is where it is helpful to have Brennig on hand. Unlike everyone else at Fuentimilanos he and Ingo keep up a friendly banter in English. Not the same English, but English. Ingo talks in metres above site whereas Brennig announces feet above sea level. No wonder they can't find each other when pair flying but to me it was extremely helpful as out in the blue ahead they were in a thermal at my first TP at Riazza.

I took lots of snaps of Riazza with the motorised 35mm camera which is standard equipment on Oerlinghausen gliders along with other luxuries such as a vario with TE and audio and another instrument for cruise control I couldn't master – quite a contrast to the Cosim fitted to my club's hot ship. I turned back along the ridge and found that in place of the great blue hole, rubicund clouds had sprouted. I engaged in overdrive and began to enjoy myself now. I was in the lead but Ingo and Brennig were catching me fast. I shared thermals with each in turn and each marked my next. They were having difficulty in locating each other again although I could see they were in the same thermal. Brennig was at cloudbase at 17 000ft while Ingo was in the same thermal at 4000m. For some strange reason it didn't dawn on me that I too was at 17 000ft and had been, off and on, for some time. As far as I was concerned I was at 4000ft, but by now flying with quite a dash.

Shortly I was back on the home ridge with 150km flown and 150 to do. The thermals stopped and the most amazing pea soup rolled in from the south. Everything was blotted out in minutes. Brennig was advising going north to a cloud street (which he called a convergence). I could see cu tops on the horizon above the murk and set off in that direction.

Half way there I had doubts. I wasn't going to get to the street with much height and would be lost as there were few landmarks on the plain. If I got established in a street it pointed straight into the military zone. I had been given the frequency to open the zone but had left my Spanish at home, so I chickened out and returned home.

I had an unforgettable flight and my Gold height by spending much of the day at 17 000ft.

Brennig is right to praise Fuentemilanos. It's fantastic and Oerlinghausen run it efficiently and with equipment you won't believe if you come from a UK club. However you won't believe the price either – my flying charges were £80 a day.

CRASHWORTHINESS TEST

For the first time a glider has been crashed to find out the forces on the airframe and "pilot". Tony Segal, a GP and Lasham pilot who has done some valuable work reducing spinal injury (see the June 1986 issue, p132), describes the test and reports on the findings

Pilots buy their gliders because they fly well and cost an amount they can afford. The last thing they consider is the crashworthiness of the glider in the event of an accident. Look at your own glider and you will find your toes separated from the nosecone (and from the ground in a crash) by a few inches of insubstantial air. This compares badly with a car in which the driver is protected by a strong safety cage and efficient energy absorbing zones. There is no reason why gliders should not be constructed so as to provide similar safety features.

You, of course, know the formula $e=\frac{1}{2}mv^2$. Modern gliders are heavy and have a high flying speed. The energy involved in a crash is therefore likely to be greater than in the good old days of gliders such as the Olympia 2. This makes crash protection all the more important. Before glider designers and manufacturers can produce such machines, they must know the complex forces involved in an accident. The purpose of the test was to record the forces acting on the glider airframe and on a pilot manikin in a representative crash.

Theory of the test rig

The classic tests on crashworthiness were carried out by NASA in 1980 using the lunar-landing test rig with Piper airframes that had been written off in a flood at the factory. A pendulum test rig was used. This provides a simple method of controlling the factors in a crash, as follows:

The impact velocity - related to the C of G drop height by $v=\sqrt{2gh}$.

The attitude - by adjusting the fore and aft suspension lines.

The flight path - given by the tangent to the arc of swing at the impact point.

In the NASA tests, the suspension lines were released just before impact by explosive charges. Sq Ldr Ian McKenzie was responsible for providing technical support for the test. He represented the "Impact and Acceleration Section" of the RAF Institute of Aviation Medicine, Farnborough (IAM). Ian suggested that the forward suspension lines remain attached throughout the test. The suspension lines would automatically go slack as the glider traversed the chord to the arc of swing formed by the impact surface. The kinetic energy of the test would be absorbed by the upswing of the pendulum. This idea made the test feasible. It had been intended to release the aft suspension lines just before the nose of the glider made contact with the ground. A micro-switch was fastened to an under-wing probe. This did not work, possibly due to the probe being too flexible.

Construction of the test rig

The test rig was designed with the help of Dennis Dowdell (Lasham). The suspension lines were made from ordinary 4.5mm steel winch cable, supplied by David Garrard. A short length of aerotow rope was fastened to the cable by a shackle and tied to a suitable point on the glider. This gave a quick and easy method of adjustment. Frank Irving calculated the lift provided by the wings under the conditions of the test. He also worked out the loading on the glider at impact, namely 2½g. Lorne Welch calculated that the cable and rope would stretch under this loading by 2in.

They were both exactly right - the impact point was 1in to port and 5in forward of the theoretical impact point chalked on the hangar floor before the test. The glider was pulled up to the drop position in the hangar roof by a doubled safety rope passing through a pulley in the hangar roof and released by an electrically operated bomb-slip attached to the tail. The bomb-slip was inverted, so the control cable could pass directly to the hangar floor, avoiding the complication of taking it *via* the hangar roof. There were two suspension points in the hangar roof. These consisted merely of two rope loops wrapped round a girder in the hangar roof, to which the suspension cables were attached by shackles.

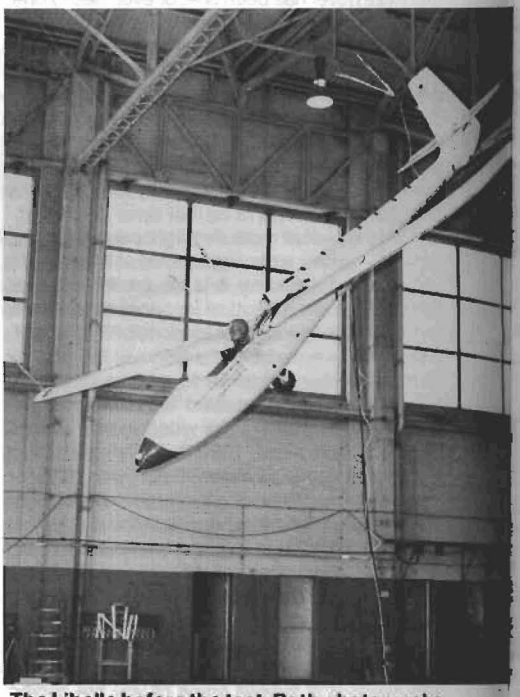
The glider

The glider was a badly damaged Std Libelle supplied by Ralph Jones. The wheel and undercarriage were provided by Bob and Karen McLean. Martin Grant (Lasham) was in charge of the repairs to the fuselage and wings. David Foster (Lasham) made the metal fittings in the workshop at his home. The glider as crashed was complete with wings and tailplane, but without the canopy.

The weight of the glider, pilot manikin and parachute was 600lb.

Technical support

Ian brought a Sherpa van full of heavy expensive equipment along from Farnborough for the test. He was supported by Les Neil, technical officer, and Ian Mitchell, senior photographer, of IAM. The pilot manikin was fitted with a parachute, and sat directly on the glass-fibre seat without a cushion. A four-point seat harness was used, supplied by Mike Fripp, and modified by IAM. Accelerometers were placed in the pelvis of the manikin and at the C of G of the glider (the compartment for the barograph was used). Strain gauges were attached to the lap and shoulder straps of the seat harness. A strain gauge was glued to the inside of the belly of the cockpit. Four further strain gauges were glued to the inside and outside of the cockpit sill. (This was to obtain information for a study being carried out by Prof Ed Crawley of the Massachusetts Institute of Technology, USA. One of his post-graduate students, Karl-Peter Kampf, has worked on improving the crashworthiness of scale models of glider cockpits. Our study would measure the forces in a full-scale crash.)



The Libelle before the test. Both photographs are by Ian Mitchell, senior photographer of IAM.

The impact was recorded on high speed video (200 frames/sec), and on two high speed cine cameras (500 frames/sec and 1000 frames/sec). A "sight screen" measuring 40ft long by 6ft high, divided into 2ft squares, was built for a cost of £8. Wooden battens were nailed together, painted black and backed by white kitchen paper.

The instrument readings were carried down an umbilical cable, attached to the fuselage by sticky tape, to the hangar floor. The readings were amplified and then recorded on a multi-channel tape deck.

The accident

Great difficulty was experienced in drawing up the parameters of the crash. The JAR 22

requirements quote a nose down impact of 45°. After discussion with the experts, I concluded this was an arbitrary figure. Dipl-Ing D. Pusch produced a paper in January 1988 on behalf of the German Federal CAA of a study of over 100 glider accidents in Germany. From his results, I felt a nose down attitude of 15° was representative. Also, the glider would land on the nose, followed by impact on the main wheel, thus obtaining maximum information from the test. After widespread discussion in the canteen at Lasham, I decided on a flight path of 1:4. The wings were to be kept level for the test.

The hangar

The test took place in the magnificent hangar of the RAFGSA Centre at Bicester, by permission of the chairman, Gareth Cunningham, and the manager, Paddy Hogg. I must record that Shane, the Centre's well known Labrador, followed the proceedings with great interest. The club were at Aboyne seeking wave and whisky, so I had sole use of the hangar for a week and the willing help of the staff. The girder from which the test rig was suspended was 40ft above the hangar floor. Access was by means of a mobile "Cherry picker" crane from RAF Abingdon, driven by SAC M. Atkinson. Working on the platform of the crane was great fun and you soon got used to the height.

The test

Erecting the test rig and installing the instruments took only two and a half days and the test was on Wednesday, October 19. I must admit I felt just the slightest bit excited before the test. I started the "count-down" from five and on the count of two the high speed cine cameras were to be started. I had reached three when Ian shouted to me to stop! I had forgotten to pick up the release button from the floor. I resumed the "count-down", this time holding the button. The glider released perfectly. I shall never forget its clean poised swoop from high in the hangar roof. It landed on the nose, bounced on the undercarriage, the tail hit the floor, then the glider swung forward and up clear of the hangar floor, exactly as planned. (The port wing broke on the rebound due to previous damage to the main spar at the wingroot that it had not been possible to repair.) Champagne was passed round to the test crew and the observers-even the pilot manikin was offered a glass in the general euphoria.

Test results

The high speed video and film show the nose and the front of the fuselage bending upwards on impact and then springing back to its original shape. Examination of the inside of the fuselage showed minor delamination of the cockpit floor and side wall. This demonstrates the basic strength of the design and of the composite materials used in the construction. The impact velocity was fairly low, owing to the low drop height, namely 9.6m/sec or 21.5mph. Despite this, the pilot manikin "submarined' down and forward under the lapstraps of the seat harness. The load on the lap straps was 2000lb, partly due to the pilot load and partly due to deformation of the fuselage. The load on the shoulder harness was 1250lb.



After the test, showing the pilot manikin slumped down having "submarined" under his harness.

The accelerometer readings in the vertical (Gz) axis were lost owing to a fault in the tape-recorder. The accelerometer readings in the fore and aft axis (Gx) of the airframe were very interesting. (This was the test axis relevant to Ed Crawley's studies on models.) High peak loadings of very short duration were recorded, as follows:

Impact of nose - 55*g*
Impact of main wheel - 41*g*
Impact of tail - 13*g*

Owing to their short duration, it is considered these loadings were of low energy and would produce only limited damage and injury.

The accelerometer reading in the fore and aft axis (Gx) of the pelvis of the pilot manikin showed a peak loading of 16*g*, of short duration. This is much lower than that recorded on the glider airframe.

Strain gauges are known to be temperamental; one was U/S before the test and one failed to record during the test. The remaining three gave interesting results. The strain gauge in the belly of the cockpit gave a deflection in tension of 0.23%. This was less than expected, probably due to the bracing effect of the cockpit floor. The two strain gauges in the cockpit still showed deflections in compression of 0.66% at the mid-sill point, and 0.55% at the aft corner of the sill. This demonstrated considerable compression loading in the cockpit sill.

Conclusions

A test rig can be constructed from materials available on gliding sites. Using this test rig, the parameters of a gliding accident can be accurately reproduced. To give a higher, more realistic, impact velocity a greater drop height is required. I suggest such a test would need to be performed out of doors. Deformation and minor delamination of the cockpit structure occurred, absorbing energy and giving considerable protection to the pilot manikin. Even at the low impact velocity of this test, the pilot manikin "submarined" and the load on the lap strap was high. This demonstrates conclusively the need for a securely attached five-point seat harness. Ralph Jones has made the fuselage of the test glider available for further tests. If a test track were to be made available, a series of tests could be carried out on the nose and cockpit area of the glider. This would produce results of great value.

RECORD BREAKER

While Joanna Dannatt of the Cambridge University GC was on holiday in New Zealand she met Yvonne Loader who broke the world height gain record (set by Anne Burns in 1961 in South Africa with a 29 930ft gain) and returned with the following details.

Yvonne's flight was to 37 114ft (a gain of 33 506ft) in a Nimbus 2 during the New Zealand Nationals at Omarama on January 12, 1988. The weather wasn't promising and on the second attempt she flew to Lake Ohau where at 10 000ft an extensive rain band forced her down to 8000ft. She flew in light rain under the cloud for 15min before climbing at between 600 and 800ft/min along the Ben Ohau range in moderate wave which became stronger near Mount Cook.



Yvonne after her record flight.

It took Yvonne 24min to climb from 8000 to 20 000ft. At that stage it wasn't looking too hopeful but as she moved closer to the mountain she contacted good lift.

Came to the sport through power flying

Yvonne, who comes from Christchurch, has been gliding since 1972 and was the first New Zealand woman to fly a 500km, but she came to the sport through power flying. She wanted to be a tug pilot like her husband and took up gliding to see what it was like on the other end of the rope. She continued to fly powered aircraft competitively until 1985, winning 30 trophies, and has been chasing this record for five years.The flight also gave Yvonne two New Zealand records.

SUFFICIENT UNTO THE DAY...

A 50th anniversary is celebrated

It's April 1939, the Spanish Civil War has just ended, the Nazi threat is in people's minds and World War II is but five months away. What matters more to 27 year-old Geoffrey Stephenson is the weather.

It has been a good spring for soaring and downwind dashes from Dunstable have been achieved most weekends. Geoffrey and two friends have just bought a Gull from Slingsby (all of £200) and their new glider is in the air whenever conditions allow.

On Saturday, April 22, 1939 it is Stephenson's day to fly and he opts to take off from Heston, near Heathrow. The plan is to fly downwind to the Surrey Club's site on the North Downs near Reigate so he can go to the engagement party of Ann Edmonds (later Ann Welch), being held nearby. However the wind is gusting too much for Major Phillips and his Avro 504 towplane at Heston so Geoffrey tows the Gull behind his Austin 12 to Dunstable. The wind is on the Downs: 28mph, gusting to 40, from 300°; just right for a decent winch launch. By 3.00pm the Gull connects with a thermal on release and is circling to cloudbase at 4000ft.

Some talk of soaring to France but this was not a burning ambition

"Steve" had gone solo in 1935 and by 1939 he had his Silver badge. There had been some talk in the London Club about soaring to France but this was not a burning ambition on anyone's part it seems. Eight years previously, in 1931, the Channel had been crossed in non-soaring glides from aerotows by Lissant Beardmore in a Professor and Robert Kronfeld in his Wien. Certainly it was not Stephenson's intention to cross to France when he took off: sufficient unto the day was flying downwind as far as possible in England.

Geoffrey had discovered how to fly in cloud (with his turn indicator) while hill soaring over the South Downs when cumulostratus frequently enveloped the glider. Climbing in cloud had become routine for most of the cross-country pilots by 1939: too few of them for collision to be thought of as a hazard.

Let Geoffrey continue his own story:

"The clouds were smooth inside and appeared slightly lighter looking upwards than downwards. This probably helped, for I managed to fly blind to Hatfield Aerodrome.

"I now made for Abridge, and just before Epping Forest the lift became scarce. I passed over Abridge and Stapleford and reached the Thames at Stanford-le-Hope. Thinking of Greig with the trailer, I hesitated a long time before crossing, but a thermal over the water decided the issue.

"The Medway was crossed at its widest part at 3000ft, and I decided that with luck Canterbury Aerodrome was within range. We proceeded cautiously along the London road and reached the town of Canterbury with 2000ft. This was encouraging, and I decided to have a shot for Hawkinge. This meant aiming south-west in order to allow for drift in the weak thermals.



A 1939 photograph of Geoffrey Stephenson in the Gull which he soared across the Channel.

"The aerodrome was reached at 1000ft and then the big surprise came. I flew slap into a newly formed thermal at 5ft per second, worked it up to 10ft per second, and immediately thought of the Channel. The lift increased to 15ft and even 20ft per second. I checked up the direction of Cape Gris-Nez and entered a large cloud at 4500ft. At 6000ft, and probably still climbing, I let the speed fluctuate a bit, so decided that to come out was a bird in the hand. We emerged on the south side of the cloud just off the coast. There were a few ships below, but none ahead.

"South-east of the cloud I had left, and adjoining it, was a rather broken cloud, which I made for. It was very little use, and ahead of it was a 10ft per second sink. Ahead again was blue sky and I wondered if it was all sink; but, at 50mph, we were very quickly clear of it, and the sink was normal. I had forgotten to allow for drift, so a slightly curved course was followed.

"Five miles off the French coast the sink was reduced slightly and I set the speed at about 35mph. The coast was crossed at about a mile east of Cap Griz-Nez. The height was 2600ft.

"The sink was still a little below normal, and forgetting about St Inglevert, I went downwind looking for somewhere from which I could be towed back home. There was no field large enough, and as height was running out I chose a small field at the village of Le Wast, 10 miles east of Boulogne. The landing was very gusty, but it worked out all right, at 5.35pm."

We now know the cloud over Hawkinge was a sea breeze front but such a phenomenon was not recognised until much later.

All that remains is to get the Gull, and its pilot, back to Dunstable. Geoffrey phones his whereabouts to Ann's party and she, without hesitation, leaves her friends to fend for themselves and starts to organise the retrieve. Ann drives the Austin 12 (though she has not mastered its crash gearbox) and it, plus trailer, is hoisted by crane on to the ferry for a stormy passage - that nor' westerly is still blowing.

Meanwhile, back in France, Geoffrey has found a hotel, finished his dinner, and sets out for a stroll before turning in. He hasn't got very far when a waiter chases after him. Well, you know what French hoteliers are like and here is this Englishman who checks in without any baggage ...

The following day Geoffrey is woken by a *Daily Express* photographer who has flown over at dawn. The first soaring flight across the Channel makes all the Monday papers and this is how Ann manages to convince the Customs at Dover that the returning Gull's pilot, with no official papers, had not thought up a novel way of smuggling. Ann reports the total cost of the retrieve, including hotel bills, is £25 5s.

The Royal Aero Club and the BGA hosted a 50th anniversary celebration lunch for Geoffrey Stephenson MBE, and Beryl, in April. Glasses were raised by Tom and June Zealley, Ben and Trish Watson, Dan and Betty Smith, Charles and

FRENCH LEAVE

John Kenny found an upmarket spot to land on a French cross-country last summer

I was walking down a long avenue, there was no one in sight and I was rehearsing what to say, like a guilty schoolboy on his way to the Head's study. The last time I'd had this sensation was when I did a cross-country with the CFI in the Blanik in 1965 and needing a landing place, chose a nice long smooth runway. We both knew the airfield was a secret establishment which did not welcome visitors. Neither of us mentioned this; it seemed the best place to put the bird down - early Blaniks had poor airbrakes.

The establishment was closed for the weekend and no one saw us land; George, a wise CFI who knew that someone who looks and talks like an idiot is often forgiven for being one, stayed with the glider while I wandered round the field looking for humanity. I walked down the long passage and knocked at the guard room door.

"Please sir, I think I have landed on your runway, please could you tell me the way out of the airfield?" The MoD police were most helpful and let us bring the Tiger in to tow us home, provided we didn't hit "that building with a tall chimney" on the way out. Apart from a polite letter asking us not to do it again, that was the end of the matter.

Now it was June 1988 and I had this sensation of déjà vue.

I was definitely going to do a 300km triangle on this second Vectis GC French expedition; friends had shaken me by the hand and wished me good luck - dear optimists!

I pulled off tow early, then slunk back with my tail between my legs for a relight. Tug pilot Jean-Paul told me not to be so impatient and he would tow me to a real *"pompe"*. He did, but it still took dear old 516 and me twenty minutes to climb high enough to set course.

Two thirty in the afternoon and setting off on 300km in a K-6E, well this was France, they have double summer-time.

This was as near heaven as I am ever likely to get. In spite of 20kt wind almost on the nose, 516 fairly romped along the north bank of the Loire with the very pinnacles of European civilisation, people, chateaux and bridges passing underneath.

There was no shortage of company; the swallows danced up in front of us like ping-pong balls on water jets in a shooting gallery, while the more sedate herons and buzzards marked some of the thermal cores.



The K-6E in the Château grounds.

Our track passed to the north of Angers, the wind thought otherwise and it was here that things started to come unstuck. We climbed to the base of a monstrous cloud south of the city, then tried a long fast glide across the swamps where the Sarthe comes to woo the beautiful Loire. We just reached the sunshine but the ground had not warmed enough to lift us again.

Down to 1000ft, what were the landing prospects? Very rough small pastures, long cereals and a kind of sports arena. The surface looked good but it was strung around with wires. Then standing in its moat and gleaming in the sun, a fairy castle caught my eye. It had a big flat lawn, must be smooth, that was the place.

I recalled Philip Wills' vision of landing at a stately home and whilst taking a genteel tea, explaining about gliding to the lady of the manor. My vision involved being entertained by the chatelaine too. My downwind checks tended to sloppiness.

We turned finals and lined up on the château, careful not to overshoot into the moat. Wow! their Flymo had broken down; no, it's a hay field.

The landing was short and soft, no one was in sight so I walked round the field looking for a gate; there wasn't one, so I climbed over the substantial fence and walked down the avenue. Then over the drawbridge and into a serene courtyard where a large black hunting dog bayed, though the gothic effect was spoiled by a plastic flea collar. I wondered if they would throw me into the cachot as I walked into the guard room; on the table were postcards of Château du Plessis Bourré. Well I wouldn't have to ask where I was.

A lady came out of the back room. *"Bonjour"* and would I like to view the château? "Yes please, it looks charming from the air and would there be a door to the field at the back?"

The inhabitants of Anjou are noted for courtesy but Madame obviously thought, "This one's simple, and foreign too."

She humoured the idiot who said he had landed on the lawn and let me phone for a retrieve.

When the crew arrived I hoped they would be brawny enough to lift a K-6 over a fence. First to get out was Peter, ever resourceful but none too brawny, followed by two of the weaker sex, Jenny and my wife, Doreen.

Fortunately resourcefulness was better than brawn and Peter found a detachable portion of fence and so we took the trailer on to the "lawn". The owners then arrived, were charming, spoke perfect English and were so polite that they asked permission to photograph the glider on their own land.

On arrival back at the airfield, Jean-Paul was not slow to point out that the fine for landing *au vaches* was *une bouteille* of the local wine. This same fine is imposed for every possible achievement and error. £1 for each *bouteille* went to club funds and the Vectis expedition and our generous and hospitable hosts had some most *cordiale ententes*.

Annabelle Ellis, Ann Welch and Roger Barrett. The venue was at Ivinghoe, just a few miles from Dunstable and 127 miles from Le Wast.

Geoffrey was presented with a congratulatory letter from the Royal Aero Club's president, the Duke of York, to mark the occasion. It will join the splendid watercolours which Geoffrey now paints, on the walls of the Stephenson's dining room.

* * *

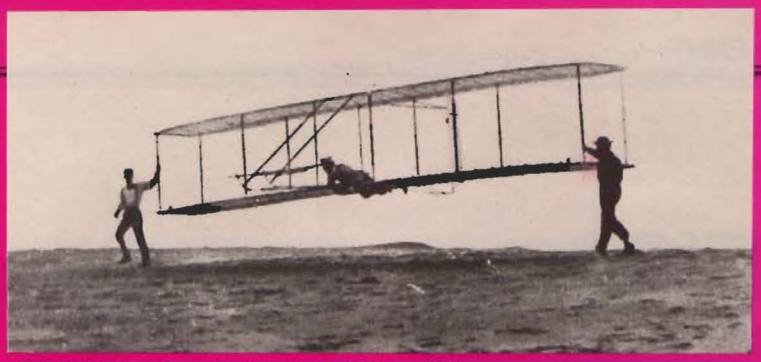
By a strange coincidence this is a year for cross Channel anniversaries. It is 80 years since Louis Bieriot made the first crossing in a monoplane.

Robert Kronfeld, by crossing both ways in a Wien 58 years ago on June 20, 1931, claimed the *Daily Mail* prize of £1000 for a glide from France to England and back on the same day.

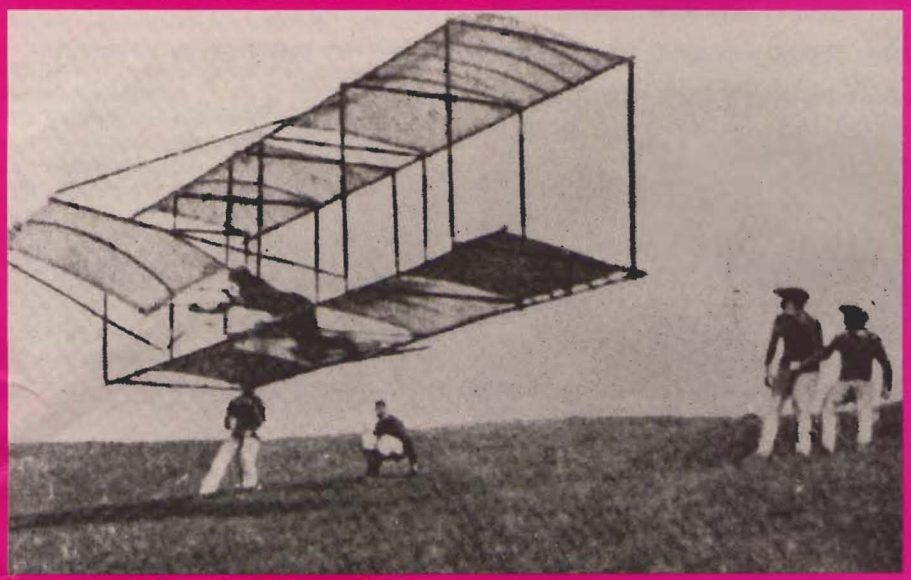
After a high tow, he took two hours on the first trip but 20 minutes on the return, leaving Dover in failing light at 9.10pm after a 9000ft tow. In fact, the tug used all its petrol on the tow and had to glide across the Channel.

WILLIAM MALPAS

MY EDWARDIA
GLIDING SCRA



The Wright brothers' Kitty Hawk, USA, 1902.



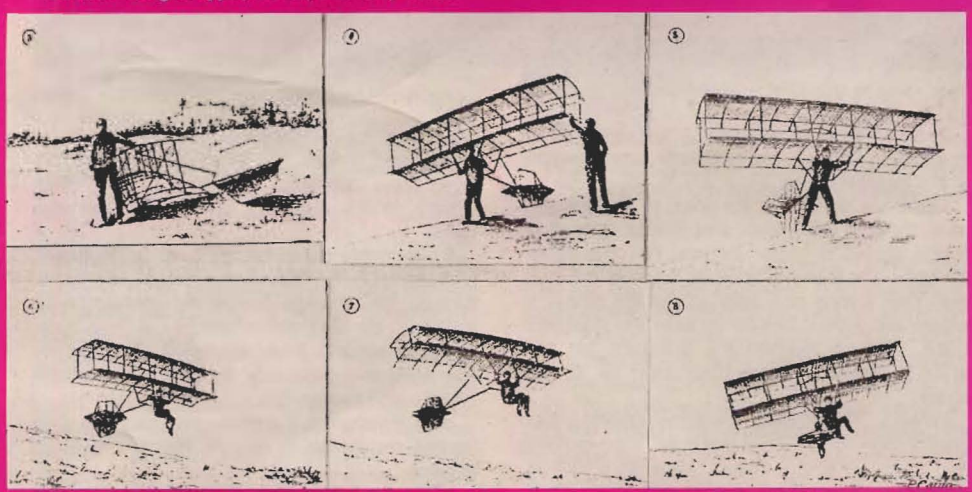
Ferber Wright-type, Beuil, France, 1902.

My Edwardian scrap-book covers the time between the essential element in progress towards successful aviation, an in 1920. Few pilots today know that gliding continued throu 1914-18 war – and it is interesting to conjecture why.

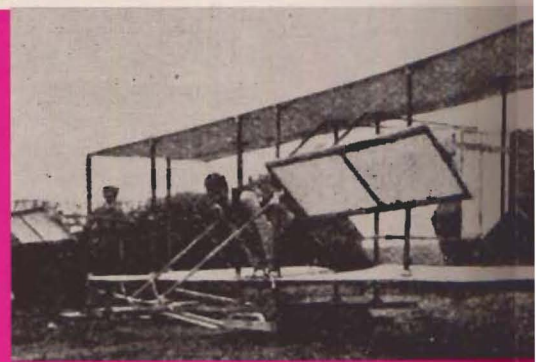
As news filtered slowly out of the USA between 1902 and 19 trolled fashion, it was noted that they had started by build Experimenters already in the field tried to emulate them, with li either failed to grasp the importance of three-axis control or rudder".

France, which considered itself well in advance of everywhe demonstration flights of 1908 by Wilbur Wright himself to be h right up to 1914, to be obsessed with the search for inherent s ness to this obsession.

From about 1909, when aeroplanes became better known t were frequent meetings with prizes for height, duration and s young men and women sought to join the ranks of the stars, j media and of sport. It was sometimes beyond their means to glider was better than nothing. The motivation was not always aviation. Some young Germans, incidentally, discovered that a again – but that is another story. After glancing through these s perhaps that there was indeed life before the Wasserkuppe



Above: How to fly a hang glider (based on photographs made by Chanute), *Aerophile*, 1903. Below: Archdeacon/Wright-type, Berck-sur-Mer, France, 1904. Pilot: Charles Voisin.



Above: Esnault-Pelterie Wright-type, 1904. Below: Arc Paris, 1905.

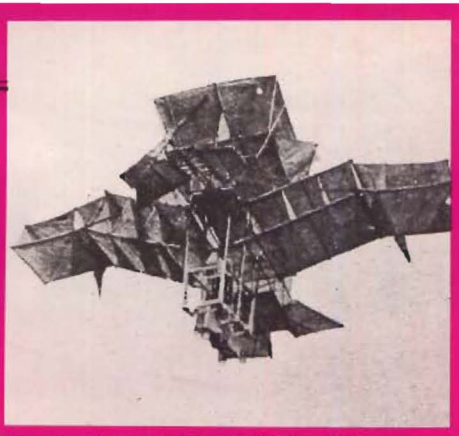




AN
IP-BOOK 1902-1914



Cody kite glider, Aldershot, 1905.



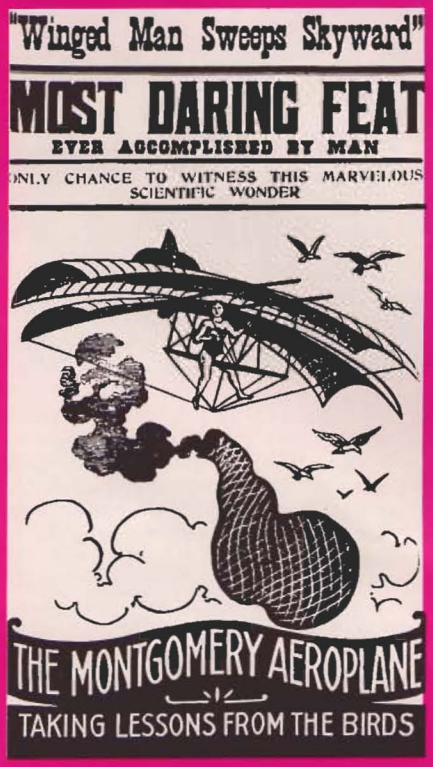
Lawrence, Pennsylvania, USA, 1907.

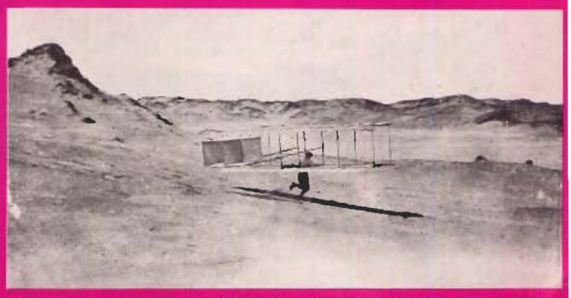
n the "heroic" period, when the lightweight glider provided an
n, and the "sporting" period which began on the Wasserkuppe
hroughout the interim period – right up to the outbreak of the

nd 1905 that the Wright brothers were flying regularly in a con-
building gliders and learning to fly, before adding a motor.
with little success as it turned out, because for many years they
ol or failed to achieve it by proper "co-ordination of stick and

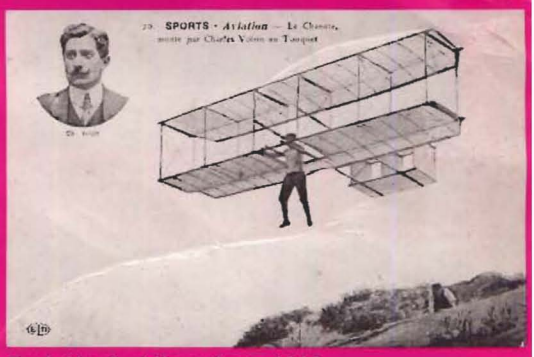
ywhere else in aeronautics, took several years and the powered
be half convinced. Even then some French aviators continued,
rent stability of aeroplanes. And some of their gliders were wit-

own to the public, the early pilots became popular heroes. There
and speed. There were many crashes. It is not surprising that
ars, just as today young people are inspired by the stars of the
ns to buy or build an aeroplane – but a home-made lightweight
ways gliding as a sport, but the first steps to the giddy heights of
that as a sport it was not too bad, and after the war they started
ese sample pages of my scrap-book, readers will be convinced
uppe.





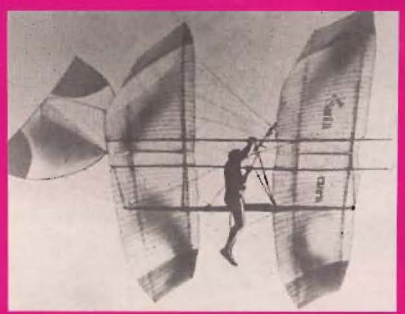
Above and below: Charles Voisin launching at Le Touquet, 1907.

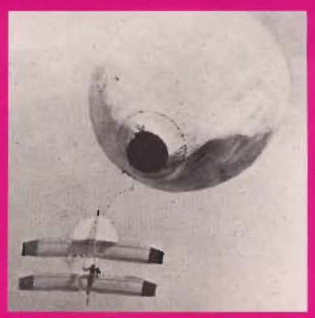


Bush No. 3 at Keynsham, 1910.

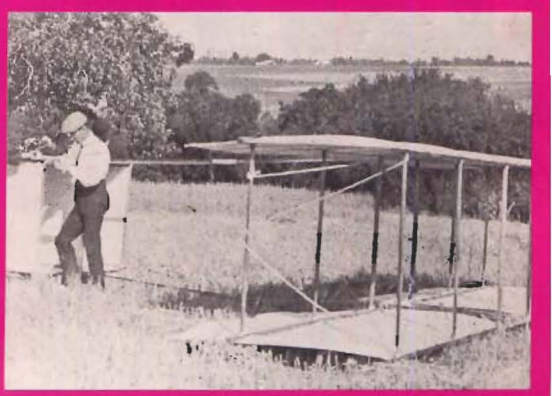


: Archdeacon float glider,



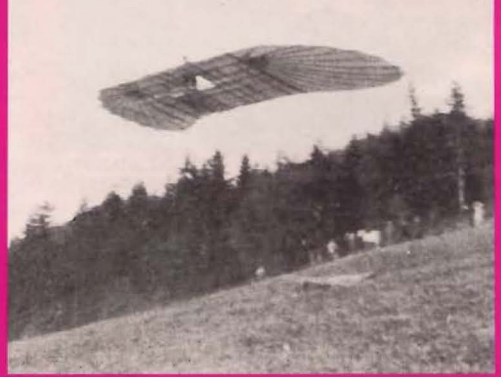


Montgomery launched by a hot air balloon in 1905. Pilot: Maloney.



Below: Etrich glider, Germany, 1906. Pilot: Wels.

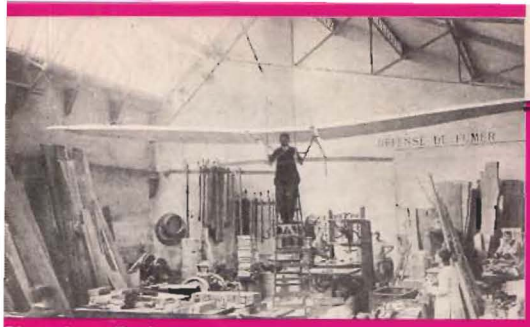




Above: Voisin glider, S. Africa, 1908. Pilot: Mansel. Below: Handley-Page, Barking, 1908.



MY EDWARDIAN GLIDING SCRAP-BOOK 1902-1914



Chauviere, Paris.



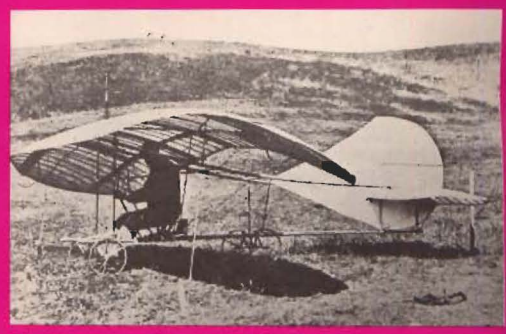
Gilbert, France, 1909.



Man-carrying box kite, *circa* 1912.



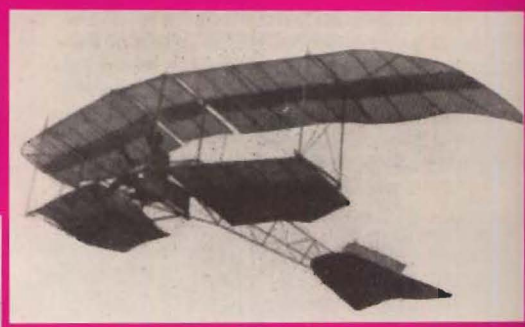
Lesh, New York.



Montgomery "Evergreen", 1911.



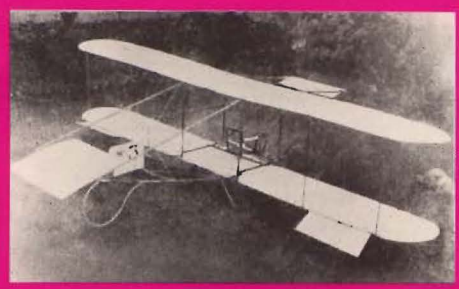
Aitken, Philadelphia Country Club, 1909.

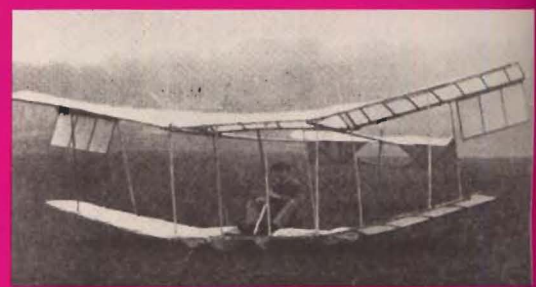


Gütermuth FSV-10, Darmstadt, Germany, 1912.

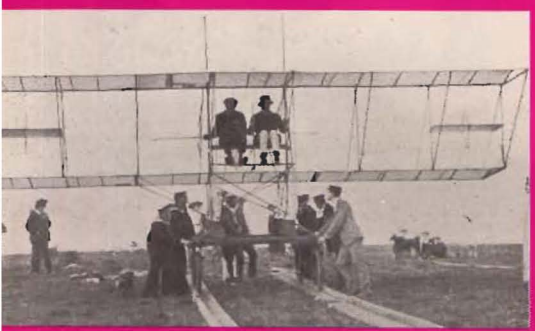


Leyat, France, 1909.





Above: Cooper No. 2, East of Scotland Aero Club, 1911. Below: Competition "Aviette", Parc des Princes, Paris, 1912.



Above: Porte and Pirie, Portsmouth, 1909. Below: Legasse, Toulouse, 1909.



Above: Bazin, France, 1910. Below: Witteman USA, 1910. Pilot: Hiram Maxim.







NO SMOKE WITHOUT FIRE

Mike Cuming takes a look at barographs and reports on a newcomer

I had a nasty feeling when I was asked to write something about barographs that I was letting myself in for a hard time. This feeling is now proven accurate and although I am now much better informed, it is only at the expense of much wear and tear on the nerves.

I have to confess at once that I am no great expert on barography and, apart from a hard won sort of expertise in smoking the things, have never had much desire even to figure out how they work. Diligent research, however, has lead me to the probable conclusion that the word barograph first came into use a long time ago (well before electronics were invented) and is derived from the conjunction of three other words. These are "bar" meaning that part of a gliding club where stories about lost height claims are told, or achieved claims are - rather less frequently - celebrated; "Oh-grr" meaning the noise made by a pilot who has just smudged his trace and "ph" being the sound made when blowing out burning tape in a hurry.

Interestingly, the Romans - generally quite quick on the uptake for things mechanical - had no word in their language for barograph, or indeed for its usual accompaniment, "hair-spray". Strange.

However, the black art of measuring height gains has now become more or less established and numerous devices have been sold to (or fabricated by) glider pilots ever since the concept of gaining height was first put about.

Most of these have involved a moving trace which is punched or scribed on by a delicate set of pressure capsules and levers, and most - though not all - have further involved intermittent calibrations, plus, of course, the careful preservation of the calibration chart. I don't dare offer a list of names in case I miss any out, but my researches indicate that there are simply lots of different models.

Some are clockwork and some are electric; some use ink that "won't freeze"; most require to be kippered before use and they all seem to be shockingly expensive. Oh yes, and they all seem to be a bit unreliable.

A few innovations have come about in recent years, coupled largely to other technological advances: you can get a recording of whether or not the engine is running in a motor glider, or when the photos were taken in a Comp, for example.

More recently, however, a new generation of totally electronic barographs is appearing, very much in parallel (although rather behind) the microprocessor-driven variometers and flight directors.

Such barographs offer a remarkable range of facilities (*eg* actually printing out the numerical values of high point and low point) and seem to be rather more accurate and less prone to temperature effects than their predecessors. Most important of all they don't need to be smoked, loaded, prepared, wound - or sealed!

"Not sealed" I hear you cry. "How can this be true? What a waste of £3 being an official observer if you can't recoup it in beer for sealing barographs! How can the BGA approve that?"

Well, the BGA hasn't. The BGA hasn't approved any barograph ever. There is in fact no such thing as a BGA approved barograph. Shocking news this: it certainly surprised me - the more so since I'd only just published an (incomplete) list of what I thought were approved devices in the BGA's own newsletter.

So I sought out Mike Sinclair (in his official capacity as BGA badge man) and asked what was going on. "Nothing" he said. "We don't need to approve barographs. We look at each claim on its merit. When someone sends in a claim on a new barograph then we'll look at that, too."

"So what do the 00s do? I demanded, still thinking of that three quid. "Well" Mike replied "they **unseal** barographs." This had me floored. How can you unseal something that doesn't need to be sealed? Eventually, however, and after careful peering at the rules, I came to realise that the pilot needs to convince one or more 00s that he has done the flight. The 00s sign the forms to help convince Mike. Mike checks it all to help convince the BGA Comps and Awards Committee and they endorse a claim in order to help convince the FAI if necessary. So it all boils down to trusting the official observers: and if you can get an 00 to endorse your trace then there's a good chance that you'll get your badge.

The primary concern seems to be "how obvious is the tamper-proofing?"

Naturally the barograph must be demonstrated to be both accurate and tamper-proof; the primary concerns in establishing this seem to be "how obvious is the tamper-proofing (*eg* sealing with gummed tape versus electronic sealing)?" and "how regularly have we dealt with claims from this device before (*ie* how established is the barograph)?"

I had hoped when first planning this article to set out a reference work on how 00s should handle, unseal and generally deal with the various makes. With the foregoing information in mind, however, it appears that the only cogent advice to 00s is to tell them only to unseal barographs that they understand. If, as an 00, you aren't entirely satisfied that the flight trace meets all the requirements of the **Sporting Code** then you can't endorse it.

This, of course, means that the established makers will tend to stay established while newer devices will have a hard time getting going. So a word about a new barograph.

There is one new electronic barograph that has a lot of novel features, not least of which is that it is **British.** This is the EW Electronic barograph made by Ed Davies and Wayne Richards (who happen to be Booker members); it is also the only wholly electronic barograph I know about, although there are comparable German and American makes I believe.

After much design work and many technical hurdles, Ed and Wayne have finally produced a very small (calculator sized) barograph that is both very accurate and yet simple to use. A small keypad allows you to check on the clock to see if it is correct, enter a reference number (perhaps your club membership number) and then, whilst flying, to enter any number as a point of reference on the trace.

The barograph will store multiple traces up to 30hrs in total and after landing the stored information is passed to a portable printer or to any Epson compatible printer. These printed traces can be reprinted any number of times unless they are wiped or overwritten in memory. The LCD display allows a display of time, date, altitude or user number along with flight information such as the highest and lowest points.

Because of the flexibility of the computer controlled printing system, height scales are automatically chosen to give the best visual scale dependant on maximum height. The time scale is chosen by the user dependant on whether he wants a very detailed printout or one of similar proportions to the Winter type trace. The option of a numerical trace is available - no longer will 00s have to decipher whether a trace is the required height, it will be written in black and white.

To make the more discerning pilots happy they have incorporated both a camera detect and motor detect pin. This makes automated gate starting possible. If you have a motor drive on your camera it's feasible to have a remote button in the control column to activate the camera/barograph. This could obviously lead eventually to fully computerised competition results with just the simple downloading of the EW Barograph to a personal computer and all the results would be calculated without all the human input that is required today.

Since the information from the EW Barograph is *via* a RS232 industry standard port, all the number crunching, analytical and standard type functions are done on your personal computer. Perhaps if enough clubs approached Ed and Wayne then a fully computer controlled accounts ➡

SOMETHING SPECIAL

Peter Foster, who suffers from multiple sclerosis, is now a member of the Shropshire Soaring Group. He flies mainly with Vic Carr in Vic's Twin Astir and writes about a 150km they shared in summer wave

Vic had landed at 5pm after a 300km triangle in his Kestrel 19 and then took me on a three hour flight to Bala and Vyrnwy in wave to 10000ft. We were launched to 4000ft by our Chipmunk and it took some time to get away, but Vic's persistence eventually put us into wave.

His technique for climbing into wave is to soar as high as possible in thermals then fly in the clear air in front of a cloud upwind of a cloudstreet. He "knits" his way in when the lift is intermittent and minute, repeatedly circling very very carefully and gently at modest angles of bank, occasionally flying straight to recover precisely the original position until a substantial rate of climb is established.

I looked upwind but couldn't make any sense of the jumble of clouds ahead. Vic said "Shall we go?" I said "Yes" - and we went! It takes courage to set off into the teeth of a 20kt wind over 3000ft mountains in 4 down at 60kt. He saw a gap in the upwind cloud and made for it. The decision was right, it was a wave cloud and sure enough the variometer was showing 4 up.

"You have it" said Vic and I climbed in the wave like a wind surfer until the lift slackened. Vic took control while I took photographs. It was breathtaking. We were scudding over the lower clouds with the upper wave clouds ahead. I did my bit of wave soaring in the next slot and Vic took us over the top of the Berwyn range of mountains.

Just ahead we had our first view of the primary wave. It was a long thin white cloud at 10000ft. My next wave climb took us to 7500ft and Lake Bala came into view. By now we were leaving the lower cloud way below us. Vic's next dash upwind took us to Bala town and we could see the whole lake spread out before us, capped by the primary wave cloud. We were now at 8500ft.

At this stage Vic was doing all the flying. We flew along looking at the lee of the wave cloud searching for a gap or saddle. It took us to the end of the lake to find one and behind it was the main primary wave.



Peter started flying in 1966 at Avro GC, soloing in a T-31. Later he joined Staffordshire GC and bought an Olympia 419 just before developing MS. Since then he has moved to Shropshire Soaring, is a country member of Black Mountains GC and has 360hrs in over 1000 flights and a Bronze C.

Going through would be a big gamble. The sink would be severe and there would be no second chance. Under us were the 3000ft Aran mountains so it was now or never. Even Vic was nervous in the Twin Astir with me on board. He plucked up courage and went for the gap. He didn't want to be caught in cloud at that spot.

We kept clear of cloud and shot out to the other side in 10kt up at 45kt right up to 10000ft - what a ride! Looking upwind you could see the high cirrus indicating the approach of the warm front that was the cause of the wave. Downwind all the stepping stones we had used to our present position were visible.

Now we were 75km from base. Vic, who was in shirt sleeves and feeling the cold, said "Fly me home." I flew us over Lake Vyrnwy to avoid the sink on to the Briedens near Oswestry and back to Sleap at 80kt with my ears popping.

LIFTIN' THE BLUES

I have to say at once that I was somewhat involved in the making of this film and we had such a great time it is difficult to be critical now.

The film is about the 1988 Standard Class Nationals and attempts to tell the story of the Comp while nonetheless explaining what it's all about. In this respect it is very successful, relating a coherent story that will hopefully interest not only newcomers to the sport but also existing pilots who may have no idea (or worse, ugly preconceived notions) of what competition flying is about.

On the basis that Booker provided about a third of the Nationals entries, I played my review copy in the Booker clubhouse and we had a fine time laughing at one another's poses. There are a number of obvious fake shots - like Justin polishing his own glider, or Gwen Garton sitting still - but the funniest bits are the interviews. Martyn Wells, viewed through a wide-angle lens looks exactly like Eric Morecambe while Andy Davis comes over as a cross between Beau Geste and Rambo. How embarrassing!

So - a laugh a minute for those who already know about Comps flying, and a well presented story for those who don't.

MIKE CUMING

(See the advertisement on p154 for further details.)

(Continued from p137)

system with automatic flight recording, tow release and account updating could be possible.

Such is the revolutionary step towards the future made by this sort of instrument that it, sadly, will probably take ages to re-educate people to change a lifetime of habits. No longer will it be merely a companion to your flying but a powerful and valuable aid. And it will certainly make flaring masking tape sacrifices a thing of the past.

The EW Barographs, priced at £357, are under evaluation at a number of sites and it will be interesting to see who is first to claim a badge - or a record - using one.

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By L. GLOVER senior inspector



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'DOC' SOUPER- A TRIBUTE

Norfolk GC's remarkable glider pilot – Dorothy Souper

One summer afternoon in 1961 a lady doctor returning from a house visit with her daughter saw a glider in the south Norfolk skies and followed it to its landing at Tibenham, home of the Norfolk GC. Although then aged 55 she saw the opportunity of realising her ambition of learning to fly. She asked about the possibility of learning and was assured that there would be no difficulty in giving her daughter lessons. Her reply "Not my daughter, me." evoked the usual sharp intake of breath from the male sexist and ageist members who wondered if perhaps at her age it would not prove too difficult, and her a woman at that. But they reckoned without the forceful determination of the doctor who turned up the following Saturday to enrol and take her first lesson.

So began the remarkable flying career of a remarkable lady who, happily, is still flying regularly at the age (the mathematical amongst you will have calculated) of 82. Dorothy Souper or "Doc" – as she is universally known even by other "Docs" in the club – is a legend in her own lifetime and an inspiration to all who do not subscribe to the view that life begins at 40 and ends at 45.

In 1961 flying at Tibenham was a fairly simple affair limited to autotow launching. Doc progressed quickly gaining her Silver badge in 1964 with an Easter Sunday flight which began rather unpromisingly with a back-release at 1000ft. A helpful passing thermal hoisted her to a reasonable height and she landed eventually in the Forest of Dean some 150 miles away. Retrieve crews were often grateful for Doc's practice of tethering her glider and running to the nearest main road chalking "GLIDER THIS WAY" at all the road junctions.

Doc has served the club throughout. She assisted financially with the purchase of motor gliders and was treasurer for 15 years when she was a fearsome defender of the club's financial interests as anybody who inadvertently forgot to pay flight fees will recall: "Oh Geoff, I have checked the flying log again and I think you owe 10p."

At 62, her power appetite whetted, she decided to take a PPL

Though essentially a glider pilot, she had her power appetite whetted by the Falke she had helped to buy and decided at 62 to take the full PPL, which she did in 1969 at Swanton Morley. Seething and Felthorpe. She held shares in an Oly 2B, a Skylark 4 and K-6 and now, as she is necessarily accompanied, a Bergfalke.

Stories of Doc are legion and have enlivened many a wet afternoon in the clubhouse. She is thought to be the only member to have rolled an aeroplane, a trailer (happily gliderless at the time but containing some surprised members hitching a lift back to the clubhouse in the trailer) and a towcar. This last is worth telling.

Doc was the driver and had complained that the safety wire cutters, mandatory in towcars, had been stolen by some irresponsible member.



"Doc" photographed at Tibenham by John Piper.

During the launch of our K-13 for reasons which have never been satisfactorily explained the car veered from its intended path and rolled on to its back. The co-driver jumped (or fell) out and was much exercised by the fact that Doc had completely disappeared. She was, after all, getting a little too old for that sort of caper. Running round to the other side of the car he was dismayed to see Doc's feet protruding from underneath the car but relieved to hear her cry "I've found the missing wire cutters, they must have been under the seat." Such is her casual disregard for her personal comfort.

During many gliding expeditions to Sutton Bank and elsewhere she astonished members by her wide knowledge of almost everything. Several pilots have been the beneficiary of her skill as an opthalmic practitioner. Wet day visits to country houses have revealed detailed knowledge of antiques and history.

Her flying is a model of economy. To Doc, height is purchased expensively and therefore height is money. Equally drag results in loss of height and, therefore, of money. No aileron is moved 1mm more than absolutely necessary and to arrive at the runway threshold with more than 2ft to spare is regarded as an unpardonable extravagance. On one occasion she over did it and landed short but as the wrathful CFI approched she was equal to the occasion and, drawing on her encyclopaedic botanical knowledge, diverted his attention to a rare species of plant which she happened to have noticed that very moment.

Although a commonly accepted sight amongst Norfolk GC members, visitors stand agape as Doc, tiny of stature, walks to her glider engulfed in a mountain of cushions, lead weights, parachute and handbag.

Is determined to continue to enjoy gliding and the company of another pilot

Following a hip replacement operation and increasing arthritis the club decided that it would be wiser for Doc to fly accompanied by another pilot. It was apparently not easy to find anybody willing to tell her, for Doc, normally forceful, can be formidable. Whilst accepting that decision she firmly believes the club's nerve failed before hers did though she now admits her arthritis can cause difficulties under turbulent conditions. Characteristically she has no thought of giving up and is determined to continue to enjoy both her gliding and the company of another pilot.

Surely she must be the oldest active glider pilot of either gender. Imagine, following her example, if y ou are but 55 you would still be flyinig in 2016. But what motivates her, what is her philosophy, what causes her to come out to Tibenham summer and winter alike, often on days when few venture from their firesides? Her passion for flying burns as brightly as ever but, in addition, she takes great pleasure in sharing the company of a gliding club and especially that of young people. She believes that as physical abilities inevitably decline, one should enjoy to the full those which remain. When young she scrambled over mountains; then she switched to the more sedentary but equally exhilarating adventure of gliding. At the age of 80 she sampled hot air ballooning.

We in Norfolk are proud of Doc as a wonderful example of all that is best in our movement. Never aspiring to the heights of Golds or Diamonds nor to the cut and thrust of competitive flying, she is a living example of the ideal member: safe, sensible, considerate and unselfish with a long record of service to the gliding community.

May we take this opportunity of reserving space in one of the 1997 issues of *S&G* for a celebration of Doc's 90th birthday, still actively flying?

The wrong choice!



Is something we all make at one time or another.

It can be very frustrating when you've committed yourself to whatever chore is top of the list, to find you have chosen the best day of the year (as everyone at the club will be delighted to tell you later!).

When it comes to glider insurance, it's fortunately much simpler, just contact Mowbray Vale.

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AMERICA

Trevor Foxen describes the joys of Calistoga



Trevor took this photograph of the site.

I picked up the wing and held it while the Pawnee took up slack. Nothing happened for a while then the canopy opened. "If you'd kindly put the wing down we can get going". Oh dear, lesson one - a very red face!

Via radio the signal is given and off goes the tug dragging one large tin ship plus the crew of three for a 40min survey of local mountains. Having flown there before I should have remembered the "on ground rules" are slightly different. Spot on 40min later the glider approached and landed in the opposite direction to take-off (no not downwind), did a ground run - on its tandem wheels - at probably 25kt and then turned and braked to a standstill in exactly the take-off position. The accident rate I was told was zero.

Calistoga is in the wine region at the end of NAPA valley and surrounded on almost four sides by mountains. The gliderport is a strip - actually an acute angled triangle with the base being the road end where offices, a hangar and most of the action is. Gliders are moored along the fence and the hangar has a goodly collection of various bi-planes and crop dusters/glider tugs.

My visit was a flying one but I intended to return for a week as soon as funds have recovered. The operation is professional and right away that removes it from the club scene. You make a reservation, turn up on time and fly. The costs are translated at $1.70 to the pound:

Instructor (£18); K-21 (£27); K-23 (£20); Grob Club 3 (£20) - all per hour; aerotow to 1000ft (£10), 2000ft (£4); 3000ft (£4.50); 4000ft (£4.50) and 5000ft (£5).

Estimates: zero experience to solo (said to be 12hrs dual) £900 and can be achieved at 14 years. From solo to PPL, including written FAA exam, £600. To convert from a power rating, but no further exams, approximately £180.

This may sound expensive and perhaps exotic to the average club pilot, but there are no hidden costs and it does away with hundreds of hours standing in the wet.

Now is this your idea of heaven?

A beautiful lady sat behind me - remember it's hot so no grotty jerseys or flying suits, just shorts and a T-shirt; mountains and vineyards all around; no fuss; slack is taken up and we were away with never a word spoken. At about 900ft we hit enormous lift and I pulled off. "What are you doing?", she asked. "It's a whopping thermal". "Well hardly that, but if you're happy scratching at 6 up OK."

I explained that anything over 2kt was very welcome

I managed to centre having been told to use bootfulls of rudder and eventually got 10 up and approval from the beautiful lady. I explained, to cover my embarrassment, that anything over 2kt was very welcome in the UK. "Gee whiz how do you ever get Silvers and Golds?"

On landing the visitor might wonder why there were no assistants on the field. Well after Alexander Schleicher has spent many hours smoothing the wings and doing amazing things to the tips, our friends at Calistoga hammer a ½in bolt through and put a great wheel on to save all that handling.

So what's the downside? It's a long way to go - San Francisco is the best point of arrival - but it is possible to combine other sporting activities and there are many places of interest. For more information, contact the Calistoga Soaring Centre, 1546 Lincoln Avenue, Calistoga, CA 94515, USA.

REPRODUCTION ANTIQUE



Expected to fly at this July's International Vintage Rally near Budapest is this modern reproduction of a 1940s Hungarian design, the pod-and-boom Vöcsök, seen here hangared at Hármas Határ Hegy, Hungary's first gliding site in 1922. Note the cut-away port side for ease of entry and egress of antique pilots too. Photograph and caption by Bob Rodwell.

TWO HONOURS

We congratulate Peter Saundby, an Air Cdr and the BGA's medical advisor, on being appointed as one of Her Majesty's honorary physicians. Also Dick Stratton, BGA chief technical officer, on his appointment to the Airworthiness Requirements Board for four years by the CAA.

NATIONAL LADDER

April and soaring already? News of a rather splendid nature from Dunstable which dispatched an ASH-25 to within 12 miles of Ireland on a little 440km jaunt in January. Big stuff in March also with a very impressive 80km/h 300km from Edward Downham in a Libelle. Alas, all were undeclared.

The National Ladder is easy to contribute to and gives many people a chance to compete in a low key but widely based competition. If there is anyone keen to help by becoming a ladder steward for their club, please contact me at 77 Holland Pines, Great Hollands, Bracknell, Berks RG12 4UZ, tel 489913.
Ed Johnston, *National Ladder Steward*

Open Ladder

Leading Pilot	*Club*	*Flts*	*Pts*
1. I. M. Stromberg	Yorkshire	4	3096
2. E. Downham	London	4	2286
3. M. Carter	Yorkshire	2	1750
4. A. P. Hatton	Yorkshire	2	1620

Club Ladder

Leading Pilot	*Club*	*Flts*	*Pts*
1. D. Taylor	Yorkshire	3	1344
2. P. Holland	Yorkshire	2	1260
3. J. Birch	Yorkshire	1	500
4. B. Shaw	Yorkshire	1	360

DOC SLATER's LIBRARY

Doctor Alan Slater was part of the history of gliding in the UK. He was one of the first British glider pilots, a vice-president of the BGA and a supporter of every aspect of the sport; but perhaps his most important contribution was as the editor of *S&G* from 1933. On his death in October 1987 he bequeathed his collection of books on gliding and general aviation to the BGA and they are now housed at the Leicester office together with a large number of papers. The English language books on gliding (about 200 titles) have now been catalogued but the foreign language books and those on aviation have yet to be dealt with.

There is excellent coverage of the early history and development of gliding up to about the 1960s but there are very few titles from 1970 onwards. Books from the last two decades including those by Ann Welch, Derek Piggott, Bill Scull and even Philip Wills are hardly represented. These are just the years when many of our senior pilots were buying gliding books as they were published and it occurs to me that if some of these could be given to the BGA we could add them to Doc's collection and build the library up to a most useful facility.

We would be very grateful to receive books on gliding, and indeed books and papers on aviation generally. Space on the shelves is limited so we must be selective but I would be happy to have lists of material which people are prepared to donate. Please write care of the BGA office.

For the time being the collection will be kept at Leicester but it may be that at some time in the future it would be best housed with a comprehensive collection of books and papers, perhaps even with a museum of gliding.
Joan Cloke

BRITISH TEAM FUNDING

I have just got back from a short overseas holiday; I find that in my absence I have been tasked by the Executive to provide a quick note to explain recent changes in the way the BGA will fund our national team. After four years on the Executive I should have known better than to miss a meeting!

The more financially or constitutionally aware will no doubt have regularly scanned the club noticeboard since Christmas waiting avidly for the appearance of the BGA AGM agenda and later the minutes; if you fall into that category read no further for what I am about to write will be old hat!

The problem is how to raise the considerable sum of money required if we are to compete successfully at international level. It is not a new problem, it has been with us for at least twenty years to my certain knowledge.

It was, I think, in 1981 that we tried to address the problem with the present *per capita* levy of 50p. This raises £5000pa and though helpful, falls a long way short of the £75000 it cost to send the 1987 team to Australia. We have of course been generously supported in the past by the Sports Council and this year we have been allocated some £20000 for that purpose. But the very nature of Government finance with its system of annual allocation means that you can never be sure until the last moment how much will be allocated and when it is likely to be available. The team manager and the Competitions Committee have also vigorously pursued sponsorship - with some notable success. But we have not yet succeeded in attracting sufficient commercial money for the guaranteed period necessary to allow for effective planning and the commitment of resources.

Lastly, the nature and cost of preparation for Internationals has changed. The competition is tough and serious contenders believe that taking part in the Pre-Worlds and the European Championships is essential experience on the road to becoming a World Champion. Historically, our record is good, with British World Champions in 1952, 1956, 1976, 1978, 1981 and 1987. We can do ever better, but only with sufficient money to plan, select and train effectively. The Junior Nationals are an essential part of this development plan.

The Competition Committee wrestled with the problem of raising such a sum of money for months. At the very end of 1988, the committee recommended an increase in the *per capita* levy from the present 50p to £2. The Executive reluctantly accepted the need for this sizeable increase and accordingly put the following resolution to the 1989 AGM.

5. To consider and pass, if thought fit, the following resolution:

"That the element of the annual subscription paid by member clubs to the BGA for the purpose of providing some of the funds for British representation at the bi-annual FAI World Championships shall be extended for funding British representation at the Pre-World Championships and the official European Championships; and

the element of such annual subscription for the above mentioned purposes shall be up to £2.00 per member (as defined by the BGA in its membership renewal documentation) per annum with effect from October 1, 1989; and the funding so generated each year shall be administered and accounted for having regard to the anticipated net expenditure requirements on British team squad and British team representation over a period of time covered by the next two World Championship events following the end of the financial year in which the income is raised."

This resolution has been submitted by the Competitions and Awards Committee in order that the BGA may:

(a) Continue to and enhance support for British representation at official FAI World Championships; and

(b) Provide reasonable financial support for the sending of British team squad pilots to the Pre-Worlds Championships and the offical European Championships; and

(c) Maintain a policy of pilot selection on the basis of merit for the British team squad and the British team for each of the above mentioned Championships.

No club representative spoke against the Resolution and it was subsequently carried with an overwhelming majority. The effect of this will be to raise some £20000 a year which together with Sports Council Grant, sponsorship and personal contributions from team members, should be adequate for the purpose I have outlined. To reassure those who might imagine that we are about to embark upon a policy of highly subsidised flying for team members, let me emphasise that their personal contributions will remain at the present high level.

This increase will of course bear heavily on clubs, but the benefits to the gliding movement as a whole are substantial. These range from the quality of the aircraft we fly to the prestige and influence which are generated. These are important to Government bodies and to the public at large.
Don Spottiswood, *BGA vice-chairman*

VHF RTF CHANNELS

The CAA have reported two areas of misuse of VHM RTF channels:

1. Transmitters left in the transmit condition; for instance handsets/headsets stowed so that the transmitter switch is permanently depressed, objects placed on a desk type transmitter switch causing inadvertent operation and hand portables discarded while still switched on.

2. RFT channels used outside the planned range/height limits.

They ask pilots to make sure the transmitter is switched off when not in use and confine contact with a ground radio station for normal operations within the range and height limits applicable to the service.

WORLD DIRECTORY

The BGA are distributing the World Soaring Directory in the UK, see advertisement below. It is available from the BGA sales department at £5.00 including p&p.

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PHILIP WILLS MEMORIAL FUND

The Trustees met during the BGA Conference and decided to draw clubs' attention to the small amount of capital available in the fund for loans towards the acquisition of land or buildings. There is currently some £10-12000 available which would hopefully make two separate loans to gliding clubs - the loans are usually for a period of not more than 10 years, repayable in equal annual instalments and

BGA ACCIDENT SUMMARY –

Compiled by JOHN SHIPLEY, Chairman, BGA Safety Panel

Ref No.	Glider Type	BGA No.	Damage	Date Time	Place	Pilot/Crew Age	Pilot/Crew Injury	Pilot/Crew Pl/Hrs	Summary
12	Grob G109	M/G G-ROBB	W/O	4.7.88 1430	Eaglescott P2	63 73	N S	193 0	**Late 1988 report.** This was a reportable UK motor glider accident. The aircraft touched down too far down the runway so the pilot initiated a go around. The pilot realised he would not clear the boundary hedge so cut the power before hitting it, substantially damaging the aircraft and injuring the passenger's back.
13	Bocian 1E	1605	N	27.11.88	Strubby P2	55 35	N N	180 0	After a normal landing P1 noticed that no up elevator was possible. The glider had previously flown several uneventful sorties. The tail was removed and a 4in piece of 3/16th plywood was found to be jamming the elevator bell crank. The origin of this could not be identified although it may have been a packing piece from a past repair.
14	Bocian 1D	3345	M	11.11.88 1550	Keevil	48	N	110	At about 600ft in the launch the rear canopy opened and detached. The pilot released at 800ft and made a normal circuit and landing. In spite of the pilot remembering checking the canopy before launch, no fault was found with the mechanism.
15	K-6CR	2259	W/O	31.12.88 1200	Rufforth	44	S	13	During mixed aerotow and winch operations the tug pilot noticed adjacent cables so, after pointing them out to a club member, taxied forward some 25ft to ensure the glider was clear. However, during the take-off run the cable caught in the tail skid of the glider and at 300ft the pilot released. The nose went down and the glider rolled and crashed.
16	SZD Puchacz		S	17.9.88 1720	Feshiebridge	40	N	15	**Late 1988 report.** The visiting pilot was briefed to return from the hill if the cloud was on it. With cloud on the hill it is thought that he ignored, or was distracted by, the radio message to return. The glider was found belly flopped into the side of the hill.
17	Blanik	1826	W/O	1.1.89 1046	Waldershare Park P2	54 28	S M	620 2	After a simulated cable break at 300ft P2 turned left rather than land directly ahead. P1 then expected a S turn but realised too late that P2 intended a full turn. Over woods, P2 overbanked and the glider entered an incipient spin. P1 took over, recovered, but was unable to prevent a crash into the trees which cushioned the impact.
18	Olympia 460	1242	S	17.12.88 1400	Pen-y-Parc	52	M	18	The weak link broke at about 200ft on the winch launch as the pilot rotated into a full climb. Instead of landing ahead the pilot was seen to fully extend the brakes and do a circuit to the left. As a result the glider hit the ground in the turn with the brakes still out. He may have pulled the brakes instead of the release when too fast on launch.

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P.S. Order in advance for Tom Bradbury on Meteorology and Flight at £12.95 plus 50p post. Available this summer and bound to be a gliding best seller.

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BGA WEEKEND CONFERENCE

We went to Gloucester for this year's BGA Weekend Conference – February 25-26 – where the Bristol & Gloucestershire GC were excellent hosts at the Gloucester Hotel and Country Club.

More than 180 were at the dinner where Sir Peter Scott was a delightful, entertaining guest speaker, and the conference and exhibition attracted more than 250. Sir Peter had a very successful involvement in gliding, becoming National Champion, League I, in 1963 and BGA chairman for two years from 1968. He remains a BGA vice-president.

Lady Scott presented the annual trophies which were awarded as follows: **Seager** cup (longest two-seater flight), Tony Parker and Trevor Wilson (Cotswold GC) for a 306km triangle in a SF-34 on August 16; **Frank Foster** trophy (fastest declared 500km closed circuit), a 517km triangle on May 20 at 79.61km/h; the **Manio** cup (fastest declared 300km), 309km quadrilateral on May 21, both in a Discus, and the **Enigma** trophy (first place on the National Open Ladder), Andy Davis (Bristol & Gloucestershire GC); **California in England** trophy (longest distance by a female pilot), Jane Nash (Kestrel), a 410km on May 21 in a PIK 20; **Wakefield** trophy (longest distance flight originating in the UK) and the **Volk** trophy (longest O/R), Chris Garton (Surrey & Hants) for a 570km O/R to Wakefield on May 20 in a Discus; **John Hands** trophy for services to competition gliding, Ken Sparkes for many dedicated years as competition director of Enstone Regionals; **Du Garde Peach** (National Club Ladder), Chris Starkey (Surrey & Hants); **Slingsby** trophy (second position on National Club Ladder), Derek Westwood (Coventry) and the **Firth Vickers** trophy (second place on the National Open Ladder), Trevor Stuart (London GC).

At the AGM the BGA chairman, Ben Watson, presented the BGA diplomas. Dudley Steynor's citation was for encouraging and instructing at Booker for longer than anyone can remember and in particular for his special ability to teach well even the most nervous of pupils. Tony Segal of Lasham was praised for his painstaking work on cockpit safety, back protection in particular, and for devising practical, simple and cheap improvements so quickly. John "Paddy" Hogg is retiring as manager of the RAFGSA Centre, Bicester after 32 years in the RAF. He was described as a renowned scratcher in low lift, a patient instructor and a tactful, resourceful manager who had won a wide circle of friends through his unfailing courtesy, dedication and sense of humour.

Chris Simpson was presented with an award by Ben on behalf of the British Parachute Association for his work for sporting aviation generally and in particular during the hire and reward CAA negotiations.

There was an election for Executive places which went to John Cadman, Keith Mansell, Roy Proctor and Paul Steiner.

19	K-13	2734	N	30.12.88 1130	Stafford Cross P2	54 64	N N	363 34	The two-seater was making a practice field landing into a known field in good visibility and calm conditions. P2 failed to see power cables on the approach and P1 failed to take control in time to stop the glider's main wheel hitting and breaking the cables.
901	Karman JP15 3AR		?	29.1.89 1515	Dishforth	0	N	?	**AAIB initial notification.** The glider undershot the runway and struck a marker board with a wingtip.
902	Chipmunk 22	G-BCCX	M	14.1.89 1300	Dishforth	52	N	522pwr	**AAIB Bulletin 3/89.** While lining up for the next tow the tug pilot crossed the take-off run centre line then turned into wind. The tug pitched slowly nose down despite the throttle being closed and an unsuccessful attempt to release the brake, and the propeller contacted the grass. Forecast wind was 260 at 15-20kt gusting 40-50kt.

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

The conference had a good mix of subjects from new sailplanes to travellers' tales with a particularly interesting discussion of gliding topics lead by Brian Spreckley, our World Champion. Michael Bird's expertise as the conference chairman kept the programme running at a brisk pace.

As well as the exhibition with 17 stands, the Stemme 10, DG-400 and DG-600, were rigged in the grounds.

It was a time for talking, exchanging ideas, meeting old friends and being updated on current thinking and trends and this conference must rate amongst the best.

FAX MACHINE

S&G's editorial office now has a fax machine operating on the main telephone line, No. 0223 247725.

GLIDING CERTIFICATES

ALL THREE DIAMONDS

No.	*Name*	*Club*	*1988*
257	Dobson, J.	Clevelands	30.7
258	Mitchell, T. M.	Fenland	29.1.89

DIAMOND DISTANCE

No.	*Name*	*Club*	*1988*
1/376	Dobson, J. B.	Clevelands	307

DIAMOND HEIGHT

No.	*Name*	*Club*	*1988*
3/870	Taverner, J. G.	Clevelands	29.1
3/871	Crabb, P. G.	Coventry	29.1
3/872	Newmark, P.	Burn	29.1
3/873	Heaton, S.	Yorkshire	5.2
3/874	Booth, D. A.	Coventry	5.2
3/875	Mitchell, T. M.	Fenland	29.1
3/876	Swales, A. W.	York Gliding Centre	30.1

(Five heights were flown from Dishforth, one from Sutton Bank and one from Rufforth.)

GOLD BADGE

No.	*Name*	*Club*	*1989*
1289	Smith, S. M.	Cambridge Univ	9.10.88
1290	Wesley, J.	Coventry	29.1
1291	Pozerskis, A.	Coventry	29.1
1292	Mitchell, T. M.	Fenland	29.1

GOLD HEIGHT

Name	*Club*	*1989*
Oram, S.	Shalbourne	29.9.88
Smith, S. M.	Cambridge Univ	9.10.88
Mills, A. M.	Bannerdown	29.12.88
Wills, G. R.	Coventry	5.2
Crabb, P. G.	Coventry	29.1
Wesley, J.	Coventry	29.1
Pozerskis, A.	Coventry	29.1
Miller, J. R.	Wolds	29.1
Eckley, D. M.	Black Mountains	27.9.88
Houghton, K. G.	Shropshire	5.2
Storry, J. G.	Strubby	27.2
Mennell, B. R.	Clevelands	4.3
Mennell, G. R.	Clevelands	4.3
Fellis, M. A.	Northumbria	5.3
Thomas, G. E.	Coventry	4.3
Mitchell, T. M.	Fenland	29.1

SILVER BADGE

No.	*Name*	*Club*	*1989*
7823	Thomas, G. E.	Coventry	30.12.88
7824	Evans, W. J.	Vale of Neath	8.2
7825	Jones, C.	Coventry	29.1
7826	Taylor, N. A.	Coventry	29.1
7827	Stuart-Menteth, O.	Bristol & Glos	12.2
7828	Clements, K.	Northumbria	28.12.88
7829	Collins, D. B.	Trent Valley	5.7.87
7830	Shaw, P.	Burn	16.2

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CLUB NEWS

Copy and photographs for the August-September 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 June 6 and for the October-November issue to arrive not later than August 8.

GILLIAN BRYCE-SMITH
April 5

ANGUS (Arbroath)
The usually bad months blessed us with soarable weather although recently we have been plagued with wind and rain.

The annual dance and prizegiving on March 31 marked the start of our flying week. Both were highly successful with prizes awarded to Carol Horribine (club ladder), Moira Haxton (most improved pilot), Boyd McLaren (best flight) and Hugh McKenzie (best duty pilot).

Visitors are always welcome.
J.S.

AQUILA (Hinton in the Hedges)
At our well attended annual dinner, Martin Bell was awarded the Jim Wright cup for contribution and effort and Bob Murray the Most Improved Member's cup. Martin is now an assistant Cat and Bob has gone solo.

At the AGM a slightly changed committee was elected with Duncan McKay welcomed back as CFI - our thanks to Ken Jarman for his help and encouragement as CFI.
J.R.

BANNERDOWN (RAF Hullavington)
The following awards were presented by Jane Jones at our AGM: Club cup, Harry Nerain (best *ab-initio);* Mike Parkin tray, Andy Mills (most promising beginner); Dawson trophy, John Joiner (support work); Navigation cup, Jon Arnold (landing out on the first leg on a 500km day); Colerne cup (best flight, with a 500km), Britton trophy (most progress), De Havilland trophy (greatest height gain) and the GSA Ladder trophy, Mel Dawson.

Simon Hutchinson and Andy Smart also won GSA awards for their performance in the Standard Nationals and Inter-Services Regionals and Tom Eagles the George Lee trophy for the highest placed GSA pilot in his first Nationals.
D.C.F.

BICESTER (RAFGSA Centre)
Congratulations to Jim Forbes on going solo on Easter Monday and to Ken Miniet on his Bronze badge.

The Vintage Glider mini glide-in was a tremendous success at Easter with flying each day. Many thanks to the organiser, Harry Chapple, and helpers, also Shas Stephenson for yet another splendid party and disco.
M.H.

BOOKER (Wycombe Air Park)
The Junior Nationals (starting on August Bank Holiday weekend) is going to be lots of fun. There are already several team entries, *eg* University College London who have booked the BGA Janus for the week (plus Chris Rollings as P1).

The debate surrounding the relative merits of "casual" (versus "group") gliding (see the last issue, p78) seems likely to be a long one - meanwhile if you want to do casual gliding just drop in at Booker. Any time.
M.F.C.

BORDERS (Galewood)
Congratulations to John Romanes on going solo - he now needs a Bronze badge to fly his syndicate SHK!

We were badly let down having agreed to buy a second Bijave from France. Phil Allard took the trailer to collect it and was first told that the price had gone up by £1000 and then that the glider was no longer for sale. We feel this was disgraceful treatment and have complained to the French authorities.

We are hosting another instructors' course and hope to have several new instructors by the time this is printed to help with our summer evening courses and ease the load on the others.
A.B.

BUCKMINSTER (Saltby Airfield)
Our Scout has been replaced by a Rallye and the winch is back after having new oil seals and a service. With two club two-seaters and two single-seaters, the use of the Nottingham University Blanik and syndicate aircraft, we hope to keep them busy.

Courses started on May 8 with our instructor from last year. We are again flying every day, alternating the courses with club instructional weeks and trial instruction lessons.

Successes since our last report include instructor and AEI ratings, badge flights and first solos. Bronze badge lectures by Rob Cook, CFI, and Frank Cox, chairman, have been enthusiastically attended.

Visitors are always welcome but prior warning is appreciated at mid week. Our entrance is on the road between Skillington and Sproxton.
A.B.

CHANNEL (Waldershare Park, Dover)
There have been longer flights than usual in February and March. Congratulations on going solo to Peter Davis and to Nic Silk on a Bronze leg.

There was an enthusiastic welcome for our first club single-seater and the return of the Falke. A hangar for the T-21 will ensure its use even more this year.

We have weekday flying by arrangement and our numbers have increased with one day courses proving to be a popular introduction to gliding.
N.J.S.

CLEVELANDS (RAF Dishforth)
The mild westerlies have given an almost continuously flyable (and soarable) winter. Congratulations to Gary McKirdy on going solo, Steve Harper on Silver height and Neil Goulding on Gold height.

The Mennell team (Brian and son Gary) managed their Gold heights on the same day and two members have made multiple badge claims - Vince Suttle took time off from his sterling work in the bar to do his first solo and Silver height, while Jim McLean gained his Bronze badge and Silver and Gold heights all within a week.

We have a third and more powerful winch together with a smart new bus for tea duties. Our vintage yellow bus, so long a landmark for students' circuits, will be pensioned off - still running, but in need of cosmetic attention. Any offers?
J.P.

CORNISH (Perranporth)
Although a fairly quiet winter, durations were achieved by Tom Cullen, John James and Dick Gillow. Congratulations to them and to Julian Davey on going solo.

The AGM on March 4 was well attended with the CFI's cup for all-round flying efficiency going to Martin Keer.
G.A.H.

COTSWOLD (Aston Down)
Excitement in March when a burglar, apprehended in the early hours by the bunkroom occupants, baled out through a plate glass first floor window, landing on a car. He made off with about £2 coffee money but we reckon he felt pretty cut up by the experience!

Congratulations on going solo to Chris Suraway, Stan Prezleski, Rupert Maddox, Patrick Hand, Nick White, Ted Walker, Michael Rouse, Robert Horton and on re-soloing to Martin Clark and John Allan; Erik Black on his Bronze badge and Ray Brown and CFI Ruth Housden for Diamond heights at Aboyne.

Trevor Wilson and Tony Parker were awarded the BGA Seager cup for the longest two-seater flight, a 306km in the club's SF-34 (see BGA News). At the annual dinner-dance they also received the Best Two-seater Flight pot; Tim Macfadyen the Ladder trophy; Paul Gentil the Best Flight cup; Ken Lloyd the Height Gain trophy; Erik Black, the Ron Hurcombe trophy; Ruth Housden, the Housden 100km pot and Fraser Wilson the Best Pre-Silver cup.
G.M.

CRANWELL (RAFGSA)
Congratulations to John Lawson on becoming our first AEI. The first hour off the winch was flown on January 7.

A small expedition went to the Long Mynd at the beginning of April. We are planning a fun Comp for the May Bank Holiday weekend. Meanwhile we wait patiently for a glass-fibre two-seater having to borrow Syerston's Grob Acro to convert early solo pilots to the Astir. Thanks Syerston.

A contingent is venturing to the Inter-Services Regionals at Roanne in July with the Janus on tow.
B.S.

DARTMOOR (Brentor)
At a well attended EGM in March members decided that after six years' effort professional help was needed to allow us to expand and a bank loan was vital to make improvements to our field. The priorities will be an all weather track the length of the main runway with glider turning circles at each end, and the erection of a large hangar, though its position will have to be approved by the National park authority.

We have been labouring on the moor to recover a five mile length of well built fence which

our entrepreneur in chief, Brain Cordier, bought for a derisory sum and which we will store for future use.

Meanwhile members do get a rest from all the field labour by flying at Perranporth.
F.G.M.

DEESIDE (Aboyne)
The airfield faired well in the February hurricane with only one trailer rolling and a torn windsock. Strong winds have been frequent recently but so has strong wave.

The Easter week produced a good crop of badge claims - four Diamond heights, lots of Golds and a 5hrs, not to mention several other flights over 20000ft. Unfortunately we were down to one tug for several weeks due to engine damage.
D.S.

DERBY & LANCASTER (Camphill)
At our annual presentation of trophies we applauded the achievements of two pilots in particular - Mike Armstrong for his cross-country flying and Alison Wheeler for gaining her Silver badge whilst pregnant - a unique achievement perhaps? Other awards went to Dave Smith, Steve Carver, Mike Grundman and Clive Wilby.

This Easter Tim Robson achieved Diamond height and Gold heights were gained by Peter Wills, Bob Carlisle, Chris Williamson, Elaine Carver and Tom McKernan.

The courses have started and our manager, John McKenzie, is organising seven day week flying. The task week is from June 26-30. Visiting pilots are welcome - contact John on 0298 871270. Also we have four new instructors.

We welcome a new K-6 syndicate - Angie Johnson, Peter Oliver, Harry Krebbs and Andy Hodges.
E.C.

DEVON & SOMERSET (North Hill)
Due to Tim Parsons's illness he has handed over as CFI to Chris Miller with Les Hill as DCFI. There is doubt that Tim will be able to fly again and for the time being we have lost a first class CFI and a great gliding enthusiast. We all wish him well.

We are extending the side of the main hangar to house winches and tractors.

Wet, windy weather has limited flying but Dave Reilly (Libelle) flew to the Mendips GC, taking 5hrs 2min - a determined effort!

Our training programme continues with several *ab-initios* waiting for course places.
E.C.W.

EAST SUSSEX (Ringmer)
We had a happy if muddy winter with a steady diet of winch training spiced with aerotowing by courtesy of the Tiger Club. The K-6 is back in service and new arrivals are a third K-7 and the beginning of a larger clubhouse.

At the AGM Ian Smith became CFI and Barry Weller chairman, releasing the outgoing chairman to spearhead his attack on the mud.

Congratulations to Ian Bull, Barry Laker, Bill Nicholson (AEI); Steve Barter and James Edwards (Bronze badge); Pat Broad, Kevin Kirkham, Malcolm Sparshott (going solo) and James Edwards (re-soloing) and getting his BGA inspector's ticket.
L.M.

Obituary - Graham Pratt
It is with great sadness that we report the untimely death of Graham Pratt from stomach cancer in January. Graham was a hard-working senior instructor and our safety officer. He had been a member of the club for a decade and prior to that an instructor and tug pilot at Lasham.

Graham was universally liked and respected, well known for his ability to scratch away in the merest suggestion of a thermal and our most experienced cross-country pilot. He was also one of the most decent human being we have known. He will be sadly missed and condolences are extended to his wife and two children.
R.S. & J.E.

ENSTONE EAGLES (Enstone Airfield)
At the AGM in March Tom Miller, Jonathan Smith and Roddy Maddocks joined the committee, with the regretted retirement of Frank Burgess to Wales. Chris Richards is vice-chairman. Ken Sparkes, chairman, reported on our increasingly healthy state and vigorous growth. After several years, inflation has meant increasing the annual subscription by £10 and the launch fees by a small amount.

After a considerable amount of work, discussion and bargaining by the site sub-committee, it is with great relief that by the time this is published we should have the exclusive flying rights over the grass strip.

We expect that aerotows by our two tugs will be off the grass strip with the runway for autotows. Visiting pilots should note that virtually all take offs and landings are east/west off the main runway or the grass strip. Glider circuits are always to the south and power to the north.

Congratulations to Tom Miller on his full Cat and Keith Millar on his assistant rating. Our best wishes to Mark Gurney-Coombs on becoming a tug pilot at Le Blanc. Roger Teaves has set up a club ladder.
R.J.P.-B

FENLAND (RAF Marham)
Martin Pike used the early spring thermals to gain his Bronze legs. Dave Manning has gone solo and Len Bircham has become our first AEI. We also congratulate Rhod Evans and Colin Elliott on their full Cat ratings.

Paddy Hogg and Vic Dawson visited us from Bicester with the motor glider - our thanks to them for a very successful weekend.
N.J.T.

HEREFORDSHIRE (Shobdon Airfield)
We have had continual flying this winter with a number of excellent wave days culminating in many good gains of height, the latest being Ossi Vaughan's Gold height with a 15000ft climb.

We are running courses during July and, if there is enough demand, into August. Members and private owners will be welcome.
B.S.

HUMBER (RAF Scampton)
We welcome back from the Falklands Clive Joosse and David Maggs.

Steve Ashton has his second Bronze leg and Anne Buxton, John Dyer and Al Hoy (a Red Arrows' pilot) went solo. John Dobson now has all three Diamonds having eventually had 500km in France accepted.

Club News Reporters. ***If you are sending in handwritten copy, please print all names. If there are some strangers mentioned in your reports, it's because we had trouble deciphering the writing.***

The launch rate is steadily rising but we are short of members.
K.M.G.

KESTREL (RAF Odiham)
Peter Charnell was elected CFI with Steve Nash as DCFI at our AGM in February. Congratulations to Jane and Steve Nash, Chris Wick and Bob Davis who received annual awards. Jane was also awarded the California in England trophy at the BGA Conference (see report in this issue).

Fred Field and Tom Russell have gone solo.
J.N.

MIDLAND (Long Mynd)
The course season is well underway and we are organising courses for mountain flying at Sisteron, France in June under the leadership of John Stuart.

Paul Shuttleworth (Skylark 3F) gained Gold height from the site in wave on March 26 as well as flying 200km.

Our mobile workshop greatly assisted Ron Hawkes with the winter C of A programme enabling him to complete work on an increased fleet earlier than last year.

Louis Rotter and John Docherty are going on assistant rating courses to help on the weekend rota. Our task week is from August 19-28.
R.D.

NENE VALLEY (RAF Upwood)
Congratulations to Doris Bryant and Richard German on going solo. The Bronze badge course had an interesting visit to RAF Alconbury's Met office, kindly arranged by our president, Dan Honerbrink.

The annual dinner-dance in March was very successful, thanks to John Taylor's organisation.

The custom built two drum winch will soon be completed. We are organising another flying course for the Army at Bassingbourn.
A.H.

NEWARK & NOTTS (Winthorpe)
We have started flying again after our shut down on November 5. Everything has either been rebuilt, repaired or repainted and new on site are two SF-27s, an ASW-15 and a Pirat.

Congratulations to Dan Goldsworthy and Melvin Frost on resoloing and to Mike Abrahams, Roland Carver and Frank Hunt on their Bronze badges.

Stan Denner and Ray Mackay have retired as chairman and secretary respectively. We thank them for their grand work and welcome their successors, Mike Davies and Shirley Maddex.
M.A.

NORFOLK (Tibenham)
The annual dinner-dance on February 4 was much enjoyed with Ben Watson (BGA chairman), Bill Scull (BGA director of operations) and Dick ➡

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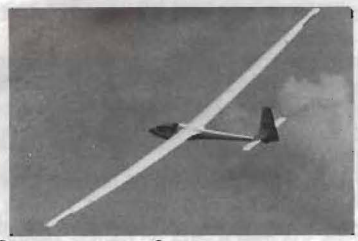
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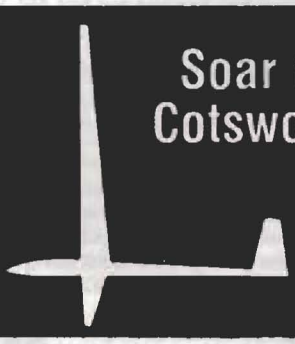
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Stratton (BGA chief technical officer) as guests of honour.

Jenny Everett and Richard Harrowen received the award for the longest retrieve - 300 miles to Holywell in North Wales to collect Alf Warminger, our president, who was on a 400km speed record attempt.

We were hosts to the BGA Regional Conference on February 5 when female members prepared lunch, helping to make it a most successful day.

Several members have their AEI ratings and congratulations also to John Lancaster on his MGPPL.

The Motor Falke is looking very smart after a respray and major overhaul.
G.E.

NORTHUMBRIA (Currock Hill)
The first months of 1989 have produced excellent wave. Martin Fellis climbed to 13500ft in the Skylark 2 for Gold height and on the same day our chairman, John Graham, gained the same height from a winch launch but unfortunately without a barograph. Many pupils have enjoyed wave flights from 6000 to 8000ft.

Bill Fuller is re-covering the K-8 and the three K-7s are being made ready for the course season.
R.D.

OXFORD (Weston on the Green)
The mild weather has meant more flying than usual at this time of year. Howard Stone, Andy Butterfield and Maggie Roberts have gone solo.

Our T-21 "Daisy" is to have an engine fitted to make it a self-sustaining motor glider. There is an expedition to Talgarth in June.
F.B.

PETERBOROUGH & SPALDING (Crowland Airfield)
Our annual dinner was a great success with prizes going to Ray Hall (longest cross-country from Crowland); Frank Nixon (CFI's cup) and Mick Wright (most horrendous retrieve). Jonathon Chapman won the wooden spoon and the newly created Field Landing trophy by demonstrating great flair and style combined with an element of exhibitionism when, in full view of everyone, he performed a textbook landing in an adjacent bean field.

We thank Mike Jefferyes and Chris Rolands for running an AEI course. John McLoughlin and Mark Wilson have gone solo.
M.J.

PHOENIX (RAF Brüggen)
We continue to attract as many *ab-initios* as we can accommodate. Our regional examiner, Chris Heames, has put Peter Heys through his full rating checks.

The Sisteron expedition has already resulted in a Diamond climb to 27000ft for Bill Gibson (ASW-20) and 5hrs for Simon Waterfall.

The Motor Falke has had a major service and is resplendent in a new coat of paint.
P.J.H.

PORTSMOUTH NAVAL (Lee-on-Solent)
The Easter *ab-initio* course went well with several solos and re-solos from the 35 students.

Our AGM was a great success - we are flourishing and improving financially as well as in achievement. The following trophies were awarded: Corner cup, Derren Francis (most improvement); Courage cup, John Hale for being an outstanding instructor; Goodhart trophy (flying achievement), Bruce Lincoln and Mike Budgen the Peter Sharp trophy and Marc Morley the Humphry Dimock trophy, both for unstinted contributions.

Edna Clark and Peter Davis were given life memberships in recognition of many years' valuable service.

A more recent "adventure" in aid of Children in Need was an airborne streak in the primary glider. Unfortunately the hero can't be named - it could be misconstrued as conduct unbecoming an officer and a gentleman. The video is not for sale. Nice one Brian.
H.C.

RAE (Farnborough)
CFI Mick Wells recently clocked up 1204km over several flights at Benalla despite unseasonable "English" weather.

At the AGM the retiring committee members were thanked for their work. The chairman said the club was at its healthiest for years.

Easter Sunday saw the first three cross-countries of the year when Rob Taylor, Paul French and Rod Westbrook flew to Odiham.

A special thanks to Dave Pearson and Neil Emerson for their work on our two-seater fleet, seen in all its glory on the front cover of this issue.
M.T.D.

RATTLESDEN (Rattlesden Airfield)
Thanks to the efforts of many, but in particular Roy and Roger Firmin and Peter Neeves, our rather tatty World War 2 control tower has been transformed into a clubhouse which will be the envy of many. Our oak panelled, mock beamed, Regency style embossed wallpaper bar aptly named "The Turn and Slip Inn" complements our executive style lounge area and kitchen complete with serving hatch - and this must be called "The Pre-stall Buffet". We haven't a name for the lounge area yet.

The annual dinner was a tremendous success and an impromptu cabaret by members filled the gap left by our decision not to have any guests speakers - greatly appreciated and much preferred.

Our weekend courses continue to be fully booked, bringing in much needed revenue. The committee thanks members for putting up with an influx of a dozen or more strangers once a month.

Congratulations to John Goldsmith on going solo and completing his Bronze legs during the Easter Flying week and to John Lee for being our first member to go solo on his 16th birthday.
R.W.



John Lee of Rattlesden GC who went solo on his 16th birthday.

SCOTTISH GLIDING UNION (Portmoak)
Courses got off to a good start but Easter visitors had a mixed reception with poor weather to begin with. Richard Allcoat, Lawrence McPhillips and Vic Roberts have their AEI ratings and congratulations also to John Brady (Silver badge).

Stan Milne finishes his three years as chairman with a financial year much improved on last year's and we are looking forward to a period of expansion. The catering has been franchised and being run successfully by Joe and Alma Nugent, and we hope shortly to have new office accommodation. John Ferguson has taken over from Peter Copland as treasurer - we wish Peter a successful recovery from his illness.

We are sad to record the death of George Buchanan who looked after our tugs in recent years.
M.J.R.

SHALBOURNE (Rivar Hill)
Six weeks of no flying due to wet weather and a waterlogged airfield did little for morale or club finances, so the sunny Easter weekend was more than welcome. The Bergfalke 4 is on line and looking very smart after work from the usual dedicated band.

We have had another break in. There was not much damage or anything missing, but our Land ➡

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Rover was taken on a joyride and found three days later in a local wood – now there is more to do for our overworked equipment officer.

Congratulations to Malcolm Black on going solo and to Dennis Maynard and Mark Woolridge on passing their Bronze paper.
S.C.O.

STRATFORD ON AVON (Snitterfield Airfield)
Our local ridge gives many interesting, sustained flights in prevailing WSW winds of moderate speed. We are becoming adept at exploring local soaring spots and improving our knowledge ready for the season.

A diesel Daihatsu has proved to be the best cable retrieve vehicle ever and superb for soggy conditions. The toilets' irrigation is fully operative thanks to the hard work of Martyn Greenwood and Robin Smith who celebrated their solos by renewed strength in their digging operations!

Congratulations also on going solo to John Boddington and Robin Childs, to Paul Timms on his Bronze badge and to Martyn Greenwood and Mike Calder on their Bronze legs.

We have a spring dinner-dance and expedition to Sutton Bank this month.
H.G.W.

Obituary - Andy Coffee
It is with great sadness that we record the loss of Andy Coffee on Easter Sunday after a short illness.

A founder member, Andy was the club's original chairman, an office he held with distinction for many years. His dedicated leadership inspired the club's rapid growth and earned him universal respect. Having firmly established the club, he finally relinquished his chairmanship, only to take on the unenviable role of treasurer.

In recognition of his exceptional service, Andy became the only member to be granted honorary life membership.

A wartime Spitfire pilot, his passion for flying shone through in his style of instructing; authoritative yet always enthusiastic, warm and considerate.

Whether known to us as a leader, a teacher or simply a friend, Andy will be remembered as a true gentleman, a veritable statesman in the gliding movement and an example to us all.

Our sincere condolences to his wife Beryl, son Mike and daughter Carol. Andy will be sorely missed by us all but remembered with great affection.
Chris Morris

SURREY & HANTS (Lasham Airfield)
At the AGM the Southdown Aero Services trophy went to George Caswell for progressing from solo to blue card (requiring two 100km cross-countries) in a year. Roy Pentecost received the trophy for a series of long pre-declared flights.

Well done to Sue Hinder for completing her Gold badge with the height gain this winter.

For a trial period three of the five K-8s have been removed from the morning ballot. They will be allocated by the CFI/group leader as seems most appropriate given the weather and requirements of pupils. This should result in more members being satisfied more of the time.
C.G.S.

THRUXTON (Thruxton Airfield)
Despite losing our tug for three months for wing refurbishments, Neville Almond, Tony Bailey and Tony Walker have gone solo and Ian Grant, Andy Mercy and Barry Lovett have AEI ratings. Congratulations to all.

We are now operating mid week.
J.B.L.

TWO RIVERS (RAF Laarbruch)
Martin Pengelly proposed to Lynn Turner during a hangar flight in the Twin Astir. Congratulations and best wishes to them both.

Congratulations also to Andy Gardiner, Colin James, Phil Jones, Mitch Mitchell and Martin Pengelly, our first to have AEI ratings (Andy and Colin going on to become assistant Cats), and to Ian Pettman on his full Cat rating.

The private fleet has expanded with an ASW-20 bought by Mike Foreman and Keith Curtis, an Astir by Dave Mayfield and "Taff" Williams has bought Jules Jansen's K-2.

Paul Burston, Jim Brayford, Derek Taylor, Mike Law and Mick Morton have been posted and will be a great loss.

We are half way through our four week Sisteron expedition and Kevin Baker has his 5hrs and Bodo Heuser flew Gold height but had a problem with his barograph.
I.P.

VECTIS (Sandown Airport, Isle of Wight)
CFI Neil Watts started the soaring season on January 2 with a 1½hr flight under an 8/8 sky.

For the second winter we have worked on the Super Cub (G-BAFS), this time re-covering it, replacing wing spars and rebuilding the fuselage, engine and undercarriage.

At our AGM in March Peter Tuppen retired as treasurer after 3½yrs' conscientious service and was replaced by Jenny Pragnell with John Chape as our new safety officer and Andy Noctor as publicity/social secretary.

An ASW-15 and a K-6E join our club fleet. We have another expedition to Saumur, France in June.
A.J.N.

WELLAND (Middleton)
Following our AGM the new committee comprises Peter Strong, Barry Chadwick, Phil West, Dave Strachan, Al Booth and Norman Martin. Alan Bushnell and Ken Wells were thanked for their past services.

At the annual dinner the awards were as follows: Duration shield, Gerard O'Callaghan; Distance cup, Barry Chadwick; "267" trophy, Keith Scott; Ray Clarke trophy, Bernard Underwood and *Ab-Initio* cup, Al Booth.
R.H.S.

WOLDS (Pocklington)
We have only had one good flying day in March. Our new Astir is proving popular and our syndicate gliders have increased to 25 with the addition of two ASW-20s, a Pirat and a Std Jantar which should keep the Pawnee busy.
S.McN.

WYVERN (RAF Upavon)
At the AGM annual awards went to Bob Brett (Mike's mug for best *ab-initio*), Rik Malam (Aquila cup), Alan Millson (CRI's trophy) with Roy Gaunt and Alan Millson sharing the award for the longest flight.

Justin Lavender gained his 5hrs on Huish ridge, Congratulations to them all.
D.G.

YORK GLIDING CENTRE (Rufforth Airfield)
We are learning to live with the noise of microlights now operating from a corner of the airfield not owned by us – so much for planning laws!

There is more flying throughout the week and evening trial instruction lessons. Our holiday courses are almost booked, and we may have to have additional ones to meet the demand. We are on the way to realising Rufforth's full potential as an attractive soaring and holiday site. We welcome Colin Jacques as a full time aircraft engineer.

Membership is steadily increasing with some good progress. Congratulations to Stuart Sampson. Howard Milner, John Empsall, Graeme Reay and Mike Cohler on going solo; to Meg Stark and Alan Swales on their Gold and Diamond heights respectively from Rufforth and to Andy Todd and Richard Stembrowicz on becoming assistant instructors.
C.R.

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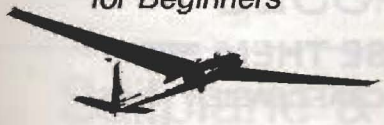
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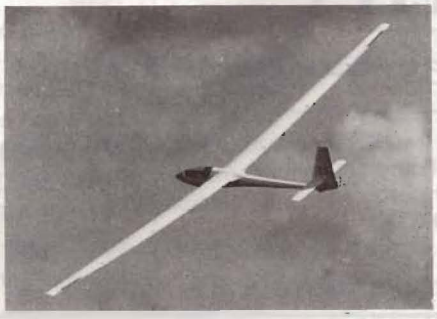
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AN 66C/50:1 Open Class, Swiss glass/wood construction, very good condition, full instruments (electric vario, radio 720 channel, parachute) with trailer. ONLY £7000!

*Contact **Léonard Favre, Route de Choëx 10, CH-1870, Monthey, Switzerland. Tel 025/713120***

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ELFE-S4D, JUBI built. 15m glass, low hrs. Very good condition, metal trailer, basic instruments. Offers. Tel 01-349 2408.

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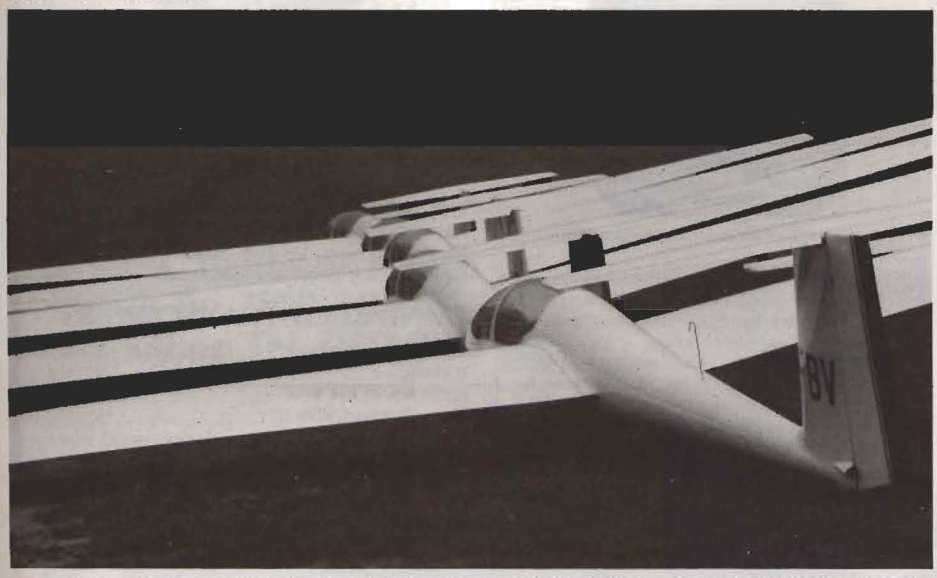
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As mentioned in the BGA and General News section in the last issue, our classified advertisements will also be circulated in the interim month to clubs and S&G subscribers. The cost of the combined service will be £12, including VAT, for 20 words. Photographs will cost £5 extra and Box Nos. £2.50.

ODD SHOTS



The London GC K-21 fleet photographed by John Richardson in 1986. Have you an unusual gliding photograph for this picture feature? Black and white or good quality colour prints reproduce well.

SPEED ASTIR 11B. 15m flapped. Very good condition. 175hrs. One owner since new. Instruments, T/S, electric vario, computer VW911 and radio TM6. Parachute, glass-fibre trailer. £15000. Contact 0422 73487 (Mid June onwards).



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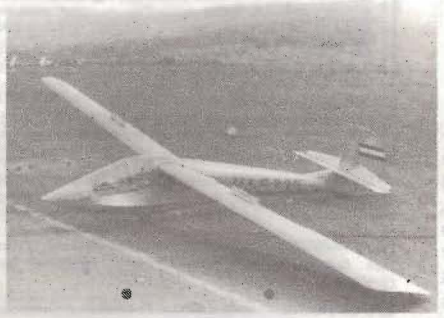
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CLOSED Trailer for K-6CR. Must be road worthy. Tel 0477 34655 or 0329 832801 (eves).

K-6E, preferably with trailer & ready to Fly - Tel 0834 4225 - Tony.

SLINGSBY SWALLOW wanted. Details please on 0740 656693. Answer machine when not at home.

ENCLOSED TRAILER wanted for two-seater in reasonable condition. Contact L E Rotter on 0244 326555.

RALLYE 180 with hook for glider towing. Tel John Scott 0386 860125 Eves and Weekends.

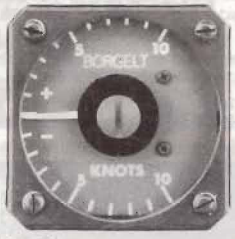
DAMAGED GLASS-FIBRE glider by private buyer. Top price paid - would consider complete outfit. Will travel in Europe to view. Tel 01-998 1510.

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The Borgelt Flight Enhancement system is built to the highest quality and uses the B-21 as the basic building block unit. The B24/25 units are upwardly compatible and can be added at any stage to make up a full system. The Borgelt equipment is suitable for all levels of Glider Pilot and can greatly enhance flying skills by giving real time information to the Pilot in a readable presentation which can be interpreted quickly and put to use immediately in flight. Glider polars can be changed easily should the Characteristics change or the equipment be transferred to another aircraft. The Netto information presented on the B-21 is 'Real Time' air mass indication and not approximated or historical. The units are easily installed and do not involve complex wiring or plumbing. Package prices available on request.



B-21 Vario - £225.50
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B-21(R) Repeater Vario Unit - £127.95
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B-24(R) Repeater Unit - £184.95
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NEW ZEALAND: "Gliding Kiwi" official Gliding Magazine of NZ Gliding Association. Printed October and alternate months. Write NZ Gliding KIWI, Private Bag, Tauranga, New Zealand. £10.00 Sterling for year's subscription (inclusive of postage).

AUSTRALIAN GLIDING, monthly publication of the Gliding Federation of Australia, Editor Allan Ash. A complete coverage of Australian Soaring and exclusive features of international interest. Subscription. Surface mail $A35.00, airmail $A55.00pa (12 issues), payable in Australian currency or by international money order. Subscribers may also pay by cheque (UK pounds) as follows: surface mail £18.00, airmail £27.00. Box 1650, GPO, Adelaide, South Australia 5501.

Poetry Corner

FIRST SOLO

Up slack! All out! Comes the cry.
Training's done, ready to fly.
First solo flight, this is it!
Butterflies flutter in stomach's pit.
Sweating palms and drying mouth.
Wind direction? From the south?
Behind P1 vacant seat,
No harshness of instructor's bleat.
Practised turns and co-ordination,
Experienced negative "*g*" sensation.
Cable breaks high and low
Ready now for that solo.

Glider's hurled into the air,
Feeling sensation beyond compare.
Swiftly up to 1000 feet
Rising air or "sink" to meet.
Unlucky - two down all the way,
Thermal practice another day.

Circuit planning next operation
Get it right for approbation.
USTAL checks on downwind flight,
Base leg! Well it looks all right.
Approach and finals, don't flap or spin.
Round out now! Yes! Safely in.

Canopy open, release the straps,
Another flight today? Perhaps.
Elation, joy, the head - it flips.
Subsequent dual and solo trips.
Enthusiasm - the fire doth burn.
Yet from this point much to learn.

Dave Firman

GLIDING

Here,
the rush of air is
silence.
Trapped within myself,
I would almost
cry as soon as
speak.
Below,
houses are marbles
scattered by thumb
across the fields.
Roads wind crazily.
following no pattern,
While I
make circles in the
air:
a coiled spring unwinding
from sanity
to earth.

Carole Ann Wilneff

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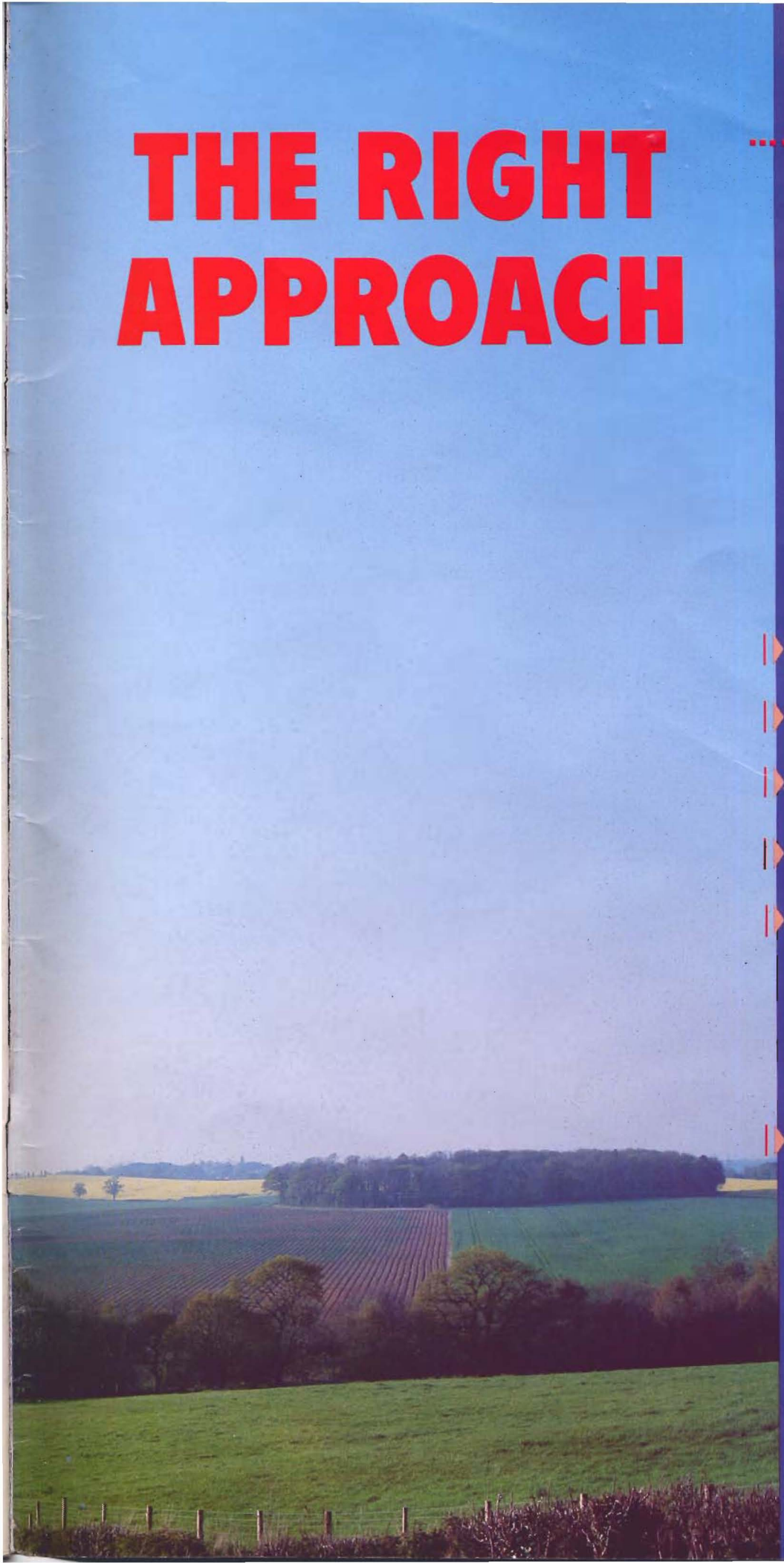
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